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# **“Vitrina Campesina”: Contribution of ICT to rural development in the Maule Region, Chile**

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## **Abstract**

In the last decades ICT has greatly contributed to the rural development in Chile, mostly in ways of education and information sharing. Most likely, many of these improvements can be achieved when ICT is widely deployed in poor remote rural areas (PRRA's). In PRRA's of the Maule Region-Chile, around 200 SMEs are active in economic activities such as: processed agricultural products, handicrafts and rural tourism services. Nevertheless many of these entrepreneurs have not managed to consolidate sustainable businesses, due to breaches such as: limited access the information for the decision making, high transaction costs to arrive to the market and their invisibility to the general public. The present project will develop and implement an integrated platform in website format to promote the commercialization of those products. The main outcomes of the project will be the generation of a georeferenced digital platform to supply the following services: diffusion, e-commerce, education and communication among the entrepreneurs. In the present article we present preliminary result about de characterization of 25 selected SMEs associated to processed agricultural products, handicrafts and rural tourism services in the Maule Region-Chile and the main critical points for implementing a digital platform among them.

## **Keywords:**

Internet Platform; Agritourism; Rural development; Community tourism

## **Introduction and objectives:**

According to estimates by the Institute of Agricultural Development in Chile (INDAP), around 200 SMEs are actively developing their activities related to processed agricultural products, handicrafts and rural tourism services in the Maule Region-Chile. Nevertheless these entrepreneurs have not managed to consolidate sustainable businesses, due to breaches such as: limited access to information for the decision making, high transaction costs to arrive to the market and their invisibility to the general public. In order to increase the competitiveness of the sector, international institutions, such as IICA, the FAO, the UE and the Regional Government Maule (GORE-Maule), have recommended in their Strategy 2020, the shortening of the commercialization chains by utilizing “Short Chains Commercial Models” and the incorporation of Information and Communication Technology (ICT) in the management of these small companies. ICT services can support development in rural areas (Okhovvat et al., 2009), but limited access to it in the past meant that rural communities lacked basic information that could assist them in improving their livelihoods. With the cooperation of the government, and local communities a reliable telecommunications network had been built In PRRA's of the Maule Region, especially during the last five years, providing communities with access to the internet and the possibility to develop applications such as e-government, e-commerce, e-learning, e-banking and other types of electronic services.

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The main objective of the project is to generate a georeferenced thematic information base in a digital format about the regional supply processed agricultural products, handicrafts and rural tourism services in the Maule Region-Chile.

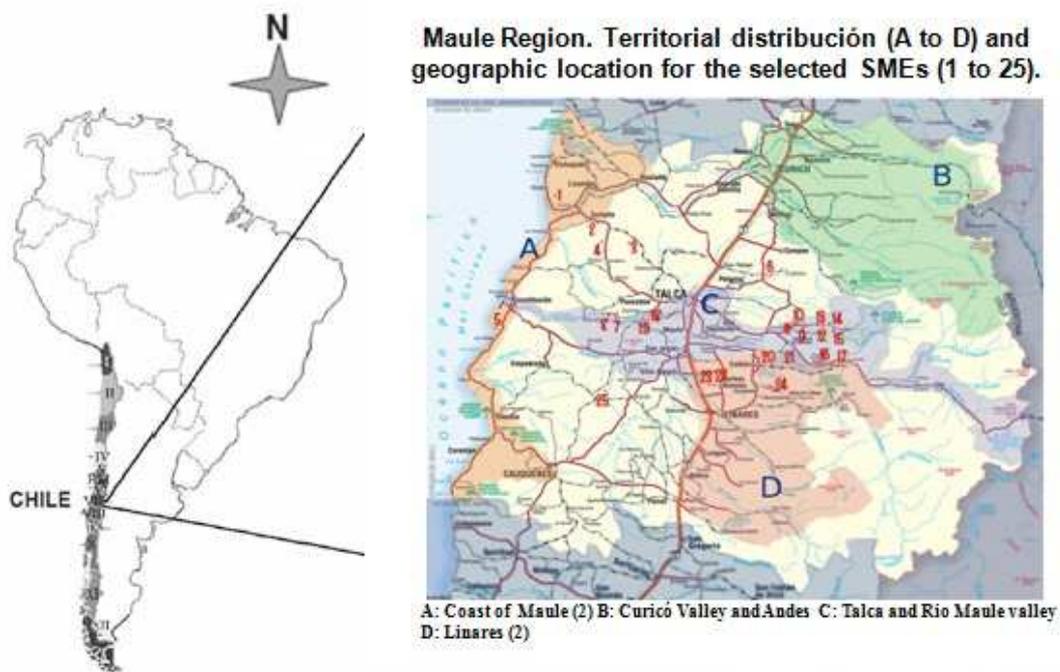
In the present work preliminary data about the Identification/characterization, and description of the most important critical points for selected SMEs associated to processed agricultural products, handicrafts and rural tourism services in the Maule Region-Chile to join the platform.

## Material and methods:

### Project Location

#### Maule Region

Coordinates: 35°26'S 71°40'W. The region covers an area of 30,296 km<sup>2</sup> and is bordered on the west by the Pacific Ocean; on the east by the Argentine Republic (Figure 1). Maule Region is also the area that concentrates a higher proportion of rural population in Chile (35.5%) (Jara et al., 2012).



**Figure 1.** Map of the Maule Region with the territorial distribution and geographic location for selected SMEs (see also Table 1).

### Characterization of 25 selected SMEs

From the total number of SMEs associated to the platform “Vitrina Campesina”, 25 of them were selected for this study. Their main characteristics are described in Table 1. Locations are presented also in Figure 1.

**Tab. 1 Characterization of selected SMEs**

Names		Commune (Figure 1)		Location (UTM coordinates)			Main activity	
				Zone	Latitude (S)	Longitu de (W)		
1	María Catalan	Licantén	1	18	6122800	757894	Adventure tourism	Hippotherapy
2	Jaime Reyes	Curepto	2	18	6111795	228020	Agrotourism	Horse ride
3	María Saez	Curepto	2	19	6101345	239326	Agrotourism	Agro-hostel
4	Nibaldo Bravo	Curepto	2	18	6102062	228191	Agrotourism	Agro-hostel
5	Eliana Bueno	Constitución	3	18	6077024	728447	Agrotourism	Agro-hostel
6	Ana Maturana	Pelarco	4	19	6084415	289291	Agrotourism	Agro-hostel
7	María Lopez	Pencahue	5	19	6071947	233843	Agrotourism	Agro-hostel
8	Berta Rojas	Pencahue	5	19	6072359	233271	Agrotourism	Agro-hostel
9	Andrés Lopez	San Clemente	6	19	6061981	304447	Adventure tourism	Horse ride
10	María Muñoz	San Clemente	6	19	6062289	300611	Agrotourism	Handicrafts
11	María Casanovad	San Clemente	6	19	6062330	300123	Agrotourism	Handicrafts
12	Francisco Pacheco	San Clemente	6	19	6060204	309035	Agrotourism	Handicrafts
13	Eladio Gajardo	San Clemente	6	19	6060822	308760	Agrotourism	Horse ride
14	Clara Astaburuga	San Clemente	6	19	6060275	309410	Agrotourism	Processed agricultural products
15	María Valenzuela	San Clemente	6	19	6057936	312072	Agrotourism	Processed agricultural products
16	Gabriel Valenzuela	San Clemente	6	19	6044991	302457	Wellness tourism	Termal bath
17	Elizabeth Hernandez	San Clemente	6	19	6046201	308450	Agrotourism	Processed agricultural products
18	Telma Baez	Maule	7	19	6069862	241328	Agrotourism	Horse ride
19	Irma Jofré	Maule	7	19	6069331	240944	Agrotourism	Handicrafts
20	Ana Molina	Colbún	8	19	6046019	290417	Agrotourism	Agro-hostel
21	Néstor Basoalto	Colbún	8	19	6046062	291262	Agrotourism	Agro-hostel
22	María Antunez	Yerbas Buenas	9	19	6039341	262756	Agrotourism	Agro-hostel
23	Mirtha Antunez	Yerbas Buenas	9	19	6039535	262452	Agrotourism	Agro-hostel
24	Milsa Sepuelveda	Linares	10	19	6038190	283167	Agrotourism	Agro-hostel
25	Juan Abarza	Cauquenes	11	18	6043140	760001	Agrotourism	Processed agricultural products

## Characterization

In order to characterize the SMEs, a survey with continuous/discrete variables was applied. Among the main variables included, in the present study: Name, location, size, type of activity, gender and age distribution, access to Internet, competences in ICT, Level of education, total income per family in one year (CLP), including all economic activities, Total income per family in one year (CLP), including only economic activities related to the project. Main critical points for the success of the activities (Own perception of SMEs). Additional information from previous surveys applied by INDAP was also utilized.

## Results:

The group is conform mainly by women (68%) and the average age is 56 years. 40% of the participants range from 55 to 65 years and 24% are between 30 and 45 years (Table 2). The percentage of the total income per family in one year (CLP), represented by the economic activities related to the project is 67% (2.590.400 CLP average) (Table 3). Quantile distribution for the 25 SMEs is presented in table 4.

**Tab. 2 Descriptive statistics (Gender and age distribution)**

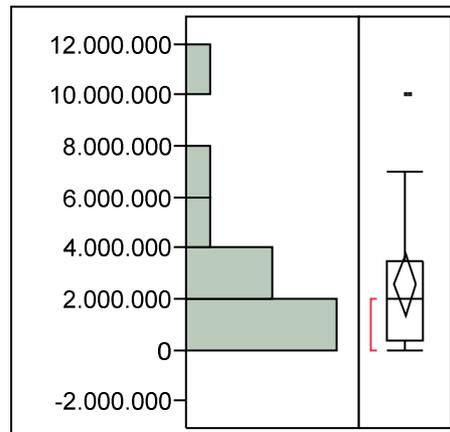
Gender	N	Men		Women		Age parameters	
		N°	%	N°	%	Mean	56,8
<b>Age distribution</b>	25	N°	%	N°	%	Median	57
<35						1	4
36-47		4	16	3	12	Range	45
48 - 59		0	0	7	28	Min	37
60 - 71		3	12	5	20	Max	82
72<		0	0	2	8		
<b>TOTAL</b>		<b>8</b>	<b>32</b>	<b>17</b>	<b>68%</b>		

**Tab. 3. Descriptive statistics (Income distribution)**

Variables	N	Mean	Min	Max	St.dev.
Total income per family in one year (CLP), including all economic activities	25	4.675.880	1.869.003	7.482.756	6.799.938
Total income per family in one year (CLP), including only economic activities related to the project	25	2.590.400	1.396.274	3.784.525	2.892.888
Percentage of the total income per family in one year (CLP), represented by the economic activities related to the project (%)	25	67	52,4	83,3	37

**Tab. 4. Quantile distribution for the 25 SMEs.**

Total income per family in one year (CLP), including only economic activities related to the project



The percentage of participants with complete or incomplete technical or University education is 40% and a significant percentage (36%) have only complete or Incomplete basic education (Table 5). The lack of sufficient education may be a detrimental factor for the future incorporation of these SMEs into the platform. ICT competences of the participants also reflect a low level. 16% of the women and 24% of men have none or only elemental ICT competences.

**Tab. 5. Descriptive statistics (Education level)**

Education (highest level achieved)	Men		Women	
	N°	%	N°	%
None	0	0	0	0
Incomplete basic education	1	4	3	12
Complete basic education	3	12	2	8
Incomplete secondary education	1	4	0	0
Complete secondary education	0	0	5	20
Incomplete technical or University education	1	4	3	12
Complete technical or University education	2	8	4	16

**Tab.6. Descriptive statistics (ICT competences)**

ICT competences (highest level achieved)	Men		Women	
	N°	%	N°	%
None	1	4	2	8
Elemental	3	12	4	16
Basic	4	16	5	20
Complete	1	4	5	20
Intermediary	0	0	0	0
Advanced	0	0	0	0

In the Maule Region, the percentage of the rural settings with a population of over 100 people, which are connected to the information networks is about 85%. The percentage of households with internet access is close to 60%. Nevertheless middle age people in rural Areas suffer from the widening digital gap. This is important in the case of the present project, where the participant's average age is 56 years and 40% of the participants range from 55 to 65 years. New technological innovations often fail because too much attention is still given to technical-related features without taking into account the most important parameters which directly relates to the users' adoption phenomenon (Verdegem and Marez, 2011). This is a factor that should be closely consider in the present project, specially taking into account the low ICT competences of the group.

According to the participants inadequate or insufficient promotion is the most important critical point (48%). Access to ICT and the necessary competences to manage this technologies was also considered as a very important critical point for the success of their businesses (40%) (Table 7).

**Tab.7. Main critical points for the success of the activities  
(Own perception of SMEs)**

Critical point	Level of relevance			
	First	Second	Third	%
Lack of Capital	3	4	0	28
Contextual problems	6	3	1	40
Access to ICT	6	3	1	40
Temporality of the business	2	3	0	20
Management problems	3	0	1	16
Inadequate or insufficient promotion	3	4	5	48
Lack of support (Government)	0	1	0	4
Lack of training	0	1	1	8
Insufficient demand	0	0	1	4
Competitors	0	0	1	4
Don't know	2	6	14	88
Total	25	25	25	

Other important issues that should be taken into account during the implementation of the platform are: seasonality and tourist inflow. The majority of the SMEs are runned by the own families (80% of the cases). The business is subject to high levels of seasonality. In the cases of adventure tourism and agrotourism the inflow of tourists is concentrated in only 2 to 3 months (Summer vacations). The tourist inflow is conformed mainly by tourist from Santiago (aprox a 40%), then tourists from big cities in the region like Talca or Curicó. 11.588 visitors were registered during the season 2012-2013. This inflow may be increased if by means of the promotion activities of the platform.



**Pic. 1 Fiesta de los Negros (Blacks carnival) in Licanten, Maule Region. Photo by Victor Manuel Moya**

## **Conclusions:**

In order to be successful in the adoption of this new technological innovation (Vitrina Campesina Platform) attention should be focused not only in the technical-related features, but also on very important parameters which directly relates to the users' adoption phenomenon.

Among the main aspects that should be improved are: Access to ICT, ICT competences and promotion.

Training activities should be carried out considering gender and age factors of the group

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# The area of oilseed rape needed in cultivation conditions of Slovak republic by the variable percentage of FAME in diesel

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Pavol FINDURA<sup>3</sup>

## Abstract

Agriculture is an important part of the economy of state, employs people and performs irreplaceable role in ensuring nutrition. The basic production resource is land. Characteristic activity in agriculture is currently the cultivation of soil and planting crops. One of the most oilseed crops, which are grown in Slovakia, is oilseed rape which use is negligible as in human nutrition, as well as in the cosmetic and pharmaceutical industries and in recent years is growing its importance by increasing biofuel production. More attention is paid right to biofuels, which recently observed a significant increase in the world but also in Slovak Republic. Increased production of FAME in Slovakia affects the use of oilseed rape for industrial purposes, instead of human nutrition. Our article is focused on sown area of oilseed rape, which is needed to satisfy the demand for FAME at different levels of blending mandates in Slovak Republic. The aim of this paper, based on increasing the percentage of FAME in diesel fuel for the period 2005-2012, is to analyze the impact on the cultivation area of oilseed rape, under conditions we do not take into account foreign trade. Materials needed to prepare article are derived from secondary sources, mainly from the Situation and Outlook Reports of Research Institute of Agricultural and Food Economics, as well as from other sources. In the methodology we work with several relationships and value. During the processing of the data we used base and chain indices that allow us to express the growth and decline observed values with respect to the baseline period and the previous period. The need of oilseed rape area under cultivation, which is used to produce FAME, we calculated based on actual average indicators in the Slovak Republic for the chosen period. To the above calculation we used the following indicators: the percentage of biodiesel in the fuel, adopted by Government Regulation of SR, yield coefficient of rapeseed oil, diesel consumption in each year, and average yield from 1 ha<sup>-1</sup> of oilseed rape. Production of FAME from 1 ha<sup>-1</sup> of oilseed rape was calculated as a conjunction of the harvest from 1 hectare<sup>-1</sup> of oilseed rape and yield coefficient of oil from rapeseed, which represents about 34%. Under these assumptions, the consumption of FAME is equal to the conjunction of diesel of the year and the percentage of FAME in diesel. Total consumption of FAME in Slovakia we divided by FAME production from 1 ha<sup>-1</sup> of oilseed rape and we got projected sowing area of oilseed rape, which is needed to cover the needs of FAME in diesel. The work indicates to the increase in consumption of oilseed rape for the FAME production and the associated loss of land needed for the nutrition of the population. Renowned economists critically point to that condition, which may be the cause of rising food prices. The present article gives an overview of the actual needs of hectares for biodiesel production in the legislative conditions in Slovak Republic. Our article can serve as a methodological basis for further research, which will deal with the general loss of agricultural land due to the progress of the biofuel industry in the EU and worldwide.

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**Key words:**

cultivation area, oilseed rape, yield, FAME, legislation

**Introduction**

Everyday part of life is energy and people use its various forms, depending on the reason for using it. With increasing energy needs, the society must minimize the negative impact on the environment and therefore it is necessary to increase the share of renewable energy in daily life. Movement of energy development is slowly but surely changing from conventional combustion of fossil fuels and the use of traditional technologies for incineration, towards the use of environmentally friendly fuels and energy from renewable sources. Importance of renewable energy sources is undoubtedly increases and takes on added significance.

Fossil fuel shortage and environmental pollution are considered to be two basic energy problems of mankind. Interest of the EU in achieving energy efficiency presents a strategy for renewable energy. EU policy in the process of promoting renewable energy focuses also on the fuels in the transport sector. Thanks negative response to the consumption of biofuels under the new EC proposal, which wants to achieve that in 2020 the half of the defined 10% of biofuels will be second-generation biofuels, produced from waste materials instead of agricultural crops.

New market economy conditions, the entry of foreign retail chains to our markets and relative surplus food in economically developed countries creates for our farmers a new perspective on business. Was released a considerable amount of land that is no longer needed for cultivation forage for animal feed. Significantly increased area of cereals and oilseeds and these sectors are preferred because they are well feasible on Slovak agrarian market and abroad and economically contribute to the profit farms.

Oil seed crops are grown in order to obtain production of oilseeds, and serve as raw material for the production of vegetable fats and oils. In addition to human nutrition, oilseed products are important in the pharmaceutical and cosmetic industry as well as raw materials for biodiesel and lubricants production.

**Biofuels as an alternative energy source**

Nowadays biofuels represent one of the most discussed groups of alternative fuels. One reason for their introduction to daily use is that they are among the renewable energy sources that one has available and their stocks are refreshed at intervals comparable to their use, unlike fossil fuels, which can be depleted within a few decades. Another reason is that increased consumption of biofuels in transport sector, can reduce dependence on imported oil and influence the fuel market. Last reason, but not least is, that the cultivation of biomass for biofuel production offers additional use of agricultural land and it is one of the opportunities to create jobs in the sector of agriculture and forestry. In general, the production of biofuels must be environmentally sustainable.<sup>1</sup>

There are many definitions for biofuels, a majority of which is identical and differ only minimally. According to most experts, biofuels are fuels derived from organic matter, respectively. biomass, which is produced in agriculture, forestry or fisheries, as well as waste from agriculture and food industry.<sup>2</sup>

The use of biological materials and sources of energy that is renewable and which can mitigate the accumulation of carbon dioxide, has attracted considerable attention. Divide the use of biofuels according to the form:

- Solid fuels: biomass and waste
- Gaseous fuels: bio-methane (biogas), hydrogen and dimethyl ether (DME)

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<sup>1</sup>Hromádko, J. (2012) Speciální spalovací motory a alternativní pohony

<sup>2</sup>Pokrivčák, J. et al (2011) The Economic Impacts of Increasing Biofuels Production

- Liquid fuels: methanol, bio-ethanol, bio-butanol, synthetic diesel, synthetic diesel, bio-diesel, (esters, organic oils, hydrocarbons plants and algae oil algae).<sup>3</sup>

Support for the production of biofuels in the last decade caused, that this issue is becoming increasingly debated. Primary benefits and advantages of replacing fossil fuels with biofuels, were replaced by critical feedback. Biofuels have become particularly interesting because thanks to them it is possible to dispose of dependence on imported oil and reduce global warming. Critics argue that because of the expansion of biofuels production, began the grubbing of forests, which absorb carbon dioxide. Another reason for criticism became just the rivalry of agricultural crops used for the production of biofuels and food.<sup>4</sup> Biofuels added to the fuel, are according to several studies responsible for rising food prices. Price increase is associated just with crops used for biofuels.<sup>5</sup>

Critical opinions are accompanied by the opinions, which support biofuel production. European farmers argue that increase in agricultural commodity price is unrelated to the production of biofuels and cultivation of crops for biofuel production does not occupy the land for food, because the EU is still plenty of unused arable land. According to them, the biofuels industry is important for agriculture because it creates new jobs.<sup>6</sup>

### Support tools for biofuel production

In most countries, developed and developing, the production of biofuels is supported by the many support tools. States use one of them, or a combination of more tools. The share of biofuels for all producers in the market is pre-determined, whether in the form of pure biofuel or blended with fossil fuels.<sup>7</sup>

*Blending mandates-* Countries have set a target of achieving a certain share of renewable energy in total energy consumption and the share of renewable energy sources in the total fuel consumption. In the EU, the target was 5% share of renewable energy in transport by 2015 and a 10% share by 2020. The Commission later proposed limit the amount of biofuels and bioliquids produced from food crops that can be counted towards the EU target to the current level of consumption of 5% by 2020.<sup>8</sup>

Other support tools include *tax exemptions-* In general, fossil fuels are charged with high tax and to support the production of biofuels, some countries have introduced tax relief biofuel consumption. EU Member States may allow tax reductions or exemptions for fuels from renewable resources.

*Subsidies for biomass production-* In order to reduce production cost of biofuels and to support farmers' incomes, some countries provide subsidies for biomass production.

*Grants and loans-* To build ethanol refineries and manufacturing enterprise to produce biodiesel, governments provide investment grants, which reduce investment costs.

*Price support-* Price support may also be one of the tools to increase the production of biofuels. The government determines the guaranteed price above the equilibrium market price.

*Duties and quotas-* This tool is used by countries to support domestic producers of biofuels. Most of the countries producing bioethanol use MFN duty (most favored nation), which adds at least 20%, or 0.10 euro per liter to the price of imported ethanol.

*Research and development of biofuels-* Many countries regularly invests in applied research of biofuels. The European Union supports research and development through its research framework programs.

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<sup>3</sup> Scragg, A. (2009) Biofuels: Production, Application and Development

<sup>4</sup> European Parliament (2008) Workshop on biofuels :eco saviours or destroyers?

<sup>5</sup> EurActive (2013) EU report: Brussels biofuels policy hikes food prices by up to 50%

<sup>6</sup> Webnoviny (2013) Európski farmári bojujú za biopalivá

<sup>7</sup> Pokrivčák, J. et al (2011) The Economic Impacts of Increasing Biofuels Production

<sup>8</sup> European Commission (2012) : New Commission proposal to minimise the climate impacts of biofuel production

## Slovak legislation on biofuels

Based on Government Regulation No. 246 / 2006 about the minimum quantity of fuel produced from renewable sources, according to Directive 2003/30 / EC, manufacturers and retailers are obliged to offer motor gasoline and diesel used for transport purposes minimum of specified amount of bio fuels or other renewable fuels. By 2009 it will be 2% of the fuel since the beginning of 2010, this limit shifts to 5.75%.

The Ministry of Economy is obliged to draw up each year for the European Commission report on the production and sale of renewable fuels in Slovakia.<sup>9</sup>

In the law no. 98/2004 about excise duty on mineral oils is anchored tax relief for bio fuels. Bio components added to fuels of maximal amount 5% of esters and 15% of ETBE are exempt from excise duty.<sup>10</sup>

Act no. 309/2009 about the promotion of renewable energy sources and high-effective combined production; make provision for the support, production support conditions, rights and obligations of producers of bio methane. Bio methane support is provided through priority to the issuance and distribution of the quantity of biomethane. Biomethane producer must notify to the office by 31 January each year the amount of bio methane produced and supplied to the distribution system for the previous calendar year.<sup>11</sup>

## Data and Methods

The aim of this paper, based on increasing percentage of FAME in diesel for the period 2005-2012, is to analyze the impact on the cultivation area of oilseed rape, under conditions we do not take into account foreign trade. Methodology in this paper consists of two parts. First part includes data collection, which are derived from secondary sources, mainly from the Situation and Outlook Reports of Research Institute of Agricultural and Food Economics, as well as from other sources. In second part we work with several relationships and values. During the processing of the data we used base and chain indices that allow us to express the growth and decline observed values with respect to the baseline period and the previous period.

Mathematical relationship to calculate indices has following form:

$$I_b = \frac{X_t}{X_0} \quad (1)$$

Where:

$I_b$  – base index

$X_t$  – value in current year t

$X_0$  - value in base year

$$I_{ch} = \frac{X_t}{X_{t-1}} \quad (2)$$

Where:

$I_{ch}$  – chain index

$X_t$  – value in current year t

$X_{t-1}$  – value in current year t-1

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<sup>9</sup>Government Regulation č.246 / 2006 of 19 April 2006 on the minimum amount of fuels produced from renewable sources in motor gasoline and diesel fuels marketed Slovak Republic

<sup>10</sup> Act. No. 98/2004 on excise duty on mineral oil

<sup>11</sup>Act. No. 309/2009 from 19 June 2009 on the promotion of renewable energy sources and high-efficiency cogeneration.

The need of oilseed rape area under cultivation, which is used to produce FAME, we calculated based on actual average indicators in the Slovak Republic for the chosen period 2005 – 2012. To the above calculations we used following indicators:

- Percentage of biodiesel in the oil
- Yield coefficient of FAME from oilseed rape ( in %)
- Diesel consumption in SR in each year (in t<sup>-1</sup>)
- Average yield from 1 ha<sup>-1</sup> of oilseed rape ( in t.ha<sup>-1</sup>)

To calculate the production of FAME from 1 ha<sup>-1</sup> of oilseed rape we used following relationship:

$$Q_M = \bar{x}_{RO} \times \beta \quad (3)$$

Where:

- Q<sub>M</sub>- production of FAME from 1 ha<sup>-1</sup> of oilseed rape (in t)
- $\bar{x}_{RO}$  - average yield from 1 ha<sup>-1</sup> of oilseed rape (in t.ha<sup>-1</sup>)
- β- yield coefficient of FAME from 1 t<sup>-1</sup> of oilseed rape .β=0,034<sup>12</sup>

The consumption of FAME is equal to:

$$C_M = C_D \times \alpha \quad (4)$$

Where:

- C<sub>M</sub> - consumption of FAME in SR (in t<sup>-1</sup>)
- C<sub>D</sub> - consumption of diesel in SR (in t<sup>-1</sup>)
- α - percentage of biodiesel in diesel ( in %)

Under this assumptions, the area of oilseed rape needed in cultivation conditions in SR for FAME production is calculated as:

$$N_{RO} = \frac{C_M}{Q_M} \quad (5)$$

Where:

- N<sub>RO</sub> - area of oilseed rape needed (in ha<sup>-1</sup>)
- C<sub>M</sub> - detto (4)
- Q<sub>M</sub> - detto (3)

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<sup>12</sup> Cvengroš, T.(2008) : Motorové biopalivá – ich súčasný stav a perspektívy.

## Impact of biofuels production on the structure of agricultural land usage in Slovakia

In recent years, growing an oilseed crops in Slovakia is gaining in importance and its sowing structure is on the second place, after cereals. Harvested area of oilseeds since 2005 have significantly increased and in 2009 reached the highest value of 267 700 hectares. After this year, there was a decrease of harvested oilseeds area in Slovakia and in 2012 harvested area decreased to 223 100 hectares. The most grown oilseed crop in our country is oilseed rape, which share of total oilseeds is 48%. Development of harvesting areas and oilseed production during the period 2005-2012 are presented in Table 1.

**Tab. 1 Harvested area and production of oilseeds in Slovak Republic**

	2005	2006	2007	2008	2009	2010	2011	2012
<b>Oilseeds</b>								
Production (thousand t)	453,5	514,7	467,5	633,2	595,8	500,7	574,6	454,3
Harvested area (thousand ha)	213,5	250,4	231,4	249,3	267,7	267,0	257,4	223,1
<b>Oilseed rape</b>								
Production (thousand t)	235,1	259,7	321,1	424,4	386,7	322,5	332,2	212,7
Harvested area (thousand ha)	106,2	122,5	153,9	162,9	166,4	164,0	143,7	106,8
<b>Sunflower</b>								
Production ( thousand t)	195,3	228,6	132,7	192,4	187,2	150,3	201,0	197,2
Harvested area (thousand ha)	91,1	108,8	64,8	75,0	83,0	82,9	90,1	90,1
<b>Poppy seed</b>								
Production (thousand t)	0,704	0,681	0,482	1,215	0,832	0,878	0,887	0,296
Harvested area (thousand ha)	1,3	1,5	1,6	1,9	1,9	1,6	1,1	0,8
<b>Soy</b>								
Production ( thousand t)	19,0	20,6	11,0	11,4	15,4	24,1	37,0	41,9
Harvested area (thousand ha)	10,9	12,0	7,8	5,4	9,3	14	19,6	21,9

Source: authors own processing based on VUEPP data

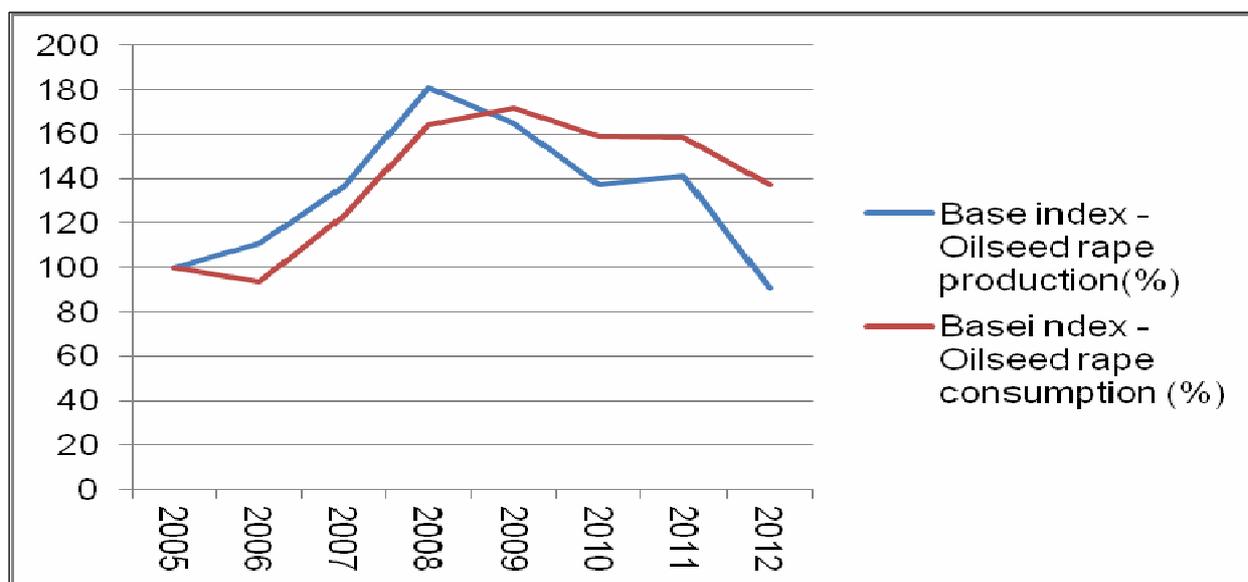
Since 2005 we have recorded rapid growth of harvested area of oilseed rape, as well as its production. This trend prevailed until 2009, when harvested area of oilseed rape was around 166 476 ha<sup>-1</sup>, compared to 2005 it is about 60 000 ha<sup>-1</sup> more. After this year, however, there was a decrease in harvested area, which in 2012 reached 106 839 ha<sup>-1</sup>. See table 2. Average yield of oilseed rape from 1 ha<sup>-1</sup> in production conditions of the SR fluctuates significantly, which is mainly caused by different climate conditions in different years. This trend is the most significant in 2010, when the yield of oilseed rape reached only 1.97 t. ha<sup>-1</sup>. The highest yields per hectare were recorded in 2008 with 2.61 t .ha<sup>-1</sup>. In 2012 there was a decline in total balance sheet indicators of oilseed rape because of bad weather. From the values of chain indices from rated years 2005 - 2012 shows, that the production of oilseed rape in Slovakia has each year fluctuating trend. This is the result of different climate conditions.

**Tab. 2 Harvested areas, hectare yield and production of oilseed rape in Slovak Republic**

	2005	2006	2007	2008	2009	2010	2011	2012
<b>Harvested area (thousand ha)</b>	106,2	122,5	153,9	162,9	166,4	164,0	143,7	106,8
<i>Base index (%)</i>	100,1	115,4	144,8	153,4	157,0	154,0	135,0	101,0
<i>Chain index (%)</i>	X	115,4	125,6	105,9	102,2	98,5	87,6	74,4
<b>Hectare yield (t.ha<sup>-1</sup>)</b>	2,21	2,12	2,09	2,61	2,32	1,97	2,31	1,99
<b>Production (thousand t)</b>	235,1	259,7	321,1	424,4	386,7	322,5	332,2	212,7
<i>Base index (%)</i>	100,0	110,5	136,6	180,6	164,5	137,2	141,3	90,5
<i>Chain index(%)</i>	X	110,5	123,7	132,2	91,1	83,4	103,0	64,0

Source: authors own processing based on VUEPP data

Overall, from the value of the base index is visible, that compared to 2005 there was a 10% decline in production of oilseed rape in 2012. The largest increase in production was recorded in 2008, when the yield per hectare reached its maximum value of 2.61 t. ha<sup>-1</sup>. Consumption of oilseed rape increased to almost 40% in 2012 compared to the base year. The highest consumption of oilseed rape was in 2009, up to 260 000 tons.



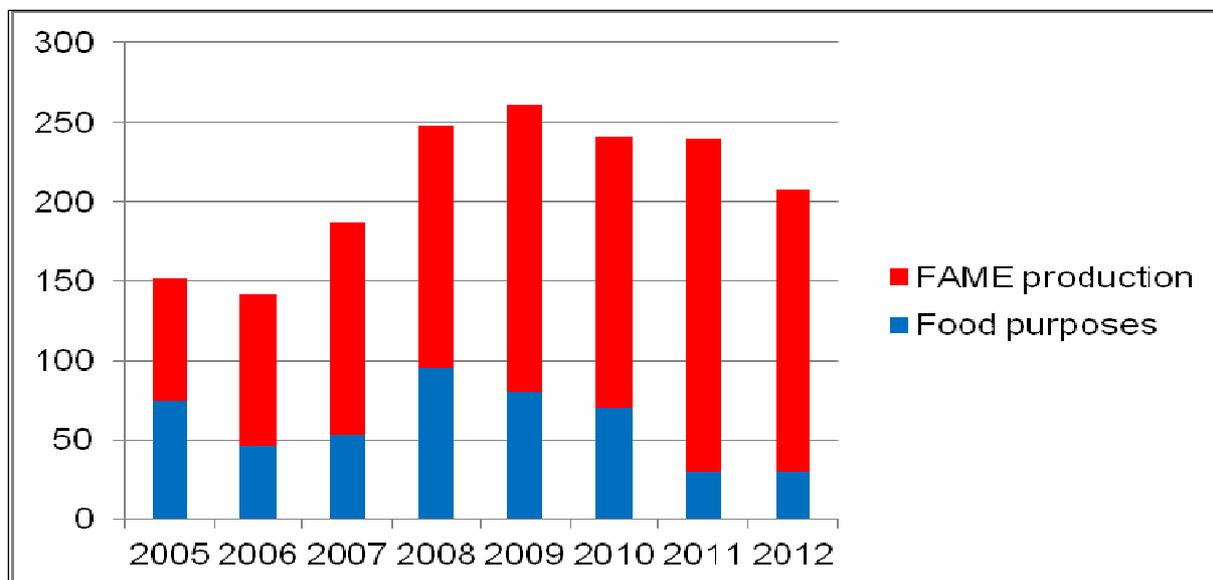
**Pic. 1 Production and consumption of oilseed rape in Slovak Republic**

Source: authors own processing based on VUEPP data

Total consumption of oilseed rape in Slovakia is divided between consumption for food purposes and for the production of biodiesel. Targets set by the Direction of the European Union substantially influence the consumption of crop. The highest consumption of oilseed rape in Slovakia was recorded in 2009 with a total consumption of 260 000 tons. Figure 2 shows the significantly changing composition of the consumption of oilseed rape. In recent years, prevails the consumption of oilseed rape for industrial purposes.

The Figure 2 shows, that the development of oilseed rape allocated for the FAME production in Slovakia recorded significant increase compared to the baseline period, which reached the highest value in 2011, up by 172,7% more than in 2005. This phenomenon is caused by supporting policy of biofuels production and consumption in the EU, which has Slovakia implemented into its legislation as an approximation While in 2005 the

consumption of oilseed rape was almost equally divided between consumption for food and for the production of FAME, this trend is gradually changing in favour of biodiesel production. In 2012, 85,6% of oilseed rape was consumed used for biofuel production.



**Pic. 2 Purposes of oilseed rape consumption in Slovakia (in thousands t)**

Source: authors own processing based on VUEPP data

With increasing fuel consumption in transportation and changing legislation in the field of renewable energy sources, has also changed the purpose of oilseed rape consumption. As was already mentioned above, consumption of rapeseed oil for the FAME production clearly outweighs the consumption for the food purposes of the population. With increasing consumption increases the need for agricultural land for growing rapeseed oil for biofuel production. Significantly, this area should be affected by the yield and percentage of FAME in diesel fuel. Table 3 highlights the ever changing hectare yields, percentage of biofuel in diesel fuel, which was different in each year in Slovakia.

**Tab. 3 Indicators affecting the changing needs of land for biofuel production in SR**

	2005	2006	2007	2008	2009	2010	2011	2012
<b>Hectare yield (t.ha<sup>-1</sup>)</b>	2,21	2,12	2,09	2,61	2,32	1,97	2,31	1,99
<b>Percentage of FAME in diesel (%)<sup>13</sup></b>	1,46	1,04	3,13	3,63	3,4	4,41	5,03	4,81
<b>Consumption of diesel (thousand t)<sup>14</sup></b>	1124	1263	1360	1384	1274	1547	1566	1486

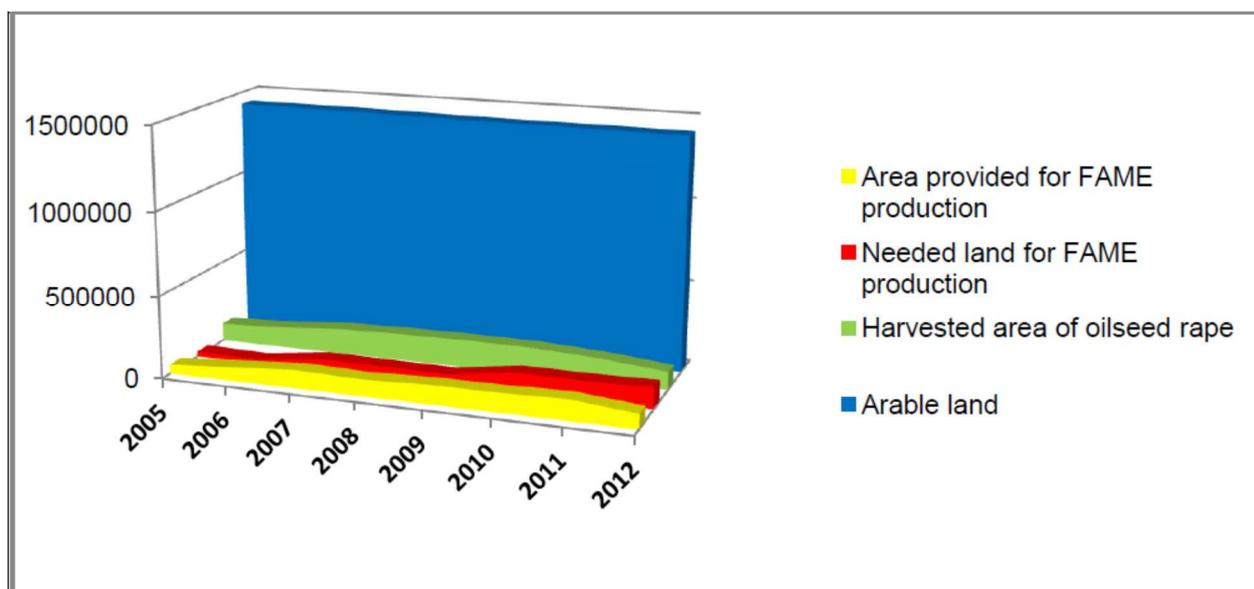
Source: authors own processing based on VUEPP data, Government Report and SAPPO data

Figure 3 shows the development of arable land needed for the cultivation of oilseed rape. Harvested area shows fluctuating trend of oilseed rape sowing. The need of oilseed rape for FAME production since 2005 steadily increased. It is a consequence of the introduction of the European Union policy, which increases the proportion of FAME in diesel fuel. While in 2005 the harvested area of oilseed rape amounted to 106 204 ha<sup>-1</sup> and the need for the area under cultivation of oilseed rape under the current yield and % share of FAME in diesel only 30 000 ha<sup>-1</sup>, in 2012 the need of the oilseed rape area for the production

<sup>13</sup> Report on the use of bio-components in motor fuels in 2008 the Ordinance of the Government no. 246/2006

<sup>14</sup> SAPPO(2013): Annual Report 2013

of FAME exceeded the harvested area. In Slovakia was recorded significant reduction production of rapeseed oil for food purposes, as enterprise Palma Group -Bratislava finished its production on 1.1.2012 and Slovak Republic currently import 95% of rapeseed oil for food purposes from abroad. Sales options are reduced only to the production of FAME. In Slovakia currently operates several companies engaged in production of biodiesel, the largest market share has company MEROCO. Company annually processes about 200 000 tons of oilseed rape.



**Pic. 3 The ratio of arable land to the harvested area of oilseed rape and land needed to produce FAME in Slovakia (in ha<sup>-1</sup>)**

Source: authors own processing and calculation based on VUEPP data

## Conclusions:

Slovak Republic is a country with a relatively small area of agricultural land per capita. In Slovakia currently accounts about 0,44 hectares of agricultural land per capita and 0,26 hectares of arable land per capita. In the world the ratio is 0,80 ha<sup>-1</sup> of agricultural land and 0,27 ha<sup>-1</sup> of arable land.

In recent decades, the structure of the land is unfavorable developing, which is manifested by a significant loss of agricultural land in the context of intensive construction and the downgrading of agricultural production. Since 1950 there is about 380 000 ha<sup>-1</sup> of agricultural land less. The reason for this is the preference of the technical and economic advantages of agricultural land for capital construction. The implications of this phenomena are the steady decline of agricultural land per 1 inhabitant.

Despite this trend, the Slovak Republic has, due to demographic changes, enough land as a production base to ensure food security from own resources. Based on analyzes, it is clear that the current production potential of Slovak soils is sufficient to cover the food supply for about 6, 2 million people.

Currently has Slovak Republic about 5,5 million inhabitants, which means that the potential of the soil are taking about 700 000 inhabitants more. From our calculations is clear that Slovakia has a surplus of arable land about 189 000 ha<sup>-1</sup>, which in its production and economic conditions may be set aside for the production of FAME. In 2012, was used for the FAME production 88 890 ha<sup>-1</sup> of arable land, which represents about 83,2% of the total land sown of oilseed rape. According to our calculations at given yield per hectare, consumption of diesel and % share of FAME in diesel, oilseed rape area needed to FAME production is amounted to 125 762,917 ha<sup>-1</sup>. It follows that the rest of oilseed rape for FAME production

have been imported from abroad. However, the difference between the free arable land and land used for the production of FAME was in 2012 about 100 110 ha<sup>-1</sup>.

From our calculations implies, that in need of oilseed rape are for the production of FAME in 2012, which was 125 762,917 ha<sup>-1</sup>, falls to one inhabitant in SR about 0,027 hectares of arable land, while in 2005 in need for oilseed rape area 29 999,720 ha<sup>-1</sup> it was only 0,005 ha<sup>-1</sup>. This represents approximately 500% increase in appropriate areas of oilseed rape for the production of FAME per capita. Fortunately, as already mentioned above, Slovak Republic has enough free agricultural land to meet this need.

In all variants it is calculated with the plan of bio components development according to the approved National Action Plan for renewable energy by the year 2020. Diesel consumption in the baseline scenario should be developed to continue growing pace depending on the dynamics of economic development and the extent of the use of alternative motor fuels.

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# **Agriculture production of member states in the context of development of the EU common market**

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## **Abstract:**

The paper deals with production and economic contexts and consequences of changes in the business environment of the European Union agriculture induced by both the expansion of the internal/common market and the acceleration of globalization processes. The main features of the competitiveness on the European and world market since the early nineties of the twentieth century in the context of the framework and rules of the Common agricultural policy (CAP) application are evaluated there. The results of the research are discussed in relation to the differences in production of major agricultural commodities in the old and the new EU Member States mainly. Our findings have demonstrated that the differences in dynamics of the agrarian sectors of individual member states do exist and are based and influenced by wide variety of inner and outer factors. It raises the question of whether the CAP framework allows each country to apply its own strategy appropriate to the conditions of the current and future development of this sector. It concludes that the success of specific regional development strategy is subject to its ability to find and foster links between agriculture and other sectors often exceeding the size of the region concerned. In connection with the choice of priorities of the CAP 2020 points out need to promote effective links with relevant manufacturing industries and commodity distribution along the verticals, including infrastructure development, which should be the basis for real progress associated with the identification of forms and benefits of the agricultural sector as directly connected not only with the quality of the natural resources, but also with amenities and skilled human resources able to face new challenges of modern agribusiness directions adequately.

## **Key words:**

Agriculture, agricultural policy, competitiveness, commodity markets, structural change

## **Introduction**

The original strategy of the Common agricultural policy (CAP), which was established at the end of 1950s, mainly on the principles of supporting the prices and protecting the inner market (when the decisive factor was the need of quick dealing with the lack of food), fulfilled its aim in the subsequent twenty years. The great price support really got the production growth started in the thirty years to come. At the same time, however, it caused that the level of European agriculture commodity prices was isolated from the real price and other conditions on the world agrarian market where it was ever more difficult to break through. This resulted in gradual growth of costs of removing the effects of growing surpluses of basic commodities on the unbalanced home market as well as the costs of other (already budgeted) expenses on support for export, storage and liquidations of surplus production. The need to limit arising overproduction while trying to keep relatively high prices paid to the agrarians and the challenge to balance the export conditions when the world prices were decreasing demanded, in opposition, the implementation of other strong deformational tools in the market (especially the quantity quotas, export subventions) also increased the financial demands put on this politics.

The changes of CAP strategy were in the given phase admittedly the response not only to the growing WTO pressure on the liberalization of agrarian markets, but also to the need off fundamental solution of the overproduction inner problems in the common market, that

happening in the time of falling-off of the EU position in the world market. The problem of financing the agriculture in its production and non-production dimension has been further complicated by the massive widening of the European Union with the new states of central and Eastern Europe in 2004, which was not supposed to show very much in the further growth of agriculture demands on European budget. Direct payments into the agrarians' income were offered as a suitable solution.

This solution has been especially sensitive in the context of forming the common EU market. The problem of creating the strategic frame and setting the rules of unified agrarian market for current phase and extent of production base had to be dealt with because of the more and more significantly divided production base of agriculture of 28 member states in the meanings of performance, structure and level of financial support. The important role, not only from the point of view of stabilizing the "agrarian" EU budget, was played by the direct payments. As it has been already mentioned, the process of the market extension brings many changes which should, in their results, positive influence on the development of a given economics in three spheres:

- expansion to a bigger market, supports the differentiation of producers, leads to regional removals of production capacities and to the growth of production at the most effective subjects; therefore accelerates the specialization including the potential of realizing the savings of cost from extent while using the innovations,
- increase of the competition on the wider (inner/common) market enables the improving of allocation of production factors towards the (most) effective actions and subjects; the better starting points for growth of the competitive abilities in the globalized market are created like that,
- bigger common market and growing competitiveness demand, but also enable faster scientific and technical development, development of new products, technologies and methods through the common (internationally connected) research if its direct application in praxis in all national economics included in this market.

All these changes should theoretically lead to the economic growth, to the increase of factors' productivity, higher efficiency and also to the growth of economic wellbeing of the whole society of the given district, in this case of all EU member states.

## **Data and Methods**

In this paper the authors present partial results of a long-term research that focus on the dynamics of agriculture sectors of the Member States of the European Union. Previously published results of our research can be found at e.g. Bečvářová, Vinohradský, Zdráhal (2009), Bečvářová et. al. (2008), Bečvářová, Vinohradský, Zdráhal (2010 a, b) and Bečvářová, Zdráhal (2013). In this paper are used the results obtained in previous research, but there were also added the results of new analyses that were performed on actual time series provided by FAOSTAT. More detailed description of the analyses is described below.

Evaluation of production dimension of European agriculture is based on the analyses of the development of eight key commodities of plant (wheat, coleseed, potatoes and sugar beet) and animal production (pigs, beef, milk and poultry), representing 80 % of the final EU production in the period 1993-2013 (to 2012 in case of animal products). Selected methodological approach enabled capture not only the general trends in the production of the Union as a whole (respectively in a group of old and new member states) but also offers a more comprehensive view of the development and changes in the position of the EU in the context of the current development of the global market and twenty -year period also allowed to identify the typical national responses to changes in internal conditions and external environment and covering both conceptual issues in the reactions of the old Member countries on the EU CAP reform, and especially the broader context of decreasing of the size of agriculture in the new member countries before and after accession to the EU.

## Results and discussion

### Production dimension of European agriculture in world context

From analyses of trends in crop and livestock production in the world and in the EU were mainly derived the following general finding and conclusions:

The World production of **wheat** increased from 564,5 mil. of tons in 1993 to 713,2 of tons in 2012. Production increased from 84,1 mil. of tons (EU 15) to 143,3 mil. of tons (EU 28) in EU. The increase in production takes place both in the old Member States as well as in the new Member States (in EU 15, +23,9 %; in EU 13 + 43,1 %) and therefore is not only due to the entry of new member states to the EU, but generally rising production across the EU. As a consequence of this development has increased the EU's share of world production from 14,9 % to 20,1 % in 2013.

The world production of **coarse seed** increased from 26,2 mil. of tons in 1993 to 72,5 mil of tons in 2013. Production increased from 6,6 mil. of tons to 21,0 mil. of tons in EU 28 in 2013 (production grew in both old and new Member States). Despite this significant increase in production, the share of EU production on world production increased only from 25,2 % to 29,0 % between 1993 and 2013.

The world production of **potatoes** increased from 304,9 mil. of tons to 367,8 mil. of tons in 2013. The share of European Union on World production decreased from 16,1 % to 14,2 %. Although the EU expanded to 13 countries, in both old and new Member States the production decreased in general. For new Member States we can observe very significant decline.

The world production of **sugar beet** declined from 282,4 mil. of tons to 250,2 mil. of tons in 2013. Production in the EU countries also decreases, so the EU's share of world production is maintained around 42%.

In the assessment of the evolution of the EU position in World context (in terms of volume and market share in world **milk production**), it is visible significant drop of European producer's position. The World production of milk increased from 461,4 mil. tons in 1993 to 625,8 mil. tons in 2012. In these time period, milk production in the EU accounts for roughly one quarter of total world production, but maintaining this share is primarily due to the gradual accession of the new 13 countries to the EU in the years 2004, 2007 and 2013. Overall, the share of regions that currently make up the EU on the world milk production gradually diminished from 32,6% in 1993 to 24,1% in 2012.

The World production of **cattle meat** increased from 52,1 mil. of tons to 63,3 mil. of tons in 2012. The EU production decreased and thus the share of EU production on the World production has fallen from 15,8 % to 12,2 %, and also, even in a situation, that the EU expanded to include 13 new countries.

The World production of **pork meat** increased from 73,6 mil. of tons to 109,1 mil. of tons between 1993 and 2012. The share of European Union on World production decreased from 21,8 % to 20,9 %. There are differences in the development of production in the old and new Member States. The production increased by 20,9 % in the old Member States. In the new Member States production decreased by 29,2 %.

The World production of **chicken meat** increased from 41,3 mil. of tons to 92,8 mil. of tons between 1993 and 2012. The share of European Union on World production decreased from 13,7 % to 11,1 %. Production in the period rose as in the old Member States (+36 %), and especially in the new Member States (+214 %). New Member States, however, produce only about one third of the EU 15 countries production, which affects this high relative increase.

The growth rate of agricultural production in the EU 28 is generally slower in comparison with other regions of the world. Typical is decline in the share of the world production. This development is differentiated (depends on commodity), especially significant are effects of changes in the structure of livestock production in European countries. From the overall evaluation of commodity development in the frame of EU 28 arises that the significant decrease

of production involves mainly new member states of EU 10 (or 13, further NMS) in plant and animal commodities, with the exception of wheat, colaseed and poultry.

### **Production dimension of Member States of EU**

Typical for the development in NMS is also the fact that the decrease in production in these states has been started already in the first half of 1990s and then in the pre-admission period. But, this decrease usually does not stop even after the entrance into EU, which is after 2004. The most significant decrease in most of the commodities is experienced by the Czech Republic, Slovakia and Hungary. In opposition to that, the Polish agriculture and especially new federal countries of Germany experience the more permanent regeneration.

In the plant production, the decrease of both decisive root crops (potatoes and sugar beet) is structurally significant, when the whole decrease of production is to the debit of NMS, here with the most significant negative impact on the production of the Czech Republic. The decrease in the previous period is currently stopped and acreage of sugar beet increased, as this crop is increasingly used for bioethanol production

But the decisive producers from original member states keep their original content of production of the mentioned commodities.

Actually, the overall extent of production is slightly increasing in cereal (France, Germany, United Kingdom and Poland), sugar beet (France) and in potatoes (France, Belgium).

The growth of production in the NMS group is only in colaseed. In this commodity, there is essential growth of production even in the biggest producers of the original EU 15 (France to the triple of its original production, and Germany and Great Britain to double). In the last five years we could see also a higher increase (Latvia, Lithuania) in wheat production in new Member States compared to the original Member States. Crop production of the NMS increasingly relies on so-called cash crops.

Even more critical are the values in animal commodities. The fundamental decrease is again happening in new member states.

Especially the decrease of the milk production and beef affirms the overall decrease in the branch of the beef-raising. This fact belongs to the problems not only in the sense of production, but also from the point of view of using the permanent grass growing's and realization of positive externalities.

Decisive European producers, France, Germany or Holland, still keep in both commodity verticals roughly same content of production. In the case of beef production, the position of original member states is even improving. For argumentation and mechanism of supports, the relationship of beef-raising to the permanent grasslands which also contributes to the support of successful functioning of the according vertical of agribusiness (especially Spain, Italy and also both countries of the British islands).

Despite the overall decrease in production of pork in EU 28, the production of decisive producers in Germany and especially in Spain is increasing, while Spain and Poland are very actively involved in the verticals and nets of agribusiness. The similar strategy is also chosen by successful poultry producers. The development in the Czech Republic is absolutely opposite. It is another commodity of the animal production which has experienced significant decrease to one half of the original content, just after 2004.

The positive acceleration of production in the EU dozens occurs in poultry meat. Even here, however, are world production and markets determined by non-European producers and companies in the global networks of agribusiness. Crucial EU production retains United Kingdom, followed by Spain and France. Recently, there is a significant increase in production in Poland and Germany.

## Conclusions

The paper deals with production and economic contexts and consequences of changes in the business environment of the European Union agriculture induced by both the expansion of the internal/common market and the acceleration of globalization processes.

The concept of a balanced European model of multi-function agriculture and its implementation under the European Union (hereinafter referred to as CAP) for many as 28 current member states, which differ in terms of their bases, reach as well as productivity, is more than ever confronted with new challenges arising from accelerated globalization processes. The environment of agrarian markets is changing and Europe's position at these markets is changing as well. New priorities are assigned the criteria of competitiveness and demand on their provision.

Processes connected with the liberalization and extending of the agrarian market actually led to the limiting of regulating interferences and politics, designed on the principles of market protection with the aim of removing the isolation of specific market segments in individual branches and sectors. They also meant looking for other norms (and reasons) of agriculture support.

Second attribute of driving the agrarian markets in this phase was, however, the growing market power of decisive subject of the European and world market, in the given sector especially the finalising phases of agribusiness, type of the international organisations and nets using various forms of connections determining the structure and development of global markets.

Both tendencies, which were mentioned above, strongly quarrel with each other in praxis.

In the frame of more extended markets, the interests of decisive commodity chains/nets come forward. Another cause of limiting the possibility of choice of the production structure and its extent are the models of agrarian markets (which are significantly motivated by demand, and the consumer point of view is usually interpreted differently through the subject politics in the whole chain of vertical towards the primary production. The results of these analyses indicate significantly increasing position of such a countries on the Single EU market, that have highly competitive food industry. As a result of this development we can observe tendencies of differentiation in development of individual countries.

The socio-economic context resulting not only from the general specificities of agriculture as an industry but also from institutional issues and historically determined differences in the structure and level of production and technical base in the EU-28 countries is playing an increasingly important role in particular in the focus of the just discussed CAP strategy. The success of its implementation is definitely based on the efficiency of business activities. It is subject to actual performance as well as knowledge of the conditions of the globalizing environment and ability to adequately respond to its changes. Looking at the preconditions and readiness of the Czech agriculture for the thus determined competitiveness based on the evaluation of production parameters, we find reasons to support the production dimension at this stage of development.

An analysis of the technical and economic efficiency of the entire sector shows that the level of productivity of agriculture reaches 70-75% of the level of productivity of the original EU-15 and is still significantly lower compared to countries whose production crucially affects the global food market. In this phase, the need to create space and conditions for the development of such entities which meet the conditions and can successfully compete to become part of the perspective commodity verticals as well as European and global food networks, is extremely topical. It means strengthening our position in the EU single internal market which would allow for creating new opportunities for growth, investments and employment in the increasingly dynamic global agribusiness and thus improve conditions in the rural communities in the longer term.

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# Assessment of the satisfactory level of education in the individual municipalities

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## Abstract

Paper analysed and evaluated the satisfactory level of education in municipalities within the scope of activity of the Local Action Group Association for Development of the area of Poličsko. Based on the results obtained from this study, there is a difference between frequencies of the assessment of the satisfactory level of education in the individual municipalities and frequency of the assessment of the satisfactory level in the whole microregion Poličsko.

## Keywords:

Knowledge society, education, microregion

## Introduction

Strategic planning is implemented in solving problems relating to economic growth and increasing regional disparities. The task of regional plans is to establish a framework for private investment and significant activities funded from public resources. The first planning in the 1950s and 1970s did not prove to be effective. Therefore, since the 1980s, the advanced European countries began to put more emphasis on the enforceability and implement ability of regional plans. The European Union criticized the lack of coordination of regional planning and while financing projects from the Structural Funds, it began to focus on strategic documents.

In the current concept, strategic planning is perceived as a process of creating and promoting common interests of the region. It includes a situation analysis, formulation of development objectives, strategies and actions for achieving these goals. An essential part of the strategic planning of regional development is the actual implementation and control. Following innovative aspects are applied (Ježek, 2006):

- searching and using development potentials;
- change from firmly planned (once for ever) objectives to flexibly responding strategy and determination of strategic objectives fulfilled by development activities;
- conceptual integration of partial activities and interests;
- more specific and pronounced orientation to demand groups;
- emphasis on the coordination and participation of relevant regional actors (not only in politics and public administration, but also businessmen, representatives of public associations, movements and associations, etc.)

According to Wokoun R. (2003), the regional planning can be described as a process of a thoughtful application of regional policy measures to specific conditions of the individual regions. Therefore, it is a methodological approach to the implementation of regional policy

The result of planning in the regions is the Strategic Plan for the Development of Microregions, which is considered to be a policy document (Škrabal et al., 2006). It describes the key events and evaluates them and proposes long-term goals and measures. Their

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implementation should be used for the positive development of the given area, i.e. the growth of local economy, development of social-cultural and cultural activities, environmental protection and sustainable development in a manner preventing the increase in diversification of rural areas. The development strategy solves the coordination of activities within the micro-region with the aim to achieve solution of problems which are common to several communities of the region.

The Rural Development Programme of the Czech Republic (RDP) ensures operation of the European Agricultural Fund for Rural Development for the period 2007 - 2013 (Ministry of Agriculture CR, 2007). The existence and implementation of RDP CR contributes to achieving the objectives set by the National Strategic Rural Development Plan, i.e. the development of rural areas, and thus it promotes the development of rural areas of the Czech Republic on the basis of sustainable development, improves the environment and reducing the negative impacts produced as a result of intensive agricultural farming, mainly due to the intensive application of chemicals (e.g. pesticides), etc. The programme will contribute to creating the conditions for the competitiveness of the country in basic food commodities. The RDP measures contribute to fulfilling the objectives of the Lisbon Strategy in all its areas (Rural Development Programme of the CR for the period 2007-2013):

- knowledge-based society,
- internal market and entrepreneurial environment,
- labor market,
- sustainable development.

The RDP CR supports the expansion and diversification of economic activities, development of business activities, creating new jobs reducing thus unemployment in the regions. Rural communities have a higher unemployment rate than the urban ones. In addition, the RDP CR supports the sense of togetherness among people in the country.

The aim of all micro regions is the effort of its members is to jointly develop the region. In this effort, namely rural micro-regions are supported by the state. There are many programmes designed for rural renewal and subsidies and grants for rural regions. At present, the rural development is also supported from the EU structural funds and by managements for the implementation of their development plans.

In 2013, preparation of the Rural Development Programme (RDP) for the period 2014-2020 started, on the basis of the first draft of the regulation of the European Commission from 2011 and its six key priorities of the EU. The aforementioned RDP is divided into four basic axes (Ministry of Agriculture CR, 2007). Each axis fulfils some of the main objectives of the RDP:

- Axis I – Improving the competitiveness of agriculture
- Axis II – Improving the environment and landscape
- Axis III – Quality of life in the rural areas and diversification of the rural economy
- Axis IV – Leader.

Leader is the approach and method determined for the rural development. As apparent from the above principles, the Leader, a Local Action Group is an ideal group for the use of the principles of this method as a methodological tool of its activities. The Local Action Group is defined by the Council Regulation (EC) No 1698/2005, Coll., on support for rural development by the European Agricultural Fund for Rural Development. As the most common form, LAGs were founded as a civic association, which is defined by the act no. 248/1995 of representatives of local governments, entrepreneurs and non-profit organizations. It is based on a partnership agreement about main objectives of rural region development, joint development of strategies of projects leading to achieve them.

The strength and importance of MAS lies in connecting the public and private sectors and cooperation among various partners (Gavlasová, 2007). Local Action Groups (LAGs) are

based on the principle of partnership and cooperation between public, private and voluntary sectors at local the local level.

The LAG includes public and private organizations, local entrepreneurs, non-profitable organizations and active citizens. In terms of the legal status, LAGs are non-profitable organizations, mostly civic associations (c.a.), public benefit corporations (ops) or interest associations of legal entities. The LAG territory must be complete and must be occupied by 10 to 100 thousand inhabitants with the exclusion of cities with more than 25,000 inhabitants, each municipality can belong only to one LAG. Each LAG will work out its territory intersectional development strategy, which is approved by all its members.

LAGs using the Leader method are not contradictory to local self-government, but they appropriately supplement local self-government in the efforts for reconstruction and development of communities. LAG contributes to the development of agriculture and care for nature and landscape. Within their activities and measures of Axis IV the local action groups implement their Strategic Plan Leader. Support is provided to those LAGs that meet the acceptance criteria. These are assessed by the State Agricultural Intervention Fund (SAIF) as the certified paying agency. LAGs are selected by an evaluation committee, composed of appointed ex-perts. Measures are implemented according to the Leader principles. Support may be provided to those projects that are in compliance with the approved strategic plan Leader of the local action group and the relevant RDP conditions.

Projects for implementation are selected according on the predetermined scoring criteria by LAG through its selection committee at least once a year. The scoring criteria must include the application of innovative approaches. LAGs can within their sphere of activity select projects of final beneficiaries. The subsidy is not sent to LAG's account, but to the final applicant's account. LAGs obtain direct subsidies for their operation, administrative and consultancy costs linked to the implementation of the Strategic Development Plan, which must be drawn up by each LAG.

## **Materials and methods**

The aim of the paper is assessment of the satisfactory level of education in the individual municipalities and frequency of the assessment of the satisfactory level of education in the whole microregion Poličsko. The knowledge capital can be explained as the highest level of formal education completed. Questionnaire-based survey was used and in the sample (n = 969) of respondents relating to the assessment of the level in selected areas, both in the municipalities and the whole microregion, were collected. The investigated areas were selected by the LAG according to their relevance for the development of the individual communities and microregion. The questionnaire was set up by the LAG Association for development Poličsko management in compliance with the LAG strategy and fulfilment of the SDP objectives. The questionnaire was distributed among the inhabitants in hard copy and simultaneously released on websites of the LAG Association for development Poličsko. Thus it was highly probable that citizens living in 18 municipalities of the microregion Poličsko would fill it in. Posting the questionnaire on the websites was very important for the LAG although this manner of publishing does not exclude that it could be fulfilled also by a citizen from a community outside the microregion.

The Microregion Poličsko is a voluntary association of municipalities, it was established in 1999. The voluntary association of municipalities was set up for a territorially compact region. It is a catchment area based on the cohesion principle, where several municipalities enforce their interests with the objective to solve problems beyond the scope and capabilities of individual municipalities. In terms of the area segmentation, the Microregion Poličsko belongs to the Pardubice Region, which is part of the cohesion region NUTS II Northeast. It is the easternmost part of the Pardubice Region forming the border with the region of the Highlands and the South Moravian Region, in the north bordering with the municipalities of the administrative district POU (administrative districts of municipalities with authorized municipal

office) Litomyšl and in the east with ORP (municipalities with extended powers) / POU Svitavsko. The territory of the Microregion Poličsko includes the territory of 21 municipalities

Wilcoxon nonparametric test was used for the verification of the hypothesis whether two selections can be considered as selections from one basic set. The advantage of this test is its efficiency, i.e. it is able to reveal minor differences between the two measurements.

Hypothesis  $H_0$ : There is not a difference between frequencies of assessment of the satisfactory level of school education in individual municipalities and frequencies of assessment of the satisfactory level of school education in the whole microregion Poličsko.

Hypothesis  $H_A$ : There is a difference between frequencies of the assessment of the satisfactory level of education in the individual municipalities and frequency of the assessment of the satisfactory level in the whole microregion Poličsko.

## Results and discussion

The assessment examined sphere of education. Frequency of the assessment of the level of quality of education and possibility to select a type of the vocational education by respondents in the individual municipalities and the microregion was analysed.

Most of the respondents assessed positively or did not have a negative opinion about the quality of education in the individual municipalities and the microregion. The level of education in the individual municipalities and microregions is assessed by most respondents as satisfactory in the individual municipalities (313) as well as in the microregion (204) or neither satisfactory or non-satisfactory in the individual municipalities (490) and in the microregion (527). Only a small part of respondents in the individual municipalities (62) and in the microregion (68) was not satisfied with the level of educational possibilities. The level of the offer of programs at schools was evaluated reversely, here the number of satisfied and dissatisfied was almost reversed and the majority of respondents was either dissatisfied or did not take a clear position. There were 66 respondents satisfied with the level of offer of schools in the individual municipalities and 98 in the microregion, while 271 respondents in the individual municipalities and 112 in the microregion were dissatisfied. We can observe a higher dissatisfaction with the selection of the educational programs in the individual municipalities, which is given by a smaller number of schools there, while selection of schools and studying programs in the microregion is higher. A group of respondents who take a neutral standpoint in the individual municipalities was represented by 274 and 567 respondents in the microregion. These respondents are relatively satisfied, but they are also for the further improvement in this area. Theoretical concepts include knowledge society or society of knowledge (Drucker, 1993, 1994, 2000, 2001). Drucker (1993) considers social development based on transformations of societal processes which characterize post-capitalist society. His approach to post-capitalist society is basically based on the idea knowledge has a production role. Society based on this principle represents an initial stage of transition to knowledge society and society of organizations. Knowledge becomes the object of entrepreneurial activities based on production and distribution of knowledge. The importance of knowledge is growing as they represent a strong source for innovative processes while these processes are necessary to gain competitive advantage in business (Targowski, 2005).

Knowledge society is characterized by centralization of knowledge together using modern information and communication technologies. Therefore, the role of employees changes in a reaction to changes in the nature of labor. Labor cannot be implemented without knowledge and without cooperation which leads to production of new knowledge (Banathy, 1996).

The test criterion  $T$  by Wilcoxon test = 31 and when compared with the critical value for 18 pairs of values and at the significance level  $P = 0.05$ ,  $T_{0.05}(18) = 40$ . Calculated  $T$  is less than critical, which means that we reject  $H_0$  and accept  $H_A$ , that there is a difference between frequencies of the assessment of the satisfactory level of education in the individual municipalities and frequency of the assessment of the satisfactory level in the whole microregion Poličsko.

Thus it was proved that the frequency of assessments of the satisfactory level of education in the individual municipalities and frequency of the assessed level of education throughout the microregion is a statistically significant difference. Respondents assessed with significantly higher frequency a satisfactory level of school education in the individual municipalities (313) than in the whole microregion Poličsko (204).

Far-reaching impact of social changes affecting social institutions also reaches social structure. In a social macro-environment a new knowledge phenomenon of knowledge class emerges (Banathy, 1996, 1998). In micro-environment, there are changes, particularly in the focus on creating utterly new knowledge. Banathy, who is concerned with complex social systems and their projection, puts emphasis on holism when working with knowledge, much like Smuts (1927). Knowledge society is based on knowledge which becomes dominant production factor. Knowledge has a share on the concept of institutional knowledge tools and technologies and on transition of social organizations creating new knowledge or participating on its innovations. Transmission dynamics of social actors knowledge who participate in more or less codified social networks is related to that issue. Veselý (2004) holds that knowledge society is a metaphor and substitute term rather than a theoretical concept. Veselý also points out the complexity of understanding the whole range of problems related to dominating influence of knowledge as a new production factor. Structure of education in the Czech Republic represents the attainable indicator for social-economic status and cultural position. The level of education is reflected in the quality of labour force being crucial for economic development (Hubelová, 2013) and for the security agenda of state (Ušiak and Nečas, 2011).

## **Conclusions:**

Most respondents assessed the level of school education as satisfactory or they did not take or did not incline to either of the two marginal evaluations both in the municipalities and the microregion. However, after statistical evaluation of frequencies, the frequency of the satisfactory assessment of school education was significantly higher in the municipalities compared to the microregion. A higher frequency of a more positive assessment in the communities can be explained by the fact that mainly basic school education was evaluated as there is only one secondary school in the microregion, i.e. grammar school in the biggest town of the microregion, Polička. We can therefore conclude that the area: level of school education is well known to the respondents in the communities and they are satisfied with its level.

Conversely, a satisfactory rating of the level of offers of vocational courses was statistically significantly more frequent in the evaluation of the microregion than in the municipalities, which is logical, since most vocational courses are in Polička, the largest municipality of the microregion.

In addition, lower frequencies of satisfactory assessments in the microregion compared to the assessment in communities in the spheres of school education, transport accessibility, after-school/free-time activities, care for the environment, safety and cultural sights are also noticeable. Higher frequencies of the assessment of the satisfactory levels in the above mentioned spheres in the municipalities suggest better understanding and knowledge of the situation of the respondents of these areas in the municipalities where they live, in their familiar.

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# The effect of the enterprises' size structure development on the food industry performance – example of the Czech beverages sector

Ivana BLAŽKOVÁ<sup>1</sup>

## Abstract

The paper deals with the development of size structure of enterprises in the food industry and the effect on the performance of food companies. The analysis is based on the assumption that large food processors achieve higher profitability within particular food industry and thinks over the question how this fact can influence agricultural producers. The analysis is applied on the manufacturers of beverages in the Czech Republic, which was in 2012 the most significant sector from the food sectors in the Czech Republic in terms of turnover and value added. The concentration in beverages sector is high and almost half of total employees of this sector is employed in the largest enterprises. Significantly stronger economic position of the large enterprises in the Czech beverages sector and large share of these enterprises on the performance of the sector were also confirmed by the Spider Analysis. The solution of this market situation for farmers and the other firms in agribusiness is to better their position by cooperation of farmers, processors and distributors on the long-term contract basis which will lead to developing of successful partnerships within commodity verticals.

## Keywords

Concentration, food industry, performance, size structure of enterprises

## Introduction

As stated by many authors (e.g. Bečvářová, 2002; Blažková, 2002; Konefal et al., 2005; Wilkinson, 2002), the character of agro-food chains functioning has changed significantly. Higher competitiveness, increasing global competition, capacity to follow market trends, power to negotiate or the increasing influence of some segments of the food chain represent some of the challenges that farmers and agro-food companies have to face. In the present agribusiness the successfulness of farming is influenced by extent and forms of imperfect competition at the subsequent vertical stages. Hence, positions and perspective of farming are substantially affected by competitiveness of the processing sector. Costs, effectiveness and production quality of food processors become decisive factor in formation of conditions for agricultural production usage on both domestic and foreign markets. There is no doubt, that the extent of this influence differs according to character of agricultural commodities and depends both on technological and transport possibilities of sales to foreign food processors and on the position within the given commodity chain.

Changing market structures, increasing concentration of companies and increasing impact of large transnational chains on the character of food markets are some of the manifestations connected with globalization, which is nowadays considered as the most significant global trend. In general, globalization can be understood as the creation of global financial, energy, information, trade and labour flows. Globalization has a global scope and causes interconnections of relations and processes that take place in different areas with varying intensity and results (Cihelková, 2001). Besides other things, it forms also the food market. According to Niles and Roff (2008) the food production was, in a certain period of time, even seen as a tool of globalization driven by multinational corporations producing chemicals

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needed in agriculture. In connection with changes on the food market, Tansey and Worsley (1995) use the term "food system" which includes biological, economic, political, social and cultural aspects of food. According to the authors the system varies under the influence of the following factors (Tansey and Worsley, 1995):

Increased life expectancy and population growth in the world have resulted in increased demands on the environment (reduction of biodiversity and areas of rain forests, desertification, disruption of the ozone layer).

Intensive urbanization increases the distance between food producer and consumer, increases the importance of multinational retail chains and has the effect of reducing the number of local growers.

The globalization of markets helps to concentrate "food power" in the hands of multinational corporations, which are also the primary and main actors of globalization of the food system. At the same time trade liberalization causes impotence of states towards large commercial companies.

Agriculture is changing due to the changes in technologies – biotechnology, genetic engineering, information technology.

In the society the traditional role of housewife is in decline, which is related to the lack of time to prepare meals and thus increasing the availability of semi-finished products and fast food meals.

At present, the major players in the food market are multinational corporations. As reported by Daniels, et al., (2008), through contracts with food producers these corporations are also crucial in determining the nature and quality of the food supply. It is clear that the quality of food produced is determined by supermarkets and other transnational actors, often organized into large corporations, which currently can more simply succeed in the intense competition, pricing policies and legislation regarding food quality and safety than small local producers.

Multinational retail chains achieve the control of the food market due to merging and buying up companies each other in order to expand the product portfolio, to eliminate competition, and to broaden into new geographic markets. Multinational producers achieve such results due to production of specialized products tailored to local requirements for local markets. Large retail chains dominate these markets through the purchases of local sellers who meet local conditions and requirements. Dicken (2011) points out the interdependence between multinational food producers and multinational retail chains and indicates the current shift in power towards multinational retail chains. Worldwide global leaders of such multinational retail chains are, for example, Ahold (Netherlands), Carrefour (France), Metro (Germany), Tesco (UK) and Wal-Mart (USA).

The process of globalization and the associated concentration of capital is a global phenomenon of the 21<sup>st</sup> century. Given the need to strengthen competitiveness the concentration is gradually increasing also in the Czech food industry. High concentration is reached in the sugar industry, in other fields of the Czech food industry the process is gradually under way (markedly in the dairy and bakery industry). Generally, the low concentration of the food producers makes the food industry to be less competitive. In contrast, the retail concentration is very dynamic. While CR<sub>5</sub> indicator<sup>2</sup> in the Czech food industry in 2011 reached the value of 11.25%, concentration in the retail sector was more than four times higher – in 2011 CR<sub>5</sub> value was 45.5% (calculated on the basis of data published by Bisnode in the database Albertina). The lower level of concentration in the food industry means smaller volume of investment and consequently deepening the disproportions in profits of manufacturer and trader and in overall market position.

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<sup>2</sup> The concentration ratio (CR<sub>m</sub>) is the percentage of market share held by the m largest firms in an industry  $CR_m = \sum_{i=1}^m S_i$ . Market share is the percentage of a [market](#) accounted for by a specific entity (in this case it is calculated in terms of revenue).

## Materials and Methods

The aim of the paper is to evaluate the position and perspectives of food processors with respect to the structure development. Structure development is evaluated in terms of company's size, which is defined according to the number of persons employed. Companies are classified in four size groups – with 1-19, 20-49, 50-249 and 250 or more persons employed. The analysis is based on the assumption that there is a positive relationship between concentration and price-cost margins, which is reflective of profitability (as researched in many studies, e.g. Collins and Preston, 1966; Cowling and Waterson, 1976; Setiawan, et al., 2012), and the question is whether large food processors achieve higher profitability within particular food industry and how can this fact influence agricultural producers.

The paper deals with chosen commodity chain in the Czech Republic – the processing sector within the commodity chain of beverages production. The main methodical approach is based on the share of value added which is the indicator of performance showing the rate of production factor usage (input) on the final production (output) and on the turnover produced. Furthermore other indicators of economic situation are evaluated (see Table 1).

The analysis is based on the data published by Eurostat – Structural Business Statistics (SBS) and the database Albertina published by Bisnode. The common statistical methods (analysis, synthesis, comparison) were employed in the data processing. The Spider Analysis<sup>3</sup> method was used for comparison of economic performance of enterprises' size categories in 2011. For the purpose of the presented analysis there were chosen 5 indicators (see Table 1). Higher values of the indicators mean better results and longer distance from the centre of the diagram.

**Tab. 1 Indicators used in Spider diagram**

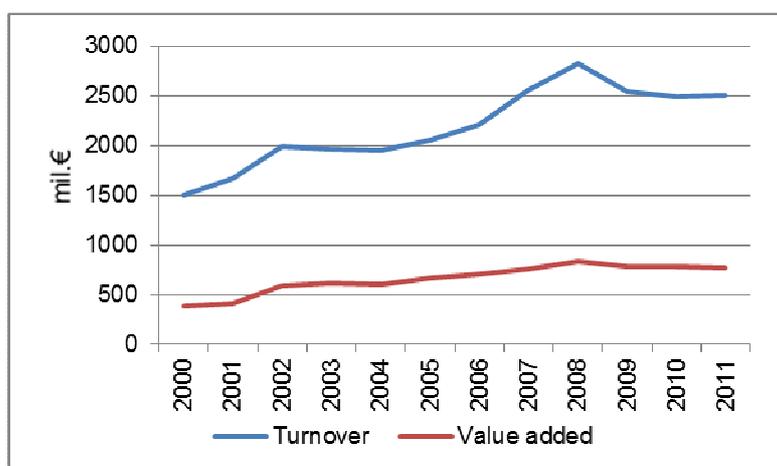
Variables are defined according to Commission Regulation No 2700/98 used by Eurostat.	
Value added at factor cost in production value [%]	The gross income from operating activities after adjusting for operating subsidies and indirect taxes (included value added) divided by production value.
Turnover per person employed	The totals invoiced by the observation unit during the reference period (this corresponds to market sales of goods or services supplied to third parties) divided by persons employed.
Apparent labour productivity [%]	The indicator of productivity calculated as value added divided by persons employed.
Wage adjusted labour productivity [%]	Value added divided by personnel costs, after the latter has been divided by the share of employees (paid workers) in the number of total persons employed. It can also be calculated by dividing apparent labour productivity by average personnel costs.
The gross operating rate [%]	The indicator of profitability where the gross operating surplus is related to the turnover generated. The gross operating surplus is the surplus generated by operating activities after the labour factor input has been recompensed. It can be calculated from the value added at factor cost less the personnel costs.

<sup>3</sup> According to Synek et al. (2009) the Spider diagram has up to 16 half-axis with percentage scale, which are often divided into four groups – profitability, liquidity, structure of financial resources and structure of assets. The selected base (industry or competitors), with which the company is compared, is incorporated into Spider diagram as a circle, representing 100 percent. The value of a company is then compared relatively to this basis. The positive is considered if the firm exceeds the value of other companies (i.e. the value of the selected base).

## Results

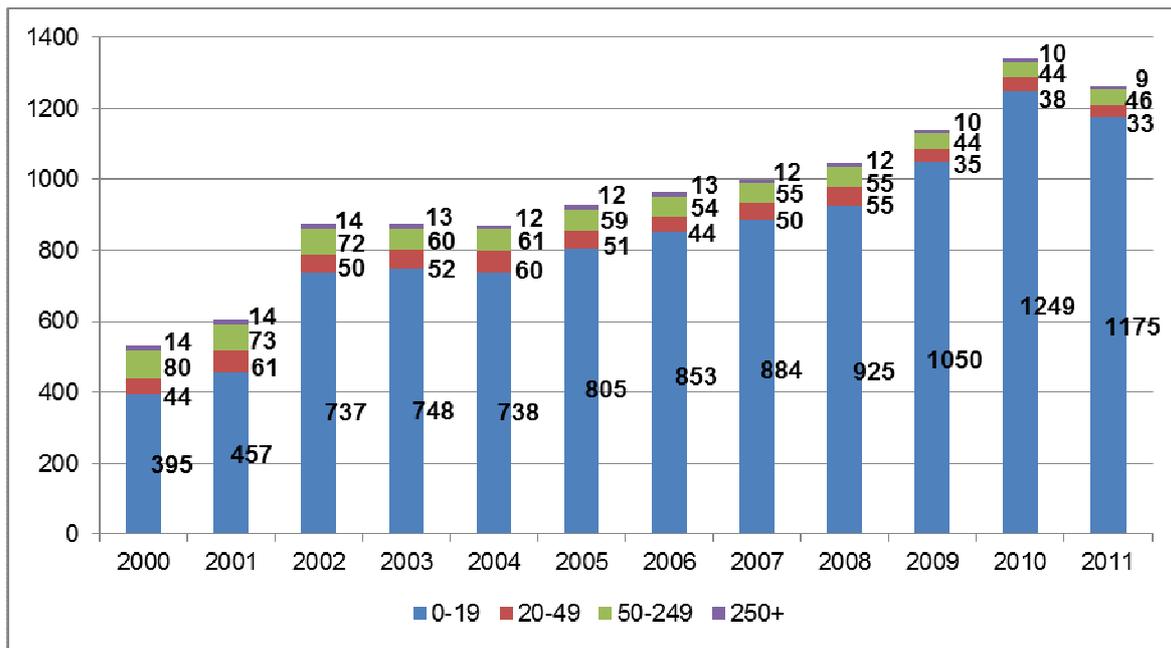
The sector of manufacturing of beverages belongs in the Czech Republic to the sectors with high performance and growth rate during last 20 years. In this sector there are a typical high share of second stage of processing, high value added, heterogeneous products differentiated by brands, that are encouraged by aggressive marketing and distribution network. There is concentrated competition due to multinational companies with substantial market share.

The manufacture of beverages sector (CZ-NACE 11) includes alcoholic and non-alcoholic beverages, including mineral water, soft drinks, beer, wine and spirits (Ministry of Agriculture of the Czech Republic, 2013). In terms of turnover and value added this sector was in 2012 the most significant sector from the food sectors in the Czech Republic. According the Eurostat data, the share of the beverages sector on turnover of the whole food industry (CZ-NACE 10 and CZ-NACE 11) in 2012 was 19.9% and on value added 33.4%. The development of value added and turnover of the Czech beverages sector in 2000-2011 is shown in Figure 1.



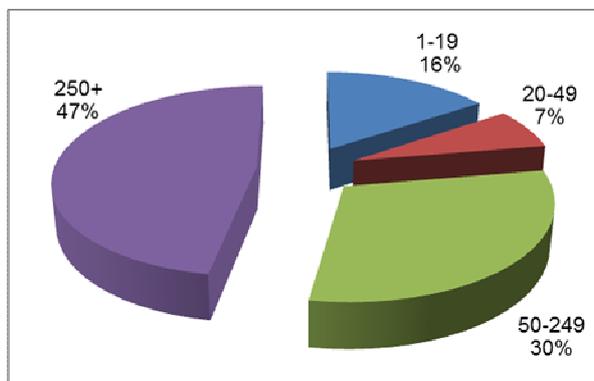
**Fig. 1 Turnover and value added (CZ-NACE 11).** (Source: Eurostat – SBS)

In Figure 2 it can be seen the development of size structure of enterprises in this sector. The total number of enterprises has been increasing since 2000, however only in the category of the smallest enterprises. The opposite development is in the category of the largest enterprises. This fact confirms increasing concentration in the sector, which is the highest one within the food and beverages industry of the Czech Republic. While CR<sub>5</sub> indicator in the food industry in 2011 reached the value of 11.25%, in the beverages sector concentration is higher – in 2011 CR<sub>5</sub> value was 43.4% (calculated on the basis of database Albertina published by Bisnode).



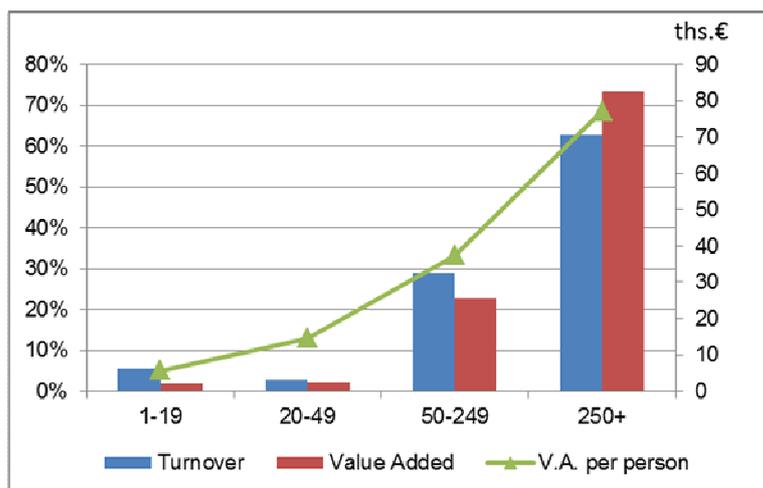
**Fig. 2 Number of enterprises according to size categories (CZ-NACE 11).** (Source: Eurostat – SBS)

Almost half of total employees of this sector is employed in the largest enterprises in 2011 (47% of the total) as seen in Figure 3. However, these largest enterprises represent only 0.7% of the total number of enterprises in this sector (see Figure 2). Small enterprises (with 1-19 and 20-49 persons employed) together employed in 2011 only 23% of the sector employees.

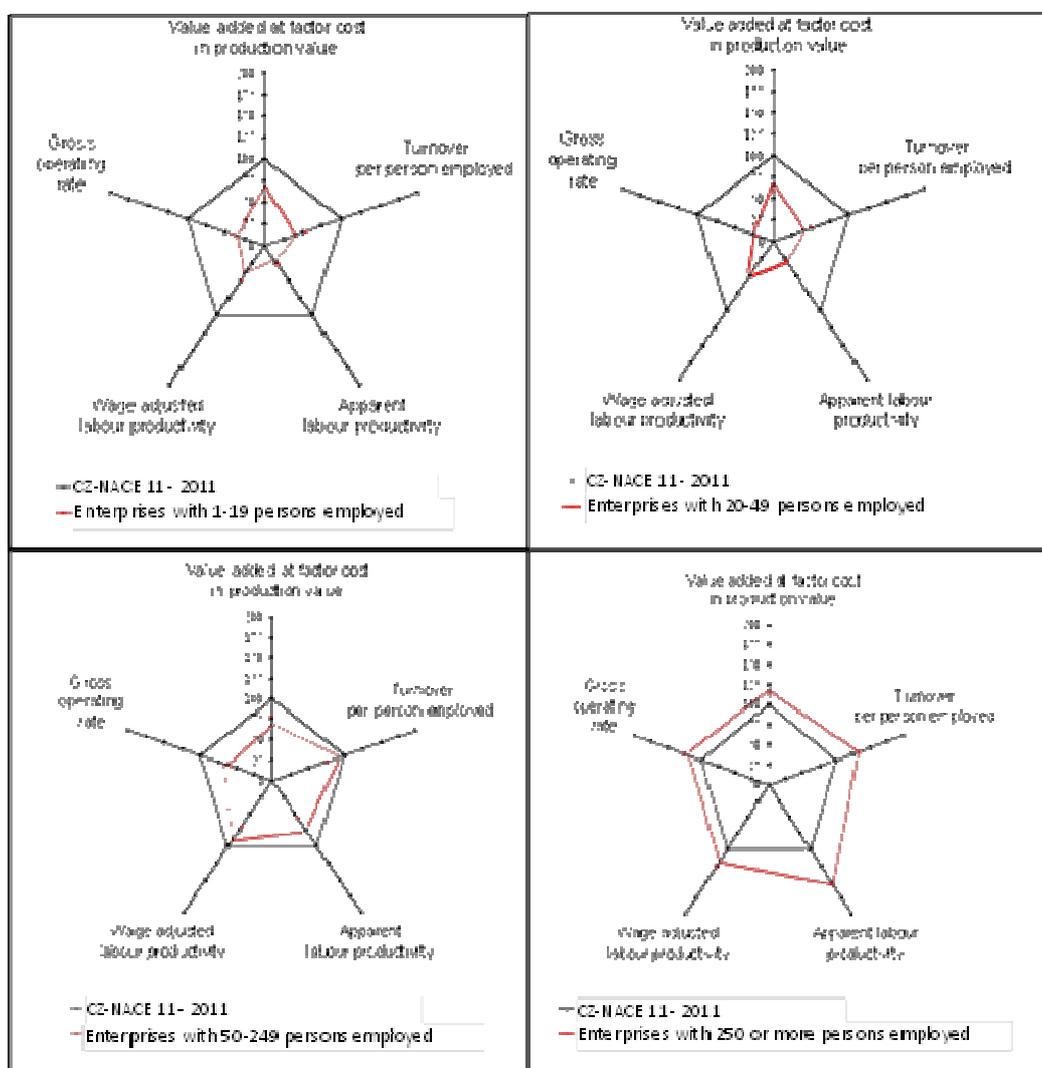


**Fig. 3 Share of enterprises' size categories in employment in 2011 (CZ-NACE 11).** (Source: Eurostat – SBS)

The importance and the best position of the largest companies in the sector is manifested also in the value added and turnover – while looking on Figure 4, we can see high share of large enterprises in sector turnover (63%) and the highest value added per person employed in this size category. Large enterprises in this sector are the most prosperous, they generate high value added and they have powerful negotiating position enabling them to realize higher prices of their production, respectively to gain low-cost production inputs than their smaller competitors. As a reason of these results economies of scale may be given. Also the Spider Analysis, which presents the comparison of the position of particular size categories of enterprises in the manufacture of beverages sector with this sector as a whole, confirms these results (see Figure 5).



**Fig. 4 Share of enterprises' size categories in the sector performance in 2011 (CZ-NACE 11). (Source: Eurostat – SBS)**



**Fig. 4 Spider Analysis of the beverages sector in 2011. (Source: Eurostat – SBS)**

The best economic position can be seen in the size category of the largest enterprises with 250 or more persons employed – values of all indicators reach about 117-153% of the values of the total sector indicators. Their strong market position enables them to generate high value added, turnover, productivity and also profitability. The position of smaller producers is worse, because they cannot compete against large distribution and retail companies as their larger competitors.

The characteristic feature in beverages sector during the last periods was also high level of innovation. Some smaller companies cannot afford it and their economic results are worse because the competition is very tough in the Czech beverages market. Sector is dominated by multinational enterprises that are supporting their world brands by massive advertisements. Despite this intense competition some small and very small breweries can be successful in their local markets thanks to their specific products.

## **Conclusions**

The results of the analysis clearly confirmed significantly stronger economic position of the large processors in the Czech beverages sector and large share of these enterprises on the performance and employment of the sector. An explanation of these results can be stated in better access to innovations, economies of scale and long-term contracts of large and stable producers with suppliers of raw materials who guarantee them the required quality, quantity, terms and structure in order to meet retail requirements for standard quality and continuity of supply of food products for consumers. It can be stated that in this sector the decisive subjects are large processors, mostly multinational companies. This is visible mainly in beer production that has in this sector in the Czech Republic crucial position – the majority of the turnover of the beverages sector is created in beer production (53.9% in 2011). Beer production is dominated by multinational companies, but there is also rising number of private breweries which are targeting local markets and their production is based on quality, product specialisation and difference.

Increasing competition makes farmers and the other firms in agribusiness to look for possibilities to strengthen their competitiveness, which is increasingly determined by the ability to develop successful partnerships within commodity verticals. However, the use of agricultural contracts is controversial. Contracts may lead farmers to exchange price risks in the market for unexpected contracts risks. Under some circumstances, contracts may allow buyers of agricultural commodities to exploit market power by deterring other buyers from entering a local market or by allowing the buyer to reduce price paid in related spot markets. On the other hand, contracts frequently provide farmers with important benefits, such as reducing costs associated with uncertain income streams. Contracts can lead to reduce processing costs and provide consumers more customized and affordable products. (Blažková and Sadílek, 2008)

Nowadays food companies face increasing pressure to document where and how their products were produced and distributed through the food system, from farms to processors to consumers. Such traceability facilitates food safety and pollution control, as well as the identification of differentiated products with valuable quality characteristic. Contracting is considered as one way to achieve traceability, therefore it can be expected the growth of contracts in the agro-food production. Cooperation of particular stages of the commodity chain, i.e. farmers, processors and distributors, may better the economic performance of all particular subjects within the chain. The arguments for contracting and vertical coordination in the Czech Republic include especially retail sector expansion, requirements on growth of labour productivity by way of specialization, concentration and investment in modern technologies, requirements on stability of raw commodity quality for processing and especially intense competition on particular vertical stages which implies the necessity to look for possibilities of cost savings and economies of scale.

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# Risk Society, Environmental Hazardous and Social Capital

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## Abstract

In a modest exercise to identify obstacles to collective action, in the climate change context, the article aims to analyze how social capital can influence the construction of a reflexive awareness of people regarding environmental risks. In this debate, concerning social capital, we discuss the Civic Culture and Confidence indicators, in a more general discussion context, under the impact of Social Capital on the environmental issues. Taking into consideration theories of authors such as Putnam (Capital); Giddens and Beck (Risk) and Acemoglu and Robinson (Institutions), the article seeks to understand why the risk society is incredulous and disappointed with their institutions. To illustrate the potential destruction of the risk society, the article inspired question has become: What is the influence of social capital in relation to the perception of the environmental risks? The study concludes that while political and economic institutions do not offer alternatives to individuals in positions of social struggles, the social capital will not overcome the obstacles to collective action, not having a perspective for building up a reflexive awareness of people regarding environmental risks.

## Keywords:

Risk Society, Global Transformation, Social Capital

## Globalization: Why do Nations Fail?<sup>3</sup>

What is globalization? There has no intention, with this article, to exhaust the infinite possibilities that the concept of globalization can relate. Despite the many points of view on the topic, we highlight Castells (1999), for whom globalization is a movement of political, technological, cultural and economic interdependence that "(...) does not embrace all economic processes of the planet, does not cover all territories and does not include all the activities of people, although directly or indirectly it affects the lives of all mankind" (Castells, 1999, 173).

Globalization of the so-called Third Industrial Revolution is neither good nor bad, but it is has being corrupted by such behavior that accentuates inequalities; synthesized the sociologist Giddens (2000) on the book called *The World in disarray - what globalization is doing to us*. Assuming that the current process of globalization is uneven, the question that arises is: what are the consequences and what to do to confront them? The answer is tied to how we manage the risks and hazards to what Beck (2010) has called the risk society, not exceeding the social, medical, psychological and environmental limits.

This new framework is streamlining institutional arrangements of rules and relationships that canalize behaviors in order to answer to the contradictions between the pace of bio-geo-chemical cycles and the human production cycles. In order to understand the perspective of political and economic institutions, or institutional arrangements, the economists Acemoglu and Robinson, on their work called *Why nations fail?* (2012), refute cultural, geographical and political explanations and state that economic development derives from the ability of countries

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to democratizing its political and economic institutions for different actors (consumers, workers, politicians, businessmen), distributing the risks for groups of interests not to benefit from the the cake.

So, how does the process of globalization influence the success or failure of the internal structures of each country and international policies? Globalization is not a fair trial, compared to ecological risk, that this growing inequality of opportunity is connected to (Rousseau, 1989). Therefore, the process of globalization negatively impacts nations dominated by what Acemoglu and Robinson (2012) call heavily extractive economic institutions which are governed to concentrate power and income of a privileged elite and to restrict political participation to a select group of actors.

In contrast, the process of globalization positively influences nations that build economic institutions and plural and inclusive policies (Acemoglu;Robinson 2012) that meet a set of interests and are able to create growth opportunities for a wide range of social actors. In the context of the differences between political and economic institutions, an example of contrast is North Korea (extractive) and South Korea (inclusive). If institutions determine the success or failure of nations, the central question being debated is how these processes affect, shape conditions and determine patterns of influence that overcome barriers of collective action, in a future perspective, to a reflective consciousness of people in relation to environmental risks?

## **From Industrial Society to the Risk Society**

During the industrial period the center of discussion, in which Marx and Weber (1988) worked, was the distribution of profits between the state and non-state actors in international relations. In the so-called risk society (Beck, 2010), the challenge is to distribute the risks posed by current or potential use of certain technologies. Here, the emphasis is given to overlaps between economic institutions and their interdependencies with environmental, chemical, nuclear and genetic risks. These risks would generate a new form of personal life, society, economics and global order (Beck, 2010).

The starting point of the concept analysis of risk society is the recognition that globalization is not only a structural movement of interdependence (Keohane; Nye, 1989) among international actors, as well as the impacts on everyday life and it is extremely uneven in their consequences. It is noteworthy, for example, the ecological risks and *detraditionalization*<sup>4</sup>of our personal lives - in sexuality, relationships, marriage and the family (Giddens, 2000).

According to Held et al (1999) the contemporary phase of globalization begins in World War II, in 1934, with the conflict between the fascist totalitarianism system and the market democracy with the neutrality of communist totalitarianism, from 1941. With use of the atomic bomb and the emergence of the United States as a global superpower, the international system radically changes its character globally, making it clear to the looming environmental crisis. Over this period, the risks were stratified into specific classes and likely to describe its future effect based on human senses.

With nuclear warheads of equal power, enough to end the growing population, the new bipolar order has imposed an interstate conflict between the superpowers (U.S. vs. USSR). Supporting dictatorships or democracies that were against the communist regime, the U.S. wins the Cold War strengthening the market democracies and consolidating its pro-market ideas (Viola, 2008). The result of the post-industrial world was to break the territorial boundaries that characterized the risks of the industrial period. The automobile industry is a good example of the new risks produced by high demand for raw materials to reach this new global consumption.

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<sup>4</sup>Detraditionalization (Giddens, 2000) is a recreation of elements which form a tradition: habits, beliefs, manners and rituals.

With the end of the ideological and cultural control of the former Soviet Union and the rupture from the heavy industry in the late 1980s, the crisis of modernity such as Giddens (1991) points out, is a crisis in the traditions, the way we form bonds and connections with others. Given the expansion of the new global electronic economy, the traditions are taken to expose themselves to other lifestyles and the "end of history" (Fukuyama, 1992)<sup>5</sup> marks the victory of liberal capitalism in the context of globalizing society and culturally cosmopolitan. The magnitude of the world makes the abstract risks to human perception, such as climate change, natural disasters, biotechnology, nanotechnology, among others.

Due to this lack of boundaries, the process of globalization has brought the issue of risks, which penetrates all spheres of human activity of informational, global and networked forms (Castells, 1999). Informational because the productivity and competitiveness of the agents depend on their ability to manage information reorganizing ourselves and the material circumstances globally and networking. Global because production activities, consumption and circulation are globally connected or through networks. And networking because productivity is generated through interaction networks.

Based on what was previously mentioned, how to diffuse a reflexive awareness of the people regarding environmental risks? The question cannot simply be answered, given the complexity of the phenomenon. However, it can be better understood if we advance on the public and formal notions of democracy and consider the center of the idea a democracy of emotions (Giddens, 2000).

## **Democracies of emotions**

As it was noted, globalization is behind the spread of democracy, making its controversial concept with many interpretations<sup>6</sup>, as well as different levels of analysis and policy projections. Inspired by the American and French revolutions, democracy is fully developed in the twentieth century, after the 1970s with the expansion of the free market; proposal than has doubled the number of Democrat countries, like the countries of Africa and South America, recently passing by the Arab Spring that has swept across North Africa. How come?

According to the triumphalist because the other systems have tried and failed. For Giddens (2000), "Democracy is the best system, but it is difficult to consider it properly. (...) there is a widespread disillusionment with the democratic processes. In most Western countries, levels of trust in politicians fell, especially among the younger generations" (Giddens, 2000, 81). So, "how can democracy and active government support themselves when they seem to have lost their vantage in the events?" (Giddens, 2000, 84). For the author, it is necessary to democratize democracy, which means to eliminate bureaucracy, decentralize power, reform the constitution, promote civic culture and combat corruption at all levels. This implies delving into alternative democratic means for the interaction of civil society, placed between the state and the market.

To properly evaluate the alternative ways of democracy, Giddens (2000) makes a democracy parallel to private life relationships, which he calls the democratization of emotions (Giddens, 2000). The democracy of emotions would be as important as public democracy, it would not make distinctions of principles as it does the traditional family that makes use of the arbitrary power, coercion and violence instead of dialogue. In a democracy of emotions, parents should have authority over children assuming an equality of principles, where children would be able to respond, which does not imply lack of respect, obligations and rights.

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<sup>5</sup>Fukuyama, Francis. *The end of history and the last man*. Rio de Janeiro: Rocco, 1992.

<sup>6</sup>At the Brazilian academy it is large the predominance of the democracies market concept as democratic capitalism or liberal democracy. However, this perspective is marked by the negative Marxism connotation.

Something very similar happens in the public sphere between market and state, which means, to maximize market power erodes democracy, however, maximizing democracy, minimizes market economy. In this sense, democratic states should formulate public policies (Saravia; Ferrarezi, 2006) so they do not pose a threat to their interests, since it is impossible that all transnational flows are controlled by national states. The climate crisis requires a deeper understanding of this trend (Viola; Franchini; Ribeiro, 2013).

As it was noted, the obstacles and uncertainties that democracy faces today are the results not only of the consequences of a production system of global capital flows, but also a new form of family life, which replaces the rules of force by the strategic use of dialogue, persuasion, building capacity, the projection of power and influence. So, reflecting on the intellectual polarities of the current hegemony of democracies system (*demo* people and *cracy* government), in other words, government of people, it is in itself a challenge that transcends its current boundaries, mainly because there is a great ambivalence and uncertainty in ways of perceiving the phenomenon of globalization as neoliberal, globalization of capital, world government, transnational corporations, global community beneficial to democracy and obstacles to democracy in the international system.

Question: which movements that have legitimized the concept of Giddens (2000) on democracy of emotions, which includes ecological, identity and collective dilemmas? To answer this question, it is necessary to first examine the three waves of the unfinished democratic project of Modernity (Huntington, 1994), which changed our relationship with space and time toward the so-called hegemony of market democracies that "is a basic component of human nature: search for individual differentiation, rational maximization of interests and aspiration of freedom "(Leis; Viola, 2008,43).

## Waves of Democratization

The *first great wave of democratization*, the longest, from 1828 to 1886, appears in the early modern period, and it had its roots in American revolution, 1776, and French revolution, 1789. During these almost 100 years, 33 countries have democratized the search for a solution to what Hobbes (Ribeiro, 1995) calls a state of war of all against all. For Hobbes (Ribeiro, 1995), the sovereign is the sole legitimate holder of violence and his subordinates are to obey his powers. It is possible to view this theory in practice, through the so called neo-colonialism of the nineteenth century, or late capitalism, which is marked by the expansionism of the oligopolistic and monopolistic capital, which bound states to the national bourgeoisie and the hand labor, therefore the Fordism model. It is noteworthy that before the modern period, democracy was understood as a government of many to the government of all.

With the end of World War I, the emerging wave of democratization reverse, from 1922 to 1942, the result of a disorder in the capitalist development of industrial production. With the spread of the Taylorism, which enabled new levels of productivity, a major crisis breaks out in 1929, consequences of the capitalist overinvestment and proletarian under consumption; which accelerates the organization and the exercise of social power to an intercontinental level. The *New Deal* model (answer to the 1929 crisis) was the highest form of disciplinary government, subordinate to the capital and the state charges to keep the implementation of global contracted agreements. Although it has been interrupted by the World Wars, after 1945, the international system began *the second wave of democratization*, shorter, from 1943 to 1962, where, in this period, the new form of social organization, has made globalization become an irreversible<sup>7</sup> process (Ianni, 2008), since the capitalist economies of greater or lesser magnitude and duration unify a global basis in accordance with the North American model, built by the New Deal. With the undisciplined and inaccurate use of the word

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<sup>7</sup>Batista (1998) presents that it is necessary to be aware to the rationality history inserted into the capitalism route, once its irreversible idea (Ianni, 2008) legitimates the politics disclaimer at all social actors levels, due to eventual negative consequences of the Globalization process.

democracy, interventions are now based not only on law but on higher ethical principles, legitimized by universal values that hovered over the democratic creed.

To Hobsbawm (1996), the end of World War II until the mid-1970s, the industry, both in capitalist countries and socialist, has lived the Golden Age. During this period, a number of developing countries from Latin America<sup>8</sup>, Asia and Africa began their process of democratization, showing that globalization - in more appropriate terms, modifies the accounting rationalization of modern nation of industrialized and non-industrialized States, related to the notion of sovereignty.

Socialists believe democracy should be built from the bottom, to neutralize the State monopoly. However, despite the promising start, the path of socialist policy did not prosper, because as the industrial revolution progressed, in the twentieth century, the workers suffered from the drop in quality of life. Weber (1988) affirms that the socialist organization of labor corresponded to the same form of capitalist organization. Even though socialism has installed in East Germany, it is worth noting that the complete restructuring of capitalist organization, internationally, was inevitable. It is noteworthy, at that time, the role of GATT (General Agreement on Trade Tariff)<sup>9</sup>, which aimed to contain communism, prevent new wars and eliminate any restrictions on the exchange (trade) between nations.

According to Caldas (1998), GATT, now WTO (*World Trade Organization*), is one of the most successful international organizations out of its goals. The optimism about the possibilities of negotiations, at the global context, is contained by Stiglitz (2002), while arguing that the playbook of cultural-ideological package of the neoliberal system of the United States, after World War II, is responsible for the mismatch between the private and the social returns. However, issues such as global warming and the hole in the ozone layer caused, by greenhouse gas emissions, are beginning to be linked after the collapse of the system of macroeconomic regulation, in the 1970 decade, but just at the end of the Vietnam War.

From 1973, with the energy crisis and the decline of socialism in the late 1980s, the *third wave of democratization hatches*, which is a development in democratic representation. The effects of this process have consequences since the lifestyle of industrialized societies, through the crisis of political representation until the fragmentation of mass democracy. The standard 1950 family switches, the couple stops being an economic entity, the marriage shall be based on emotional communication and children no longer an economic advantage for a large financial burden (Giddens, 2000).

These trends have generated crises in different identities fields, political, economic, social etc.; reflecting mainly on the most vulnerable sectors of society. At the country level, the consequences of globalization are devastating in countries that have removed the ability of civil society to influence the state and on the ideologies of the market. In the ecological dimension, it arises a series of new epistemological reflections on environmental issues, such as Giddens's (2000) and Beck's (2010) that are relate to environmental degradation risks of ecosystems destruction. So what is the processes parallel of globalization and democratization with the capital?

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<sup>8</sup> Brazil has started its democratic trajectory during the second wave, in 1946, over the post war organization world period worried to create a more global character. This period of time initiates the dispute between the politic socialist representation and the liberal and constitutional representation.

<sup>9</sup> GATT was created by the Bretton Woods system, which defends the fiscal adjustment, the austerity, the spending reduction, the trade liberalization, the currency convertibility and the stability. "An interesting topic to say about the GATT is that, legally, it does not have members, but contracting parts and at the agreement, the Contracting parts means all the members" (Caldas; Amaral, 1998, 134).

## Social Capital and Environmental Risk Perception

The concept of social capital is recent at the academic literature and it is used by different authors to define a broad spectrum of situations. Although it has ambiguous character, the notion of Social Capital is understood here as a set of shared beliefs (trust, commitment, cooperation) that improve the performance of democratic States (Putnam, 1996). Cooperation, for example, can reduce the negative impact of globalization, increasing in the societies the organizational capacity to mitigate a crisis in transnational axes.

As it was previously mentioned, citizens who are out of the positive aspects of globalization end up suffering a democratic disillusionment, which makes them break with collective identities and social relations, leading masses of civil society to have a fragmented, individualized and especially distrustful political behavior. The study presents the debate: how do the declining Social Capital (Trust and Civic Culture) and the disillusionment with democracy influence the perception of environmental risks? Thereafter, we will make a briefly analytical exposition of sociocultural variables that affect the formation of social structures and enable major and minor resources for civic culture.

When it comes to civic culture, comes to mind the Civil Rights Movements of Tocqueville<sup>10</sup>. Author of the nineteenth century, Tocqueville (1987) believed to be crucial as the *Civic Culture* for the (locally standalone) people could contribute to the dimensions that characterized the responsibility for the common good. But this is a description that much has been written. The challenge now is: How to maintain a *Civic Culture* in a world marked by anti-democratic values? What is the meaning of these values? Values in relation to what? In this work, the values are examined from the point of view of the people's attitude regarding the risk of widespread environmental disasters.

Based on the principle that people value the institutions as mediators of demands, even phases of public policies (Saravia, E.; Ferrarezi, 2006) are painful in the short term (Training Agenda, Policy Making, Making Process decision, Implementation and Evaluation). Conversely, if public policies (Saravia, E., Ferrarezi, 2006) do not meet the priorities of the demands, the results will be the institutionalization of distrust, instability and low associative probability. The discontent of the citizens not only impacts the members of the specific community (legislative, executive, bureaucrats, unions, lobbyists etc.), but also the close ties between these actors together and with the goods. Because of this close historical link between the distribution of goods and the identity of the various interest groups, there has been a decline of political parties as instruments of articulation of interests, and at the same time, the development of disenchantment of the population of values such as protection nature, justice and equality.

In this context, how can it be possible a reflective consciousness of people regarding environmental risks in an unequal society? Before answering the question, it is worth mentioning: (1) in the context of globalization, it is not possible to think of the actors at a universal society once there are people with different contexts, ideas and ambitions, the distribution of goods is distinct. For this reason, social goods are products of the social significance of cultural and historical groups. We cite as an example the cattle that is sacred to the Indians and food to Latin Americans. (2) democracy does not work forever at the base of the crisis, despite the polarization around the political community. Surely, therefore, it is logical to deduce that the higher the *Civic Culture* of a population, the largest the chances of decision-makers hear their population. In other words, democratic governance requires citizens to share their values in *praxis*, a logical distribution and decentralization of decision making sense, implying the return of civil society. In this case, political power would be exercised by man, not just with his vote, but with participation in the political process of the

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<sup>10</sup> Alexis de Tocqueville (1805 – 1859) in his book called "The American Democracy" (1987) supports the Thesis the Americans are likely to organize themselves civil and politically because lawmakers wisely provided a political life to every territory portion, giving them local freedom to choose the common good.

State. (3) in some traditional societies, models of life may have adopted the rule as part of their own social idiosyncrasies of the territorial basis of political culture.

The analysis above indicates the need to build an associational life in a context of climate change. Due to this, Putnam's model (1996) is essential to understand the characteristics of social organizations that facilitate coordinated actions towards common goals. Merged with the instincts of societies well organized, it was noted that cooperation is facilitated by interpersonal trust and institutions, and these networks promote civic participation, where citizens come together to make collective decisions, an interaction of equal balance. However, this process requires hierarchy and the *modus operandi* suspicion, the exercise of power, certainly makes it difficult to generate trust, cooperation, norms of reciprocity and free flow of communication.

May institutions be able to contribute to a reflexive awareness of people regarding environmental risks if they are not internally democratic? Obviously not. It might work, in the formal sense, but without credibility and little legitimacy. Thus, if the political and economic institutions are not structured to include the citizens to act in democratic principles, experience shows the possible destruction of social capital base to expand reflexive awareness of environmental risks.

In the long term, it is necessary that public policies (Saravia, E., Ferrarezi, 2006) emphasize, in all phases, systemized efforts to build social capital and democratic realities. Thus, amid the collapse of collective identities, results of globalization, the greatest threat to democracy is the passivity regarding decision making in the political arena. Non-participation in public life can legitimize, for example, the decision makers to opt for a possible nuclear conflict: *Hard Power* (Military Force), or following the reasoning of Nye (2002), used the *Soft Power*<sup>11</sup> (Persuasive Power), which became as powerful as the *Hard Power* (Military Power).

Thus, the mission of civil society cannot be reduced to observe and choose who will participate in the political decision making process. In a context of extreme situations, it is necessary that the civil society members are well organized to be able to define and delimit actors' spaces. Otherwise, the effects of these policies may produce irreversible Negative Social Capital (governmental authoritarianism; administrative opacity; bureaucratic patronage, political indifference, low participatory vocation), which would hinder the construction of a reflexive awareness of the environmental risks.

## Final Considerations

In this article, we have searched the most fateful changes of globalization concepts, democracy, civic culture, social capital and environmental risks to analyze the issues facing contemporary societies; focusing on Latin Americans. From the perspective of political scientists, we have showed that the effects of globalization are revolutionizing the organizational groups structures. Accordingly, we have identified that one of the major social anaemia falls within the breasts of associative capacity of people, which is languishing at the loss of a broader social economic and political context, what does not help the perception of environmental risks.

The increase of individual interest and declining participation of individuals in political organizations were key points to understand the hostility of the civil society due to the State and its institutions as family, schools, churches, sporting habits and exhibit daily practices. Taking the authors mentioned into consideration, the article sought to understand the nature of the natural and social risk for the industrialized civilizations, loss of vitality of Public Policy

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<sup>11</sup>Some analysts foresee that at the politic life the Soft Power (Nye, 2002, 31) it is used by cultural and ideology persuasion. However, as Walzer (1993) says, if this power is used to acquire goods, it becomes tyrannical, once the goods control brings together the continuity of a dynamism domination history.

(Saravia, E., Ferrarezi, 2006) in Latin America and the commitment of democratic gains. Categorically, the study concluded that social changes penetrate all areas of private life (family, marriage, relationship) and public (legislation) by creating hazards and threats to man, such as loss of Social Capital (Putnam, 1996).

In a modest exercise to understand what the prospect of a reflexive awareness of the environmental risks is, the article infers that this perception will remain low in countries, regions and localities where there is a decline of Social Capital. Thus, low environmental perception is directly related to Negative Social Capital (Distrust), which hinders democratic actions, making the civil society an easily manipulated prey by those who hold power: individuals who run the State machine. These, in turn, seize the low cultural and civic use them as springboard for their social and material ascent; through the uses and abuses of force elements, such as sanctions, incentives, manipulation and genuine persuasion; in different quantities and with different interactions.

Finally, the article concludes that the increased awareness regarding environmental risks is remaining to the emergence of a democracy of the emotions in everyday life, acting as important as public diplomacy for the provision of social alternatives, inevitable to Modern State, through stimuli to be taught in the areas of social struggles; privileging the collective over individualism. Otherwise, we would continue moving around in circles, vicious, that break with all the vitality of private relationships and public policy (Saravia, E., Ferrarezi, 2006) (training agenda, design, implementation, execution and evaluation).

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# Evidence of the food security risk in the case of Kosovo

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## Abstract

The food and nutrition security (FNS) is a multidisciplinary term that encompasses a set of the complex economic and social determinants. Variety of determining short and long term factors influenced recently on rising concerns of food insecurity. FNS is one of the biggest challenges aggravating mankind nowadays. The commodity price hikes of 2007/2008 revived once again awareness of the hunger and food insecurity. The global debate over the food security became a challenging issue in particular after the food price spikes over the recent years. Kosovo as a small European country is undergoing the complex economic, political and structural adjustments of transition process. It is a net importer of food commodities displaying a chronic trade deficit. Therefore, implications of global food price volatility are crucial in maintaining the fragile food security. At the same time, Kosovo is considered to be self-insufficient in meeting domestic demand for the key food staples. One of the driving constraints of FNS in Kosovo is high share of the food consumption (40%) in the total household expenditure.

## Keywords

Food security, poverty, food consumption

## 1. Introduction

The early 1970s instigated a period of food price instability. As the result of sudden food price shocks, that time crisis altered rapidly bringing the humanity into the edge of food scarcity (Friedmann 1993). From food crisis of the early 1970s until the 2008, the absolute number of food insecure people was consistently around 850 million. But, when food prices spiked in 2008, more than one billion people were counted as food insecure (Gaus 2012). According to the group of authors (McDonald 2010, McMichael and Schneider 2011) recently we find ourselves stalled in a global food price crisis that is driving increased hunger and food riots in several continents. A range of casual factors has been identified to explain the sudden emergence of high food prices. Group of authors (McDonald 2010, Wiebe et al 2011, Ruby 2012) have classified the main drivers of the recent price volatility into: 1) *Short-term factors* (such as decline in growth of agricultural production, decline in global stocks of grains, increasing energy costs spur production costs, increased demand from the emerging economies, speculation in financial markets, biofuels), and 2) *Long-term factors* (such as growth in population and income, decline in investment in agricultural productivity, reduced state regulatory in agricultural production and trade, removal of agricultural tariffs and resulting import surges, shift to export crops).

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Despite its simple label, food security is an immensely complex issue (Hospes et al 2010). Ensuring food security is an ambitious goal that requires governments to work with markets rather against them (Blandford and Viatte 1997). Food security has been characterized as something to which each and every human being is entitled (Southgate et al 2010). Moreover, Carolan (2013) assumes that talking about food security means talking about something that essentially impacts every facet of social life, beyond the farm gate and food system. The broader understanding and definition of food security is vital, as it incorporates important aspects that need to be considered in order to ensure food security at all levels and for all people (Hart 2009). In the years since the World Food Conference of 1974, the concept of "food security" has evolved, developed, multiplied and diversified (Maxwell 1996). According to Benson (2004) food security is concerned with access to food. Food production does not equal food security. As such, it depends not only on how much food is available, but also on the access that people have to food (Wiebe 2003). According to the recent FAO (2009) definition food security exists "*...when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. The four pillars of food security are availability, access, utilization and stability. The nutritional dimension is integral to the concept of food security*".

Food security is a complex issue with multiple environmental, social, political and economic determinants. Group of authors (Barrett 2010, Ford and Rawlings 2007) consider that food security is commonly conceptualized as resting on four pillars: 1) food availability, 2) access of food, 3) utilization of food, and 4) stability of food supply. Moreover, in theory, two types of household food insecurity – chronic and transitory – can be distinguished, but in reality they are closely intertwined (Von Braun et al 1992): 1) *Chronic food insecurity* – is a persistently inadequate diet caused by the continual inability of households to acquire needed food, either through market purchases or through production. Chronic food insecurity is rooted in poverty. 2) *Transitory food insecurity* – is a temporary decline in household's access to needed food, due to factors such as instability of food prices, production, or incomes. In its worst form, transitory food security can result in famine.

There are important differences in household food security issues in rural and urban context. In urban areas, household food security is primarily function of real wage rate and of the level of employment (Von Braun et al 1992). Because rural incomes fluctuate from season to season and a multitude of risks affect income levels and consumption, poor rural households in developing countries demand access to financial services to help stabilize income and consumption and alleviate chronic and transitory food insecurity (Zeller et al 1997). Moreover, differences in calories consumption and requirements exist between rural and urban areas as well. Typically, calorie consumption is lower in urban areas, partly because of differences in activity levels (Von Braun et al 1992).

Food security and nutrition security are different but interlinked concepts. Nutrition security is an outcome of good health, a healthy environment, and good caring practices as well as household food security (IBRD 2012). Food security goes beyond the food production and distribution and that nutrition security is not necessary outcome of successfully achieving food security. Therefore, it is needed to present conceptual frameworks of the determinants of food and nutrition security and the links between food and nutrition security (Benson 2004). The extent to which individual food security results in good nutrition depends on a set of non-food factors such as sanitary conditions, water quality, infectious diseases and access to primary health care (Pinstrup-Andersen 2009).

In practice, analysts use proxy measures for different aspects of food security. Choice among indicators necessarily involves tradeoffs, so the objective necessitating measurement commonly drives the choice of indicator (Barrett 2010). Given the multiple dimension (chronic, transitory, short-term, and long-term) of food insecurity, there can be no single indicator for measuring it. Different indicators are needed to capture the various dimensions of food insecurity at the country, household and individual levels (Von Braun et al 1992).

From a food security perspective, it is important to understand the changes in food consumption patterns as different income groups can react differently to changes in food imports and changes in food prices in international markets (Babu and Sanyal 2009). People with increasing purchasing power, often in developing countries are able to pay more for staple crops, as they become wealthier (McDonald 2010). As economic development proceeds over the time, average per capita income and expenditure exhibit an increasing trend. This typically shifts the consumption patterns of the population. The food consumption basket changes from commodities with low quality dietary content to food commodities with a higher quality dietary content (Timmer et al. 1983).

Trade liberalization is an ally in the fight against poverty: it tends to increase average incomes and provide more resources with which to tackle poverty (McCulloch et al. 2002). The supporters of trade liberalization suggest that lowering tariffs will result in food becoming more readily available and accessible to consumers. The opposing view is more concerned with the adjustment impacts on small producers who might lose their livelihoods without being able to adjust to alternative income-earning opportunities (Ford and Rawlings 2007). The net benefits of price increases and decreases for a country should be roughly symmetrical. Countries that benefit most from price decreases will lose most from price increases. The same holds at the household level within a country (Swinnen 2011).

## **2. Data and Methods**

The most critical issues supporting this study lays on the fact that Kosovo was displaying vulnerability on the recent global food price shocks, combined with the high prevalence of poverty, sharp trade deficit of food commodities, and ongoing internal agricultural reforms. Therefore, the main objective of this paper considers the state of food insecurity in the case of Kosovo, in terms of the macro and microeconomic indicators at the national level. In this paper we aim to identify the main food security risk factors. In addition, our interest is to investigate impact of recent global food price shocks on the volatility of the domestic food prices. Here we aim to deal with the problem of horizontal price transmission from the world to the domestic market. Majority of empirical studies uses time-series econometric methods to estimate price transmission. Data used here were obtained from the Kosovo Agency of Statistics (KAS) and relevant intergovernmental institutions.

## **3. Results and Discussion**

The food and nutrition security (FNS) is a complex problem that requires multidisciplinary approach. For the purpose of this paper, here are presented a set of comparative and descriptive analyses that aims to indicate the main constraints of FNS in the case of Kosovo. Here we use some of the main macroeconomic indicators that review the current situation of FNS indicators.

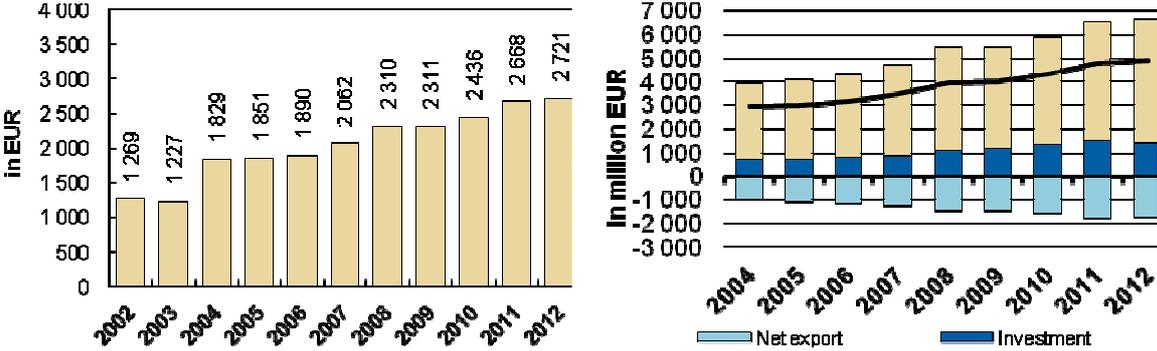
### **3.1 The case of Kosovo: Economic growth and development constraints**

Kosovo is a young European country that in terms of regional and administrative division is divided into 7 regions and 37 municipalities. Recent population census held in 2011, reports the existence of overall 290 thousand households and over 412 thousand dwellings. Kosovo is endowed with agricultural resources, with 1.1 million hectares of land. Agricultural area consists over 52% of land share, with over 55% of total area composing the utilized agricultural area. Demographic composition of Kosovo is characterized as a very young, comparable to the other European countries. With the total population of 1.8 million inhabitants, the median age in Kosovo is 25 years, indicating the youngest population in the Europe. The average household size is 5.9 members, showing the largest household unit in the continent. Kosovo could be characterized as a rural country where more than 63% of its population is living in rural areas.

Kosovo might be considered as consumption driven economy. Aggregated data (Figure 2) gives a clear outlook that consumption as the component of GDP has the highest contribution. Over the last decade, country achieved a significant improvement of its economic

accounts. Despite the positive empirical evidence showing that between the period 2002-2012 it doubled GDP (p.c.), with an average of 2,700 euro p.c. (Figure 1), Kosovo remains one of the poorest economies in Europe. Several constraints were shaping the weak development pattern, however the most important determinants might be listed as follows: inherited weak political profile, low investment profile, underutilization of resources due to the corruption practices, high level of unemployment, dependency on migrant remittances etc. The key socio-economic constraint of Kosovo is the high level of unemployment. High degree of unemployment (35%) is particularly spread by the youngest share of active population. More than 55% of youth (age 18-25) remains unemployed with no source of income. Moreover, the long term unemployment aggravates furthermore development and welfare perspective of Kosovo.

**Figure 1: Growth and development of GDP p.c. Figure 2: Contribution of the main components on GDP (2004-2012)**

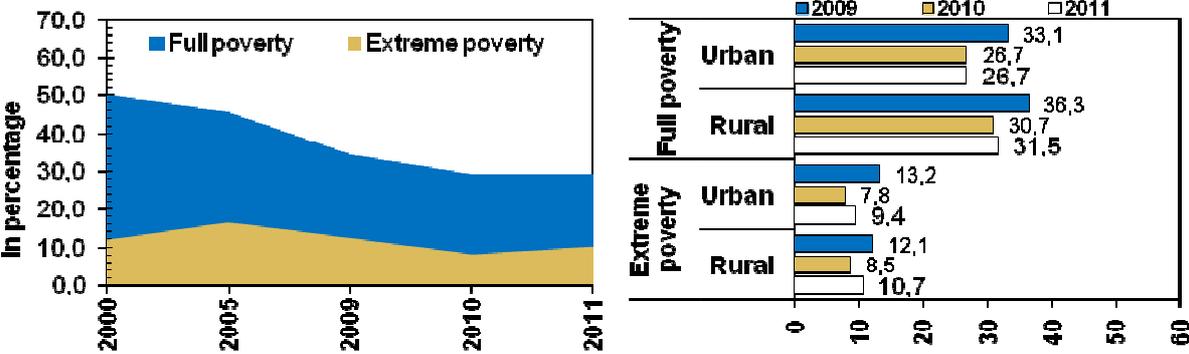


Source: Own elaboration based on the data of Kosovo Agency of Statistics (KAS)

**3.2 Poverty assessment in Kosovo**

Kosovo went out from the devastating war in the end of 1990s with the significant share of poor population living in the edge of existence. In the year 2000, more than a half of population (50.3%) were considered as poor, with over 12% living in the extreme poverty (Figure 3). Over a decade after, concerns of poverty remain evident, despite welfare improvements made. Available poverty data from 2011, shows that a third of total population (29.2%) lives with the less 2\$ per day, while more 10% cope with the extreme poverty line (1.2\$ per day). Based on the data assessment (Figure 4), we couldn't evidence a significant differences in the distribution of the poverty between the urban and areas. Similar outcome is valid also in the case of income inequality (measured by Gini index).

**Figure 3: Poverty prevalence in Kosovo Figure 4: Distribution of poverty in Kosovo**

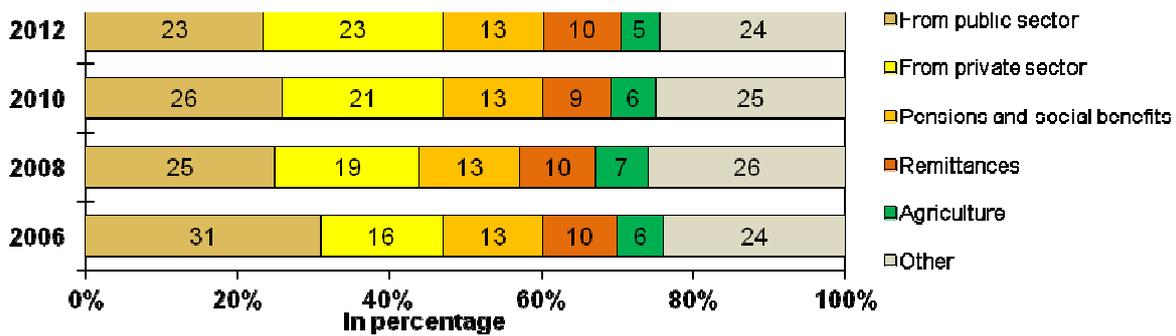


Source: Own elaboration based on the data of Kosovo Agency of Statistics (KAS)

### 3.3 Household sources of income

The aggregated HBS data gives an interesting outcome concerning the main sources of income of the Kosovo households. Employment in the public sector together with the pensions and social benefits constitutes the major source of income. More than a third (36%) of income comes from the abovementioned sources (Figure 5). Such results might signal the rising burden of the public finances and raise a question of sustainability of incomes for the Kosovo households. Further analysis concerning the impact of education on the employment opportunities and level of income, were showing positive correlation between the higher degree of education and greater income earnings.

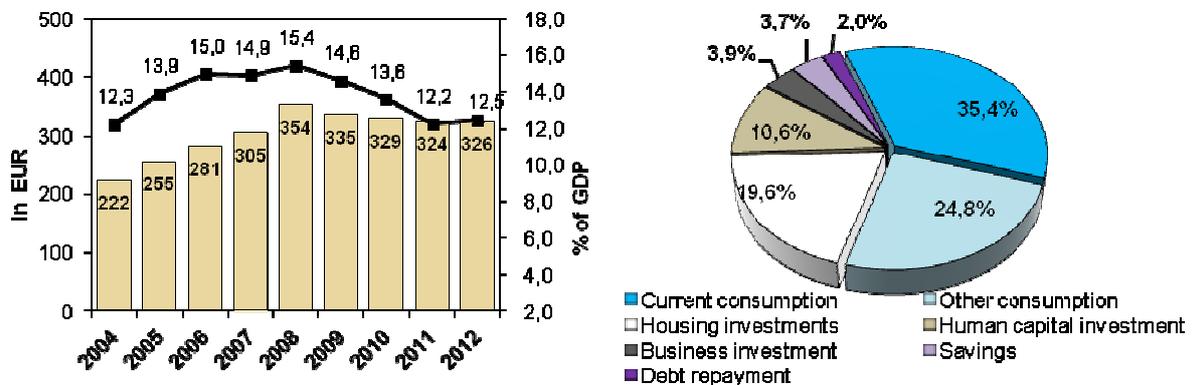
**Figure 5: Main source of income in Kosovo**



Source: Own elaboration based on the data of Kosovo Agency of Statistics (KAS)

Contribution of the private sector and agriculture sector remains weak despite the great potential of both sectors. On the other hand, one of the crucial sources of income (as well as consumption) in Kosovo are migrant remittances. The share of remittances in GDP remained relatively constant over the observed period, varying from 15.4% to 12.3% (Figure 6). In comparative terms, the size of annual remittances inflow in Kosovo is equal to a third of the total governmental expenditures. Moreover, the role of remittances rises on its importance concerning the food consumption, when considering their final use. Recent survey conducted by UNDP (2012) shows that expenditure of remittances on the food related items is as high as 35% (Figure 7).

**Figure 6: Inflow of remittances in Kosovo Figure 7: Use of remittances in Kosovo**

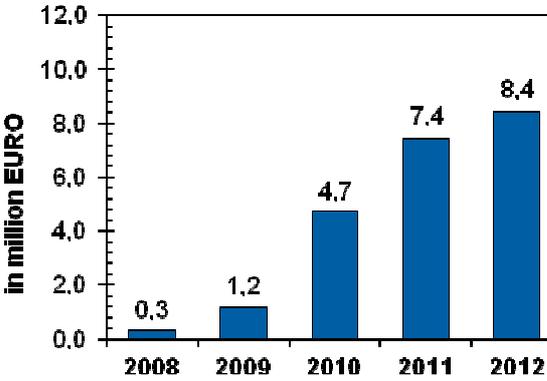


Source: Kosovo Agency of Statistics (KAS) Source: UNDP

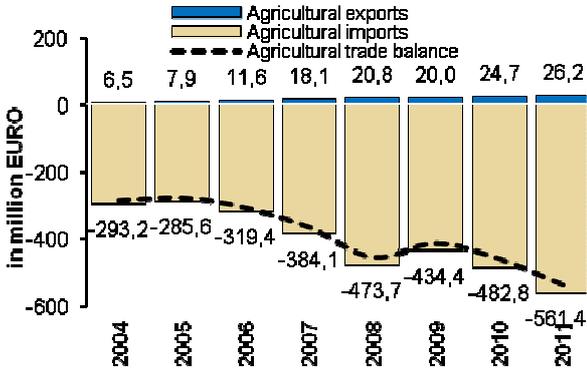
### 3.4 Constraints of agricultural sector

Kosovo’s agricultural sector despite its great potential to contribute in ensuring sustainable FNS (particularly in rural areas) remains underutilized. Degree of underutilization is presented here in terms of governmental support to agriculture and the trade deficit. The evident underinvestment in agricultural sector could be quantified at the level of 0.02% of GDP accounts (Figure 8). This depressing result actually makes Kosovo farmers non-competitive towards the heavily subsidized agricultural and food commodities from EU and other the surrounding countries. At the same time, constraints of agricultural sector are driven by the weak marketing approach, non-supportive crediting institutions and other market factors. Here we evidence that Kosovo faces a sharp trade deficit in trade with agricultural commodities (Figure 9). Kosovo is a net agricultural importer, which arises concerns of FS, in particular as potential transmission of the food price spikes from the global food market.

**Figure 8: Subsidies and transfers for agricultural sector in Kosovo**



**Figure 9: Agricultural trade balance of Kosovo (2004-2011)**

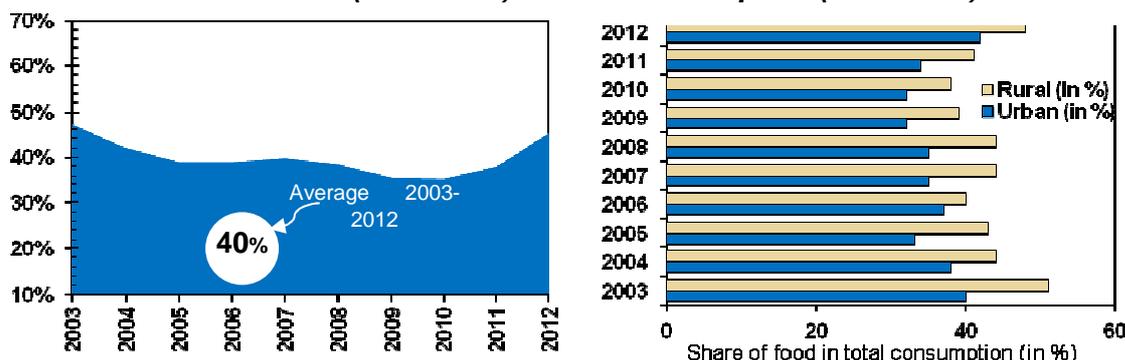


Source: Own elaboration based on the data of Kosovo Agency of Statistics (KAS)

### 3.5 Characteristics of consumption in the Kosovo households

In terms of household consumption we could evidence that total consumption nearly doubled since the early 2003. Similar positive outcome is evident also in the individual (per capita) level. However, the large concentration of consumption in the 5-key groups conveys the worrisome signal, showing that consumption is mainly financed to fulfil the basic needs. The average share of food expenditures in total consumption during the observed period (2003-2012) varied between the lowest 35% to the highest 47%. Within the same period (Figure 10), average expenditures spent on food exceeds the share of 40% of the total consumption expenditures. Statistical evidence presented in the Figure 11, makes clear distinction on the food consumption between the rural and urban households. Food expenditures in the rural areas tend to be greater than in urban settlements. In particular years of observation (2003 and 2012) more than a half (50%) of the rural expenditures were spent to the food consumption.

**Figure 10: Share of food in total consumption in Kosovo households (2003-2012)** **Figure 11: Urban/rural differences in the food consumption (2003-2012)**

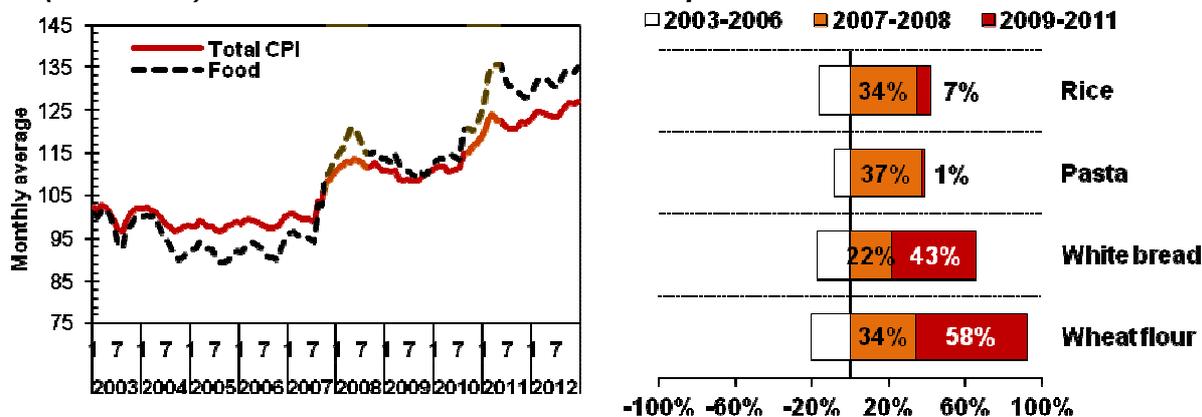


Source: own elaboration based on Kosovo Agency of Statistics (KAS)

### 3.6 Food price development

As the result of the recent global food price spikes here we could evidence clear signals of price transmission of the food commodities from the world into domestic market. Basically, the period of food price spikes highlighted in the Figure 12 is authentic and corresponds with the period of price shocks taking place in the global food market. In the Figure 13 are shown the price changes of the key cereal products such as flour and bread. Prices of both goods were increasing rapidly after the beginning of the global food price spikes. An interesting outcome derived from the figure below is the fact that price most significant increase of prices took place in after the 2009 when the food price volatility calmed down in the world food market.

**Figure 12: Monthly CPI development in Kosovo (2003-2011)** **Figure 13: Price changes of key food products**



Source: own elaboration based on Kosovo Agency of Statistics (KAS)

### 3.7 Trade and price transmission analyses

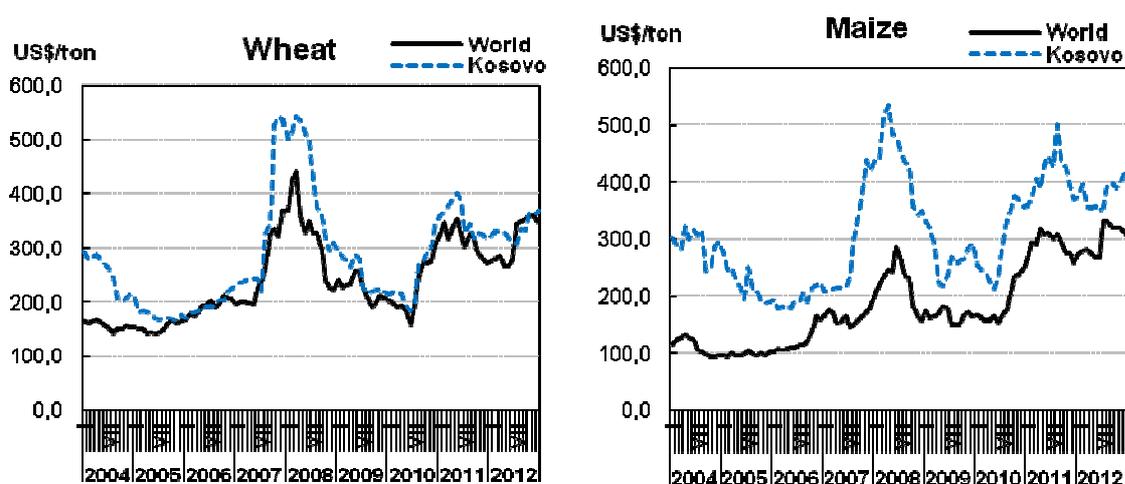
Preliminary assessment of the spatial price transmission in the case of Kosovo indicates the existence of the cointegration (Figure 14). Price development shown in the times series of two main food staples (wheat and maize) shows the cointegrated movement over the observed period. In order to quantify relationship between the domestic and world price we employed here simple percentage ratio analyses (Table 1). The outcome of this empirical approach (in the case of the price of wheat) shows that transmission of the world price into the domestic market is nearly perfectly elastic (1.08). Such a result indicates that if the price of wheat in the world market increased for 10%, the domestic price will increase of the same level. Therefore, the risk of spatial price transmission is considered to be evident in the case of Kosovo. Further comprehensive empirical assessment will be conducted in the later stages of research, in order to present not only the outcomes, but as well to outline the key trade policy recommendations related this important issue for FNS.

**Table 1: Spatial price transmission analysis: Ratio of percentages**

Commodity	Wheat price (\$US/ton)		Maize price (\$US/ton)	
	Kosovo	World	Kosovo	World
Jan 2006	169.4	167.2	193.6	102.7
Dec 2012	367.3	347.9	419.8	308.7
$\Delta$ price (\$US/t)	197.9	180.7	226.5	206.0
% change	116.8	108.1	116.8	200.6
Elasticity of transmission	1.08		0.58	

Source: own elaboration based on IMF and Kosovo Agency of Statistics (KAS)

**Figure 14: Price development of wheat and maize in the world market and Kosovo**



Source: own elaboration based on IMF and Kosovo Agency of Statistics (KAS)

#### 4. Conclusion

The food and nutrition security (FNS) is defined as a complex issue involving economic, social, political and environmental determinants. A set of the short and long term factors were influencing recently on the price spikes at the global level. As the result, more than a billion people were accounted to be food insecure after the recent 2007/2008 food price volatility. Sensitivity of this problem requires the global respond in utilizing available scarce food resources. FNS concerns are not anymore issue only for the developed countries, but as well as for the developed economies. Despite the hot global debate and extensive empirical research conducted recently, there is no single indicator introduced to measure the FNS. The conceptual framework of the food and nutrition security (FNS) is examined at different functional levels. Research approach is extended from the global to the individual level. It covers rural and urban context, as well as can takes chronic and/or transitional form. Nutritional aspect is part of food security that requires specific attention, contemporary studies have been integrating nutrition aspects as indivisible part of food security assessment.

Provisional results provided in the case of Kosovo in this paper were showing that country is significantly exposed to FNS risks. The set of FNS risk factors indentified here were drawing attention on specific concerns, such as: existence of high degree of the poverty prevalence, high unemployment accompanied with the low level of incomes, high share of food expenditures in total consumption, high dependency on the migrant remittances, sharp agricultural and food trade deficit. Percentage ratio time series assessment of the spatial price transmission in the case of Kosovo, were showing that world price transmission into the domestic market is nearly perfectly elastic. In order to respond to the abovementioned FNS risks there must be undertaken systematic, complex and multidisciplinary approach. The FNS policy should integrate vision of economic growth, food policy, trade policy, agricultural policy,

food safety net policy, social and healthcare policy etc. All of mentioned issues we aim to assess in the later stages of our research in order to come out with appropriate policy recommendations serving that might be beneficial to design and implement comprehensive FNS for Kosovo.

## Acknowledgements

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# Customer value estimation in the channels of value distribution on the example of brewing industry

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Emília ŠKORECOVÁ<sup>2</sup>

## Abstract

Changes taking place in the environment of contemporary enterprises, especially concerning intensified competitive struggle, have forced the enterprises not only to direct their activities and resources at customer value creation but also to maximize the value of business relationship linking the customer and enterprise. The effect of this is the necessity to measure the customer value.

The first part of the article is focused on use of the tools, which are suitable for customer value estimation: monitoring of cost by ABC method (Activity Based Costing), use of CRM systems (Customer Relationship Management), use of data mining.

Attention is paid to these instruments from a theoretical point of view and in terms of their use in brewing enterprises in the Slovak Republic. 24 Slovak breweries were researched. The second part of the article is focused on verifying the hypothesis, whether the dependence exists between the business size and the contents of database as well as the scale of its use. In the analysis there are the structure ratios used concerning the particular variants of features characterizing the respondents and also descriptive statistics characterizing the sample using variables. Therefore, arithmetic mean, standard deviation, median and other descriptive measures are used. Research was conducted on a set of 79 subjects. The conclusions of the research are worded at the end of the article.

## Keywords

Customer value estimation, Activity based costing, Customer relationship management, Data mining, Slovak breweries, Polish breweries

## Introduction

According to the founder of modern management Peter F. Drucker „the objective of the company organization begins in external environment at the customer... it is a customer, who is determining, what the company will be like, what the company will produce and if it will be prosperous” (E. H. Edersheim, 2007).

The enterprise (alebo the company) must adapt to the customer's needs with the maximum effectiveness. Nowadays, the success does not depend on the size of the company, but on its ability to adapt to the market. From a philosophical point of view we can say that customers give their resources to the companies to use and at the same time they expect to receive a compensation for the provided resources. Profit from the business is then to some extent a customer's investment in the future development of the enterprise (Lehtinen, 2007).

The first crucial step in the management of value flows in the company is to determine the customer. Followed by the identification of customer expectations, which means of

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outputs from the entire business process. The basic principle is: not to produce anything what the customer would not need (Spilka, 2012).

Hence the need to build an information system also from the perspective of a "customer-oriented logic", in which the costs shall be borne by the customer and the price is an independent parameter of the market – the market will set the price based on the value, that product brings to the customer (Caputa, 2009).

Manufacturers usually have to act with dozens to thousands of customers, who buy a quantity of products or product groups. Customers can have individual conditions, such as prices, discounts, transport or the amount of receivables. These conditions affect the volume of products that the customer will buy. If the entrepreneurs want to achieve truly effective sales and maximize the profits, they need to make the sales situation more transparent and to keep track of each customer asking if brings profit or loss (Veščičík, 2002).

For efficient customer relationship management, it is necessary to know the customer value for the enterprise. The customer is perceived for the determination of his value as a cost object, to which must be progressively allocated all relevant costs and benefits, not only current but also future - potentially (Lošťáková et al., 2009). In addition, it is necessary to know the characteristics of the customers, strengths and weaknesses of maintaining the relationships with the customers and expected development of these relations.

Customer Relationship Management – CRM and management accounting with a focus on the customer are needed to obtain the mentioned information.

CRM systems (Customer Relationship Management) form the opportunity to change the business tactics quickly and flexibly according to the development of the situation in the market for business managers as well as to acquire the ability to establish the effective strategies and tactics of access to the customer segments and individual customers. They can identify risks quickly and reliably and eliminate their impact on the trade relations (Látečková, 2009).

Customer oriented management accounting contributes to the increase of business efficiency by monitoring costs and revenues of individual customers. Reports about the costs of customers need to be processed the way that the managers can identify the causal factors of the costs and revenues associated with the individual customers (Škorecová, Váryová, 2013).

It is necessary to design and implement such a bookkeeping of costs, which: creates the opportunity to identify a range of factors affecting costs, allows their thorough identification, increases the efficiency of decision-making and thereby allows a management of costs in the long and short term (Caputa, 2014).

This requires a transition from cost accounting model, based on the perception of the company in terms of functions to the model, based on the perception of the company in terms of processes (Wnuk–Pel, 2012). Therefore, the question concerning the knowledge of Activity Based Costing methods, as well as the extent of its use becomes justified.)

If a company decides to implement ABC method, then it can get a new view of costs and profitability. It obtains detailed information about the costs of processes running in a company and about the profitability of products, customers and sale channels. This method enables to compare the processes within the company or between different companies (Škorecová, Košovská, Ferenczi Vaňová, 2010).

Top managers of successful enterprises know, that the application of systematic processes reduces risk, reduces the occurrence of defective performances, errors and discrepancies and guarantees a high probability of achieving a good result (Kaplan, Norton, 2010).

## **Objective, material and methods**

The key objective of the article is:

1. to present as the tools are used, which are suitable for customer value estimation, 2. to describe the scale of use of the customer value measurement methods in a selected group of enterprises. The considerations are concentrated on verifying the following hypothesis: the dependence exists between the business size and the contents of database as well as the scale of its use.

The starting material for writing this article was acquired: through the study of professional and scientific literature sources in printed form or on the websites, through research, that was conducted by the article authors in the brewing enterprises in the Slovak Republic and in the Poland.

The starting material was processed by the following methods: method of selection, comparison, questionnaire method, a method of controlled conversation with the managers of the selected enterprises, method of analysis, synthesis, mathematical-statistical methods (arithmetic mean, standard deviation, median, etc.) method tabular and graphical data processing.

## **Results and Discussion**

### **1. The tools, which are suitable for customer value estimation**

If the customer is a key to the strategic reorganization of the enterprise on the market then MIS of the enterprise should be focused on the systematic identification of the values highly appreciated and perceived by the customers, on the systematic monitoring and analysis of shopping behavior and characteristics of customers, on measurement of profitability (loss rates) of customers and their value for the enterprise. Obtaining this information in conditions of turbulent economic environment requires its own, unique, non-standard data processing within the managerial accounting and management information systems.

Costs and revenues per customer are required to be drawn from the accounting system of the enterprise. It is not enough to rely on the traditional cost accounting, because it does not allow identifying the actual causal factors, including the benefits associated with individual customers. Management accounting is needed, that allows compiling overviews of costs with a wider range of factors affecting costs.

Whereas the costs are not caused by a product, but by the activities carried out in the process of manufacturing the product and in processes related to the product manufacturing, management accounting should be focused on identifying and evaluating the effectiveness of activities and processes that create the customer value. To meet this requirement, it is necessary to keep accounts by activity (Activity Based Accounting).

The result of tracking the costs per activities is the ability to answer not only the question, what the costs per customer, per product, or other cost object are, but also the question, why the costs are just the way they are. Activity-based cost accounting allows identifying the actual factors of the costs creation associated with the customer.

Costs associated with acquisition, keeping and servicing of individual customers are incurred in a very differentiated way. They can be most accurately determined by the actual consumption of the different activities related to the particular customer. Calculation by the ABC method (Activity Based Costing) is suitable for this purpose.

CRM systems (Customer Relationship Management) serve to the comprehensive customer relationship management. Their base is a living, constantly updated database of customers and business partners. Using CRM it is possible to effectively analyze the situation with its customers and partners, to respond quickly to the incentives, changes in the market, to introduce new products on the market, to inform about the marketing and

sales activities (discounts, discount coupons, loyalty programs, consumer contests, etc.). CRM systems allow interconnection of the quantity of telecommunication channels and can be integrated directly in the call centers.

Well-run CRM systems allow identifying the profitable and unprofitable customers, while noting the causes of profit or loss.

CRM systems offer a huge space for realization of the creative ideas with help of innovative information and communication technologies. Data mining techniques are used for analysis and segmentation of the customer database and customer relationship management. Data mining is the procedure applicable anywhere where the large volumes of data are, from which it is necessary to extract a certain knowledge and transform it to the commercial advantage. In the data there lie hidden potentially useful information, which are rarely clearly obvious at first sight to be able to draw the advantages from them, which they offer. (Krošlák, 2010).

Dr. Daniel T. Larose, one of the world's leading experts and founders in the field of data mining, states that data mining is the process of discovering new, previously unknown meaningful correlations, patterns and trends, through the review of large volumes of data stored in data warehouses (DWH - Data Warehouses ), using the standard technology of recognition, and statistical and mathematical techniques. (Larose 2005).

Data mining covers a wide range of techniques used in a range of sectors and can be defined as the process of extracting relevant, previously unknown or undefined information from very large databases. Due to the intensified competition in the marketing, data mining has become a necessary practice, leading to the maintaining the competitiveness (Petr, 2006).

In the corporate informatics data mining is used mainly in marketing within CRM systems, but also in the control of the products quality. It is used to identify the suitable customers for a marketing campaign etc.. Through the data mining models it is possible to predict the behavior of a particular client in a given situation, based on the history of the customer's behavior that is stored in the database in the form of data (Lacko, 2009).

The result of a proper made depth analysis is unveiling ("mining") important information, on the basis of which it is then possible to take the necessary measures and changes, for example in the area of a marketing strategy. Final product of data mining is therefore a knowledge (Novotny and others, 2005).

Use of the appropriate tools to estimate the value of customers, we examined in the Slovak breweries. The main criterion for the breakdown of breweries was their size.

Beer is produced in Slovakia in about 33 breweries nowadays. In the last 5 years there has been a big boom in small breweries. More than 30 small breweries were established and founding of the next breweries is scheduled. However, more than 90% share of the Slovak beer market, have two big breweries, the owners of which are transnational companies:

Hurbanovo Brewery, Inc. is owned by Dutch company Heineken and has approximately 50% share of the Slovak beer market,

Brewery Topvar, Inc. is owned by SABMiller, based in the UK and has approximately 40% share of the Slovak beer market.

Managers at the headquarters of two mentioned breweries are actively working with customers, taking advantage of CRM systems, data mining technology and the ABC method. The remaining 31 breweries are among the small breweries. Their customer information systems have different levels, which depend mainly on whether brewery distributes beer to some customers or produces beer only for a specific restaurant.

Overview of the use of tools for customer relationship management and content of customer information is documented in Table 1.

**Tab.1 Use of the tools, which are suitable for customer value estimation**

The size of the brewery and the market share	Type of business entity	Number of enterprises	Use of CRM,DM, ABC	Content of information about customers
<b>Large breweries</b> approximately 90% market share	incorporated (Inc.)	2	all tools	segmenting customers, ABC analysis and profitability widely used in the management
<b>Small breweries</b> approximately 10% market share	incorporated (Inc.)	2	partly DM	custom reports on customers especially for the needs of annual business plans and advertising campaigns
	limited company (Ltd.)	12	no	sporadic reports from billing data, especially for the needs of promotions
	individual entrepreneurs	17	no	only data from the invoices issued to the customers without their further analysis

Source: own work

The research was conducted in 24 breweries - in Inc., in Ltd. and in 8 restaurant breweries, owned by individual entrepreneurs. As the situation was the same at individual entrepreneurs, we generalized it to all 17 breweries owned by individual entrepreneurs.

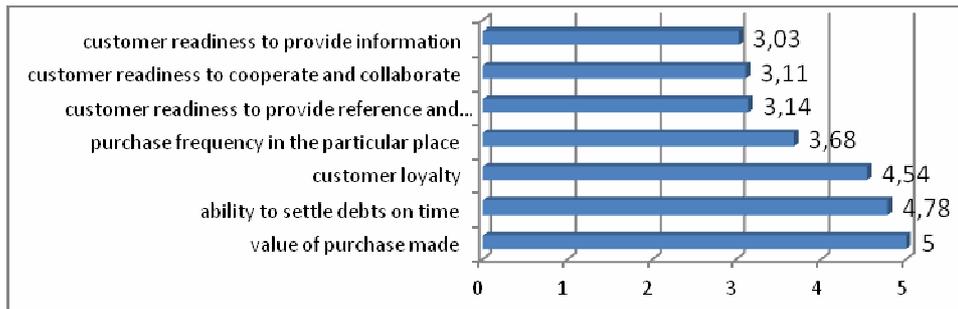
From the table 1 it can be seen that the use of CRM systems, data mining, monitoring costs by method ABC, are mainly used in large enterprises of brewing industry, in enterprises that are owned by transnational brewing companies. Small enterprises assess the value of individual customers by using own reports, that contain information such as the invoiced amounts, discounts, bonuses, the quantity of products sold, overdue receivables, etc. Individual entrepreneurs are owners of the restaurant breweries. They deliver beer to one particular restaurant and therefore they have no need to analyze the customer data.

## **2. The measurement of customer value and information content of the information system in the light of research**

Against the background of the existing considerations a question can be state, whether the enterprises estimate the customer value, based on what methods and what kind of information base do they have at their disposal?

A survey research conducted in year 2013, on the sample of 79 subjects specializing in the distribution of beer (owners, managers and direct vendors of beer) in Poland, has been subordinated to this goal. Those subjects were classified under the average annual income, which in the subjective evaluation of the respondents was assessed as: large (76%), average (13%) and small (11%). It should be emphasized that research encompassed 16 distribution centers that constitute separate entities belonging to the large brewing companies in Poland.

While raising the issue of measuring the customer value in the practice of enterprises, one should note the ranks that were ascribed by the respondents to the factors determining the customer value (Pic. 1)

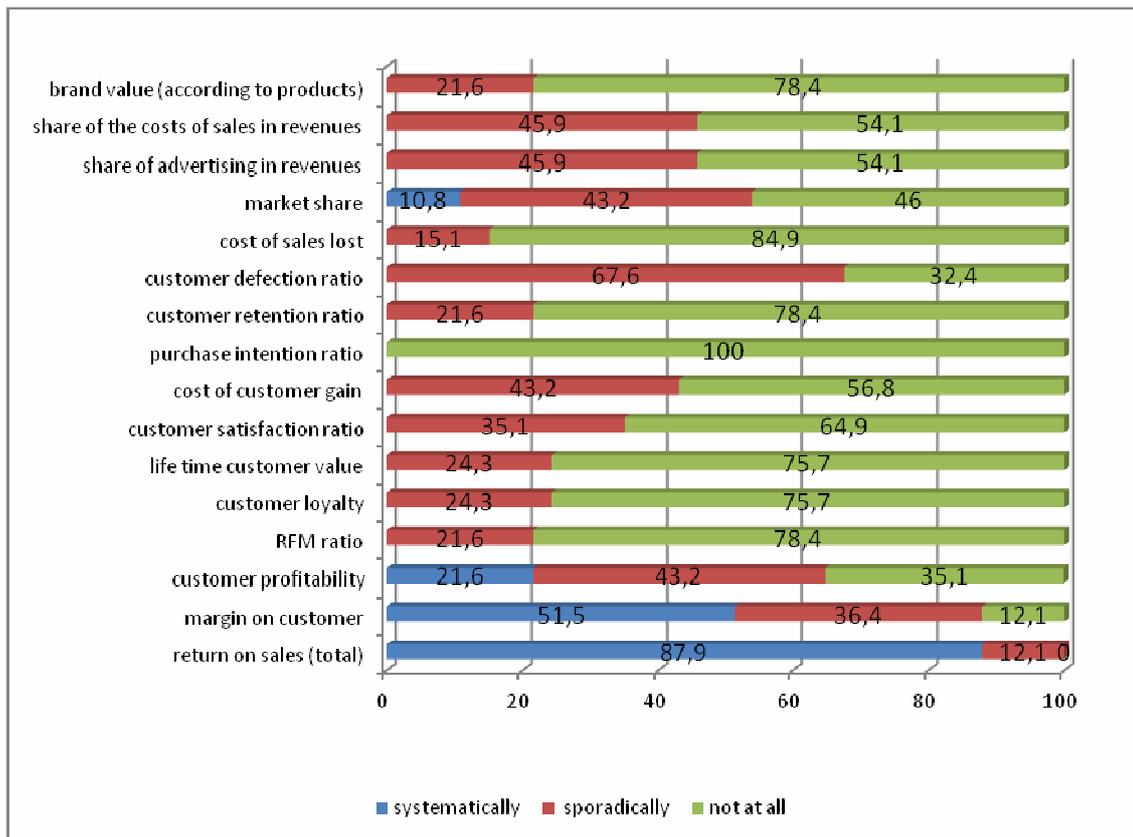


**Pic. 1 The significance of factors determining the customer value in the opinion of people representing the examined subjects** Source: own work

A definite majority of the respondents pointed out, that it is the value of the purchases made, punctuality of regulating liabilities and the customer loyalty. The frequency of making purchases received the fourth place in this classification. It should be pointed out that all of the suggested factors received an average note exceeding the value of 3, which means that all of them were significant while estimating the customer value, even though they did not influence it in the same way. However, one should emphasize that assessment of the customer value from the point of view of the bidder, even though it grants priority to the factors determining the transactional value of the customer, also takes into considerations its resource value. The ranking list of the presented factors confirms the previously made statement that from the point of view of the customer value, the key meaning for the enterprise has assessment of the transactional customer value. The estimation of the aforementioned value is tied with the need to assess the profitability of the customer. The examined group of respondents declares that measurement of the customer profitability takes place at least once a month (49.62%). Almost (36.2%) does it sporadically while the rest bases the assessment of the customer value on the level of sales to the customer. It means that the measurement of the customer value based on the profit is not a commonly employed practice and still a large number of enterprises evaluates the customers from the perspective of the value of the achieved income.

A definite majority of the enterprises is based on the traditional model of cost account (74%). Only 26% declared the use of the process account, however, these were large subjects, mostly representing the distribution centres that are owned by the producers or large commercial networks. It also should be noted here, that over 54.04% of those examined, apart from the obligatory information system declares using the CRM system.

Taking into consideration the fact that measurement of the customer value can be based on various measures and the term 'customer value' itself has a subjective and multidimensional dimension, the respondents were presented a set of indicators along with a request to show the extent and frequency of their use. In this set however, apart from the indicators directly linked to the final assessment of customer value those were mentioned that may be used in the process of managing the customer base (Pic. 2)

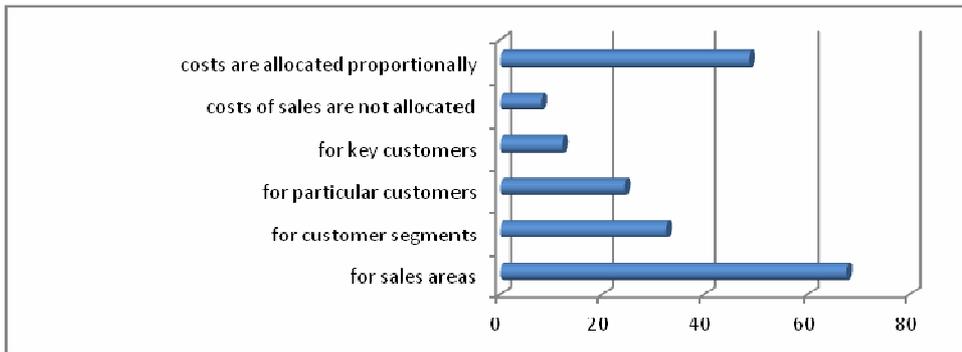


\* The margin on the customer does not include the cost of sales

**Pic. 2 The frequency of using selected indicators, including the indicators of measuring customer value** Source: own work

In the set of regularly used indicators the following can be found: return sales (total), which is calculated by over a half of those surveyed, margin on the customer (51.5%), customer profitability (21.6%) and the market share (10.8%). In result in this group there are two indicators used in the evaluation of the customer value although irregularly such indicators are used as: customer defection ratio, the cost of customer gain and the indicators describing the share of the chosen positions that are a part of the costs of sales in the value of the revenues achieved. It is also worth noting that the indicator of the customer lifetime value, on which the prospective customer evaluated is often based, is rarely used in only 24.3% of the examined enterprises.

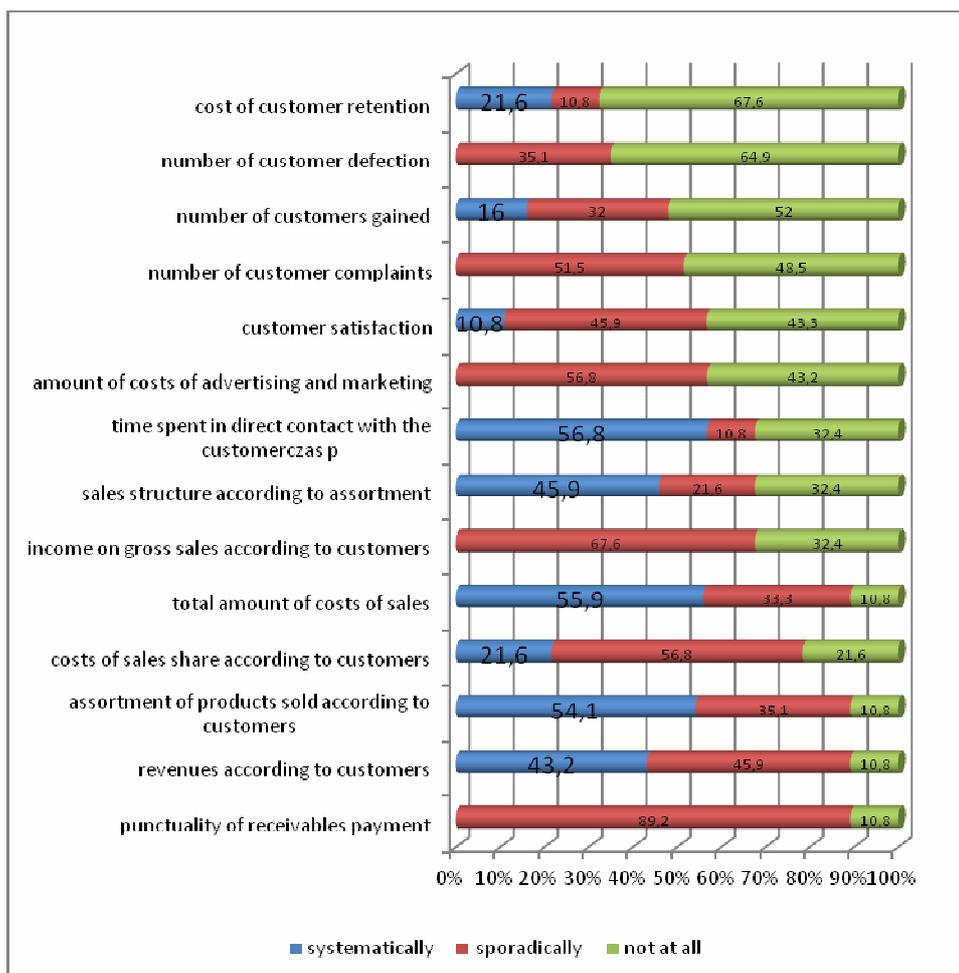
Referring to research presented above it is also worth mentioning the replies from the respondents concerning the way of cost recording and calculation, connected with the customer service. Here it should be emphasized that according to the Polish accounting act, detailed calculation of those costs is not obligatory. As it may be seen in picture 3, the subjects covered by research calculate the cost of sales while almost the half of the enterprises calculates the indicated costs proportionally to sales revenues.



**Pic. 3 The extent of calculating the cost of sales in the examined subjects (in %)**  
Source: own work

The traditional calculation based on arbitrarily chosen allocation keys remains the dominant way of calculating the cost of sales. It should also be noted that over 24% of the examined enterprises attempts to calculate the costs for the particular customers.

In research the respondents also referred to assessment of the information system in the context of possibilities of acquiring some information quickly that remain in relation to assessment of customer value and the frequency of using such information (Pic. 4).



**Pic. 4 The availability of the chosen information in the information system of the examined enterprises and intensity of their utilization (in %)** Source: own work

As it may be seen in the figure, the information system functioning in the examined enterprises creates for over 90% of the examined enterprises a possibility to acquire information concerning: punctuality of receivables payment, achieved income and assortment structure of sales according to the customers. This information is commonly available but it does not mean that it is regularly used.

Generally the piece of information regarding punctuality of receivables payment is used sporadically (89.2%). On the other hand a large percentage of enterprises declared systematically using the information regarding the purchase structure of the particular customers (54.1%) and about the value of revenues achieved (43.9%). Even though this information is typical, coming from accounting documents, over 10% of those examined states that they are not used at all.

In the set of information, that according to the respondents is impossible or difficult to acquire, most commonly the following are given: the level of costs of customer gain and retention, number of gained customers and customer defections, as well as the number of the complaints made. Therefore, the presented results of research indicate that the extent of information possible to be acquired and systematically or sporadically used in the examined enterprises is different.

In order to achieve a synthetic assessment of information resources of the examined enterprises a transition was made of the gathered data in the area of ownership and the frequency of using information by the particular sales centers. To this end the Multidimensional Comparative Analysis (MAP) was used, first transforming, then standardizing the variables. The variants of qualitative characteristics determining the frequency of using particular pieces of information were transformed into variables that are stimuli, in which the expression 'not at all' was replaced with the value of 0, 'sporadically' with the value of 1 and 'systematically' with the value of 2. The total result was referred to the maximum possible grade, which made it possible to standardize the measure of information usability, expressed in the scale from 0 to 1.

The results of the comparisons of three examined groups divided by the criterion of the size of turnover (the size of the enterprise) indicate a statistically significant diversification of the values of average measures of informational usability (i.e. the availability and utilization of informational resource) in the particular groups ( $p=0.0458$ ). This indicates confirmation of the hypothesis assuming the existence of relation between the size of the enterprise and the usability of the informational base and the extent to which it is utilized. However, it should be emphasized that the ANOVA analysis, by indicating the significant diversification of the average values, does not indicate the statistically significant dependencies between the size of the enterprise and the synthetic result of the information usability. The designed synthetic measure for centers with a low level of turnover equaled  $0.61\pm 0.0$ , for centers with the average level of turnover it equaled  $0.56\pm 0.17$ , while for centers with high level of turnover it equaled  $0.69\pm 0.19$ . Thus, no significant dependency between these values can be observed. By analyzing the relations between the size of the enterprise, measured by the level of turnover, and the usability of the informational base and the degree of its utilization it was determined that some values are highly correlated with the size of the enterprise, while others do not show any interdependency.

**Tab. 2 The value of the coefficient of correlation**

Dependency between the level of turnover and the usability of informational base	Kendall coefficient
profit on the gross sales in customer intersection	0.4344
revenues in customer intersection	0.3307
level of advertising and marketing costs	0.4344
level of the costs of sales	0.2788
share of the costs of sales in total sales	0.2788
level of the costs of customer gain	0.2609
cost of customer retention	0.0529
number of customer defection	0.1900
number of customers gained	0.1960
number of complaints made	-0.0700
assortment structure of sales	0.1455
time spent on direct contact with the customer	0.6834
assortment structure of sales according to customers	0.4414
punctuality of receivables payment by customer	0.2352
customer satisfaction	0.2425

Source: own work

As it results from the table, along with the increase of the size of the enterprise measured in the level of turnover, availability of the information concerning the time spent on direct contact with the customer increases. The coefficient of correlation is high and positive, ( $r=0.68$ ;  $p<0.05$ ). Other correlations are slightly lower, though the relation can still be described as moderate ( $r<0.5$ ), and they concern: availability of information concerning profit on gross sales according to the customer, level of advertising and marketing costs and assortment structure of sales according to the customers. A lack of linear relations with the size of the enterprise was observed in case of information concerning: costs of customer retention, number of customers (left and gained), as well as number of complaints made by the customers.

Therefore, it should be stated that the hypothesis assuming the existence of relation between the size of the enterprise and the usability of the informational base and the degree of its utilization has only partially been confirmed. It was only stated that the size of the enterprise differentiates the availability and utilization of such indicators as: profit on sales according to the customers, level of advertising and marketing costs and assortment structure of sales according to the customers.

## Conclusions

The following conclusions result from the contribution:

Successful implementation of CRM systems, data mining techniques, ABC analysis and ABC profitability requires mastery of theoretical backgrounds of customer relationship management, thorough knowledge of the mentioned tools, their consistent overwork in the terms of the enterprise and combining with the corporate strategy. If employees do not use these tools properly, it may complicate and deform the relationships with customers. Management support then fails and these tools can be considered an unnecessary investment.

For monitoring customer value appropriate tools (monitoring costs by method ABC, the use of CRM systems, data mining) are mainly used in large enterprises of brewing industry,

in enterprises that are owned by transnational brewer companies and in enterprises with foreign capital. Small enterprises with a small number of customers assess the value of individual customers by using own reports, that contain information such as the amounts invoiced, discounts, bonuses, the quantity of products sold, receivables overdue, the direct and indirect costs expended on the customer, etc.

During the course of research, the thesis of the work regarding the existence of relation between the business size and the extent of the methods used was proved. In small enterprises the assessment of the customer value is most often based on the value of income gained. Along with the increase of the size of the enterprise the extent of the accounting records gets wider, while at the same time the emphasis is placed on the implementation of information technology systems. Unfortunately, the extent of utilization of the available data is rather limited.

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# **Czech citizens in Zambia: Preliminary research on the process of adaptation**

**Jiri Cenek**

**Miroslav Horak**

## **Abstract:**

This study describes the process of adaptation of citizens of the Czech Republic to the cardinally different cultural, societal and environmental conditions of the African continent. In the theoretical section the focus is on the issues of immigrants and expatriates in the globally inter-connected world and the process of psychological adaptation of an individual to a foreign culture.

In May 2013 semi-structured interviews were conducted with 6 Czech expatriates currently living in Zambia (5 women and 1 man). Most of the interviewees live in Zambian society for at least 2 years, and work in the development sector. The interviews were designed on the basis of the four dimensions of CCAI (Cross-cultural adaptability inventory) by C. Kelley and J. Meyers (1995). The main areas of adaptation we focused on were: the cognitions and feelings of expatriates after arrival to the host culture, the effect of time spend in the host culture on feelings and cognitions, stresses and problems in everyday life, Czech and Zambian cultural differences, and social relations with members of host culture.

As a method of qualitative data analysis we used the content analysis. The results show the limited potential of full social and cultural adaptation of members of European culture to African culture, and identify the main areas, where cultural clashes, misunderstandings, and conflicts may arise. Our results show that probably the most pressing matter, and the biggest barrier to the full adaptation to the Zambian culture, lies in the area of close and intimate relationships and dyadic relationships such as differences in the concepts of friendship and love. Another important group of topics that have arisen in the process of data analysis are the differences in time perception and time management, and differences in work-related behavior.

In this paper, we have identified key skills and competencies, whose training in the period before the departure should help Czech immigrants and expatriates to adapt more successfully to the African culture. These key topics are going to be applied in the following research on the adaptation of Czech immigrants and expatriates on African continent.

## **Key words:**

adaptation, cultural adaptability, culture, culture shock

## Introduction

Globalization, which connects continents and regions economically, socially, politically, culturally and technically, causes increased mobility of people around the globe. People from different cultural backgrounds, with different values, attitudes and models of behaviour, interact with each other on a daily basis. They differ in the ways they think, in their lifestyles and in their verbal and non-verbal communication. Travellers, immigrants and sojourners encounter with culturally determined patterns of behaviour that are substantially different from what they are accustomed to, and what they would expect. This paper will try to explain how and why different people have different patterns of reactions to novel social environment.

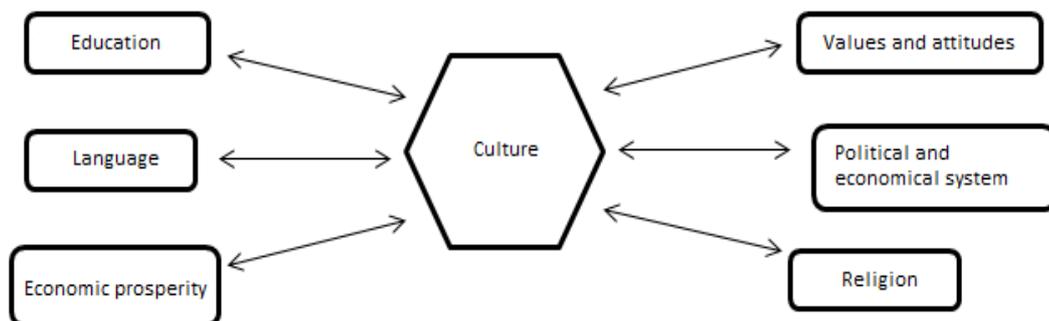
The objective of this paper is to present a current theoretical framework connected with the processes of adaptation of an individual to different cultural environment, and to present results of our preliminary study on cultural adaptation of Czech expatriates in Zambia.

## Culture

According to Hofstede (2007), culture is always a collective phenomenon that is common for all individuals, who currently share or have shared the same cultural environment. Individuals acquire certain culture during the courses of their lives through learning processes. The term “culture” is commonly used in many scientific disciplines (anthropology, culturology, psychology, sociology, etc.). There are a number of definitions for the concept of “culture”. These definitions can broadly be classified into two categories (Průcha, 2010).

- The broader definition of culture states that culture is everything created by human civilization.
- The narrower definition of culture declares that culture is connected to human behaviour. Culture is connected with a certain social group, and its habits, symbols, norms, rituals, communication patterns and knowledge.

In this text we will use the narrower definition of culture (used also in cross-cultural psychology in general). Fig. 1 offers a summarized illustration of the factors influencing culture.



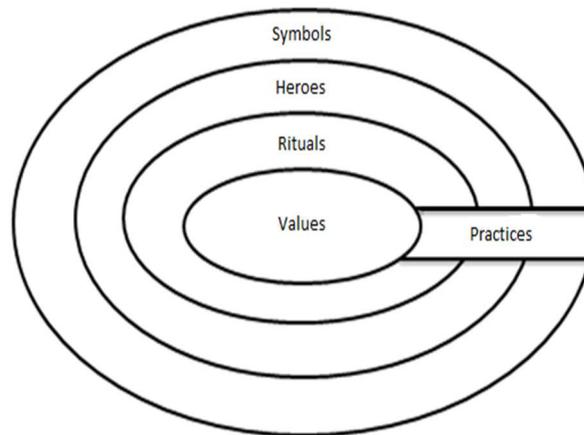
**Fig. 1 Factors influencing culture (adapted from Štěpánková, 2014)**

Hofstede (2007) suggests that there is a comprehensive set of aspects in which cultures differ. Fig.2 offers an illustration of Hofstede's model of culture, clearly distinguishing four components of culture. Following on this illustration, it is important to clarify that:

- Symbols are words, gestures and cultural artefacts that share a specific meaning for people from the same culture. They are not rigid, but constantly change and develop.
- Heroes represent dead or living persons with characteristics, which are highly valued in certain culture, they serve as role models.
- Rituals are collective activities or practices that are socially important for members of a certain culture (e.g. greetings, religious ceremonies, political manners, etc.).

Symbols, heroes and rituals are all practices that have their meaning within a certain culture, but their exact meaning is obscured for an observer outside the culture. Values occupy the core position in the model. They are general tendencies to prefer certain states of reality over others, and they are connected with national consciousness and self-identification.

When two or more cultures meet, two or more conceptions of reality collide (Kolman, 2005), which can result either in mutual enrichment or in negative consequences: cross-cultural conflicts, misapprehensions (see Ting-Toomey & Goetzel, 2001; Morgenstern, 2007).

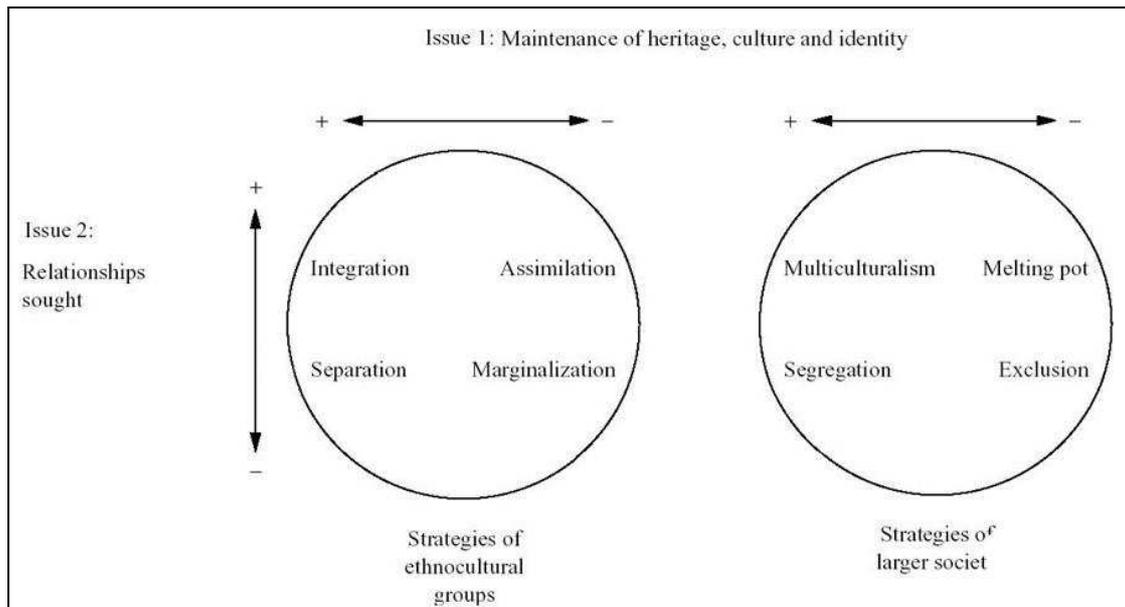


**Fig. 2 Hofstede's model of culture (adapted from Hofstede, 2007)**

### **Adopting culture**

Berry (2002) presents two basic processes of adopting a culture. The first one – *enculturation* – is a process during which an individual acquires knowledge, skills and behaviour (mostly from parents, peers and teachers) that allow him or her functioning successfully within a certain society (culture) (Hartl & Hartlová, 2000). Enculturation occurs during the whole ontogenesis of an individual; its meaning is similar to the psychological term “socialization”. Enculturation occurs at both conscious (education) and unconscious (imitation) level.

The second process – *acculturation* – occurs in situations when two cultures make contact. Direct and long-term contact of individuals from two different cultures causes changes in cultural patterns in one or both cultures (Herkovits, 1997). Berry (2002) indicates that two cultures can influence each other in similar degree. In many cases there is one of the cultures dominant and influences the other culture (or cultures) to relatively higher degree. In his model of acculturation Berry (2002) defines four pairs of acculturation strategies (four for dominant culture and four for individual or ethno-cultural group). This is illustrated in Fig.3.



**Fig. 3 Berry's model of acculturation (adapted from Berry, 2002)**

Berry's model is based on 2 dimensions that proposes to relate two important issues:

- Issue 1: maintenance of heritage, culture and identity; and
- whether minority seeks to form relationships with dominant culture (Issue 2).

On the basis of these dimensions minority culture (or individual in foreign culture) can adopt one of four possible strategies of acculturation. The cultural contact is a two-way process: dominant culture reacts to presence of minority and adopts a mode of approach to the minority (Liu, 2011).

- *Assimilation* (weak maintenance of heritage, culture and identity; strong bonds to dominant culture): Due to lack of maintenance of its own cultural heritage, attributes of culture (symbols, rituals, etc.) dissolve and the minor group adapts to habits, modes of behaviour and values of dominant group (Průcha, 2010). Assimilation is a common strategy of acculturation in dominant societies that can be described as melting pots – e.g. Brasil, USA. This strategy is also often mentioned in connection with the colonial era, when colonial powers tried to impose their own cultural values and behavioural patterns upon inhabitants of conquered areas (Ward, Bochner & Furnham, 2001).
- *Integration* (strong maintenance of heritage, culture and identity; strong bonds to dominant culture): Integrated cultural group (or individual) preserves its own components of culture, but it is able to adopt identity of dominant culture – becomes multicultural (Morgenšternová & Šulová, 2007). Societies that want to adopt multicultural strategy of handling with immigrants and minorities have to adjust institutions concerned with education, public health care and labour to comply with needs of all cultural groups within them. This strategy is typical for some European countries (UK, Germany, and France) (Berry, 2002).
- *Separation* (strong maintenance of heritage, culture and identity; weak bonds to dominant culture): Individuals that adopt segregation as an acculturation strategy avoid a contact with dominant culture; do not consider the contact to be important or desirable and stay in relative isolation from the rest of the society. In the case the impetuses for separation come from dominant culture, the strategy of dominant culture is called segregation (Průcha, 2010). Separation is a typical strategy of e.g. Czech Vietnamese.
  - *Marginalization* (weak maintenance of heritage, culture and identity; weak bonds to dominant culture): Is a process when cultural groups do not want to adopt dominant

culture and simultaneously lose their own cultural heritage; they identify just with their group's subculture (e.g. some groups of Roma people in Czech Republic).

## **Cultural contact**

Cross-cultural contact means a situation when individuals stemming from different cultural backgrounds encounter. Contact can be established among different cultures or among subcultures within a particular culture. As mentioned above globalization processes drive frequency of the encounters, many originally homogenous societies transform to multicultural societies. There are many factors that define the cross-cultural contact – location of the contact (home/host society), duration, motive (education, business, tourism, etc.), intensity (Ward, Bochner & Furnham, 2001). Cross-cultural contact can be stressful and demanding for its participants. Ward et al. (2001) distinguish four categories of participants of cross-cultural contact:

- Tourists: the relatively biggest group of individuals establishing cross-cultural contact
- Expatriates (sojourners): individuals, who spend between six months and five years in foreign culture; usually students, businessmen, diplomats, technical experts, soldiers, missionaries, etc.
- Migrants (immigrants/emigrants)
- Refugees

## **Process of adaptation**

Social adaptation can be defined as a relatively stable adjustment of behaviour, thinking, perception, and attitudes to conditions of social environment (Hartl & Hartlová, 2000). Other definitions of adaptation distinguish adaptation as a state and as a process. Adaptation as a state can be defined as a level of adjustment between an individual and an environment. Adaptation as a process can be defined as a completion of acculturation of an individual in novel environment (Halsberger, 2005).

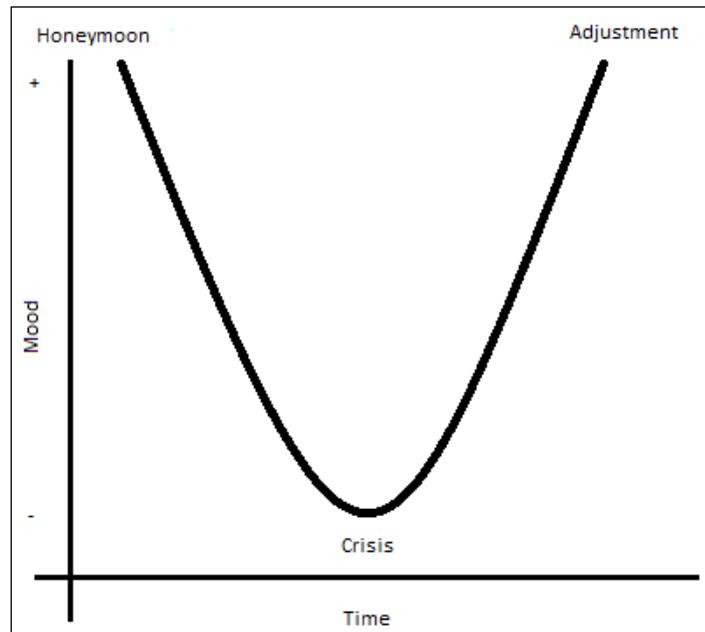
Adaptation occurs after intensive contact of an individual and different culture (Morgenšternová & Šulová, 2007). Adapted individual is able to react outside of his or her cultural context, acquires competencies that are useful in the host culture (communication skills, language, cultural intelligence, etc.) (Shiraev & Levy, 2013). Adapted individual also experiences higher levels of psychological comfort, control, self-esteem; levels of stress of adapted individual are lower (Maertz, Hassan & Magnusson, 2009).

Three areas of cultural adaptation can be distinguished (Ward & Kennedy, 1999).

- Psychological adaptation: Psychological adaptation is connected to psychological well-being. It is influenced by personality of an individual and by social support the individual has got.
- Sociocultural adaptation: Sociocultural adaptation is connected to the ability to fit in the new environment and ability to function in it efficiently (Sussman, 2000). It is influenced by the magnitude of differences between original and new culture, knowledge of the new culture, language skills and intensity of cultural contact (Ward, Okura, Kennedy & Kojima, 1998).
- Economical adaptation: This refers to the degree to which work is obtained, is satisfying and is effective in the new culture (Berry, 1997)

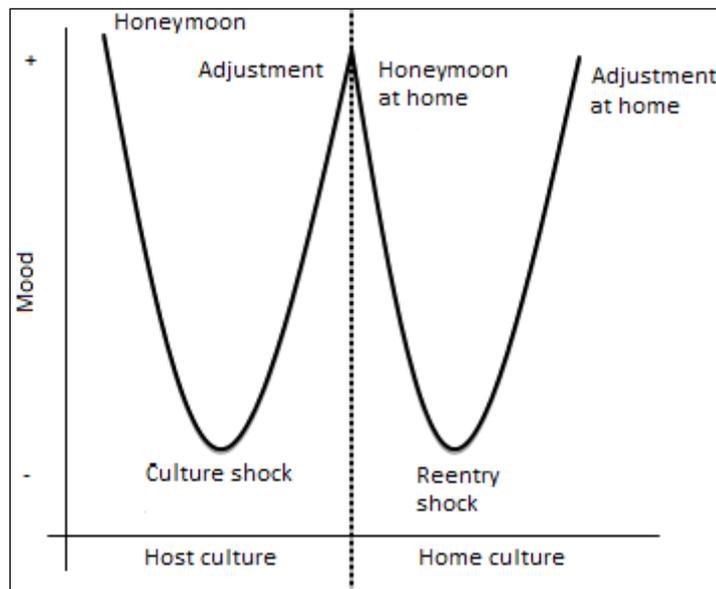
## Theories of adaptation

One of the first models of cultural adjustment was developed by Lysgaard in 1955 (Chang, 2009). According to his view, adaptation process can be depicted as a u-shaped curve (Ward, Okura, Kennedy & Kojima, 1998) (see Figure 4). In the honeymoon stage an individual experiences an initial arousal due to the arrival in a novel environment (Cheng-Ji, 2006). This phase is characteristic with mostly positive feelings (Brown & Holloway, 2008). In the next phase (hostility) the individual realises the cultural differences, finds some of them unnerving, and experiences feelings of hostility and stress. In the final stage an individual regains his or her psychical balance, accepts cultural differences and acquires basic skills needed in different cultural environment.



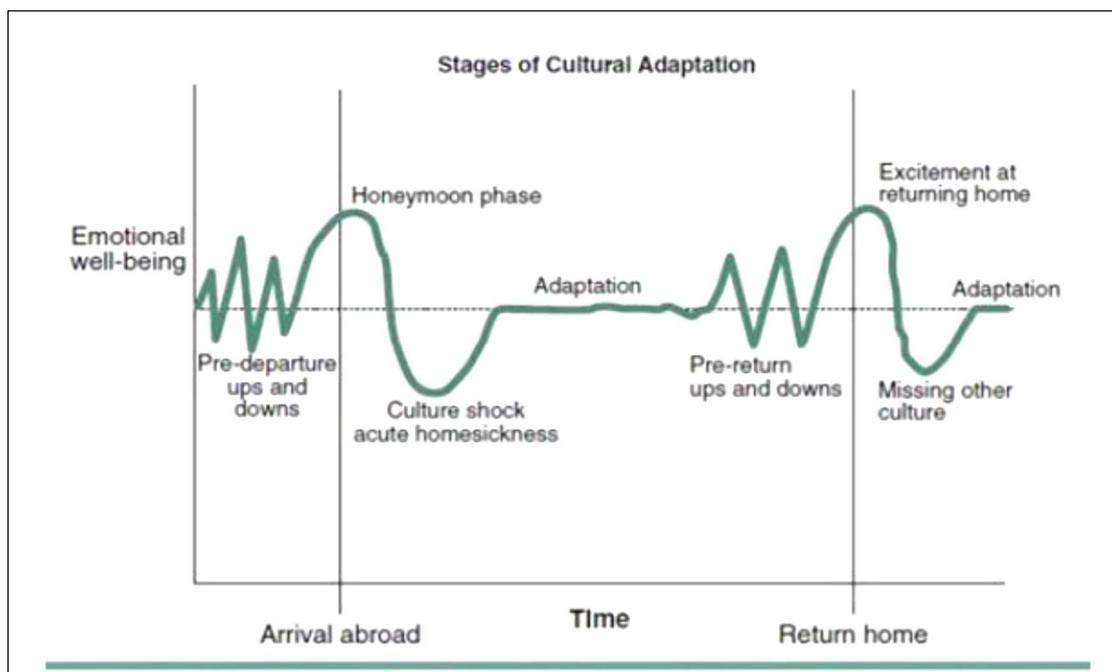
**Fig. 4 Lysgaard's model of cultural adjustment (adapted from Štěpánková, 2014)**

A similar model was developed by Oberg (1960), and later was extended by J. T. Gullahorn and J. E. Gullahorn (1963), who developed the so called W-curve model of adaptation of expatriates (Fig. 5). The W-model adds to the initial three stages in the U-model another three stages of readjustment, which occurs when an expatriate arrives back to his or her home culture.



**Fig. 5 W-curve model of cultural adaptation (adapted from Štěpánková, 2014)**

Last model of cultural adaptation that will be described here is model by Mitchell and Myles (from Rajasekar & Renand, 2013). According to their model the process of adaptation starts before the arrival to different culture, an individual experiences emotional imbalance from the travel itself. Emotional distress is experienced again before the departure back home.



**Fig. 6 Stages of cultural adaptation by Mitchell and Myles (Source: Rajasekar & Renand, 2013)**

## **Stages of adaptation process**

In this section four stages of adaptation process (according to Oberg, 1960) will be closely described. The process of adaptation is influenced by the intensity of contact with a host culture. Above mentioned models of adaptation were designed for expatriates (see above), the course of adaptation process of tourists can be different – unified environments of hotels, summer resorts and airports, and relative isolation from the local culture can change the process of adaptation: duration and experience of particular adjustment stages (Winkelman, 1994).

### **Honeymoon**

Honeymoon is characteristic with interest for new culture, emotional excitement, feelings of joy, pleasure and euphoria from new culture and its elements. Although an individual can experience stress or anxiety, the overall feelings are positive. Duration of this stage can vary from several days or weeks to several months. Brown and Holloway (2008) argue that honeymoon stage does not have to be present in the adaptation process – some expatriates report mostly negative feelings (depressions, stress, loneliness) after arriving to a new culture.

### **Culture shock (Acculturation stress)**

Culture shock is caused by the loss of subjectively important elements of home culture (values, traditions, rituals, symbols, norms, social relationships, etc.), which provide feelings of security to an individual (Henry, Hamdi & Shedid, 2009). An individual might not find and identify the identical cultural elements in the new culture; he is not able to react to the novel environment appropriately, which causes feelings of powerlessness, stress and anxiety. Xia (2009) categorized symptoms of culture shock:

- Physical symptoms: spaced-out look, headaches, insomnia, skin irritation, excessive thirstiness (Bhawuk & Brislin, 2000)
- Psychological and behavioural symptoms: feelings of anger, powerlessness, dependence, disorientation, discomfort connected to activities related to food, hygiene (excessive cleaning of hands), fear of physical contact with members of different culture, homesickness, aversion to language, fear of being mugged (Oberg, 1960).

### **Adjustment**

An individual tries to learn how to behave in new culture effectively. Not all people are able to successfully pass this stage and reach the stage of adaptation. Some individuals might isolate from the host culture and avoid contact with its members. An individual develops language skills. The intensity of negative attitudes and feelings decreases as a function of increasing ability to understand the new culture. Adjustment is a slow process with occasionally recurring crises (Winkelman, 1994).

### **Adaptation**

Individual is fully adapted to new culture; he accepted its cultural patterns; he is able to solve problems; he does not suffer from negative emotions. Fully adapted person does not only adopts to different culture and its elements, he starts to enjoy it – he develops bicultural identity (Oberg, 1960).

## **Aim of research**

The aim of this study is to identify the main concepts in the experience of Czech expatriates regarding their adaptation to Zambian society. Analysis of these concepts – resulting from various adaptive strategies and processes – can contribute to the explanation of differences in conceptualization of Zambian cultural and social background.

## **Methods**

To achieve the aim of the study the method of substantive coding was applied. This method consists of two sub phases, namely open and selective coding, (Strauss & Corbin, 1990). Substantive coding is concerned with producing categories and their properties. Theoretical coding occurs at the conceptual level, weaving the substantive codes together into a hypothesis and theory.

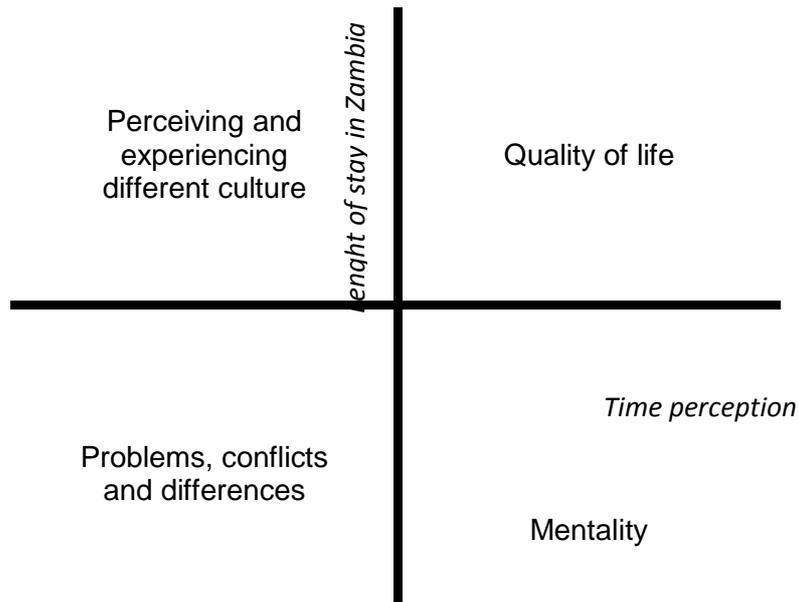
Substantive coding means conceptualizing on the first level of abstraction. Transcripts of recorded semi-structured interviews with 6 informants (anonymized using capital letters A, C, E, G, I, K) were conceptualized line by line. However, the paragraph was used as basic unit in content analysis because of the difficulties that have resulted in attempting to code and classify the various and often numerous thoughts stated and implied in a single paragraph. (Berg, 2001: 247) All basic units were numbered (code example: A26).

In the beginning, each basic unit was coded minutely in order to find out about the problem and how it is being resolved by the informant. No traditional variable as age, sex, social class was assumed the analytic relevance. The data were later organized in coding frames and commented for further sorting.

The coding was done using MS Excel. The transcripts were divided into cells (one column per informant) and tagged using general categories. All the incidents in the data were conceptualized using different colours. All concepts that yielded were noted in the second sheet and then sorted. Sometimes new concept emerged, so it was necessary to rename and modify what was previously selected. While comparing data, the concepts were constantly changing, and sharpening the growing theory.

## **Results**

The above mentioned procedure separated the sample into four main categories: 1) Perceiving and experiencing different culture, 2) quality of life, 3) problems, conflicts and differences, 4) mentality (Fig. 7).



**Fig. 7 Main categories identified in semi-structured interviews**

Main categories were subdivided to produce a scheme containing key linkages to subjective declarations of each respondent (Tab. 1). All data are stored in authors' archive for further evidence and as aforementioned the declarations can be found using simple code.

**Tab. 1 Main categories and key linkages to subjective declarations of informants**

MAIN CATEGORY	CODE
<b>Perceiving and experiencing different culture</b>	A23, A24, A25, A26, A27, A28, A29, A30, A37, A38, A43, A45, A47, A49, A50, A51, A54, A57, A63, A73, A78, A79, A80, A81, A93, A94, A101, A102, A103, A104, A112, A130, A131, A132, A134, A135, A136, A142, A144, C16, C18, C14, C22, C24, C60, E11, E12, E25, E29, E41, E53, E58, E63, E94, G18, G19, G21, G30, G32, G34, G36, G38, G40, G44, G48, G57, G61, G66, G67, G81, G108, G114, G116, G117, I28, I56, I57, I58, I62, K25, K26, K27, K28, K30, K33, K47, K48, K56, K57, K58, K63, K64, K83, K85, K90, K101, K102
<b>Quality of life</b>	C30, C36, C38, C40, C66, E36, E37, E38, E39, E47, I30, I38, I39, I41, I49, K16, K17, K18, K19, K49
<b>Problems, conflicts and differences</b>	A66, A69, A70, A113, C46, C75, C93, E31, E42, E43, E44, E64, E66, E87, E96, G26, G28, G46, G75, G88, I52, I54, I61, I73, I83, I95, K66, K70, K71, K73, K74, K87
<b>Mentality</b>	A67, A68, A76, A84, A122, A124, A125, A126, A127, A128, C68, C69, C73, C79, C83, C95, E65, E70, E71, E79, E80, E83, G65, G83, G84, G86, G102, I69, I87, I101, K54, K60, K61, K76, K88, K95, K98

Main categories were analysed in detail using subcategories listed in the Tab. 2. It was identified that these categories are changing according to the time perception and length of stay in Zambia the informants declared during an interview. The length of stay ranges from 2 to 11 years and influences perceiving and experiencing different culture, as well as quality of life of expatriates. The differences in time perception are connected to frustration of expatriates from unsuccessful adaptation in Zambian society and impossibility to understand African mentality. (Blackden & Wodon, 2006; Diener, 2009: 43-71)

**Tab. 2 Main categories and key linkages to subjective declarations of informants**

MAIN CATEGORY	SUBCATEGORIES
<b>Perceiving and experiencing different culture</b>	adaptation; cultural shock; social and cultural practices; disillusionment; cliché in the perception of different culture; naiveté; perceiving and experiencing the culture changes over time; priority importance of the family in the Zambian society
<b>Quality of life</b>	well-being; difficulties in finding a job; comparison of Zambia and other countries; differences between rich and poor, rural and urban environment
<b>Problems, conflicts and differences</b>	cause of conflicts in the lack of education; lack of responsibility
<b>Mentality</b>	mentality of Czechs and Zambians; interdependence of language and mentality in humour

## Discussion

The adaptation process of Czech expatriates in Zambia generally follows the stages of cultural adaptation process as proposed by Mitchell and Miles (from Rajasekar & Renand, 2013). The respondents report various lengths of the phases described in the model. Both honeymoon and culture shock phases were reported as emotionally shallow: no feelings of extreme positive resp. negative valence were reported. The relative emotional resilience of respondents can be ascribed to their past experience with the life in a culture substantially different from Czech culture (Caribbean region, Sri Lanka, India, South Africa). No physical symptoms of culture shock were reported (Xiu, 2009). None of the respondents reported neither fear of physical contact with members of Zambian culture and severe homesickness (Bhawuk & Brislin, 2000), nor unwillingness to learn local languages or idealization of home culture (Oberg, 1960). During the following phases of the process of adaptation (adjustment and adaptation) two factors were reported as the most crucial for the successful adaptation to Zambian culture: acquirement of basic language skills and more relaxed work- and time-related attitudes.

## Conclusion

The majority of informants passed through a period of disillusionment following an initial naiveté and fascination from different cultural milieu. As previously mentioned their perception of Zambian social environment changed in time and was influenced by different perception of time.

In the context of adaptation to Zambian society, “family” can be considered a facilitating factor helping Czech expatriates to overcome the obstacles in finding a job and being admitted as a member of society. Of course, the conditions differ in rural and urban environment.

Czech expatriates mainly see the cause of barriers encountered during the process of adaptation in the lack of administrative and bureaucratic authorities' education. Another source of problems originates from different mentality and social behaviour of Zambians. Czech expatriates consider themselves more conflict. On the other hand, Zambian society is perceived by them as strictly divided between the rich and the poor.

Finally, the informants see a link between understanding of Zambian mentality and humour, where the understanding of humour and learning a foreign language is tightly interconnected. Nevertheless, also in this case the comprehension of social meaning and context is required.

## Acknowledgements

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# Water use and sustainability of agriculture in Uzbekistan

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## Abstract

Uzbekistan during the 23 years of independence still cannot escape from adhering inefficient irrigation system of the former Soviet Union. Reforms in the water sector caused small improvement in water use, but cannot stop started environmental degradation due to extensive natural resource use methods by the Soviet regime. Irrigation and drainage system efficiency is still low and investment for their operation and maintenance has been decreasing. Moreover, due to free of charge for irrigation water in the region water use per hectare and contribution of cultivating of water intensive crops is still higher. Overuse of the water resources causes to soil salinization and to negative affect to the agricultural crop yields. This paper addresses problems of adoption of water saving technologies and water pricing in irrigated agriculture for prevention of land degradation in Khorezm. Furthermore, we analyzed the institutional framework and market conditions for adoption of water saving technologies and potential water pricing.

## Keywords:

water saving technologies, water pricing, land degradation, agriculture.

## Introduction

The Khorezm region is located in the lower reaches of the Amu Darya River in the north-west Uzbekistan, covering 680,000 ha of land, of which roughly 275,000 ha is irrigated (Bobojonov & Lamers, 2007). The Khorezm's agricultural land comprises about 6 % of the total agricultural land of Uzbekistan (MAWR, 2011). Agriculture in the region relies exclusively on irrigation due to low precipitation and high evaporation rates. Five km<sup>3</sup> of water are diverted from the Amu Darya River each year to irrigate the vast agricultural fields in Khorezm. Due to external and internal factors, such as the growing demand for water resources by upstream countries and the inefficiency of the irrigation and drainage networks, the water scarcity is becoming acute in the region. Estimations by Müller (2006) show that probability of receiving sufficient water decreased from 82 to about 75 % since 1982. Farmers have a substantially higher risk of losing their crops due to insufficient water supply. According to Müller (2006), the water supply reduction by 25 % may result in the yield losses from 10 to 18 %, while a water reduction of 50 % would cause yield losses between 22 to 30 %. Forecasts of water supply and the water used by the upstream countries Kyrgyzstan, Tajikistan and Afghanistan, predict an even lower discharge of Amu Darya River water in the near future (Tischbein et al, 2014).

With the increasing water scarcity, the central problem for Khorezm agriculture is related to the extensive irrigation and inefficient drainage network, which has been in operation without any modernization for more than three decades (Bobojonov, 2008). According to Martius et al

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(2008) farmers' water management practices, misguided policies and constraints in technology adoption are often considered as main factors causing land degradation in the region. This has resulted in shallow groundwater tables and severe waterlogging of soils in the region (ZEF, 2003). The groundwater table may rise up to an average 0.7 meters below surface during the irrigation period, with a salinity content ranging between 1.68 g L<sup>-1</sup> and 1.85 g L<sup>-1</sup> (Ibrakhimov, 2005). The shallow groundwater tables, together with the intensive evaporation during the hot season, result in considerable capillary rise of water from the groundwater. This contributes to secondary soil salinity (Ibrakhimov, 2005). Moreover, the cultivation of water-intensive crops also leads to overuse of water resources. According to Bekchanov et al (2012) cotton was over-irrigated almost 64 % compared to the recommended amounts, whereas rice area covers about 10 % of the total crop area in the region, but it consumes almost 30 % of the total crop water use, and its per-hectare water use is four to six times higher than for other crops.

An additional implication of the outdated irrigation infrastructure is an inefficient allocation of the water across the network. The overuse of water resources, mainly at the beginning of canals causes water scarcity at the end of the canals. Continuous water scarcity in these areas leads to desertification of agricultural lands. This combined with the soil salinization and waterlogging cause substantial land degradation in Khorezm's. The estimates of Tischbien et al (2013) indicate that the quality of soil decreased by about 30 % during the last three decades and the yield of cotton dropped by about 20 % over the same period. About 30 thousand hectares out of the 270 thousand hectares that could be potentially irrigated in the region are known as areas with low ameliorative conditions, meaning that crop production is impossible without improving the soil conditions first (Bobojonov, 2008).

The agricultural land degradation has a significant economic consequences for the region, which is heavily dependent on the agriculture. Agriculture generates around 37 % of the regional GDP, more than 90 % of hard currency earnings, employs around 40 % of regional labor force, and produces 90 % of region's food (ObiStat, 2012).

A standard solution to the problem of inefficient water use advocated in the literature is the introduction of water pricing. Water pricing through market mechanism can incentivise farmers to improve water use efficiency and to encourage innovations in the sector. The adoption of new methods is a key prerequisite to improve sustainability of water use in Khorezm.

The objective of this study is to analyse water use conditions and mechanisms of achieving sustainable water use in the Khorezm region in Uzbekistan. The research work mainly focuses on the adoption of the water saving technologies and provides its expected efficiencies. The study also analyses the role of improved institutional framework of the water sector in implementation of water saving methods.

## **Water use and water management in Khorezm**

Agriculture in Khorezm is only possible with irrigation due to arid continental climate. The irrigation was used in the region since ancient times. Amu Darya river is a main source water for irrigation (Tischbein et al, 2012). This river is the largest river in Central Asia and it is formed by the junction of the Vakhsh (Tadjikistan) and Panj (Afghanistan) rivers, which rise in the Pamir Mountains of Central Asia. The Amu Darya's river basin includes the territories of Afghanistan, Tadjikistan, Uzbekistan and Turkmenistan (Schieder, 2010). Over 95 % of Amu Darya river's water is used for agricultural purposes.

Irrigation water from Amu Darya river to the fields is conveyed to the fields in open, non-lined canals. Because canals are open and non-lined a huge amount of water is lost due to evaporation and groundwater discharge (Hornidge et al., 2011, Hornidge et al., 2013). Canals conveying water through different regions are defined as magistral canals. Inter-district (inter-rayon) canals conveying water through districts. Inter-farm canals transport water from magistral and inter-district canals to the Water Consumers Association (WCAs). There, on-farm canals convey water from the inter-farm canals to the field level networks. Water is supplied through on-farm canals using gravity, and in some cases on-farm canal water is

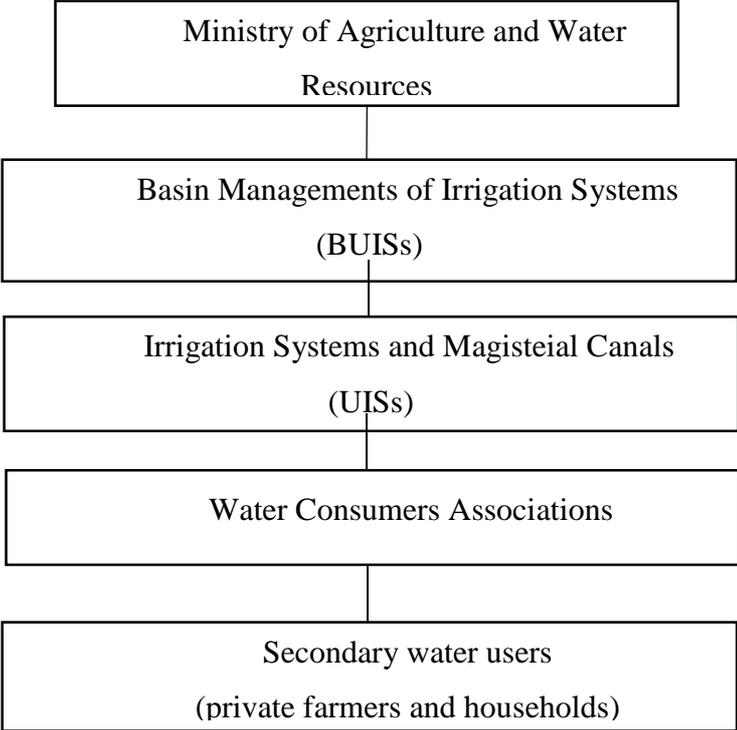
pumped into small ditches to facilitate water application to the fields located at more elevated points. Flood and furrow irrigation is the main and most widespread irrigation technique used by farms, which results in high gross water use per hectare. For example, more than 20 thousand m<sup>3</sup> of water per hectare was used in Khorezm (UPRADIK, 2006; Bobojonov, 2008).

Agricultural and water sector are characterized by the high level of involvement of government in decision making at farm, district, regional and national levels. The two most important crops, cotton and wheat, are subject to state regulated production quota system. Farmers are required to produce a the quantity of these products established by the government. As water supply is a key input factor for the fulfillment of production quotas, the cotton and wheat quotas are major determinants of the irrigation water management process (Hornidge et al, 2013). The Ministry of Agriculture and Water management is responsible for the planning of water allocation in Uzbekistan and collaborates intensively with the Interstate Commission for Coordination (ICWC). Transboundary water management between Central Asian (CA) and Afghanistan is performed by the Basin Water Management Organization (BVO) "Amu Darya", which is the executive body of the ICWC. The Khorezm region and part of Karakalpakistan is served by the lower Amu Darya Basin Management, which consists of five Irrigation System Management bodies (Figure 1). The main task of BUIS (Basin Management Department of Irrigation System) is allocating water to Irrigation Systems and Magisterial Canals (UISs); the UISs then delegate tasks to sub-UISs (Irrigation System Management Organization), which ultimately distribute water to WUAs based on properties of the different canal types.

In the next step, the WUA distributes water to the Water Consumers Association (WCA) based on their demand..The WCAs were established by the state (in the territory of former agricultural cooperatives) and represent the interests of water users (farms). Formally, WCAs are voluntary, non-governmental, non-profit entities, established and managed by water users (farms) located along one or several watercourse canals (Zavgorodnyaya, 2006). WCAs conduct all communication with the WUAs in the name of users and ensure water delivery to them.

Overall, the water allocation in Khorezm is bottom-up and demand-driven. The WCAs are the starting-point in the whole process. They send their request to WCA for the total water demanded by users. The total water requirements of all WCAs then represent the total water withdrawn from the Amu Darya river.

**Figure 1. Water management organizations in Uzbekistan**



Source: Updated from Khamraev et al., 2006

**Irrigation and drainage system**

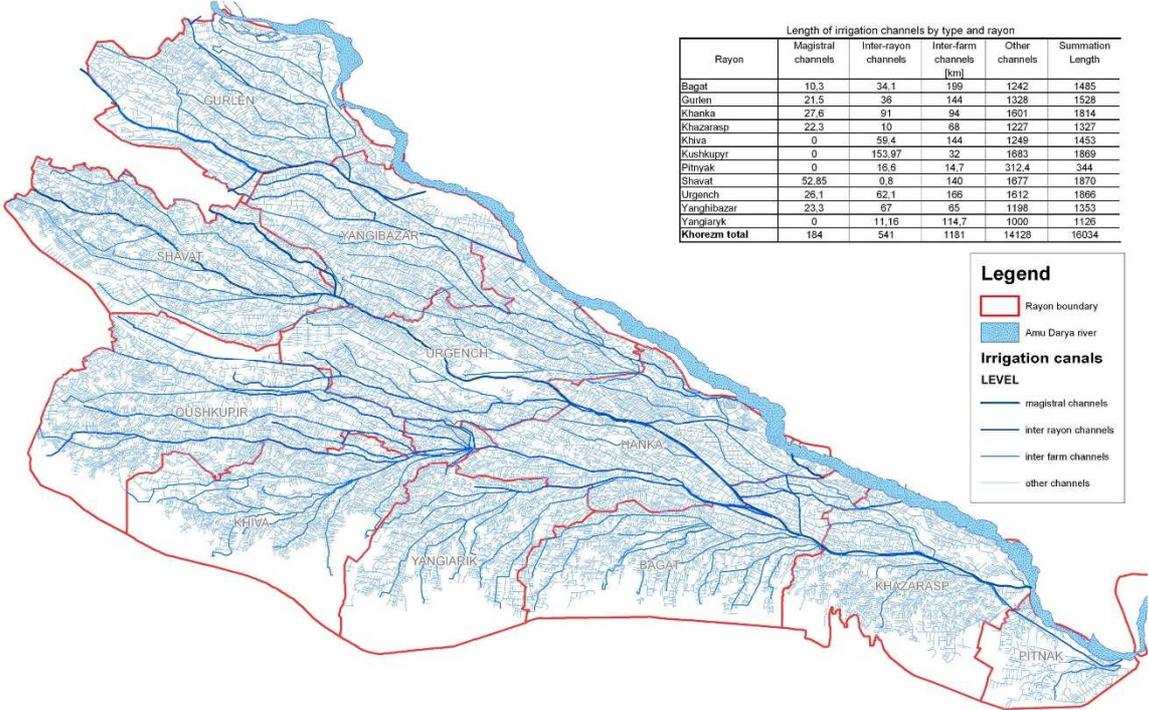
An area of around 275 000 ha is irrigated in the Khorezm region owing to the irrigation and drainage infrastructure put in place. The infrastructure was developed after 1960s. The infrastructure consists of a complex network of 16,334 km irrigation channels and about 7,679 km of drainage (Awan et al, 2011) (Figure 2). With an exception of around 10 % lined canals (Ibrakhimov, 2005), the irrigation system consists of earthen canals, whereas especially in the lower hierarchy system levels hydraulic structures (i.e. canals) are missing or dysfunctional. Drainage is realized by a network of open ditches and collectors. The irrigation in the field is applied mainly by furrows and basins (Abdullaev et al, 2008).

The water flow in transboundary (magistral) canals is controlled by BUIS and the UPRADIK (Irrigation Canals Division, branch of BVO in the Khorezm region), whereas the water distribution to the inter-district canals is executed by UISs. The Inter-farm canals are managed by canal heads seconded by staff and which function as an extended branch of UIS in the different districts. Water distribution by on-farm canals is managed by the WCAs. Water from the irrigation canals (e.g. from magistral canals) is usually pumped to the lower degree channels (e.g. to on-farm canals). During the former Soviet Union period and early independence, all pumping stations were managed by the Upravleniye Nasosnih Stansiy (UNS). The UNS was responsible for the maintenance of pumps and energy supply (UNS, 2006). After the dissolution of the collective farms (kolkhozes), most of the local pumps were transferred to WCAs or sold to farmers. Nowadays, UNS manages only pumping stations, which operate at the level of magistral or inter-district canals (UNS, 2006).

The central problems of the irrigation system in the Khorezm region is its low efficiency caused by design problems, the lack of maintenance and the outdated infrastructure (Müller, 2006). Currently about 20 % of the water used for irrigation is lost in the inter-farm canals. The inter-farm canals are owned and administered by WCA. The irrigation system applied on-farm also account for considerable water losses. The irrigation equipment, control devices and

technologies are outdated and need to be either repaired or replaced. The water allocation mechanism in place does generate incentives in the system to adopt an innovation. In particular, because water allocation is not based on volumetric methods, there are no gains from adoption of water saving technologies. The WCAs and farms do not have incentive to invest in the improvement of water network and management practices which are the main causes leading to inefficient water use in Khorezm.

**Figure 2. Irrigation network in Khorezm, Uzbekistan**



Source: ZEF/UNESCO Khorezm project

The drainage canals (collectors) in the Khorezm region consist of open drains. Like the irrigation system, the drainage system is built hierarchically (main, inter-farm, on-farm collectors). The main collectors drain water into numerous lakes and depressions. The main saline depression is the Sarykamish Salt Lake outside of Khorezm, whose water level and salinity continue to rise. Only a small amount of water is diverted back to the river. (Masood and Mahwash, 2004).

**Literature review**

**Water use efficiency and its impacts in Khorezm**

There are several studies available in the literature estimating the efficiency of the irrigation and drainage systems in Khorezm. Most of these studies find a large water losses and low water use efficiency. According to the FAO (1997), the poor condition of irrigation canals causes a loss of about 63 % of the river water diverted for irrigation in Khorezm before it reaches the fields, while the field application efficiency is around 40 % (WARMAP, 1996). Bekchanov (2013) calculated the irrigation efficiency in the whole Aral Sea Basin based on the approach of GEF (2002). According to his estimations overall irrigation efficiency in Khorezm is one of the lowest in the Aral Sea Basin (only 34 %). Further, estimates of Bekchanov (2013) indicate that the conveyance efficiency is about 52 % and application efficiency around 64 %.

Schiedler (2010) provides detailed estimations of the efficiency of water use in Khorezm based on data from the Department of Agriculture and Water Resources and interviews conducted with key stakeholders. According to Schiedler`s estimates, the average conveyance efficiency

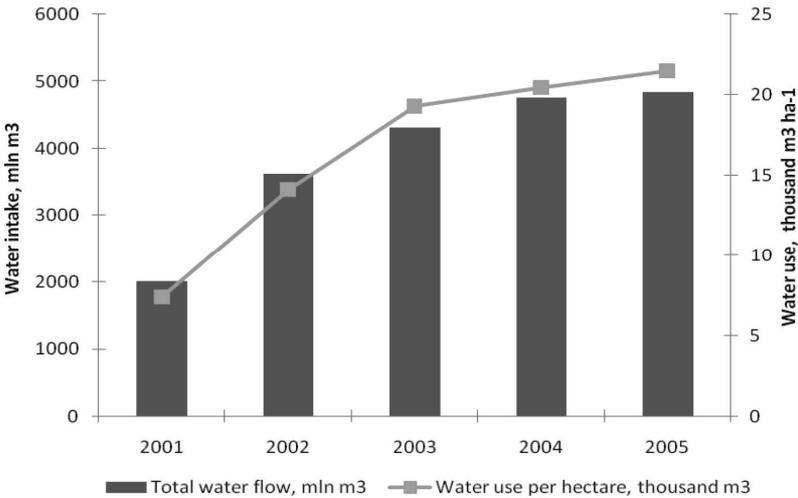
is about 55 %, field application efficiency is between 45 and 50 %, and drainage system efficiency is between 80 and 88 % (Table 1).

**Table 1. Water use efficiency in Khorezm.**

conveyance efficiency	0.54-0.55 (water arriving the crop field/total water diverted from resources)
irrigation efficiency (application)	0.45-0.50 (water effectively used by crops/total water applied to fields)
drainage ratio	0.80-0.88 (initial drained area in % of total irrigation area)

Source: Schieder, 2010

**Figure 3. Water Intake and water use per hectare in Khorezm**



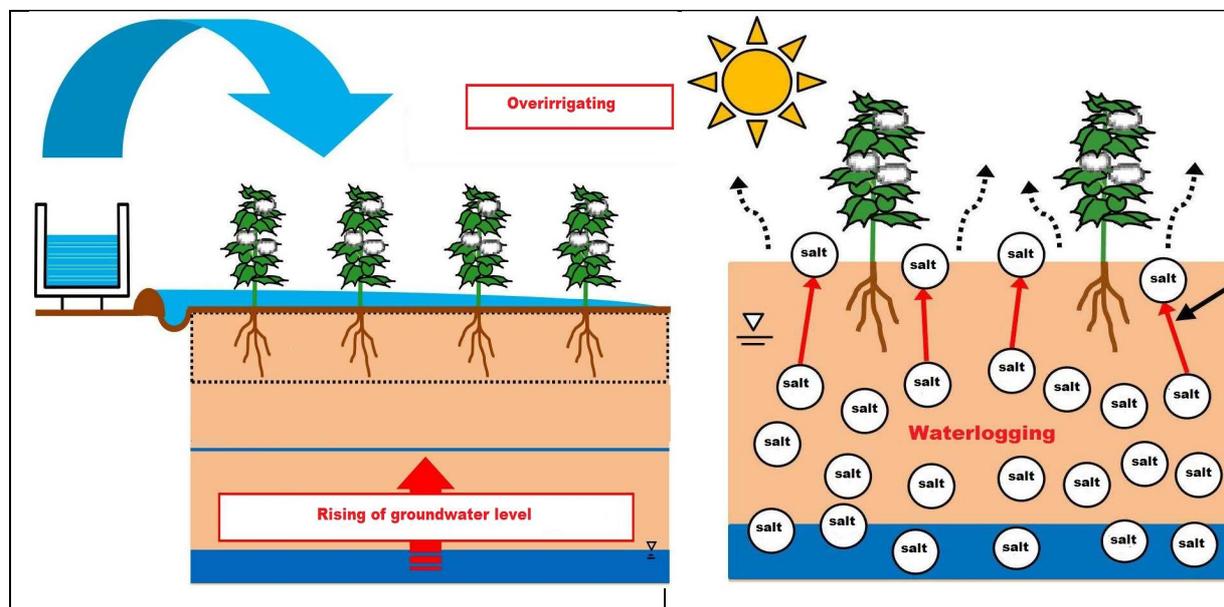
Source: UPRADIK, 2006

The low efficiency of water use has also implications for the distribution of water across fields in the region. In total, 5 km<sup>3</sup> of water per year was consumed in Khorezm in 2005, representing more than 20 thousand m<sup>3</sup> per hectare (Figure 3). However, due to the low use efficiency, this total amount of water is not sufficient to ensure a reliable water supply to all fields (Bobojonov, 2008). Many remote fields do not receive sufficient water supply. Water losses from poor maintenance of canals and inefficient irrigation techniques applied (flooding and furrow irrigation) are the main causes of heterogeneous water supply across fields in Khorezm. (UPRADIK, 2006).

Moreover, cotton covers almost half of the all irrigated agricultural area in the region, and in spite of its small water requirements, it consumes considerable water of the total region's consumption. The reasons are various. First, as mentioned above, this is due to the low efficiency of the whole irrigation network and irrigation techniques. Second, there is widespread missperception among farmers who believe that irrigation induces yield increase at any intensity of water application. However, empirical evidence suggests that marginal increase of yield decreases in the quantity of water used, while over irrigation might actually lead to a drop in the crop yields (Jacques, 2014). The large irrigation water losses combined with shallow groundwater tables have adverse impacts on the irrigated agriculture due to increasing salt accumulation in the root zone of soils, limiting the effectiveness of leaching, and causing waterlogging (Figure 4). Around 73 % of the territory of Khorezm has groundwater tables at 1-2 m deep and moderately salined (Kuziev, 2006; Ibrakhimov et al., 2007). Capillary rise from the shallow groundwater appeared to be the major factor contributing to topsoil salinity. This is because the salt input from groundwater exceeded the salt input from irrigation water by around 40 % (Tischbien et al, 2012). Due to shallow groundwater tables around 65 to 70 % of the irrigated area are at risk of waterlogging and salinization during the leaching

and vegetation periods every year (Akramkhanov et al, 2012). However, due to the heterogeneity of the fields' type, groundwater tables and the intensity of water applications, the salinization of soils occurs at different level across the region. Forkutsa et al. (2009) report that 55 % of the irrigated area in Khorezm is slightly saline, 33 % is medium saline and 12 % is highly saline.

**Figure 4. Soil salinity and waterlogging**



Source: JIRCAS, 2013

In summary, taking into account the high water consumption in Khorezm, its inefficient use and its implications for soil salinity, it is necessary to adopt a new system of water allocation and use based on market incentives. This requires adoption of water pricing methods to internalize the costs to users. This in turn may stimulate investment in water saving technologies.

### ***Water pricing theory and practice***

The OECD (1999) defines water price as any charge or levy that farmers have to pay in order to obtain access to water in their field. All the prices from simple charges to complicated pricing mechanisms, which may also include land taxes, are considered in this definition. Water pricing might be implemented administratively or through market forces. The fundamental role of prices is to help allocate scarce water resources among competing uses and users taking into account costs and benefits it generates. The main aim is to improve water allocations and to encourage more sustainable use of water resources (Johansson, 2000). A crucial aspect of an efficient price mechanism is to ensure a correct price formation to consumers. In practice, countries have various reasons for charging for water users. Some aim to recover costs, some target income transfer between sectors through cross-subsidization and others seek to improve water allocation and water conservation (Dinar and Subramanian, 1997). The main benefit of water pricing in conditions of Uzbekistan and Central Asia would be the stimulation of a more efficient and sustainable use of water in agriculture and the improvement of irrigation techniques and infrastructure.

Farmers do not pay directly for their water consumption in Khorezm. According to the law adopted in 1993<sup>5</sup> water pricing is planned to be introduced in future. However, an exact date was not established. The irrigation sector is subsidized by the state including the expenses of all water management organizations for O&M costs of irrigation canals and water distribution. Only the budget of the WCA is based on fees collected from water users. The fee per cubic

<sup>5</sup> The law "on water and water use" from 6 May 1993.

meter of water is derived as the total expenditures of WCA divided by the total water demanded (RWUA, 2006). Although farmers de facto pay for water, it is only for recovering expenses incurred by the WCA. These expenses include O&M costs and water distribution costs (water pumping). The expenditures of WCA represent only around 11 % of total costs of all water management organizations in the system.

Introducing a better pricing system is particularly relevant for Uzbekistan in general and for Khorezm in particular due to widespread water scarcity problem, while the current system does not motivate farmers directly to use water more efficiently. In 2010, farmers in Khorezm paid to WCA only US\$ 2.5 per 1,000 m<sup>3</sup> in form of water service fees, which barely covered the expenses of the Associations (Farm Survey, 2010). Bobojonov (2008) has estimated that farmers in Khorezm would need to be charged at least US\$ 5 per 1,000 m<sup>3</sup> to cover operation and management expenses for the existing water management organizations and to achieve a water use efficiency of 67%. The findings of this study also indicate that water prices of US\$ 5 per 1,000 m<sup>3</sup> of water may induce the majority farmers (80 %) to adopt more efficient irrigation technologies.

Water pricing is the central topic for discussion among many international organisations, researcher and policy makers. Most of these research works were focused on economic assessment of water pricing, its impact to farm income and water use productivity. According to Bekchanov et al (2014) an increase of water price between zero and USD 20 per 1,000 m<sup>3</sup> would result in a decrease of total regional agricultural profits between USD 65.4 million and USD 32.4 million and a decrease in the cropland area from 230,000 to 220,000 ha. Bekchanov et al (2014) recommends a reduction in conveyance efficiency between 74 % and 60 % to gain optimal benefits in terms of water efficiency use. The analyses of Bekchanov et al (2014) indicate that the introduction of water price above USD 16 per 1,000 m<sup>3</sup> most likely would increase the financial attractiveness of implementing field-level water-wise options (i.e. management practices) rather than investments in conveyance improvement (new technologies).

Djanibekov (2008) developed an agricultural sector model for Khorezm (KhoRASM), based on the approach of Hazel and Norton (1986), to assess the impact of external shocks on production and consumption patterns and commodity prices. The simulated scenarios assume water prices between 0 and to 35 USD per 1,000 m<sup>3</sup> of water.<sup>6</sup> The model simulation results indicate that "...water charging as a single policy will decrease the regional welfare and regional production levels. The model is comparatively static and the negative welfare effects of water pricing may well turn positive if long-term effects would be taken into account, such as investments into water productivity and positive environmental effects" (Djanibekov, 2008).

## **Methodological framework**

### ***Water pricing***

We calculate the price of water for Khorezm based on to the approach proposed by the Global Water Partnership (2000). According to the Global Water Partnership (2000), the water pricing should be based on the concept of full cost of water coverage. The main goal of this concept is to account for all costs associated with water use in irrigation. The full cost of water concept includes three types of costs: the full supply cost, the full economic cost, and the full cost (Figure 5). These three categories include a full analysis of the different costs items that may be factored into a calculation of the cost of water supply. The full supply cost includes the costs of O&M of irrigation infrastructure and capital investment. The full economic cost includes the full supply costs plus opportunity costs and economic externalities. Opportunity costs reflect the expected benefit forgone by using water in agriculture, instead of using it in alternative

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<sup>6</sup> Djanibekov (2008) consider water price variation across crops and farms. For example, the farmers located in the districts not bordering with the river are charged 20% lower water prices for all crops. The water price for cotton production, as a part of the state procurement system, is assumed only a quarter of the water price. The production of paddy rice in all types of agricultural producers in upstream districts is charged at a 20 % higher rate.

activities. Externalities arise where costs or benefits associated with the extraction and use of the resource are imposed on third parties.

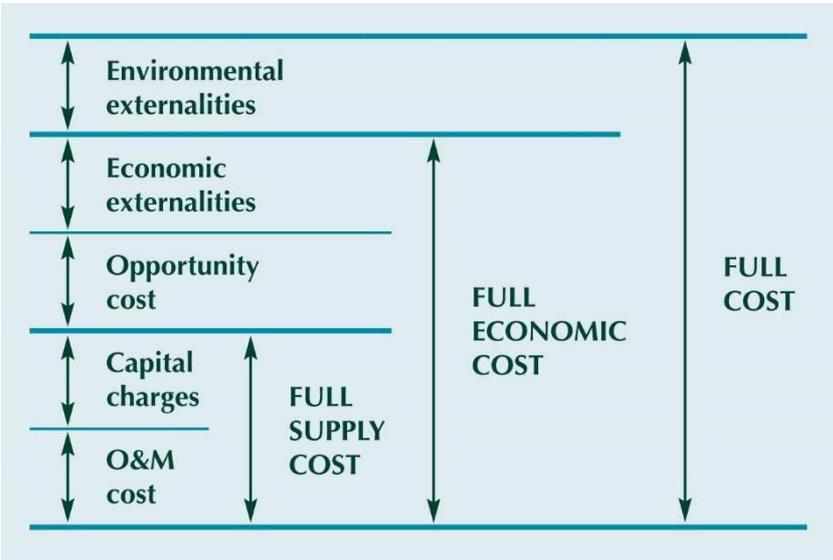
Following Global Water Partnership (2000), we apply the following formula to calculate water price:

$$(1) \quad WP = O\&M + CL$$

where  $WP$  is water price per 1,000 m<sup>3</sup>,  $O\&M$  are operational and maintenance costs of the irrigation and drainage system, including water pumping and WCA support; and  $CL$  is cost of lining of irrigation canals, including depreciation rate and interest rate of bank credit.

The price formula (1) takes into account the full supply cost concept which includes the costs of operation and maintenance of irrigation infrastructure and capital investment. It does not take into account opportunity costs and externalities because it can be very expensive for water users.

**Figure 5. Principles for cost of water by GWP**



Source: Global Water Partnership, 2000

***Irrigation efficiency and water productivity of agricultural crops***

In this section we describe indicators which we use to estimate the efficiency and productivity of irrigation in Khorezm. The indicators measure the water use efficiency and productivity across the whole irrigation network (scheme) as well as on the field.

According to FAO, the *overall (scheme) irrigation efficiency* ( $e_i$ ) captures to what extent water supplied from the source (river) into the irrigation network (canals, fields, etc) is actually used by irrigated plants. More precisely, it represents the part of the water pumped or diverted through the irrigation network which is used effectively by the plants. The scheme irrigation efficiency can be sub-divided into (i) conveyance efficiency ( $e_c$ ) and (ii) field application efficiency ( $e_f$ ).

The conveyance efficiency represents the efficiency of water transport in canals. It represents the share of water that arrives to the field (before entering the field) of total water supplied from the source. The conveyance efficiency depends on the length of the canals, the soil type or the permeability of the canal banks and their condition. The field application efficiency represents the efficiency of water application in the field. It represents the share of water actually used by irrigated plants of total water supplied to the field. The field application efficiency depends on the irrigation method and the level of farmer management practices. Once the conveyance and field application efficiency have been determined, the overall (scheme) irrigation efficiency ( $e_i$ ) can be calculated, using the following formula:

$$(2) \quad e_{l} = (e_{c} \times e_{f}) / 100$$

The above method of calculation of the water use efficiency (equation (2)) is more simple as compared with the methodology proposed by Jacques (2014).

A good level of the scheme irrigation efficiency is considered to be between 50 % and 60 %; 40 % is reasonable, while a scheme irrigation efficiency of 20-30 % is widely considered as relatively poor.

The *increase of field application efficiency* ( $e_{fi}$ ) can be calculated from the conservation irrigation field efficiency ( $e_{fc}$ ) and actual field application efficiency for traditional irrigation ( $e_{fa}$ ). The conservation irrigation efficiency is 80%. The actual field application efficiency for traditional irrigation represents 45 %. The increase of the field application efficiency can be then calculated by subtracting the traditional irrigation field efficiency from the conservation irrigation field efficiency:

$$(3) \quad e_{fi} = e_{fc} - e_{fa}$$

The increase of field application efficiency explains how the field application efficiency changes when farmers switch from traditional to conservation irrigation technology (farm practices).

Additionally, based on the secondary data on the conveyance efficiency and technical characteristics of the lined canals it is possible to calculate the *increase in conveyance efficiency* ( $e_{ci}$ ) using information on the efficiency of lined canals ( $e_{cl}$ ) and the actual efficiency of non-lined canals ( $e_{ca}$ ). The conveyance efficiency of lined canals is 90%. The conveyance efficiency of non-lined canals is about 55 %.

$$(4) \quad e_{ci} = e_{cl} - e_{ca}$$

The increase in conveyance efficiency explains how the conveyance efficiency changes when canals are upgraded from lined to non-lined.

## Data

### **Water price calculation**

Table 2 reports the values of different cost components of equation (1) to obtain potential water price for irrigation in Khorezm. Lining of irrigation canals is one of the most important improvement of the irrigation network because more than half irrigation water losses arise due to inefficient conveyance. The cost of lining canals in Khorezm represents 1,200 USD per ha (SANIIRI, forthcoming). Further lined canals can serve about 50 years at annual costs of 21.6 USD per ha or 5.6 USD for 1,000 m<sup>3</sup> of irrigation water. Average water use per ha of cotton and wheat crops after adoption the sprinkler irrigation estimated around 4000 m<sup>3</sup> (Kostovarova, 2012). Additionally the depreciation rate and the interest rate (2%) for bank credits (5%) are included in the calculation of the total costs of irrigation canal lining (TCL). These costs are calculated for 90 % of irrigation canals, because the remaining 10 % of canals were lined. According to the official UPRADIK (2002) the average annual operation and maintenance (O&M) costs per 1,000 m<sup>3</sup> of water is around 3.5 USD. We obtain O&M costs per hectare by multiplying of O&M costs per 1,000 m<sup>3</sup> of water to average water use per ha for cotton and wheat crops in sprinkler irrigation (4,000 m<sup>3</sup>). Taking all these costs into account, the potential price of irrigation water for farmers in Khorezm is about 9.5 USD per 1000 m<sup>3</sup> of water or 36.6 USD per hectare. This price is substantially higher than the fee of 2.5 USD per 1,000 m<sup>3</sup> that the water users currently pay to WCA.

**Table 2. Potential costs for efficient irrigation water supply in Khorezm**

<b>Name of potential costs</b>	<b>Costs, USD per ha</b>	<b>Costs, USD for 1,000 m<sup>3</sup> of water</b>
Operation and maintains (O&M) costs	13.5	3.5

Canal lining costs (CL)	21.6	5.6
Depreciation rate for lined canals (2%)	0.43	0.11
Interest rate for credits, lined canals (5%)	1.08	0.28
Potential water price (O&M+TCL)	36.6	9.5

\*Average Water supply for cotton&wheat in sprinkler irrigation – around 4,000 m<sup>3</sup>

Source: Own calculations based on secondary data from UPRADIK, 2006 and Kostovarova, 2012

## Results

### ***The impact of adoption of the water saving technologies on irrigation efficiency***

Adoption of the alternative technology increases the water use efficiency at all levels (Table 3). The lined irrigation canal's efficiency is about 90 % ( $e_{cl}$ ) is able to sharply increase of the conveyance efficiency ( $e_c$ ) in the Khorezm region, which the actual conveyance efficiency ( $e_{ca}$ ) is about 55 %. Also, high water use efficiency in the field level can be achieved after adoption of the sprinkler irrigation ( $e_{fsi}$ ), and it may increase field application efficiency up to 80 %. Additionally to the advantages of the sprinkler irrigation is related to lack of laser land levelling. Adoption of sprinkler irrigation in small scales may loss their advantages, due to moving groundwater from neighbouring fields. The average actual irrigation efficiency in the field level ( $e_{fa}$ ) for Khorezm is about 45 %. It means more than half of supplying irrigation water can be lost.

**Table 3. Water use efficiency for different methods**

Efficiency indicators	%
Actual field application efficiency (traditional method) ( $e_{fa}$ ), %	45
Actual conveyance efficiency ( $e_{ca}$ ), %	55
Efficiency of sprinkler irrigation $e_{fsi}$ (%)	80
Efficiency of lined irrigation canals $e_{cl}$ , %	90
<b><i>Impact of conservation technologies</i></b>	
Net irrigation efficiency, conservation method $e_{ic}$ ( $(e_{cl} * e_{fc})/100$ )	72
Net irrigation efficiency with traditional method $e_{it}$ ( $(e_{cni} * e_{ft})/100$ )	24.8
Increasing in net irrigation efficiency $e_{ii}$	47.3

Source: Own calculation based on technological data

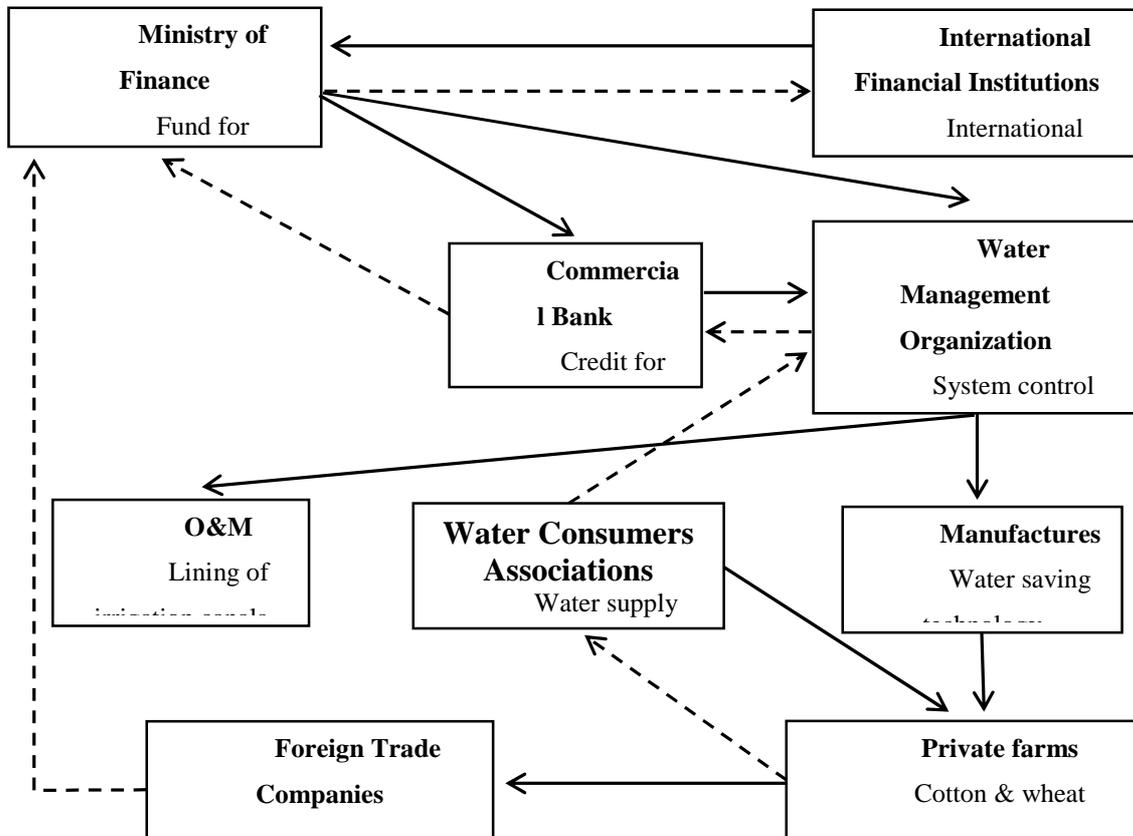
Low level of the actual conveyance efficiency and actual irrigation efficiency in the field level shows the low net irrigation efficiency ( $e_{it}$ ) for tin the Khorezm region (about 25 %). After adoption of alternative methods, the conveyance efficiency can reach to 90 % and the field application efficiency can be around 80 %. The overall net irrigation efficiency ( $e_i$ ) in the Khorezm region can reach to about 72 % against 25 % in actual net irrigation efficiency.

### ***Improved mechanism for adopting of the water conservation methods***

In spite of cost recovery potentials the water saving technologies not very widespread in developing countries due to several reasons. In case of Uzbekistan, such reasons could be unstable land tenure, undeveloped agricultural market, lack of market and water pricing. The current situation shows that farmers don't have incentives to implement water saving technologies. Adoption of water saving technologies at least in cotton and wheat production can give good enough results. Cotton and wheat crops cover about 75 % of the total agricultural land area in Uzbekistan. Private farms, which specialized for cotton and wheat production, mostly work in the framework of the state procurement system, and government receives more gains from the current production scheme. Taking into account of these

conditions, government should be responsible for adopting of the water conservation technologies and commercialize of water sector via water pricing.

**Figure 6. Potential scheme for implementation irrigation water saving technologies in Uzbekistan**



Source: Own research work

The financing scheme for cotton and wheat production via tax credits for private farmers could be useful for adoption of water saving technologies. Because, current financial conditions of the Water Management Organizations (WMO) and farmers don't allow to adopt water saving technologies and water pricing. WMO as the main representative of the government in the sector may supply new technology to farms and realize lining of the irrigation canals (Figure 6). A special fund should support the purchasing of water saving technologies by WMO for further supplying it to farms. WCA can realize water pricing, and this will help to cover O&M and canal lining costs. Conservation technologies will help to increase crop yields and provide additional revenue for government, and it should be sent to Special fund to cover of full costs for water saving technologies.

### Conclusion

Innovation in the water sector is very significant for Khorezm, because the region greatly threatened by severe and frequent water shortages. Moreover, land degradation affects to Khorezm through low agricultural productivity, higher food prices and through lower provision of ecosystem services. Adoption of water pricing and water saving technologies have high potentials for improving the situation via increasing of water efficiency. Water pricing could become relevant motivation for implementation of the different innovative land and water use technologies. Moreover, decreasing of traditional furrow irrigation and increasing of sprinkler irrigation can normalize groundwater tables and decrease secondary land salinization. A new state supporting system for water sector can provide adoption of new methods in large scales, which able to give more positive results. Government and farmers can get additional financial gains from implementation of the new system. Concentrated financial resources significantly

increase efficiency of the irrigation and drainage systems of Khorezm. The results of the current research work in case of Khorezm could be acceptable to adopt in whole irrigated areas of the Aral Sea Basin for achieving sustainable agriculture.

## **Acknowledgement**

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# Database as an Object of Intellectual Property: Company and University Perspective

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## Abstract

Databases are widely used by companies as well as universities to store and manage various types of information. Once they are filled with valuable data they might become a marketable product. However, there is a legal problem with using and spreading the information encompassed in any database. This paper examines a database as an object of one's intellectual property. The aim is to identify the issues arising from legal representation of its definition, protection, and commercial exploitation in business and university environment.

In this paper we primarily focus on Slovak market, however, we can say that these problems are also occurring abroad.

By the definition of the Copyright Act no. 618/2003 Coll. as amended and according to our practical experience we identified three basic issues associated with a database which we see as an object of one's Intellectual Property.

The first issue is that according to law, a database is considered as company's know-how but the basic conditions for being know-how are not fulfilled, mainly the sufficient protection of a database.

The second issue is that in some cases the simple data collection (e.g. a list of names) cannot be regarded as a database because its content and creation do not meet the essential conditions for its protection under the Copyright Act.

The third issue is that a database is closely linked to a database system and what one is regarding as quality, marketable and valuable a database is, in fact, advanced and specialized software used for its creation.

These three issues emphasized in our paper are common in enterprises, universities, and scientific or research institutions.

Universities, scientific or research institutions need to challenge another serious problem – to prove that they are really makers of a particular database (especially in case of contractual research, cooperation agreements and projects) because according to law - the maker of a database is the natural person or legal entity, at the suggestion, account and responsibility of who a database was made.

The ambition of this paper is not only to point out these problems but also to provide basic suggestions on how to eliminate them. As we are from university environment, the emphasis is put on scrupulous definition and protection of a database in this environment.

Furthermore, we provide comparison of possibilities of commercial database development and exploitation on the marketplace in case of business or university owner.

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All these issues need to be reconsidered when determining the value of a database for the purpose of its sale. However, this is another very important topic which needs to be further analyzed. In order to verify our recommendations, further empirical studies will be needed.

## **Keywords**

Company, Database, Intellectual Property Rights, Know-how, University

## **Introduction**

We use databases so much we don't even think about the fact that we are using databases. With the increasing digitization of available data also grows the number, scope and costs incurred for databases that keep all this information. These databases often contain "mere" facts and data which themselves are not a subject matter of a copyright protection and became valuable even when they are logically organized in the whole database. The creation of such a database is also usually associated with a great creative effort or high financial costs. (Smejkal, 2001)

For this reason, it is important to deal with the issue of protection and particular commercial use of databases in the private as well as public sector, especially at universities and scientific research institutions.

In this paper we deal with databases which are filled by data obtained in the research and development process or by simulation of certain natural or social phenomena, especially simulations of crisis phenomena.

This type of databases can be found in companies from the commercial sector, public enterprises, universities and scientific research institutions.

Public or commercial companies that own this type of databases usually created them by their own operation and on their own initiative, responsibility and expenses.

Universities and scientific research institutions, which are financed from public funds, use the finances for their research activities from:

- projects,
- public sources,
- own business activities,
- funds received by transfer of knowledge into practice,
- partners from the commercial sector.

The above facts show that it is difficult to clearly define the maker of a database (i.e. person on whose suggestion, account and responsibility was the particular database made) at the universities and scientific research institutions.

All these facts have significant impact on: commercial use of any database, use of database in the next research and development process, use of database in education, publishing the achieved results, etc. While company as a commercial entity as well as the maker of a database have rights for its protection and commercial use, universities and scientific research institutions are often limited by their partners in the research process, the way of obtaining the relevant data and applicable legal regulations.

“The ownership of intellectual property has important implications in terms of the creation of incentives for academics, and other related parties, to commercialize technology. Where property rights are weak and knowledge is tacit, the transfer of technology can be highly problematic due to the problems of hold up.” (Wright et al., 2007, p. 16)

## 1. Database and its legal interpretation

When dealing with the problems associated with the protection and commercial exploitation of databases it is necessary to define the term database.

A database is defined in the legislation as "a collection of independent works, data or other materials which are arranged in a systematic or methodical way and are individually accessible by electronic or other means." This is a wide definition which will cover traditional mailing lists and lists of customers as well as telephone directories, encyclopaedias and card indexes, whether held electronically or in paper form.

A database is a collection of information that is organized so that it can easily be accessed, managed, and updated. In one view, databases can be classified according to types of content: bibliographic, full-text, numeric, and images. (Leake, A., 2006)

A database is not only a collection of author's work or data but also any collection of tangible things if they are organized and accessible, even by mechanical means. Collection of photographs meets the characteristics of a database if the photos are organized (e.g. in albums) and are accessible by browsing through them. If these photos are strewn over the box, the characteristic of organization is missing and such "collection" does not meet the characteristics of a database. Personal phonebook can be considered as database because the data in it (names and numbers) are organized alphabetically (i.e. systematically) and simply accessible by browsing (i.e. by mechanical means). (Hartmanová, 2001)

A database can be also created as "a reorganization of other database created by another entity" (§ 2, article 4 of the Copyright Act, 2003). However, this reorganization and added value of "a new creator" must be substantial. However, if database available on the internet is newly organized the new creator must comply with the above conditions for encompassing data to the database. It is therefore not allowed to copy a music samples from the database of another entity and create own database without having the author's consent for it. On the other hand, it is possible to organize e.g. the names of companies available on the internet unless there is no unauthorized use, as mentioned above. (Smejkal, 2001)

According to § 5, article 4 of the Copyright Act (2003), "database is a collection of independent works, data or other materials systematically or methodically arranged and individually accessible by electronic or other devices. The computer program used for the creation or operation of the database accessible by electronic devices shall not be deemed to be a database".

## 2. The protection of databases

Copyright in databases seeks to protect the intellectual creativity of the author. The author's time, skill and labour must be directed to the selection and arrangement of the database, and not the mere gathering of information. Simply arranging a list of names in alphabetical order, for example, is unlikely to meet this standard.

Even if the set of data does not fall within the definition of a database, it may nonetheless attract copyright protection as a table or compilation depending on its nature. Tables and compilations are subject to the normal requirement of originality in that the author must have used his own skill and effort in creating the table or compilation. (Copyright Act, 2003)

### **Comparison of regulations for the protection of intellectual property rights in the Slovak and the European law**

According to the Slovak negotiating position in the field of intellectual property Slovakia has reached full compatibility with the EU legislation. On the 14th of January 2000 Slovakia ratified Conventions WIPO from the year 1996. Slovakia has moved towards to the world standards in the area of intellectual property rights. It is mainly because of the adoption of recent amendments to the Copyright Act, which made the system of protection of databases

complete and brought new opportunities to the active defence of the author and legitimated copyright holder against offenders of their rights, and also by the adoption of the amendment to the Trade Mark Act and Patent Act. (Moravčíková, 2003)

Chosen provisions of the Copyright Act (2003) in the territory of Slovakia point out the following two database protection possibilities, namely:

a) The Copyright protection

According to the Section 7, article 2 of the Copyright Act (2003) "the subject matter of copyright is also the work of a collection expressed in any form, including electronic form involving analogue and digital expression, especially conference proceedings, newspaper, magazine, encyclopaedia, anthology, broadcast programme, exhibition, or other database if it is a collection of independent works or other elements that is by the way of selection or the organization of its content the result of the creative intellectual activity of the author".

If a database, table or compilation does attract copyright protection, this lasts for a period of 70 years from the end of the calendar year in which the author dies. Copyright protection gives a copyright owner the right to do various acts in relation to the work and the right to prevent others from doing so without permission, for example copying or adapting the work.

b) The Sui Generis protection

The sui generis right to a database, which shows a qualitative or quantitative substantial contribution to the acquisition, verification or presentation of its content, shall belong to its producer regardless of whether the database or its content are the subject matter of copyright or of other rights.

Like copyright, a database right is an automatic right which exists as soon as the database exists in a recorded form. Database rights last for either 15 years from the end of the year, in which the making of the database was completed or, if it was published during that period, 15 years from the end of the year in which the database was first made available to the public.

If there is a substantial change to the contents of the database then the 15 year protection period recommences. This includes a substantial change "resulting from the accumulation of successive additions, deletions or alterations, which would result in the database being considered to be a substantial new investment".

The protection provided by the Copyright Act applies to all forms of databases, electronic, non-electronic, on-line or off-line, dynamic or static, including systematically or methodically organized collections of works if they are individually accessible. The potential computer program which is used together with a database can be protected as a copyright work but it is not subject matter of sui generis rights to the database. (Kováč, 2004)

Within the content of the sui generis right of the database maker is the right for extraction and utilization of all the content of a database or its qualitatively or quantitatively substantial part, and the right to grant a license to another person for using this right. From the contents of both rights it is apparent that extraction has mostly a non-commercial character while utilization has primarily a commercial intent. (Hartmanová, 2001)

The maker of a database has to face some restrictions. He or she must tolerate any extraction and utilization of insubstantial parts of its content by the legitimate user of the database. (Smejkal, 2001)

**Limitation of sui generis right to a database**

The legitimate user of a database which is made public by any means may without the consent of its maker carry out the extraction, reutilization of substantial part of its contents if the following is included:

- a) extraction of contents of non-electronic database for personal use;

b) extraction for illustration within the educational or scientific research; however, the source must be indicated and the extent of extraction must not be focused on acquiring direct or indirect property benefit;

c) extraction and reutilization carried out in order to protect the public and in administrative proceedings or judicial proceedings.

When anyone who is in competitive position to a maker of a database uses data for commercial purpose then this person break the right of the maker of the database.

What does it mean? If there is e.g. a database of companies available on the Internet or in printed form and if there is listed a logo, address, email, etc. of these companies then it is not permitted to:

a) copy data (company names, phone numbers, email addresses, etc.) for any commercial use of these data or websites on which the data are placed = the conflict of interests of the maker;

b) copy companies logos without their consent to use them = the conflict of interests of the author or right holder related to copyright works or other subject matter of the protection involved in the database;

c) copy the major part of the database for commercial use = the conflict of interests with the legal royalty-free licenses;

d) copy the parts of the database systematically and repeatedly.

A database may also be any websites with the text describing goods and services or any other descriptive information. Then copying substantial or insubstantial parts of other websites may cause prejudice the legitimate interests of the website operators. (Smejkal, 2001)

Remember that a database can attract copyright as well as database rights. The reduction in the scope of protection under database rights may mean that the makers of databases seek to rely more on copyright in order to protect their investment.

### **3. Three basic issues associated with a database definition and protection**

By the definition of the Copyright Act (2003) and according to our practical experience we identified three basic issues associated with a database which we see as an object of one's Intellectual Property. These three issues emphasized in our paper are common in enterprises, universities, and scientific or research institutions.

#### **a) A database is considered as company's know-how but the basic conditions for being know-how are not fulfilled, mainly the sufficient protection of a database.**

In practice, we often meet the fact that entrepreneurs protect their databases as part of know-how. Especially when databases contain supporting data necessary for operation of more complex technology or parameter setting of simulation software, or software to support complex management and logistics processes.

Generally, know-how means manufacturing and technical knowledge, which may represent the results of scientific and creative activity - especially long-term experience with the optimal operation of particular processes, technologies, recipes. (Jakubec and Kardoš, 2012) This knowledge and information are not governed by specific regulations and they are:

1) classified – refers to knowledge and information that in whole or in their particular precise configuration are not generally known or commonly accessible,

2) substantial – refers to knowledge and information that is useful for someone,

3) adequately identified – refers to knowledge and information that are described in a sufficiently comprehensive manner in order to verify compliance with the requirement of confidentiality and substantiality.

From the above definition it is clear that the database as a part of the know-how must be confidential, for example by using the provisions and rules related to a trade secret. This means determining the persons authorized to deal with the know-how, non-disclosure agreements, security restricted access to the database and its tracking, in the case of electronically operated databases the restricted access to the Internet from a computer on which the database is available.

The enterprise should define trade secret and the know-how in its internal documents and in accordance with this definition approach partner in common negotiations. Partner must be informed in advance that confidential knowledge and information are being presented to him.

When conducting research projects universities and scientific research institutions (SRI) often acquire data that belong to the trade secret of the cooperating commercial subject. When initiating this project (or cooperation) it is necessary for a commercial partner to sign the contract with the University or SRI in which among other things is stated that data provided to the research partner are part of its trade secret on a limited time and a limited purpose, and the University or SRI agrees to protect the data and to use them only in accordance with the contract.

Good practice is that commercial partners allow universities to partially use provided data free of charge and information for the purpose of education. Of course, researchers and pedagogues ensure commercial confidentiality. This tacit agreement means an advantage for universities since it allows them using real data in education and it also brings benefit to the commercial partner in the form of further analysis and processing of the provided data, which can lead to new findings and improvements of internal processes.

In the case of universities, it is difficult to imagine the protection of databases as part of know-how. Universities usually define what they consider as know-how as well as the conditions for its protection and use within their internal processes. In the internal regulations there are defined authorized persons for dealing with know-how, the models of non-disclosure agreements with partners and employees who get in touch with the know-how, etc. But it should be noted that in an environment where it is essential to publish and present the particular findings to a public and students the confidentiality of information is difficult and often impossible.

**b) The simple data collection (e.g. a list of names) cannot be regarded as a database because its content and creation do not meet the essential conditions for its protection under the Copyright Act.**

„Creating a sui generis protection for database was all the more necessary because of technological change. The emergence of digitization meant that databases could be reproduced by free-riders at no cost, without loss of quality and in no time. Thus there was an increased need of protection since database contents are not protected by copyright but can be so easily free-ridden, while the database's constitution cost considerable amounts of money, time and/ or efforts.“ (Derclaye, 2008, p. 46)

The database may be the subject matter of copyright protection as the author's work or sui generis protection, without excluding their accumulation. The criterion, which is crucial to provision of the database protection as the author's work is its originality, uniqueness and unrepeatability as a result of an intellectual creation of the author or group of authors. The protection relates to the database structure while the rights of any third subjects remain unaffected. The protection does not apply to the content of the database or the rights to this content. (Kováč, 2004)

The examples of databases protected by sui generis right: collections of films, novels, poems, musical works and computer works, lists of data within computer programs, football

fixtures lists, indexes, bibliographies, customer lists, websites, results of sport competitions, etc. (Derclaye, 2008)

In the university environment, databases protected under the sui generis rights are usually used and they contain data from various sources according to pre-defined purpose. These data are collected and subsequently analysed, evaluated, processed in the way that it can result in creating several different databases. In every single case the university shows qualitative or quantitative substantial contribution to the acquisition, verification or presentation of its content. This makes it possible to create a valuable output from the (otherwise) disparate data, through which you can name the causes of certain natural and social phenomena, to define turning points, view of the process, etc. These databases are usually used as inputs into other research projects as tools to simulate cases from real practice for students, and as a basis for students' theses. It should be emphasized that the data are used with the "tacit" agreement of parties or the data are gathered throughout the performance of the own university activities.

**c) A database is closely linked to a database system and what one is regarding as quality, marketable and valuable a database is, in fact, advanced and specialized software used for its creation.**

Currently, electronic databases surely have the largest economic importance, especially electronic registers from various areas of human activity. In electronic databases, in particular, there is no absolutely clear distinction between the database and the software that is operating the database allowing to search in the database, even save new records and therefore it is not possible to use the database without software at all. These are two separate intangible assets capable for the independent use. For each of them the "ability" to be the subject matter of protection under the copyright law is considered separately. Or, if it is a database that is neither a subject matter to copyright protection nor subject of the sui generis right of the maker of a database, it may be subject matter of copyright protection of a computer program that handles the database. (Hartmanová, 2001)

Any software which is used in the making or operation of a database is specifically excluded from protection as a database, software instead generally being protected by copyright as a literary work. Nevertheless, as software is often developed in modular form, it is possible that in some cases a collection of software modules may attract protection as a database. Also, some elements of a computer program (for example, on screen look up tables which users may search in order to find information) may constitute a database.

In practice, when creating software, we encounter the use of the author's databases which may be protected by the sui generis right. Databases, in this case, are perceived as a supporting means for the creation of software and are sold as a direct component. "For example, in the USA software can be patented or copyrighted. Although software protected by a patent requires disclosure in many academic institutions, software protected by copyright grants no rights of title in many universities and so does not require invention disclosure." (Shane, 2004, p.168)

The second example can be the creation of information systems, which are the results of cooperation of the author and the contracting authority while the data in the database needed for software production was provided by customer and are not included in the value of the software and the use of database is earmarked for specific cases.

The third specific case is the cooperation of author or manager with customer when the information needed for creation of information system, e-shop, etc. are constantly updated and changed, and the author is an administrator not only of a created software solution but also the documents needed for the software creation.

When dealing with this issue, it is necessary to realize that networking of a database with software is the basis of enterprise or university information systems which are encompassing selected internal processes and enabling faster and more flexible management, which ultimately represents a cost savings. In this case, these two subject matters of the intellectual

property are not perceived to be separate - neither in terms of formal or technical, nor economic representation.

It is necessary to consider the above cases, especially when determining the value of a database and software on sale.

#### 4. The university as a maker of a database

Authors or developers are interested to receive remuneration from databases which is based on their intellectual and skill inputs and want to restrict copying from databases while the users are keen to make use of the information either without paying for it or would like to have copying rights at relatively lesser cost.

The copyright owner is generally the person who creates the work. This can sometimes cause confusion with commissioned works. For example a consultant will be the legal owner of copyright in a work created on behalf of the person or company commissioning it, unless ownership is dealt with contractually. **However, if a copyright work is created by an employee it is the employer who is the first owner of the copyright provided the work was created in the course of the employee's employment.**

The maker of a database is defined as the person who "takes the initiative in obtaining, verifying or presenting the contents of a database and assumes the risk of investing in that obtaining, verification or presentation" and such person is the first owner of the database right. This definition is in contrast to that of an owner in copyright since where a database is commissioned, the commissioner will usually be the "maker" and first owner of the database right. If the database is made by an employee in the course of his employment, the employer will be regarded as the maker and therefore the owner of the database right subject to any agreement to the contrary.

School as a legal entity may be in relation to the use of copyright works only a derived entity – as the right holder who derives the execution of the copyright from the original entity, i.e. either from the employee/teacher (directly under the law), from the pupil/student (under a license agreement or based on the use of a legal license) or from a third party (just under a license agreement or on the basis of the use of any copyright restrictions). (Adamová, Z., Škreko, A., 2012)

The rights sui generis to a database should be seen as rights of economic character, which are granted to the maker of a database as a compensation for the investment in obtaining, verifying contents of a database and making it accessible. In doing so, the maker of a database in terms of the Act is a person at the suggestion, account and responsibility of who a database was made.

Universities and scientific research institutes use for funding their research the resources from different private and public sector entities. In the case of research funding from the European Union several questions have arisen recently - who owns the property rights to the achieved results? If a participation of a university in research is 10%, should be the property rights executed by the university to 100%? Should not be the results of this research available and free in the territory of the European Union? These questions also concern the databases as a form of intellectual property resulting from the project. The area of research funding has an impact on the entire process of the knowledge transfer into practice. When signing the cooperation agreement, contract research, etc. we recommend to define the rights distribution of achieved results and the way of the database protection, i.e. whether it will be protected as a part of the know - how, trade secret or under the provisions of the Copyright Act.

Universities and scientific research institutes should have processed the issue of protection and the use of databases also in its internal guidelines, which would prevent misunderstandings with authors, employees and authorized users.

## 5. Particular steps for dealing with databases

Anyone who creates organises or administers databases, or anyone extracts or re-utilises the contents of databases belonging to others, should review their position in relation to the use of such data.

When using data and information from databases is necessary to verify:

- Who is the maker of a database?
- Is a database protected by the copyright or by the sui generis database right?
- Whether there are any licences to use the databases and/or whether an assignment of the rights in such databases could be obtained?
- For what purpose will selected data and information from the database be used?
- Who are authorized database users?
- How the license fees depend on the purpose, time and spatial extent of its use?

By answering these fundamental questions it is possible to prevent potential misunderstandings and threats of the intellectual property rights relating to the database.

It is necessary to remember that the content of a database may be copyright works particularly protected by copyright act, or the content may be the data protected as a trade secret of an entrepreneur which requires specific approach to the content of a database by the authorized user and may lead to additional economic and legal requirements. As an example we can mention the downloading of images from the Internet and their use to promote one's business activities, while the user is not authorized by the maker of a photo database to its use. That means the rights abuse of economic interests at the same time as the copyright of author's photographs, which the maker of the database executes under the licence.

## Conclusions

Business in databases involves financial as well as manpower investments. Given the technological means, it is quite possible to copy full or substantial part of the database at a fraction of the costs involved in developing the same. This leads to a conflict of interests between the developers and authors of the databases, on the one hand and the users of the databases, on the other hand. (Gupta, 1997)

Specific cases occur in the environment of universities and scientific research institutes, for which it is substantial to use databases in the educational process, in the process of research and development, or in presentation of their achieved results. These organizations use a database acquired by its own activities, gained while working on projects from cooperating entities, databases containing copyright works and sensitive information. In these databases, the name of a person, at the suggestion, account and responsibility of who a database was made, is often not clear. Because of the practices in Slovakia, where the area of knowledge and technology transfer has been neglected from methodological, legal and financial points of view, there are not many databases used in the university on which the licenses were granted. Similarly, databases owned by the universities are under-valued and they do not perceive them as their intellectual property with potential for commercial application.

This paper intent to highlight the problems associated with defining and protecting databases, because of their substantial impact on the database value in its commercial success.

## Acknowledgement

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# Regional Development, Innovation and Creativity

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## Abstract

The contribution is focused on analyzing the major approaches of experts to the contents of terms creativity, invention, innovation etc. The aim is to specify the content of these terms and find degree of interconnection and influence from different perspectives. The introduction is based on the basic definition by Schumpeter, who defined innovation as combination of development changes. Following, there are characterized approaches of authors, who developed the original Schumpeter's theory, and now they are primarily focused on successful management of innovation in enterprises. Common features of definitions are application of new ideas, change, improvement and invention. It is necessary to distinct innovation and invention, which is the ability to find new knowledge, see the possibilities of useful changes, but it is only the first step in a long innovation process in which a good idea gets into the form of useful and effective product or service. Subsequently, the article deals with creativity, which means the ability to create new technical and cultural, spiritual and material values. Creativity and its link to learning and achieved experience are regarded as condition for creation, processing and dissemination of innovation and thus the highlight of creativity became the basis for creative economy, which is precisely grounded on human creativity. The article explains the difference between creativity and innovation, where innovation is more than just an original idea – it means that new ideas must be implemented successfully on the market or that things will be implemented in new ways. The essence of creativity lies in the diversity of thinking. Its base is divergent thinking, in which personality focuses on expanding and finding new and appropriate solutions to problems and opportunities of various logical alternatives. The creative potential is the sum of knowledge, skills, abilities, and motivation, personal and moral qualities which are involved in the creative process. At the end of the article, there is an innovative model, which expresses the relationship between creativity and innovation characterized by creative skills as essential part of the comprehensive model in terms of the prerequisites for innovative capacity and innovation potential of enterprises.

## Keywords

Creativity, innovation, factors of creativity, barriers of creativity

## Introduction

During last years the European Union and all advanced countries are strongly focused on creation strategies which will help to create a highly competitive and highly dynamic knowledge-based economy that is able to achieve sustainable economic development with enough jobs and social cohesion. This objective resulted of the current situation of global

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economic downturn, economic and financial crises. The major strategic documents have more frequently mentioned concepts of innovation, creativity, creative thinking, creative personalities etc. These terms are interconnected, for example in terms of challenges according which was named particular development period.

The most significant challenge was in 2009, which was declared as the European Year of Creativity and Innovation by the European Union. The European Commission has nominated 27 European personalities from the sphere of culture, innovation and creative industry, which were declared as special ambassadors of the European Year of Creativity and Innovation. The principal ambassador was appointed Esko Tapani Aho, Executive Vice President of the Finnish concern Nokia and former Prime Minister of Finland. Slovak ambassador was Ján Ďurovčík, dance choreographer.

The key role of ambassadors was to support public interest in the relevant topics from the areas of education, culture, innovation and entrepreneurship. They also promote the idea of the European Year of Creativity and Innovation not only in their own country but also abroad. "I believe that the Year of Creativity and Innovation 2009 will be a source of inspiration. It should grow into a big tree, not only the annual plant", said Ján FIGEL', European Commissioner for Education, Training and Culture (2004 – 2009). He also said: "Those who invest in creativity and innovation will be more competitive than those who do not." (Euractiv, 2008)

European leaders defined innovation as the key element of common strategy for supporting economic growth and creating of new jobs. Simultaneously, European plan for economic restoration and innovation has been put into complementary relationship. The way from economic recession led through financial support of research and development, expanding the coverage of broadband Internet in rural areas and transformation of Europe into low carbon economy.

The report issued in January 2010 by the European Commission indicated, that the progress in this area was relatively small. The gap between the European Union and the United States in the area of financing the research and development did not decrease, but instead expanded. But several experts disagreed with the assessment based on a single indicator, which was the rate of investment in research and development. Ann METTLER, Executive Director of think-tank the Lisbon Council, appreciated the effort of the European Commission to extend the understanding of innovation through addition the topic of creativity. "We should not underestimate the benefits of creative industries such as design or film production", she told for EurActiv. According to her, "the creative industries in Europe have a huge opportunity to become a magnet for talent from around the world". The executive of the European Union promised to emphasize the potential of creative industries. (Euractiv, 2010)

"We have to strengthen the capacity for solving the problems in all age groups and in every place in Europe", says Ján Figel', European Commissioner for Education, Training and Culture (2004 – 2009). "At the end of the year 2009, I would like to see, that people in Europe will understand, that through supporting human talents and resources in the area of innovation, we can actively reshape Europe and help to develop its economic and social potential." In the interview for EurActiv he also said: "Dialogue and partnership between academic and business should be a stable feature. Their absence is a loss for the both sides, but their developing brings inspiration and support. On the one hand schools, especially universities, should offer qualifications and training relevant to current labour market needs. On the other hand, universities can help to change the content of curriculum. The common agenda can be education for entrepreneurship, which is relatively weak in Europe and needs development." (Euractiv, 2009)

"Innovation can offer the appropriate tools to overcome environmental challenges", said Esko Tapani Aho, Head of the Ambassadors of the European Year of Creativity and Innovation. He required EU governments to desist from cuts in budget for research and development.

According to him, saving at the expense of research and development in time of financial and economic crisis is short and therefore not sustainable solution.

Professor Edward de BONO, Ambassador of the European Year of Creativity and Innovation and the European authority on creative thinking in the interview for EurActiv, said: "I think the enterprises should take creativity as seriously as financial and legal affairs. In every enterprise we need someone directly responsible for creativity and new ideas, who would listen to new ideas, mediate them and stand behind them." (Euractiv, 2010)

Director of Škoda responsible for international relations, Radek ŠPICAR, stressed the importance of innovation for the ability of enterprise to remain competitive. He said that during financial crisis it is the best time for thinking about innovation. He called for improving of education that will prepare students for the labour market. (Euractiv, 2010)

Martin BRUNCKO from Neulogy (company focused on knowledge management), said: "Lack of creativity and innovation is the most essential reason why the EU is economically lagging behind the U.S. Solving of this problem is only way to fulfil the goal of the Lisbon Strategy - make the EU the most competitive knowledge-based economy in the world. Challenges to creativity and innovation are nice ideas, but they have to be accompanied by concrete steps of member states. Three most important are: significant increase creativity and critical thinking in teaching at all levels of education; linking academic research with practice, and support for innovative businesses" (Euractiv, 2010)

Creativity and its link to learning and gained experience is regarded as a condition for creation, processing and dissemination of innovation and so emphasis of creativity became the basis for creative economy, which is precisely based on human creativity. (IVANIČKOVÁ, 2011)

Without human creativity, which is part of any innovation or new product, it is not possible to achieve development and progress. In previous period were labour, capital and technology defined as necessary for economic growth. Effort to raise living standard associated with technological equipment showed through high increase in creative thinking what has back resulted in growth of abilities, knowledge of individuals and their personal creativity.

The article is focused on clarification of the content of these important terms, their interconnection and influence from the view of experts in this field.

## **1. Innovation as a concept**

Innovation comes from Latin and means renewal. Joseph SCHUMPETER is considered to be the founder of theory of innovation. In 1911, he formulated combination of development changes and named five typical changes:

- using the new technology, production processes and marketing ensuring of production,
- implementation of new products, or original products with new features,
- using the new raw and materials,
- changes in the organization of production, distribution and sale,
- opening the new markets, changes in market structure.

Schumpeter considered innovation only the first entry of new product, raw, materials, technological process, etc. on the market, it means the first materialization of idea on the market. All other producers called imitators. Many authors focused on innovation and innovation management developed the original Schumpeter's theory, and nowadays their works are primarily focused on the successful innovation management in enterprises. Nowadays, there are many definitions of innovation – according to survey around 200. Their common features are application of new ideas (38 %) change/improvement (28 %), new idea (26 %) and invention (9 %). According to most contemporary authors, innovation is key term for the entrepreneur or manager. Innovation is not only about good ideas; it is a combination of good ideas, motivated employees and intuitive understanding of customers' needs and requirements. (JANOVIČEK, 2010)

Current understanding of innovation emphasizes its connection to organization's way of life, thinking and behaviour of people, impact of dependence on major elements of system environment of organization that produces the innovation and provides it to market. Green Paper on Innovation issued by the European Commission in 2004 defines innovation as synonym for a successful production, assimilation and using of novelty in economic and social sphere. Innovations offer new solutions of problems and so make possible to meet the needs of individuals and society. It is also necessary to distinguish innovation from invention, which means ability to find new knowledge and see possibilities of useful changes. Invention is the first step in long process in which a good idea gets into widely usable and effective product or service. Not all new ideas will develop into the implementation phase, not all become innovations. (JANOVČÍK, 2010)

The processes leading to innovation usually requires additional investment in research and development and continual monitoring in order to identify and support incentives to creative and innovative initiative. Therefore, innovations should be understood as a process that can be managed. (NOVÁKOVÁ, 2013) It may not be apparent process such as manufacturing process, but nevertheless it can be identified. Three main phases of innovation process are listed in Tab. 1. (ADAIR, 2011)

**Tab. 1 Main phases of innovation process**

Phase of innovation process	Efficient processes
Creation of ideas	Involvement of individuals and teams in the process of creation of ideas.
Collection of ideas	Involving the team in the collection, verification and evaluation of ideas.
Development and implementation of final ideas	Involving the team in improving and developing ideas until the enterprise will receive the first responses from satisfied customers.

Source: by ADAIR, J. (2004). In: FRANKOVÁ, E. (2011).

The process of commercialization of innovations includes four basic elements: creation of idea, initial application, verification of feasibility and final application. Each element is characterized by certain features listed in Tab. 2.

**Tab. 2 Basic elements and features of organizational innovations**

Basic elements	Characteristic features
Creation of idea	New forms of knowledge, expansion of current understanding or spontaneous creativity allowed by individual genius and communication with others
Initial application	First conceptual test of ideas through prototypes or samples and discussions with customers, technical experts, etc.
Verification of feasibility	Questions about practicality and value are verified by feasibility study in order to determine potential costs, benefits, as well as the potential market of innovation
Final application	New product is commercialized or placed for sale on open market, new process is realized as part of normal operating modes

Source: by ROFFE, I. (1999). In: FRANKOVÁ, E. (2011).

The whole innovation process has to be related to the needs of market and enterprise. Thorough knowledge of market increases the chance for high value of innovation which

determines success in the market. It is therefore necessary to build close relationships with customers, collect information stimulating creative ideas and after successful implementation of innovative process ensure saleability of the product. (ROFFE, 1999)

Enterprises which focus their strategy on innovation, can take the ideas generated and tested by other organizations (imitating innovation) or can realize new ideas (original innovation). In order the organization is able to create and implement original innovation it is necessary creativity – not just individual, but also team and organization creativity.

## **2. Theoretic definition of creativity and innovation**

The terms creativity and innovation are often exchanged. Creativity means creation of new ideas, while innovation means to bring this idea to market. In other word, innovation is more than original idea; innovation means that new ideas have to be successfully implemented on market or that things will be realized in new ways.

Creativity is derived from the Latin word *creatio*, which means creation. In the literature some authors make sensitive difference between creativity. Creativity means the ability to create new and original ideas that the author did not know before. Each individual is naturally creative. Creativity is not a predetermined characteristic of some people, but everyone has certain degree of creativity and it is possible to develop it.

ULLRICH expressed creativity as the ability to know objects in new relations and in original way, to use them meaningfully in unusual way, to see new problems where they are not apparently, to deviate from schemes of thinking and to develop ideas arising from standards also against the resistance of environment, if it's worth to find something new what enrich culture and society.

ARIETE defines creativity as a function of the ego, which gives meaning to life and work; it is source of deep satisfaction, and also the source of positive self-evaluation. (Hlavsa, 1986) Creativity means the ability to create new cultural and technical, spiritual and material values. It is activity that brings so far unknown and socially valuable creations. It can be defined as the opposite of conformity; such as subject-object relationship which essence lies in the activity regulating this relationship. The creative potential is the sum of knowledge, skills, abilities, and motivation, personal and moral qualities which are in mutual combination involved in the creative process.

Creative activity is the opposite of reproductive activity, which is based on repeating things which are already known. It is characterized by original process and its original product; is universal, reflecting in diverse situations and fields of human activity. Fundamental feature of all creative works is originality, which means ability to produce unusual, specific and also appropriate responses with surprising ingenuity. However, no creative product is totally new, but is only a fragment of a long chain of evolution. Creativity maintains a dependence on the previous achievements of mankind. The activity and product positively influences the creative relationship to reality, as well as creative potential and creative experience.

In the creative process there are two basic classes of operations – creating solutions (projects, hypothesis) and their evaluation/verification. The basis of creativity is divergent thinking, when creative personality focuses on expanding and finding new, appropriate solutions of problems and various logical alternatives. Convergent thinking is more applied in problems with one solution, which means thinking is focused on one way to one goal which results from conditions of tasks and its rules. Creative thinking includes four phases – preparation, incubation, illumination and verification.

Signs of creative thinking can be examined in two ways:

- analysis of activities and approaches to solving certain tasks, ways of work, etc., and using various tests of creative abilities and creative thinking.

Creative way of thinking occurs in production, organizational, cognitive, artistic, educational, health, sports and other spheres of human activity.

Tests of creative thinking contain set of tasks that require new, unknown solution, new point of view on known things, linking previously unrelated elements, etc.

GHISELIN said that lower level of creativity is based on the creation of new connections, combinations of elements that already exist and on the decomposition of principles and concepts that are already created for application in new areas.

Higher level of creativity creates new, valuable elements which are material for inner creativity. It means that new creations are based on old elements. The basic principles of creative thinking are selection, transformation and combining the elements of previous experience which results merge together novelty and value. (HNILIČKOVÁ et al., 1972)

The main difference of creativity lies in the diversity of thinking. This means that the individual deals with divergent roles which do not have a single correct answer unlike to convergence problems, where is possible to apply only one way and there is only one proper result.

For complex nature of creativity, which is beyond the cognitive, was created concept of creative personality, which reflects broader context of personal creativity. According to JURČOVÁ (2002) the problem of study the creative personalities is in establishment reliable criteria for their identification. The most commonly used research selection criteria were general social recognition or assessment of experts based on real creative products. Selection was done by the rating or nomination for selected criteria. Many characteristics of creative people were derived from biographical and autobiographical data of geniuses.

Essential features were derived from dozens of personalities' features acquired during 15 years of empirical research as the stable correlates of creative outputs and activities in various fields of creativity. These include general interests, curiosity, self-confidence, affinity to complexity, independent judgment, high evaluation of aesthetic qualities, intuition, etc.

There are many others characteristics of creativity in literature. MACKINNON, TARDIF, STERNBERG and others agree that there is no simple formula corresponding to anyone who is creative. It is a combination of many characteristics that may occur in one, but do not occur in other creative personality. Through this they emphasized the uniqueness of creative personality.

GUILFORD identified factors of creativity. Specific skills in this category are derived from analyses of major creative personalities. Despite the criticism GUILFORD psychometric approach has not been surpassed by anything. The factors are figural and semantic elaboration, verbal fluency, idea fluency, spontaneous picture flexibility, spontaneous semantic flexibility, association fluency, expressive fluency, visual adaptive flexibility, symbolic adaptive flexibility, originality as a factor in creativity, cognitive style, original fantasy, non-intellect factors of creativity, motivation as non-intellect factor of creativity, the relationship of general intelligence and creativity. It is known that people with high intelligence do not have also high level of creativity, but very creative individuals tend to have also high intelligence. (JURČOVÁ, 2002)

The creativity of the individual is influenced by barriers that can distort the creativity test results. JAMES L. ADAMS has identified generally accepted categorization of barriers of creative thinking, divided into four groups:

- perceptual barriers - defend to understand correctly the information which are necessary for understanding or solving the problem,
- culture and environment constraints - can significant defend creative work,
- emotional barriers – usually when personality critically evaluates its creative ideas, and
- intellectual and expressive barriers – result from lack of intellectual assumptions or they demonstrate the lack of ability to interpret the idea.

Specific example of the barriers of creativity is assessed level of irrational opinions. Increased level of irrational opinions can be a potential barrier to creativity and relates negatively with originality and imaginative part of thinking.

The effects of conformity, which is considered to be one of the key barriers to creativity, and independence, were followed in decision-making in pro-social and anti-social dilemmas. Within determining the relationship of creativity and pro-social aspects of conformity were shown positive relationships of creative abilities to non-conformist behaviour in quantitative and qualitative indicators.

In deciding about social dilemmas, in the view of independence and conformity, plays a major role flexibility of thinking, which shows significant relationship to the non-conformist behaviour in highly creative personalities and understanding of social and moral standards. The quality of argument in justification of prosocial and antisocial behaviour were these significant differences: in case of highly creative people reasoning by gender behaviour, reciprocity and ability to risk; people with low creativity mentioned as the most common reason for prosocial and antisocial behaviour conformity with the group. (KUSÁ, 1994, 1995)

### **3. The relationship of creativity and innovation in knowledge-advanced companies in Slovakia**

As a part of the project KRENAR (Creative Economy - National economic and regional conditions and incentives) was carried out research focused on determination the relationship of creativity and innovation in highly innovative enterprises operating in the Slovak Republic. At the beginning, research problem has been set - to define the relationship of creativity and innovation and also aspects that influence this relationship. The first research objective is to identify the characteristics and features of creative employees in the enterprise, including their position and the second research objective is to define the relationship between creative abilities of employees and innovation in the enterprise.

The research questions (RQ) were:

- RQ1: The most of creative employees work out of management positions.
- RQ2: The most important characteristics of creative personality are independence at work and endurance.
- RQ3: Independence at work is considered the most important feature of the environment that supports creativity and innovation.
- RQ4: Enterprises prefer creative teams to individual creative personality during creation of innovative ideas.
- RQ5: Most enterprises consider creativity as the integral part of their innovation processes.

The questionnaire was completed by 21 enterprises, so the return of questionnaires was 31 %. Most enterprises/respondents, who were identified by Statistical Office of the Slovak Republic as knowledge-advanced enterprises, work in design (6 enterprises) and energetics (6). Others work in building (4), transport (2), mechanical industry (1), healthcare and pharmaceuticals (1) and services in the area of work safety and fire protection (1). Regarding the number of employees, 2 enterprises have less than 10 employees, 9 enterprises have 11 - 50 employees and 10 enterprises have more than 50 employees. Eight query enterprises are located in the Nitra region; seven enterprises in the Bratislava region and from other regions were one or two enterprises.

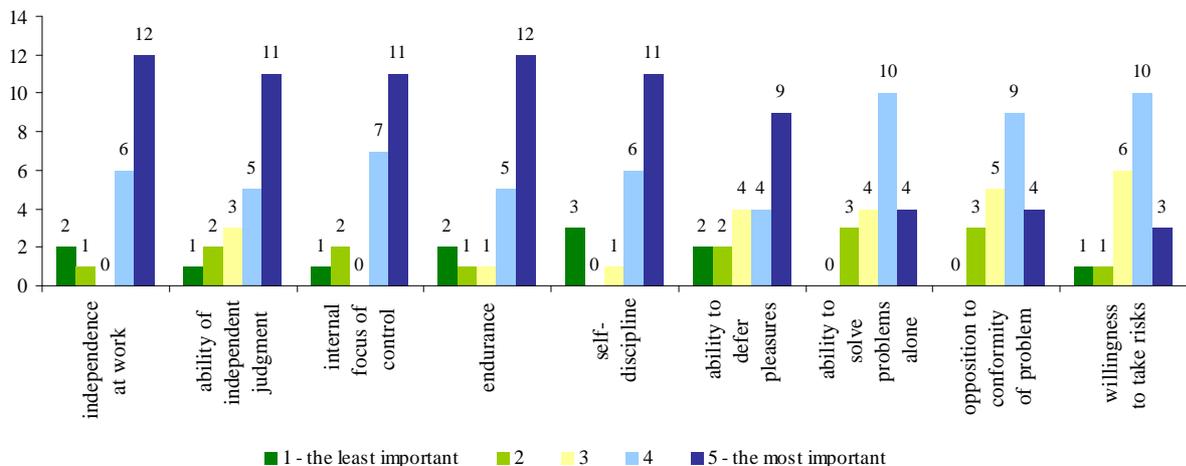
**Tab. 3 Research plan**

<b>Type of research, types and sources of data</b>	<b>Type of research:</b> quantitative research <b>Type of data:</b> primary, interdependent, state, quantitative, facts, opinions
<b>Method of collection</b>	Query
<b>Technique of collection</b>	Electronic questionnaire
<b>Sample</b>	n – sample, number of respondents, Z <sub>1-α/2</sub> – required confidence interval (from statistics tables), s – standard deviation, H – margin of error, p – proportion of characters (characters with unknown proportion p = 0,5) Required confidence is 95 %, margin of error ± 12 %, proportion of characters 0,5. $n = \frac{z_{1-\alpha/2}^2 * p * (1-p)}{H^2} = \frac{1,96^2 * 0,5 * (1-0,5)}{0,12^2} = \frac{0,9604}{0,0144} = 66,69$ The minimum size of sample is 67 enterprises.
<b>Method of data analysis</b>	Nominal or percentage expression

Source: by Ranik, F. (2012).

Most of creative employees work at middle management positions (in 13 enterprises); in top management positions (4 enterprises) and out of management positions (4 enterprises). According to these results, the RQ1 the most of creative employees work out of management positions was not confirmed, because the most of creative employees work in middle management positions.

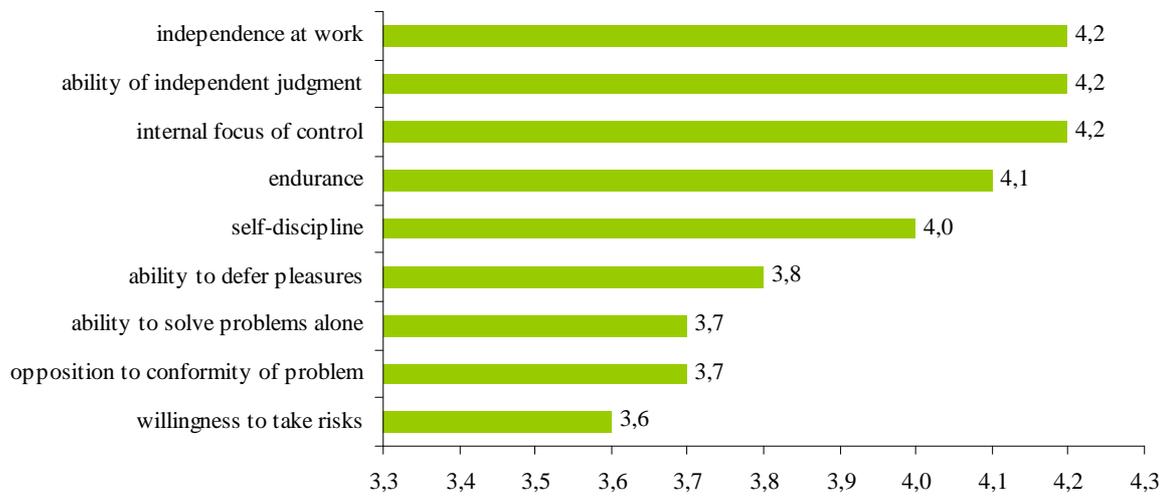
As the most appropriate form of motivation the creative employees is considered salary (in 14 enterprises), participation in enterprise management (4 enterprises), benefits beyond the range of the Labour Law or Collective Agreement (2 enterprises) and combination of mentioned forms (1 enterprise). In another question, the respondents should identify characteristics and features of creative employees. Results are shown in Fig. 1.



**Fig. 1 Importance of creative personality's features**

Source: by Ranik, F. (2012).

For easier interpretation of creative personality's features was created Fig. 2, which presents average values of particular features (5 = the most important, 1 = the least important).

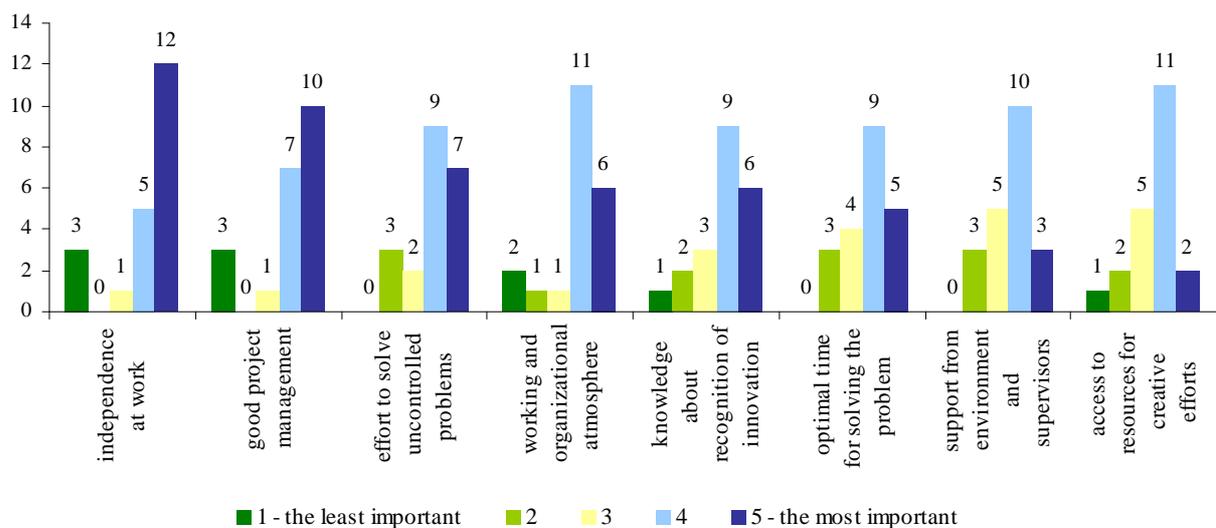


**Fig. 2 Average values of importance of creative personality's features**

Source: by Ranik, F. (2012).

RQ2: The most important characteristics of creative personality are independence at work and endurance was not confirmed. Enterprises have identified independence at work as one of the most important features, but endurance was less important than other two features.

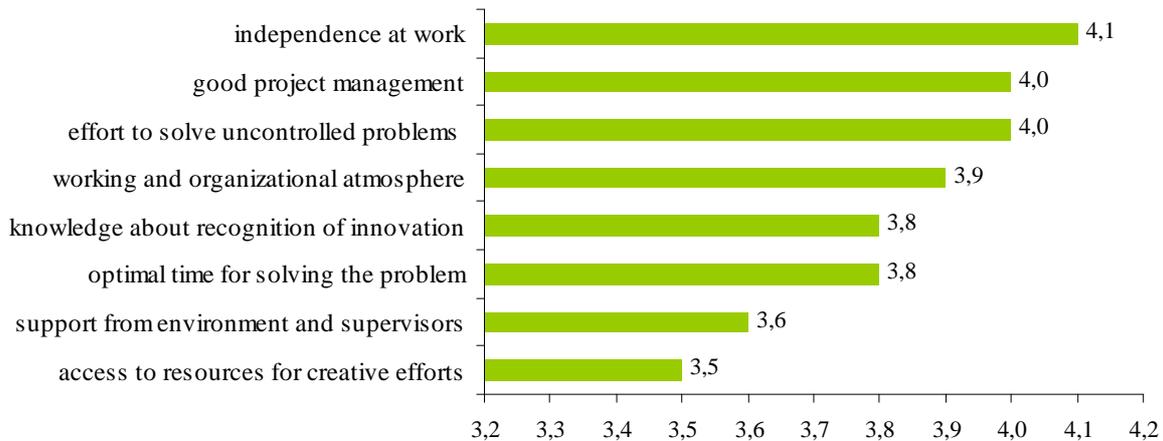
For supporting creativity and innovation is very important environment in which creative personalities work. Such environment is characterized by independence at work, good project management and access to resources for creative efforts (financial support for creation ideas), support from environment or supervisors, working and organizational atmosphere, recognition of innovation, optimum time for solving the problem, etc. Fig. 3 presents evaluation of these characteristics of environment that supports creativity and innovation.



**Fig. 3 Characteristics of environment supporting creativity and innovation**

Source: by Ranik, F. (2012).

Average values of particular characteristics are listed in Fig. 4 (note: 1 = the least important characteristic, 5 = the most important characteristic).



**Fig. 4 Average values of importance of characteristics of environment supporting creativity and innovation**

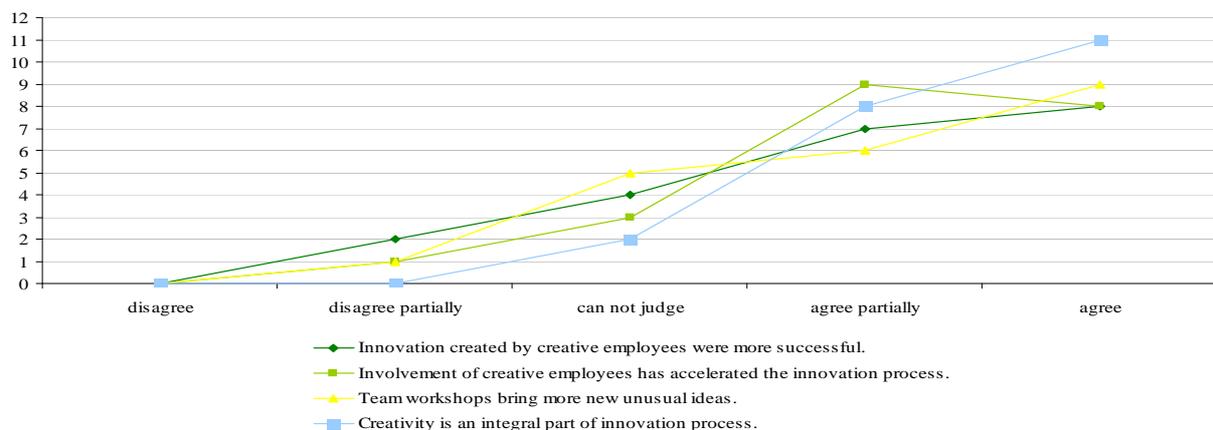
Source: by Ranik, F. (2012).

RQ3 Independence at work is considered the most important feature of the environment that supports creativity and innovation was confirmed. During creative work it is very important whether the personality works alone or in team with other creative personalities. Through research, we wanted to find out whether enterprises prefer individual creativity of personality to creative teams, because teamwork increases assumption to develop creative potential of more people. 19 enterprises prefer creative teams and 2 enterprises prefer individual creativity. Based on these results, RQ4 Enterprises prefer creative teams to individual creative personality during creation of innovative idea was confirmed.

Then enterprises should express opinion on the following arguments:

- Innovation created by creative employees was more successful.
- Involvement of creative employees has accelerated the innovation process.
- Team workshops bring more new unusual ideas.
- Creativity is an integral part of innovation process.

The answers to these arguments are presented in Fig. 5.



**Fig. 5 Rate of agreement with arguments about creativity and innovation.**

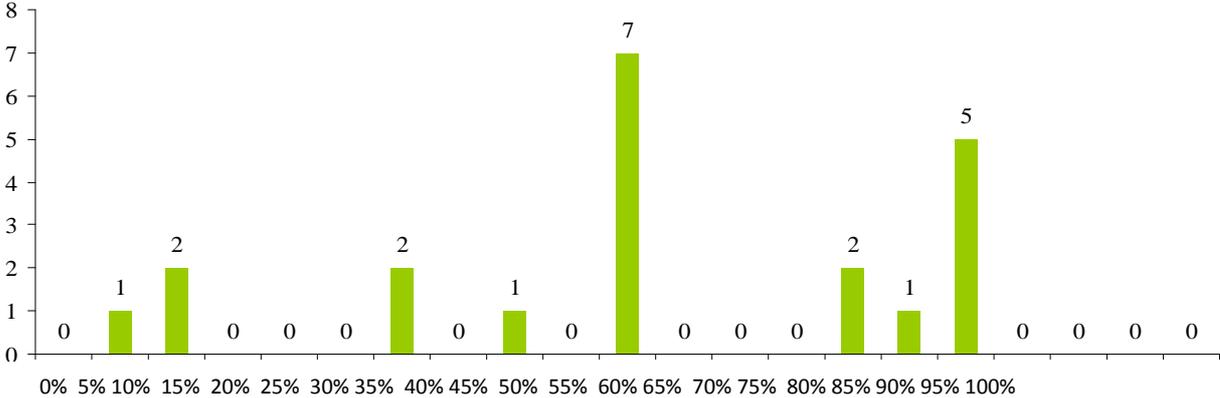
Source: by Ranik, F. (2012).

As seen from the results most enterprises partly or fully agree with all statements; no enterprise indicated disagree with the arguments. Five enterprises could not judge the

degree of agreement with arguments "Team workshops bring more new unusual ideas" and four enterprises the argument "Innovation created by creative employee were more successful".

RQ5 Most enterprises consider creativity as the integral part of their innovation process was confirmed because 8 enterprises agree partially with the argument and 11 enterprises agree with the argument.

Within detection the relationship between creativity and innovation it is necessary to know how many ideas created by creative personality was implemented. The answers to this question represent Fig. 6.



**Fig. 6 Percentage of implemented creative ideas created by creative personality**

Source: by Ranik, F. (2012).

According to the Fig. 6, seven enterprises estimate that 50 % of creative ideas generated by creative personalities reach up the implementation phase and five enterprises estimate that 80 % of creative ideas reach up the implementation phase. Not every idea can be realized. There are many reasons or barriers why it is not possible. The most common of them presents Fig. 7.

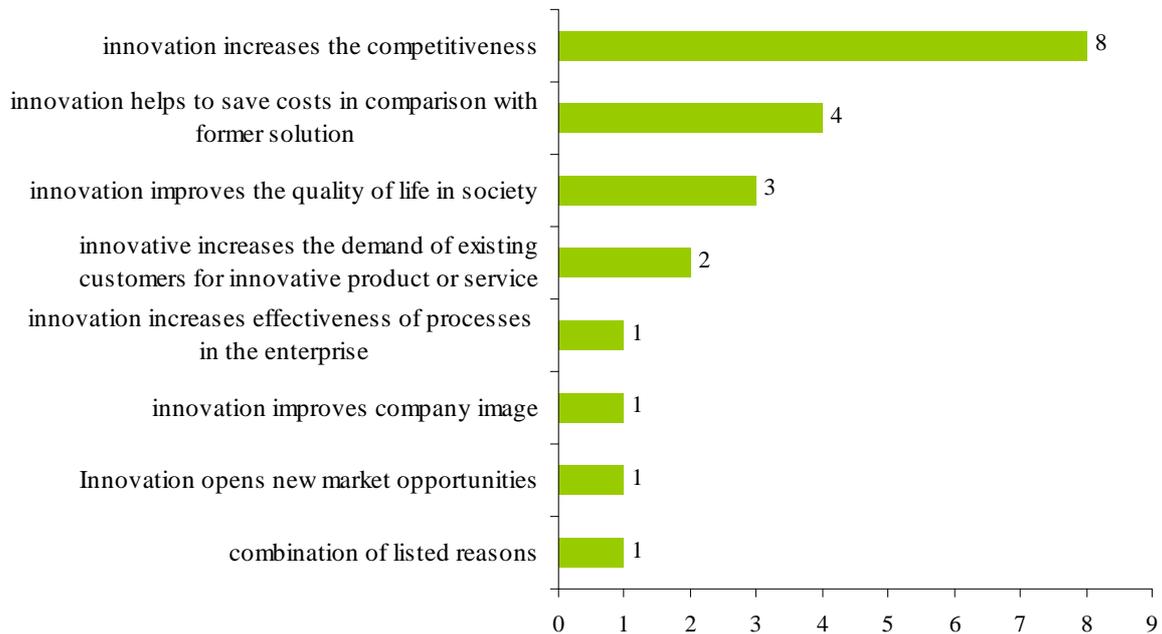


**Fig. 7 Reasons for non-implementation of ideas**

Source: by Ranik, F. (2012).

The most common reason is lack of enterprise funds for implementation of ideas (9 enterprises). Contrary, no enterprise sees the fear of losing market position in case of failure as a reason why the ideas are not implemented.

To develop ideas, there have to be aspects which encourage creation of new idea. In Fig. 8 there are listed the most important of them.



**Fig. 8 Aspects encouraging the decision to implement the idea**

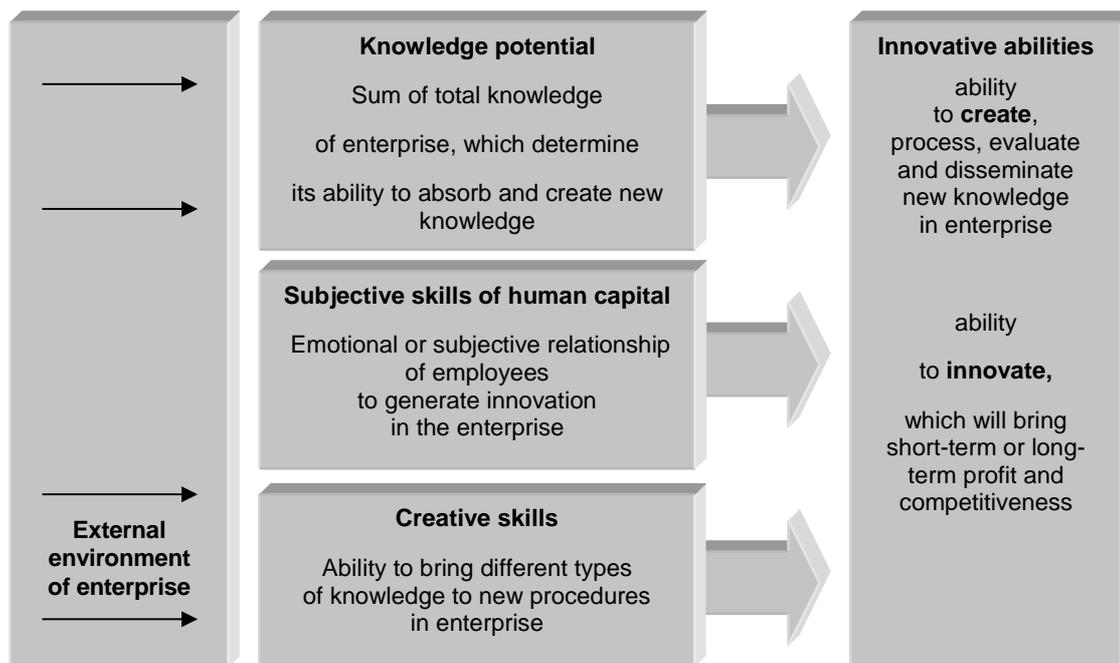
Source: by Raník, F. (2012).

The most common aspects encouraging the decision to implement innovative idea are that innovations increase competitiveness (8 enterprises); save costs in comparison with former solution (4 enterprises), improve the quality of life in society (3 enterprises) and increase the demand of existing customer for innovative products (2 enterprises). Each of other options was identified as a key aspect by one enterprise.

## Conclusion

The difference between creativity and innovation according to Howkins is that creativity is internal, personal and subjective unlike to innovation, which explains as objective and external. Creativity is able to manage innovation but vice versa does not work. (Kloudová, 2010a)

The innovative model presents the relationship between creativity and innovation, where creative skills are essential part of the comprehensive model in terms of prerequisites of innovative skills and innovation potential of enterprises.



**Fig. 9 Innovative model based on skills of individuals and enterprises**

(by ROSTÁŠOVÁ, M. et al. (2010))

The model combines main attributes – creativity and ability to innovate, which documents the strong link between them and the conditionality of every aspect by other factors.

## Acknowledgment

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# Food Demand in Romania: Estimating an Almost Ideal Demand System<sup>1</sup>

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## Abstract

A brief description of recent economic development and food security in Romania is provided in the present study. We further employ several quantitative methods to analyze recent food demand patterns. We first assess Engel curves by nonparametric Kernel regression and then estimate an Almost Ideal Demand System for aggregated food groups. Computed elasticities are consistent with the economic theory and four out of five food groups are perceived as luxuries by low-income, rural households. All the own-price elasticities are negative and lower than one meaning a price inelastic demand except for the dairy products with a price elastic demand. Majority of the cross-price elasticities have positive values revealing a possible substitution effect among food groups. Demographic effects such as family size, number of kids, and age of the household's head significantly impact on food expenditures as well. Furthermore, results indicate that low-income, rural households tend to grow (produce) foodstuffs which are perceived as luxuries at home rather than purchase them at stores.

## Keywords:

Almost Ideal Demand System, Food demand elasticities, Food security, Romania

## Introduction

Food demand both in developed and developing countries has been actively researched for over a century. Recently this topic has received an increased attention due to food price spikes, economic growth in developing countries, and economic stagnation in developed countries. These events made both economists and policy makers more interested in assessing the impact of changes in income and commodity prices on food expenditures and consumption patterns. Estimation of food demand systems is closely related to food security issues. Information on food demand responses to growing global commodity prices and income changes can help policy makers adopt policies that reduce the food and nutritional insecurity for whole countries and specifically for the vulnerable low income groups within the countries of all Central and East European Countries that are now members of the EU, Romania is

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affected by relatively higher problems with food and nutritional security. There is higher poverty rate in Romania (24.8%) in the year 2007 than in other new member states, such as Bulgaria (22.0%), Czech Republic (9.6%), Hungary (12.3%) or Slovakia (10.6%). Poverty rate in Romania was still higher in rural areas where it reached 40% in 2007 (estimated on cash income, the consumption from own resources being excluded). Households in rural areas depend heavily on their own production of food rather than buying it on the markets. With the value of own food production included, poverty rate in rural areas would fall from 40% to 30%. Romanian economic reforms and EU accession resulted in relatively high economic growth after 2001. This was accompanied by a growth in food consumption both in terms of quantity and quality, mainly in products that are considered important from the nutritional point of view, such as meat, dairy products and fruits. However, the share of food expenditures remains still at very high level of 36% of household disposable income.

In the literature, analyses of food demand systems have been conducted not only for developing countries where the food security problems are the gravest but as well for developed countries where some vulnerable regions and income groups are heavily affected by food and nutritional security problems (e.g., Molina, 1994 for Spain; Banks et al., 1996; 1997 for the UK; Moro and Sckokai, 2000 for Italy; Abdulai, 2002 for Switzerland). However, food demand responses to income and price shocks have not been widely studied in the new EU member states. Despite the importance and current relevance of the issue there are only a few older studies on food demand in Romania. Meyerhoefer et al. (2006) estimate a complete demand system from the Romanian household survey data; Petrovici and Ritson (2000) analyzing the Engel's law in Romania after the transition process; Hubbard and Thomson (2006) estimate the welfare changes for food consumers resulting from rising food prices and changing incomes.

As under-nutrition and malnutrition exist to a considerable degree in both developed countries and developing and transition countries a study of the food security situation in the new EU member states is timely and the case of Romania is particularly relevant.

## **Economic development and food demand patterns in Romania**

In Romania, the food security concerns have been almost always present, due to the lower incomes and higher poverty rates in comparison to the other new member states (NMS) of the EU. Whereas the food security situation has considerably improved during the period of high economic growth in 2000s in most countries of Central and Eastern Europe, food insecurity problems still exist in certain regions and within certain population groups of Romania.

Table 1 offers a summary of the main macroeconomic and food security indicators. The time period between 2004 and 2008 was characterized by high rates of economic growth followed by a sharp recession in 2009 and 2010, the growth recovery being achieved in 2011. GDP growth in Romania was higher than the EU 27 average. Although there was an increase in peoples' income, (we present the average income of 3rd quintile), Romanian incomes are still far below the EU 27 average levels. However, such increases in incomes led to a considerable drop in the share of food expenditures out of total expenditures. This is shown in Table 2 where the food expenditure ratios are reported by type of household segmented by income and residence area. Although, such ratios decreased between 2004 and 2011, their levels are still one of the highest among the new EU member states.

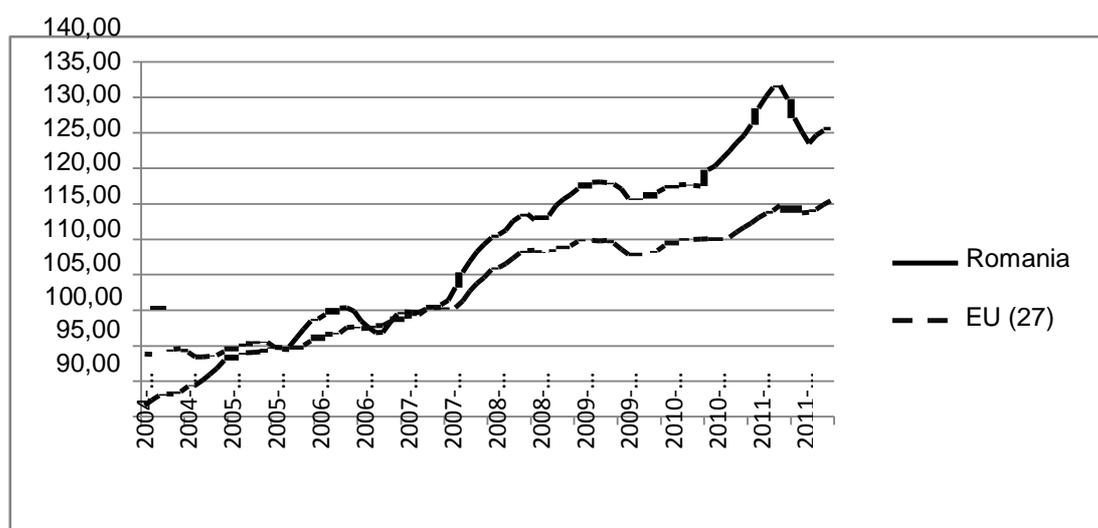
**Tab. 1 Development of macroeconomic and food security indicators in Romania**

Indicator	2004		2007		2011	
	RO	EU 27	RO	EU 27	RO	EU 27
Real GDP growth (% p.a.)	8.5	2.6	6.3	3.2	2.3	1.7
Inflation rate (% p.a.)	11.9	2.3	4.9	2.4	5.8	3.1
Income of third quintile (Euro)	n.a.	n.a.	1,927	15,686	2,449	16,862
At-risk-of-poverty rate (60% of median) (%)	n.a.	n.a.	24.8	16.5	22.2	16.9
Food expenditure (% share of total expenditure)						
National	39.3		34.4		34.2	
Urban	37.3		33.0		33.1	
Rural	41.5		36.0		35.5	
The poorest	52.9		46.0		45.6	
The richest	27.1		23.7		24.7	

Note: RO stands for Romania.

Source: Eurostat and Household Budget Survey of Romania (2004- 2011); authors' calculations

Whereas the overall inflation decreased between 2004 and 2011 (see Table 1), food price inflation as measured by harmonized index of consumer prices for food and non-alcoholic beverages was higher in Romania than in the EU27. It has been argued in other studies for transition economies, that high food prices actually push households into poverty and lead to higher inequality (see, e.g., Lokshin and Popkin, 1999).

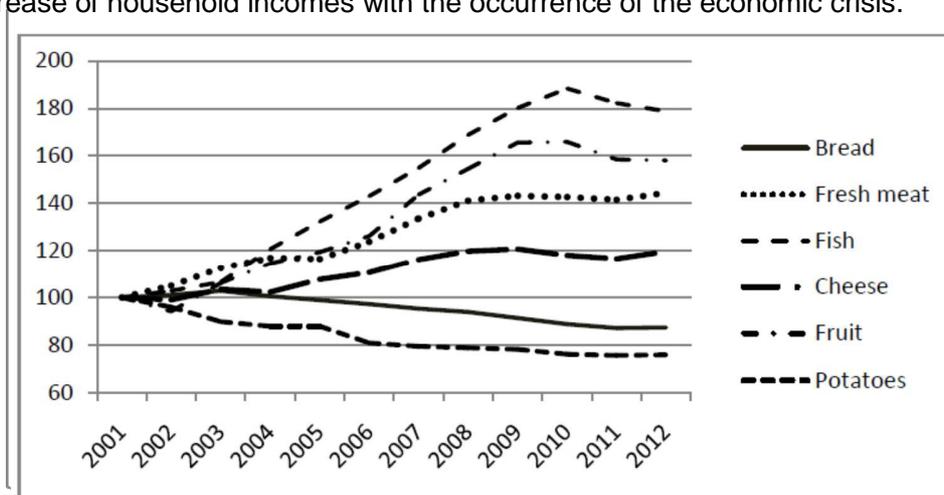


**Pic. 1 Harmonized Index of Consumer Prices: Food and Non-Alcoholic Beverages for Romania and EU 27 (2005=100)**

Source: Eurostat (2004-2011)

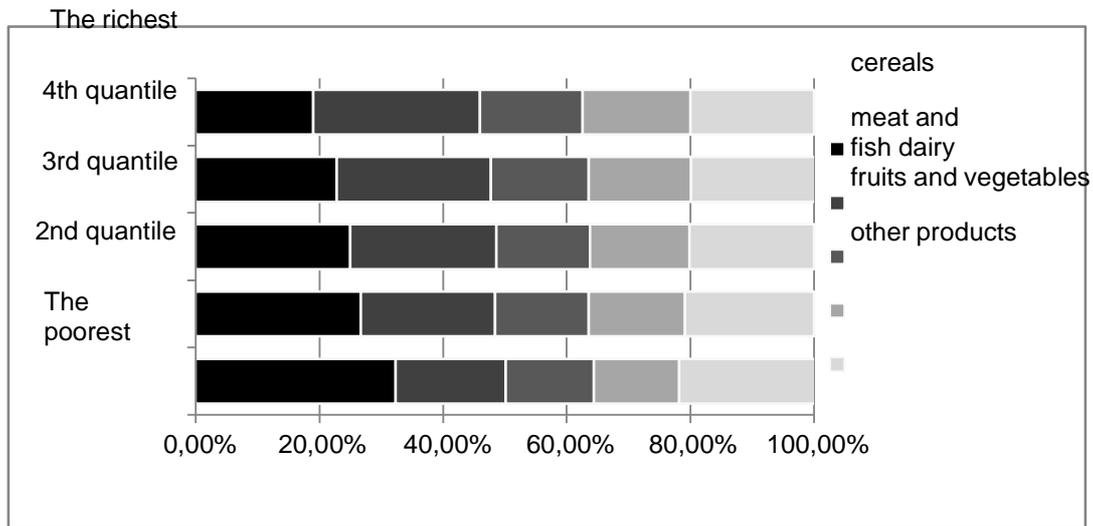
Furthermore, the issue of poverty and inequality is closely related to the food insecurity problems. As pointed out by Macours and Swinnen (2008), poverty rates are likely to differ between urban and rural areas, especially in transition countries. At-risk-of-poverty rate is presented in Table 1. Even though this poverty indicator did improve between 2004 and 2011 in Romania, it is still considerably high compared to the EU27's average.

Recent food demand patterns in Romania can be characterized by an increase in food consumption in both quantitative and qualitative terms, mainly in the products considered important from the nutritional point of view, such as meat, fish, dairy products, and fruits (see Figure 2). It is estimated (NIS, 2012) that the average daily food consumption per capita was about 2500 kcal in the last decade, with an increasing tendency of the share of calories of animal origin from 530 kcal in early 2000s to 620 kcal in the years 2008-2009. The consumption of calories of animal origin decreased in the last two years of the investigated period (2010 and 2011), most likely as an effect of the decrease of household incomes with the occurrence of the economic crisis.



**Pic. 2 Evolution of the main foodstuffs consumption (2001=100%)**  
 Source: Household Budget Survey of Romania (2001-2012)

Although there has been a clear increasing trend in consumption of main foodstuffs (see Figure 2), composition of the diet is still quite monotonous, especially for the low income households (1<sup>st</sup> quintile of the income distribution). As can be seen in Figure 3, the poorest households spend on average the highest budget share on cereals (32%), followed by other food products (21.8 %), meat and fish (17.8%) and both on dairy products, and fruits and vegetables equally by 14%. On the other hand, the richest households spend on average 27 % of their budget on meat and fish products, followed by other food products (20%), and cereal products (19%). They spend equally around 17% both on dairy products and fruits and vegetables products. As it has been argued in the nutrition literature, consumption of diverse foods is a good indicator of the food and nutritional security (see e.g. Hatloy et al., 1988). Therefore an unbalanced food intake of the low income households, with high share of cereal products and lack of meat and fruits and vegetables in their diet still needs to be improved.



**Pic. 3 Composition of food consumption in Romania by income groups**

Source: Household Budget Survey of Romania (2011); authors' calculations

Romania showed a great potential towards improved food consumption, especially during the period of economic growth. However, economic stagnation after financial crisis, rising food prices, high expenditures on food and poverty have influenced the recent food demand patterns in Romania. Therefore, it is of utmost importance to explore the food demand to a further extent with an advanced quantitative analysis and to estimate the food demand elasticities as they are important from the perspective of the food policy making.

### Methodology: Almost Ideal Demand System (AIDS)

In the microeconomic literature there are several approaches to estimate food demand system. The most used are, for example, Linear Expenditure System (LES) proposed by Stone (1954); Indirect Translog System (ITS) by Christensen et al. (1975) or Almost Ideal Demand System (AIDS) by Deaton and Muellbauer (1980). The standard AIDS was extended by the quadratic expenditure term (QUIADS) in the work of Banks et al. (1997). Whereas LES, ITS and AIDS represent a "rank two" models, QUIADS exhibits a "rank three" model.<sup>7</sup> It has been argued that a higher rank of the logarithm of expenditure term can better addresses possible nonlinear shapes of Engel curves. However, Meyer et al. (2011) compared computed elasticities from several demand systems, based on the Monte Carlo simulation, and show that "rank three" models do not necessarily provide better results than "rank two" models. We employ AIDS model rather than its quadratic version as preliminary analysis has not showed any significant non-linear patterns of the Engel curves (except for the cereal products).

In the current paper we employ standard Almost Ideal Demand System (AIDS) with a focus on the second stage of the demand system for the aggregated food categories. The set of budget share equation is characterized as follows:

$$w_i = \alpha_i + \sum_{j=1}^k \gamma_{ij} \ln p_j + \beta_i \ln \left\{ \frac{m}{a(p)} \right\}, \quad i = 1, \dots, k$$

(1)

<sup>7</sup>See, for example, Gorman (1981) or Lewbel (1991) regarding the concept of Engel curves ranking.

with the price index of transcendental logarithmic function:

$$\ln a(p) = \alpha_0 + \sum_{i=1}^k \alpha_i \ln p_i + \frac{1}{2} \sum_{i=1}^k \sum_{j=1}^k \gamma_{ij} \ln p_i \ln p_j. \quad (2)$$

For consistency with the microeconomic theory and to reduce the number of parameters to be estimated adding-up, homogeneity and symmetry restrictions are imposed. The fact that  $\sum_i^k w_i = 1$ ; The adding-up condition, requires that  $\sum_i^k \alpha_i = 1, \sum_i^k \beta_i = 0$ , and  $\sum_i^k \gamma_{ij} = 0 \forall j$ . Since demand functions are homogenous of degree zero in (p,m) we have  $\sum_j^k \gamma_{ij} = 0 \forall j$ . Finally the Slutsky symmetry also implies that  $\gamma_{ij} = \gamma_{ji} \forall i \neq j$ . These conditions are trivially satisfied for a model with n goods when the estimation is carried out on a subset of n-1 independent equations. The parameters of the dropped equation are then computed from the restrictions and the estimated parameters of the n-1 expenditure shares. Parameters of the demand system are estimated by iterated feasible generalized nonlinear least-squares method using Stata's `quads` command (Poi, 2012).

#### **Almost Ideal Demand System with demographic variables**

The standard Almost Ideal Demand System can be extended by demographic variables based on the scaling approach introduced by Ray (1983) and later modified by Poi (2002). The budget share equation of the modified AIDS model can be written as follows:

$$w_i = \alpha_i + \sum_{j=1}^k \gamma_{ij} \ln p_j + (\beta_i + \eta_i' z) \ln \left\{ \frac{m}{\bar{m}_0(z) a(p)} \right\} \quad (3)$$

with scaling function  $\bar{m}_0$  defined as:  $\bar{m}_0(z) = 1 + \rho' z$  where  $\rho$  represents a vector of parameters that have to be estimated. See Poi (2012) for further decomposition of the scaling function. By taking the first differences of the equation (3) with respect to  $\ln m$  and  $\ln p_j$  we obtain the elasticities of a demand system. The expenditure elasticity for a particular good is computed as:

$$\epsilon_i = 1 + \frac{1}{w_i} (\beta_i + \eta_i' z). \quad (4)$$

The uncompensated price elasticity for good  $i$  with respect to changes in the price of good  $j$  is derived as:

$$\epsilon_{ij} = -\delta_{ij} + \frac{1}{w_i} \left( \gamma_{ij} - [\beta_i + \eta_i' z] \times \left( \alpha_j + \sum_j \gamma_{ij} \ln p_j \right) \right), \quad (5)$$

where  $\delta_{ij}$  is the Kronecker delta taking value 1 if  $i=j$  and 0 otherwise. Finally, the compensated price elasticities are imputed by using the Slutsky identity:  $\epsilon_{ij}^C = \epsilon_{ij} - \epsilon_{ij} w_i$ <sup>8</sup>

<sup>8</sup> Since both (4) and (5) include  $w_i$  in the denominator of the fraction, we trim each observation with  $w_i = 0$  for the particular food group, otherwise the expenditure elasticity would be infinitely high. We also trim extreme values of food expenditures and food prices entering the model.

## Data: Household Budget Survey of Romania

We apply AIDS to Romanian Household Budget Survey (HBS) data collected by National Institute of Statistics (NIS). The HBS data is commonly used for social policy and the standard of living analysis, for defining consumer price index weights, and for estimating household consumption in the national accounts. Our dataset consists of three annual rounds 2004, 2007 and 2011. We have chosen year 2004 representing the first year of the series for which homogenous data exist within the HBS framework, year 2007 representing the year of Romania's EU accession as well as a year with a significant economic growth, and year 2011 representing a time period after financial crises. The survey provides detailed information on household incomes and expenditures on food and non-food goods and services. The data also contain detailed information on quantities consumed by each household, its location and size as well as individual household member characteristics such as age, education, occupation, marital status. HBS is organized as a survey on a sample of 9360 dwellings, however the samples do not form a (real) panel as surveyed households are randomly selected from the population each round.

The main variables entering the model are budget shares of the particular food groups, logarithms of prices and food expenditures. The demand system is also augmented with demographic variables such as location (rural/urban) of the household, family size, number of adults, number of children, and age of household head. Summary statistics of the main variables are reported in Table 2.

**Tab. 2 Descriptive statistics of the main variables**

Variable	2004		2007		2011	
	Mean	SD	Mean	SD	Mean	SD
<i>Income</i>	600.31	690.35	922.50	775.16	1,333.38	1,264.87
<i>Foodexp</i>	200.81	141.27	267.40	176.46	395.10	235.92
<i>Nonfood</i>	0.61	0.19	0.66	0.17	0.66	0.16
<i>Wcereal</i>	0.34	0.18	0.26	0.14	0.25	0.13
<i>Wmeat</i>	0.18	0.13	0.24	0.13	0.23	0.11
<i>Wdairy</i>	0.14	0.11	0.15	0.10	0.15	0.09
<i>Wfruits</i>	0.13	0.10	0.14	0.09	0.16	0.09
<i>Wother</i>	0.21	0.11	0.22	0.11	0.21	0.10
<i>Pcereal</i>	2.07	0.44	2.40	0.67	4.10	1.02
<i>Pmeat</i>	7.82	2.26	9.82	2.71	12.50	3.18
<i>Pdairy</i>	3.70	2.84	4.41	2.82	6.29	3.67
<i>Pfruits</i>	2.23	1.18	2.81	1.36	3.90	1.42
<i>Pother</i>	3.31	1.73	3.72	1.75	5.51	3.28
<i>Famsize</i>	2.73	1.52	2.49	1.38	2.27	1.31
<i>Urban</i>	0.52	0.50	0.51	0.50	0.50	0.50
<i>Kids</i>	0.47	0.84	0.36	0.75	0.27	0.68
<i>Age</i>	55.01	15.78	55.96	16.22	57.81	16.05

Source: Household Budget Survey of Romania (2004, 2007, 2011); authors' calculations

Note: Monetary values are presented in Romanian national currency, when 1 Romanian Leu≈0,22

## Aggregation and price specification

In order to avoid working with zero consumption levels and to reduce the amount of estimated parameters, we have aggregated food items into five main food groups: cereal products and bread, meat and fish products, dairy products, fruits and vegetables, and other food items<sup>9</sup>. In the economic literature there are no clear guidelines how to aggregate specific food groups. It is purely a researcher's decision based on the similarity of the food items.

Usually, national household expenditure surveys do not contain information on goods' prices. Prices of food items are computed as ratios between expenditures and corresponding quantities. Aggregated price indexes for all five food groups are computed as geometric means of food items using expenditure shares as weights (see e.g. Abdulai, 2002). However, such household specific prices for aggregated food groups differ between households because of the quality effects and this issue can be addressed by imputing so called quality adjusted prices (see e.g. Cox and Wohlegant, 1986 and Park et al., 1996). Based on the aforementioned procedure we impute quality adjusted prices for Romanian households for each food group as follows:

$$p_{ji} = \beta_0 + \beta_1 NE_i + \beta_2 SE_i + \beta_3 S_i + \beta_4 SW_i + \beta_5 W_i + \beta_6 NW_i + \beta_7 C_i + \beta_8 Urb_i + \beta_9 Y_i + \beta_{10} Fsize_i + \varepsilon_{ji}, \quad (6)$$

where  $p_{ij}$  is the price of  $j$ th aggregated food group for  $i$ th household;  $NE_i$  is dummy variable representing  $i$ th household residing in the North-West;  $SE_i$  in the South-East;  $S_i$  in South;  $SW_i$  in South-West;  $W_i$  in West;  $NW_i$  in North-West and  $C_i$  in Central part;  $Urb_i$  is dummy variable representing households living in urban area;  $Y_i$  is net monthly income of  $i$ th household;  $Fsize_i$  represents  $i$ th households size. To avoid the problem of colinearity, we have omitted one category from regional dummies. Thus, the reference household is located in the Bucuresti region. Then, the quality adjusted price for the  $j$ th food group is imputed as:  $p_{ji} = \hat{\beta}_0 + \varepsilon_{ji}$ , with  $\hat{\beta}_0$  and  $\varepsilon_{ji}$  being the computed constant and error term from the corresponding price/quality regressions.

## Results and discussion

We estimate an Almost Ideal Demand Systems for three specific years (2004, 2007 and 2011). We present the estimated parameters in Appendix 2. Majority of the estimated parameters are statistically significant at the conventional level. Relevant demographic variables are used as controls. To formally test for a significance of the demographic controls, we perform a Wald test. In all cases, we reject the null hypothesis that the particular demographic controls (family size, number of kids, nonfood expenditures and age of the households head) are jointly statistically insignificant with p-values of the Chi-square test below the conventional level.

Computed expenditure and price elasticities are presented in Table 3 for years 2004, 2007 and 2011. We present the food demand elasticities only for a "representative" low income household (1<sup>st</sup> quintile of the income distribution) residing in rural area.<sup>10</sup>

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<sup>9</sup> See the aggregation procedure in Appendix 2.

<sup>10</sup> The present results are only a small fraction of all the results produced. Due to the space limitation we do not present all the results and they can be obtained from the authors upon a request.

***Tab. 3 Estimated price (compensated) and expenditure elasticities***

2004						
	<u>C</u>	<u>MF</u>	<u>DP</u>	<u>FV</u>	<u>OF</u>	<u>Expenditure</u>
C	<b>-0.465</b>	0.004	0.142	0.130	0.189	<b>0.665</b>
MF	0.005	<b>-0.387</b>	0.313	-0.090	0.159	<b>1.767</b>
DP	0.310	0.290	<b>-1.032</b>	0.281	0.151	<b>1.143</b>
FV	0.321	-0.095	0.308	<b>-0.836</b>	0.302	<b>1.170</b>
OF	<u>0.375</u>	<u>0.126</u>	<u>0.133</u>	<u>0.243</u>	<b>-0.877</b>	<b>1.022</b>
2007						
C	<b>-0.543</b>	0.048	0.167	0.121	0.207	<b>0.531</b>
MF	0.058	<b>-0.442</b>	0.245	-0.023	0.162	<b>1.500</b>
DP	0.265	0.318	<b>-1.027</b>	0.246	0.198	<b>1.104</b>
FV	0.235	-0.036	0.291	<b>-0.791</b>	0.301	<b>1.249</b>
OF	<u>0.277</u>	<u>0.163</u>	<u>0.159</u>	<u>0.202</u>	<b>-0.801</b>	<b>0.942</b>
2011						
C	<b>-0.622</b>	0.085	0.188	0.159	0.189	<b>0.585</b>
MF	0.114	<b>-0.457</b>	0.265	-0.119	0.197	<b>1.387</b>
DP	0.318	0.345	<b>-1.082</b>	0.209	0.210	<b>1.095</b>
FV	0.299	-0.169	0.231	<b>-0.602</b>	0.241	<b>1.289</b>
OF	0.283	0.221	0.183	0.189	<b>-0.876</b>	<b>0.988</b>

Source: Household Budget Survey of Romania (2004, 2007, 2011); authors' calculations

Note: C- cereal products; MF- meat and fish; DP- dairy products and eggs; FV- fruits and vegetables; OF- other food.

Estimated expenditure elasticities are higher than 1 in for 4 out of 5 food groups meaning that meat and fish, dairy products, fruits and vegetables and other food products are luxury goods for low income, rural households in Romania. On the other hand, cereal products are perceived as a necessity. Low income rural households in Romania cannot afford high quality diet and therefore they switch to monotonous consumption with high share of cereal products (as presented in Figure 3).

All compensated own-price elasticities are negative which is consistent with the economic theory. Low income, rural household in Romania are most price sensitive towards dairy products (-1.032, -1.027 and -1.082) meaning a price elastic demand. Demand for the other 4 food groups is price inelastic. Large majority of the cross-price compensated price elasticities are positive, which means that these groups of products are substitutes. This can be explained by the high aggregation level of food groups.

Food consumption of poor rural households in Romania is significantly constrained by low pecuniary incomes. These households purchase at market only foodstuffs (mainly luxury products for special occasions) which they cannot produce by themselves on their agricultural plots. Consumption of dairy products is characterized both by high income elasticity of demand and by high share of consumption of self-produced products. Therefore dairy products bought on the market are those that cannot be produced by the household itself and are therefore luxurious products.

**Tab. 4 Food self-sufficiency of rural households in Romania (2011)**

Commodity	Share (%)
Bread	15%
Fresh meat	50%
Milk	56%
Cheese	53%
Eggs	83%
Fresh fruits	45%
Vegetables	60%

Source: Household Budget Survey of Romania (2011)

Note: Shares express the ratio of foodstuffs produced at home rather than purchased

## Conclusion

We analyze the food demand patterns of Romanian households (with the main focus on low-income households residing in rural areas) since the accession of Romania to the EU in 2004. Our study is one of the few food demand analysis for the new EU member states using Almost Ideal Demand System, extended with household characteristics, regional and expenditure controls. The longitudinal BHS data employed covering a three year period allow us to reveal changes in demand behavior over time as well as cast light on the food security situation at micro level. Although Romania has shown a great potential towards improved food consumption, especially during the period of economic growth, recent economic slowdown and rising food prices have pushed mainly low-income households to poverty. Such households spend extremely high share of their total expenditure on food consumption at levels of 35- 40% being far more from the EU's average.

The results show that Romanian low-income rural households are price and income sensitive. All five food groups analyzed have positive expenditure elasticities as their magnitudes suggest that all food groups except cereals are perceived as luxuries. In line with demand theory, all own price elasticities are negative with price inelastic demand except dairy products. Majority of the cross-price elasticities are positive albeit smaller in magnitude suggesting that even though the commodities from the five food groups are substitutes the substitution possibilities might be quite limited.

Taking the fact that on average expenditure elasticities for all food groups surpass in magnitude the own-price elasticities, policy tools targeting at income generating activities might be more effective compared to policies that are aimed at price reductions. Hence, in order to improve the household diet, especially to increase consumption of fruits and vegetables, income-oriented policies might be appropriate.

Present poverty, high food prices and huge food expenditure shares push low-income households to grow their own food at home rather than purchase it at stores. Demand for food in Romania is thus strongly influenced by high share of self-consumption especially in rural areas. This was also confirmed by the estimated expenditure elasticities as food items which are perceived as luxuries are likely to be produced at home (see Table 4).

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## Appendix 1

**Tab 5. Variables definition**

Variable	Definition
<i>Income</i>	Net monthly household income (Romanian Leu)
<i>Foodexp</i>	Monthly food expenditure (Romanian Leu)
<i>Nonfood</i>	Ratio of nonfood expenditure to total income(expenditure)
<i>w<sub>cereal</sub></i>	Budget share of cereal products and bread
<i>w<sub>meat</sub></i>	Budget share of meat and fish products
<i>w<sub>dairy</sub></i>	Budget share of dairy products and eggs
<i>w<sub>fruits</sub></i>	Budget share of fruits and vegetables
<i>w<sub>other</sub></i>	Budget share of other food products
<i>p<sub>cereal</sub></i>	Price of cereal products (Leu/kg)
<i>p<sub>meat</sub></i>	Price of meat and fish products (Leu/kg)
<i>p<sub>dairy</sub></i>	Price of dairy products and eggs (Leu/kg)
<i>p<sub>fruits</sub></i>	Price of fruits and vegetables (Leu/kg)
<i>p<sub>other</sub></i>	Price of other food products (Leu/kg)
<i>Famsize</i>	Number of person per household
<i>Urban</i>	1 if a household resides in urban are; 0 otherwise
<i>Kids</i>	Number of household members below age 16
<i>Age</i>	Age of the households head

Source: Household Budget Survey of Romania (2004, 2007 and 2011)

**Tab. 6 Aggregation of food items**

Food group	Unit	Food items
<i>I. CEREALS</i>	kg	Rice Bread Pasta products Pastry-cook products Sandwiches Other products
<i>II. MEAT and FISH</i>	kg	Fresh, chilled or frozen meat of bovine animals Fresh, chilled or frozen meat of swine Fresh, chilled or frozen meat of sheep and goat Fresh, chilled or frozen meat of poultry Dried, salted or smoked meat and edible meat offal Other preserved or processed meat and meat preparations Other fresh, chilled or frozen edible meat Fresh, chilled or frozen fish Fresh, chilled or frozen seafood Dried, smoked or salted fish and seafood Other preserved or processed fish and seafood and fish and seafood preparations
<i>III. DAIRY PRODUCTS and EGGS</i>	kg	Whole milk Low fat milk Preserved milk Yoghurt Cheese and curd Other milk products Eggs
<i>IV. FRUITS and VEGETABLES</i>	kg	Citrus fruits (fresh, chilled or frozen) Bananas (fresh, chilled or frozen) Apples (fresh, chilled or frozen) Pears (fresh, chilled or frozen) Stone fruits (fresh, chilled or frozen) Berries (fresh, chilled or frozen) Other fresh, chilled or frozen fruits Dried fruit Preserved fruit and fruit based products Leaf and stem vegetables (fresh, chilled or frozen) Cabbages (fresh, chilled or frozen) Vegetables cultivated for their fruit (fresh, chilled or frozen) Root crops, non-starchy bulbs and mushrooms (fresh, chilled or frozen) Dried vegetables Other preserved or processed vegetables Potatoes
<i>V. OTHER FOOD PRODUCTS ("BADs")</i>	kg	Butter Margarine and other vegetable fats Olive oil Edible oils

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Other edible animal fats  
Sugar  
Jams, marmalades  
Chocolate  
Confectionery products  
Edible ices and ice cream  
Other sugar products  
Sauces, condiments  
Salt, spices and culinary herbs  
Baby food, dietary preparations, baker's yeast and other food preparations  
Other food products

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Source: Household Budget Survey of Romania; own processing

**Tab 7. Estimated coefficients of the demand system**

Parameter	2004		2007		2011	
	Coef.	S.E.	S.E.	S.E.	Coef.	S.E.
<b>alpha</b>						
$\alpha_1$	-0.275***	0.035	-0.275***	0.025	-0.282***	0.021
$\alpha_2$	0.542***	0.029	0.558***	0.024	0.495***	0.020
$\alpha_3$	0.254***	0.018	0.252***	0.015	0.230***	0.014
$\alpha_4$	0.270***	0.017	0.315***	0.015	0.385***	0.015
$\alpha_5$	0.209***	0.018	0.150***	0.017	0.173***	0.015
<b>beta</b>						
$\beta_1$	-0.089***	0.005	-0.077***	0.004	-0.077***	0.004
$\beta_2$	0.063***	0.004	0.059***	0.004	0.047***	0.004
$\beta_3$	0.016***	0.003	0.015***	0.003	0.012***	0.002
$\beta_4$	0.015***	0.003	0.019***	0.003	0.024***	0.003
$\beta_5$	-0.004	0.003	-0.015***	0.003	-0.006**	0.003
<b>gamma</b>						
$\gamma_{11}$	0.145***	0.010	0.113***	0.008	0.089***	0.007
$\gamma_{21}$	-0.110***	0.007	-0.092***	0.005	-0.075***	0.005
$\gamma_{31}$	-0.019***	0.004	-0.009***	0.003	0.000	0.003
$\gamma_{41}$	-0.017***	0.005	-0.019***	0.003	-0.015***	0.004
$\gamma_{51}$	0.001	0.004	0.008**	0.004	0.001	0.003
$\gamma_{22}$	0.109***	0.007	0.109***	0.006	0.094***	0.006
$\gamma_{32}$	0.031***	0.003	0.023***	0.003	0.026***	0.003
$\gamma_{42}$	-0.028***	0.004	-0.024***	0.003	-0.046***	0.004
$\gamma_{52}$	-0.002	0.003	-0.016***	0.003	0.001	0.003
$\gamma_{33}$	-0.030***	0.003	-0.031***	0.003	-0.040***	0.003
$\gamma_{43}$	0.023***	0.002	0.019***	0.002	0.012***	0.003
$\gamma_{53}$	-0.005**	0.002	-0.003	0.002	0.003*	0.002
$\gamma_{44}$	0.004	0.004	0.013***	0.003	0.042***	0.004
$\gamma_{54}$	0.018***	0.002	0.011***	0.002	0.007***	0.002
$\gamma_{55}$	-0.011***	0.003	-0.001	0.003	-0.012***	0.002
<b>eta</b>						
$\eta_{fam 1}$	-0.008***	0.000	-0.008***	0.000	-0.009***	0.000
$\eta_{fam 2}$	0.004***	0.000	0.004***	0.000	0.005***	0.000
$\eta_{fam 3}$	0.003***	0.000	0.003***	0.000	0.002***	0.000
$\eta_{fam 4}$	0.001***	0.000	0.002***	0.000	0.003***	0.000
$\eta_{fam 5}$	0.000**	0.000	0.000	0.000	0.000*	0.000
$\eta_{kids 1}$	-0.001*	0.001	-0.001	0.001	0.000	0.001
$\eta_{kids 2}$	0.002***	0.001	0.002***	0.001	0.002***	0.001
$\eta_{kids 3}$	-0.002***	0.000	-0.002***	0.000	-0.002***	0.000

$\eta_{kids\ 4}$	0.000	0.000	0.000	0.000	-0.001**	0.000
$\eta_{kids\ 5}$	0.001***	0.000	0.001**	0.000	0.001***	0.000
$\eta_{nonfood\ 1}$	0.006***	0.001	0.002***	0.000	0.005***	0.001
$\eta_{nonfood\ 2}$	-0.003***	0.001	-0.001*	0.000	0.000	0.001
$\eta_{nonfood\ 3}$	-0.002***	0.000	-0.001***	0.000	-0.002***	0.001
$\eta_{nonfood\ 4}$	0.000	0.000	-0.001***	0.000	-0.001	0.001
$\eta_{nonfood\ 5}$	-0.001	0.000	0.000	0.000	-0.002***	0.001
$\eta_{age\ 1}$	0.000	0.000	0.000	0.000	0.000*	0.000
$\eta_{age\ 2}$	0.000	0.000	0.000*	0.000	0.000**	0.000
$\eta_{age\ 3}$	0.000***	0.000	0.000***	0.000	0.000***	0.000
$\eta_{age\ 4}$	0.000***	0.000	0.000	0.000	0.000	0.000
$\eta_{age\ 5}$	0.000***	0.000	0.000***	0.000	0.000***	0.000
<b>rho</b>						
$\rho_{fam}$	-0.008	0.022	-0.086***	0.019	-0.059***	0.012
$\rho_{kids}$	-0.116***	0.029	-0.010	0.036	-0.025*	0.015
$\rho_{nonfood}$	0.090***	0.019	0.025***	0.005	0.036***	0.002
$\rho_{age}$	0.008	0.006	0.005	0.004	-0.001	0.002

Source: Household Budget Survey of Romania (2004, 2007, 2011); authors' calculations.

\*P(<0.1); \*\*P(<0.05); \*\*\*P(<0.01).

# Entrants' success factors on labour market from the aspect of employers

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## Abstract

Greater effectiveness of entrants' employment has become a highlighted issue in Hungary. Last year a very extensive research was carried out where participants of the market evaluated whether there are existing or latent, positive or negative prejudice against entrants from the side of the employers in Hungary.

The quantitative part of the mentioned research serves as the background of the present study, in which employers were asked about the newcomers entering the labour market. In the course of the research several hypotheses have been defined, out of which one of the principal hypotheses was that principally it is the professional experience and practical knowledge that count the most in judging entrants and in their successful employment as opposed to theoretical knowledge acquired in school. The primary results of the study conducted justify that the importance of practical and experimental knowledge in Hungary is of the first rank in point of employability and companies with different proprietorial structures did not differ from each other in this respect.

## Keywords

Labour market tendencies, entrants, employers, and competencies, negative and positive attitudes

## Introduction

The activity of youngsters in labour-market is low not only in Hungary, but in other EU countries as well. The entrants are one social group, whose entering into labour market and their permanent employment there is quite a complex problem. It is absolutely visible that in Hungary it is the labour market, which values the diploma and the starting salary is already higher as compared to those with lower qualification. It is also true that if the number of graduates moving out of our Hungary further continues, then this difference will surely tone down. It can be observed now that the market is lacking certain professions, mainly practical professions.

The labour-market situation of the youngsters is determined by more factors. During the previous years we could mostly hear about problems, difficulties and about unemployment. More international and domestic researches justify (OECD, 2008; ILO, 2010; Eurostat, 2012), that the economic recession dynamically affected youngsters' chances of employment. The Eurostat 2012 statistics shows that the unemployment of young adults aged 15-24 in European level are double the rate of the unemployment of the total population. This rate in Hungary is also worse as the difference of the rate is 2.5 bigger. Based on the quick report of the Central Statistical Office (KSH) published on 28. March 2013 the 17.9% of the unemployed belonged to the group of young adults between 15-24, the rate of unemployment in this age group was 29.2%, almost 1% higher than in the same period of the previous year. This difficult life-situation is well circumscribed by the definition „stricken-generation' created by ILO.

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However irrespectively of what qualification one has on entering labour market, the chances of young adults to find jobs are quite complicated. The question is what knowledge employers expect from their would-be employees. Last year a complex study was carried out in order to map the previously mentioned problem and one of its main aims was to get acquainted with the opinion of employers in connection with the correspondence of entrants in labour market by using qualitative and quantitative methods. It reveals young people's preferences of work competence and also reveals factors, which promotes entrants' successful and permanent employment. Some quantitative results of the mentioned study are reported in the present paper with giving evidence to the conceived hypothesis.

### **Factors shaping youngsters' labour market position in Hungary**

Finding job is quite a big problem in the circle of students with qualification. Due to over-qualification, there is not a secure job guaranteed with any diploma. The educational systems have to create the basis, which makes all the citizens in a country possible to be competitive and successful in the labour market (Czeplédi, 2012). Based on the statistics of the Central Statistical Office (KSH) young adults with diploma will find work easier than those with lower education.

Beyond educational tasks, an educational institution has to prepare its students –as potential employees- for the relevant challenges of the labour market thus helping them to find employment sooner. The most frequently applied methods are the following: alumni program, DPR surveys, organization of job-fairs. Some subject-schedules of some institutions lack the subject about labour-market knowledge and about other background knowledge. Drawing the lesson of DPR exams we would like to underline one feature, which is the following: practical experience and the skill of transforming theoretical knowledge to practice is an indispensable condition of the success on labour market. Higher educational institutions have to provide the chances for their students to gain not only the appropriate theoretical knowledge, but also the practice as well. There is no unity among experts on how education can take the middle-and long-term requirements of the labour-market into consideration.

The necessity of labour-market information is not questioned by anybody, but it is also indisputable that at the moment such information is not available for those who are affected (Csehné, 2009). Considering the previous years' statistics on high unemployment rate, state intervention became necessary. Their initiation was the so-called: 'first workplace guarantee program'. Within the framework of the project more than 16 thousand young entrants found job in the last nearly two years. Allowances offered within the framework of the Workplace Protection Action Plan also support the employment of young people. Thanks to the technological changes, the structural development and improvement of labour market goes with the narrowing work opportunities.

For the state it means another new task involving economic policy and economy quickening. It also has to be mentioned that state has important role regarding tasks of education policy, with which it is also able to coordinate the input side of labour-market. State has great role also in career orientation supporting life, which is realized with the help of educational institutions.

The third performer is the employer. In Hungary we have several studies, which examined the skills and abilities employers expect from their employees. ("Entrants with diploma in the competition sphere 2011"<sup>3</sup>, 'Fresh graduates in the competition sphere 2013"). L. Kiss wrote in one of his papers that 'selection in general understanding predominates later, it is the companies, which will do the selection among candidates according to some aspects instead

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<sup>3</sup> The Economy and Enterprise Researching Institution ( MKIK Gazdaság- és Vállalkozáskutató Intézet) has been implementing its research program called 'Entrants with diploma in the competition sphere' since 2005. Within the framework of the research the present and the future factors of entrants with diploma is examined every year. Other factors such as the trends of being employed:salary, competencies, and last but not least how higher educational systems are judged in the labour market are also examined.

of the educational institutions; the necessarily appearing selection mechanism will take its effect on entering the labour market.' (Kiss, 88. p., 2008). To reveal the differences between the two sides, the side of the employers and the entrants it is inevitable to harmonize the demand and supply of the labour market. The present study contributes to this.

### **The method and hypothesis of the research**

The research was carried out both by qualitative and quantitative methods in cooperation with Hungarian institutions. The quantitative part of the survey serves as the background of the analysis, which asked the employers about the newcomers entering the labour market. The respondents anonymously had to reply questions compiled on the internet. The snowball method was used in the sampling and the survey cannot be considered representative. The compiled questionnaire basically contained closed questions and was built mainly on nominal and metric variables (5 grade Likert scale), which was divided into more parts.

In the first part of the questionnaire the general features, location, type of activity, circle of owners and the structure of employment were asked.

The second group of the questions on the questionnaire wanted to know the opinion of the employers about the professional and emotional competencies of their entrants.

Finally the employers had to evaluate whether their young entrants' competencies meet the requirements of the company and what chances entrants have in that company, which means to what extent institutions are attractive for young people from the aspect of employment.

The evaluation of the results happened with one-and more-variable statistical methods, out of which the latter was cross-table analysis, ANOVA, factor- and cluster-analysis. The present paper demonstrates some results of the survey along proving the following hypothesis:

#### **Hypothesis**

The institutions participating in the survey -independently of what proprietorial structure they have- basically have no negative prejudices against entrants: they recognize the theoretical knowledge of the freshly graduates, but they lack their professional experience.

### **Presenting the results of the research**

Presenting the results of the research starts with specifying the sample. 105 Hungarian institutions participated in the survey and although representatively it was the aim during sampling, the research cannot be considered representative, but it is able to give a view of the Hungarian practice.

As regards geographical location, the majority of the institutions participating in the survey (61.9%) came from Central-Hungary (this is Hungary's most developed region), while for instance 22.9% of the sample came from less developed regions of the country. (North-Hungary, North-and South Great-Plain and Southern Transdanubium).

Examining the size of the companies, 36.2% of the companies were large enterprises (employing more than 250 people), 22.9% was middle enterprises (operating with 50-249 people), 19% in the sample represented small enterprises (with 9-49 employees) and in 21.9% they were micro enterprises (with 2-8 workers).

With regard to corporation operation mainly companies providing commercial (17.1%) and financial services (19%) took part in the survey.

Based on the proprietorial structure 65.7% of them were only in Hungarian ownership, 23.8% had only foreign owners, while 10.5% was joint venture.

At the time of the research 13.3% of the respondents did not employ entrants, while almost half of them (48.6%) employed 5 people or less and 16.2% employed 20 or more entrants. It was examined whether there is any connection between the size of the companies and their structures of ownership with regard to their being open to employ entrants. Based on the Chi-squared test we could state that there is no connection between the number of employed

entrants, the size of the company and the proprietorial content. The cross-table analysis showed that with regard to the institutions participating in the survey it was mainly the micro and Hungarian-owned companies, which did not employ entrants.

In case of organizations, where there were entrants employed, 75.8% of them could be given jobs suitable for their qualification. Mostly middle-and large enterprises and companies with foreign owners behaved this way in the survey. Although a significant connection based on the size or on the ownership of the company could not be justified in this matter.

It is a fact that employers believe that entrants' fluctuation is quite high as every fifth company had the opinion that freshly graduates work for them for maximum 1 year and almost every second enterprise counts with the entrants for 2 years. This tendency could mainly be observed in case of micro companies and in case of companies with Hungarian ownership.

The respondents evaluated the assumptions regarding labour market in connection with the entrants. The 5-grade Likert scale was used to decide whether a given statement is true/valid at their company or not (1 means not really true, while 5 means completely true). The definitions connected to average and deviation became the following:

**Tab. 1 Assumptions in connection with entrants**

Statements	Average	Deviation
Young people overrate the labour-market advantages of diploma.	3.84	.942
Young people go to higher education primarily to avoid unemployment.	3.41	1.044
Young people go to higher education primarily to get jobs with higher salary.	3.93	.902
Qualification is what counts on labour market and not the university where they got the diploma.	3.14	.994
More diplomas guarantee better chances on labour-market.	3.23	1.235
Language knowledge guarantees better chances on labour-market.	4.51	.786
The newer types of diploma are more suitable for the requirements of the labour-market than the traditional ones.	3.02	1.083
On labour market professional experience goes before any diploma.	3.67	1.025
Professional connections count the most in finding a job.	3.3	1.018

Own table

The results show that employers do not really think that new diplomas are marketable, but they consider practical experience more meaningful and do not question the importance of diploma. It is interesting to see that the role of professional connections is not valued high in case of finding a job while it really matters a lot from which university or college students get their diploma. Finding a job is much easier now with diploma from a more prestigious university or college, especially because these institutions try to build a system of wide international connections apart from providing theoretical education to students, therefore students will have the chance to expand their knowledge and the circle of their connections. During the research it was examined by ANOVA test whether the companies with different proprietorial background have different opinion about the given statements. The survey showed a significant difference only in one case. In case of the following statement: 'Qualification is what counts on labour market and not the university where they got the diploma'; neither the normal distribution of pending variable, nor the homogeneity of variance prevailed. These would be the pre-conditions of variance-analysis, thus the reliability of this result can be questioned.

On a 5-grade scale (where 1 means insufficient and 5 means perfect) the respondents had to grade how they see the theoretical knowledge of the entrants. The following factors were examined: whether their knowledge is considered up-to-date (average: 3.41 deviation: 1.035), how much they can utilize their knowledge (average: 3.31 deviation: 0.870), their qualification (average: 3.01 deviation: 1.042), and practical usage of their language knowledge (average: 3.29 deviation: 1.089). In all cases the results showed an ordinary medium average, which meant that employers were satisfied with the knowledge of their entrants more or less. It was evaluated by ANOVA method whether the Hungarian companies with different proprietorial background have different opinion regarding this question, but significant difference in opinions was not observed in any cases.

The importance of gaining practical knowledge was also discussed in the survey. Respondents again had to define on the 5-grade Likert-scale to what extent they consider entrants' starting to work important before their professional career. The results justified that the employers considered having a job suitable for their specialized knowledge highly important during studying (average: 4.03 deviations: 0.814). Although at the same time they considered the following less important: having a job not suitable for specialized knowledge (average: 2.77 deviation: 1.012), gaining foreign practice (average: 2.71 deviation: 1.215), and voluntary work (average: 2.43 deviation: 1.099). The ANOVA test revealed that the participating companies in the survey - Hungarian, foreign or joint ventures- have no significant difference concerning their opinion in this question.

The questionnaire also asked about factors companies consider important when employing an entrant. Several factors were enumerated, which had to be graded again on a 5-grade scale according to the order of importance (1 means not important at all, 5 means absolutely important for them). The following table shows the collected factors with their average and deviation:

**Tab. 2 Factors- entrants consider important in work**

Factors	Average	Deviation
Practice gained previously	3.51	1.186
Language knowledge	3.4	1.182
Specialized knowledge	3.97	0.79
Professional connections developed during studying	2.79	0.997
Connections of families and acquaintances	2.43	1.073
Support from teacher, educator	2.27	1.022
Company connections of the educational institution	2.49	1.186
Travelling willingness	3.44	1.16
Age	3.2	1.078
Communication skill	4.22	0.93
Marital status	2.39	1.105
Level of qualification	3.86	0.825

Own table

The table shows that communication skill, specialized knowledge, diploma and practice mean priority for the employers, while less importance was given to different connections and age and marital status of the entrants was absolutely unimportant.

In order to continue further exams, the reduction of factoring was implemented. The variables were suitable for creating factors, KMO value: .714, the Bartlett test: approximately. Chi- squared: 340.087 df: 66 sign: 0.00. The communality of all the variables was higher than the 0.25-value (Székelyi-Barna, 46.p), accepted as thumb-rule. The rotation of the factors was done by the orthogonal rotation method and with the help of the so called Varimax process. All the factor loadings have exceeded the very important absolute value of 0.5, thus all the variables contributed to the factor analysis. The explained variance quota of the factors was

56.035%, which can be considered acceptable. The rotated factor loading matrices are demonstrated in the following table:

**Tab. 3 Rotated factor loading matrix based on the features of knowledge sharing**

Factors	Component		
	1	2	3
Support from teacher, educator	.886		
Company connections of the educational institution	.854		
Professional connections developed during studying	.753		
Connections of families and acquaintances	.632		
Age		.784	
Practice gained previously		.672	
Marital status		.559	
Travelling willingness		.540	
Specialized knowledge		.538	
Communication skill			.746
Language knowledge			.715
Level of qualification			.646

Own table

Based on factor loading the factors can be identified as follows:

1. factor System of connections supporting success on labour market
2. factor Emotional and social aptitudes of entrants
3. factor Mental skills and knowledge linked to qualification

We created clusters by using the two factors, and the aim was to make separate, homogenous groups in point of the three factors. The process of creating cluster was K-centre process, during which 3 clusters were created. The following groups were separated based on the cluster-centres:

**Tab. 4 Cluster-centres**

Cluster	1	2	3
REGR factor score 1 for analysis 1	-.79206	.49643	-.12240
REGR factor score 2 for analysis 1	.47971	-.89486	.48895
REGR factor score 3 for analysis 1	-1.57387	-.17345	.56652

Own table

Based on the cluster-centres the institutions where emotional and social aptitudes of entrants have priority can be grouped into the first cluster, while the second cluster gives priority to the system of connections and in the final cluster emotional and mental skills of the fresh graduates are taken into consideration by the organizations. Out of the questioned organizations, 15 can be grouped into the first cluster, 37 companies into the second cluster and 53 enterprises could be grouped into the third cluster. It was also clear from the survey that there is no significant difference between enterprises with different proprietorial background as regards grouping into clusters. It is a fact that 50.7% of Hungarian companies, 45.5% of joint ventures and 52% of foreign employers mainly belong to the third cluster, which

means that the majority of the organizations count on the widespread skills and abilities of the entrants (both emotional and mental).

Finally, the respondents expressed their opinion whether there are negative or positive prejudices against entrants on labour market. As regards negative prejudices 60% of the respondents had the idea that there are prejudicial pre-conceptions in employers' mind. Considering this question, significant difference could be observed in companies with different proprietorial background (Pearson's chi-squared test: 8.767 df: 2 sign.: 0.12  $p < 0.05$ ), which means 69.6% of the Hungarian institutions, 54.5% of the joint ventures and 36% of foreign companies had negative prejudice. Basically it was the practical experience and time-consuming training what was highlighted by the respondents.

At the same time considering positive prejudice, the rate of those was also high (57.1%), who thought that it existed in the circle of employers. In their opinion significant difference could also be noted in this case according to proprietorial relations (Pearson's chi-squared test: 6.431 df: 2 sign.: 0.40  $p < 0.05$ ), which means that 65.2% of the Hungarian institutions, 54.5% of the joint ventures and 36% of the foreign companies had shared this opinion. Companies considered enthusiasm and motivation of fresh graduates and their ability to be formed positive.

## Conclusions

The present study showed some results of a study researching labour-market suitability of entrants. The hypothesis conceived in the study can partly be accepted on the grounds of the results. On the grounds of the connections it can be stated that employers count mainly on entrants' wider skills and abilities, where specialized experience has emphasized role. Apart from this employers count on the emotional intelligence, flexibility and easy conformation skills of the fresh graduates. There are also strong negative assumptions beside positive prejudices against young entrants, which basically derive from the lack of their professional experience.

Moreover the results demonstrate that prejudices of any type are observed mainly in companies with Hungarian ownership, while prejudices are present in foreign companies the least. It is a fact that employers are satisfied with the theoretical knowledge of entrants, but its practical use is quite questioned in default of specialized practice. State measures on education policy moderates the labour market supply in the short run. But in the long run cooperation between educational institutions, employers and state is necessary, which may promote the testing of theoretical knowledge regarding its usage on labour market and it can also promote the testing of its long-term practical application and its 3-sided aspect and implementation. Empirical researches exploring the real problems are needed in order to reveal the connections between education and economy.

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# Human Development in the ECOWAS Member States in the Period from 1994-2012

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Bohumil Minařík<sup>45</sup>

Nahanga Verter<sup>46</sup>

## Abstract

This paper deals with human development in the Economic Community of West African States (ECOWAS) for the period from 1994 to 2012. The paper measures human development in each of the ECOWAS countries and eventually compares the results with the Sub-Saharan Africa (SSA) as a whole. The community member states with some exceptions, are among the least developed countries in the world with low level of human development. In addition to the low level of human development, the study also shows unsatisfactory results in many indicators of progress towards convergence process.

The study concludes that ECOWAS as an economic community has failed to satisfactorily function in eliminating disparities within member countries in terms of human development. For ECOWAS to experience a real convergence between member states, there is an urgent need for a broad range of socioeconomic policy formulation and implementation that would accelerate a sustainable, inclusive growth and development.

**Key words:** convergent process, community, human development, ECOWAS member states

## 1. Introduction

The Economic Community of West African States (ECOWAS) founded in 1975 by a regional group of 15 member countries with a total land area of 5,112,903 km<sup>2</sup> and a population of about 327.975 million, which represents a 73.4 % increase since 1994, or 3.1 % annual average population growth rate. ECOWAS was founded with the primary aim of promoting economic integration among member states.

ECOWAS includes the westernmost countries like the Cape Verde and stretches to Niger, whose territory extends far to the east. The most populous country in the community is Nigeria, whose population forms about 53.2 % of the total population of member states, and the capital city of the country, Abuja is also the headquarters of the community. In contrast, countries with smaller populations have the largest area. For instance, both Niger and Mali have accounted for 49 % of the overall landmass of the community. Out of the 15 member countries, eight

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countries are Francophone (72.7 % area and 5.0 % population), five are Anglophone (26.5 % area and 64.6 % population), while the remaining two are Portuguese speaking countries (0.8 % area and 0.4 % population). Islam as a religion is predominantly in 10 out of 15 member states.

From the socioeconomic development point of view, most of the community's member states are among the least developed countries in the world.<sup>47</sup> Statistical data available from the CIA World Factbook shows out of the 229 currently registered states and territories of the world, ECOWAS member countries in indicators of GDP<sup>48</sup> per capita in purchasing power parity (PPP), the highest in the region, Cape Verde ranked 165 with \$4,200 (2012 estimate). While the lowest, Liberia ranked 222 positions with \$700 (2012 estimate). The ranking shows some countries (not ECOWAS countries) like Zimbabwe, Eritrea and the Democratic Republic of Congo each with less than \$700 GDP per capita, PPP. Consequently, there is little satisfactory results and its dynamics as well as in other spheres of life in ECOWAS, which has a negative impact on the human development in the region.

ECOWAS Human development indicators and its dynamics in the period 1994 -2012 is the subject of this work. Specifically, the period of 18 years was divided into three sections (1994<sup>49</sup>-2000, 2000-2006 and 2006-2012) for the analysis, concretely

- human development index (HDI<sup>50</sup>), which, has given the time -comparability due to changes in methodology, has been studied rather than the values achieved by individual ECOWAS member states in the HDI global ranking of countries
- life expectancy at birth (LEB<sup>51</sup>) in years
- literacy of the adult population (ALR<sup>52</sup>) as a percentage
- the GDP per capita in purchasing power parity in USD.

The last three indicators above were historically represented the three components of the human development index. However, due to changes in methodology, they were replaced by indicators of education (mean years of schooling instead of adult literacy rate of the population and school enrollment) and standard of living (gross national income instead of gross domestic product). Due to the time of comparability, our contribution remained throughout the period of the original indicators.

## 1.1 Human Development

Development is a change, which can be described as the process of social and economic transformations within societies (Thirlwall, 2006). Human development is the expansion of individual freedoms, choices and capabilities to have, to lead lives that they value and have reason to value. It is about changing a society to enhance people's well-being across generations by enlarging their choices in health, education and income (United Nations Development Programme, 2013).

The the integration of individual country's economies into the global economy is partially creating unprecedented challenges and opportunities for continued progress in human development, especially in countries in the Sub-Saharan Africa, where the pace of positive change is still low (United Nations Development Program, 2013).

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<sup>47</sup> See least developed countries' classification by the United Nations: <http://unohrlls.org/about-ldcs/>

<sup>48</sup> Gross domestic product (in Czech, hrubý domácí produkt)

<sup>49</sup> Older data within the period are difficult to find, compile and incomplete

<sup>50</sup> Human development index

<sup>51</sup> Life expectancy at birth

<sup>52</sup> Adult literacy rate

Since 1990 when UNDP first published its annual Human development report, with the main goal of putting people at the center of the development process in terms of economic debate, policy, reforms and advocacy, it has been recognized as the best way of measuring countries' level of human development worldwide.

## 2. Materials and Methods

The three primary sources of information for this work: Human Development Reports (HDR) by the United Nations for the period<sup>53</sup>, annual CIA Factbooks<sup>54</sup> and the African Economic annual reports<sup>55</sup>. Information obtained from these sources are presented in this work.

Key points of the methodology

- have examined changes in each ECOWAS member countries in the world's ranking by human development index,
- the indicators mentioned in the introduction were carried out in the individual "key" years (1994, 2000, 2006, and 2012). Data on ECOWAS was compared with Sub-Saharan Africa (SSA) as a whole,
- the three "key" periods 1994-2000, 2000-2006 and 2006-2012 were examined through the convergence process of indicators that were listed in the introduction.

Convergence processes were investigated through beta-convergence, and sigma convergence in accordance with the literature - see, for instance, MINAŘÍK, BORŮVKOVÁ and VYSTRČIL (2013), for additional work on convergence from the literature references.

The basic preliminary assumptions are

- unsatisfactory position of the ECOWAS member countries in HDI- HDI and its components (social health, education and standard of living),
  - very positive dynamics of these indicators are monitored in the period 1994-2012,
  - unsatisfactory progress of the convergence process, which show the continuation of the existing differences among countries rather than in their convergence rather.
- Data from SSA as a whole was used for comparison with ECOWAS, which in many ways (socioeconomic and political issues) is the most problematic region in the world.

## 3. Results and Discussion

### 3.1 The Position of ECOWAS Member States in the HDI Scale of the World and Its Development

Historically, the most successful position ECOWAS member countries in the global HDI ranking is, the Cape Verde with 57.8 % in 2000. However, this is an exception rather than the rule. In contrast, the last places in the world (100 %) in value of HDI figured Guinea (1994), Sierra Leone (2000) and Niger (2006 and 2012). Liberia was not evaluated in the year 2000 due to the civil war in the country at that time. Both average and the median position of these 15 ECOWAS member countries for each year oscillates at the level of 89-91 % of the world ranking , the position is worse than the 90% level scale (i.e. between last 10 % of the countries evaluated) show a stable 8-9 countries of the community.

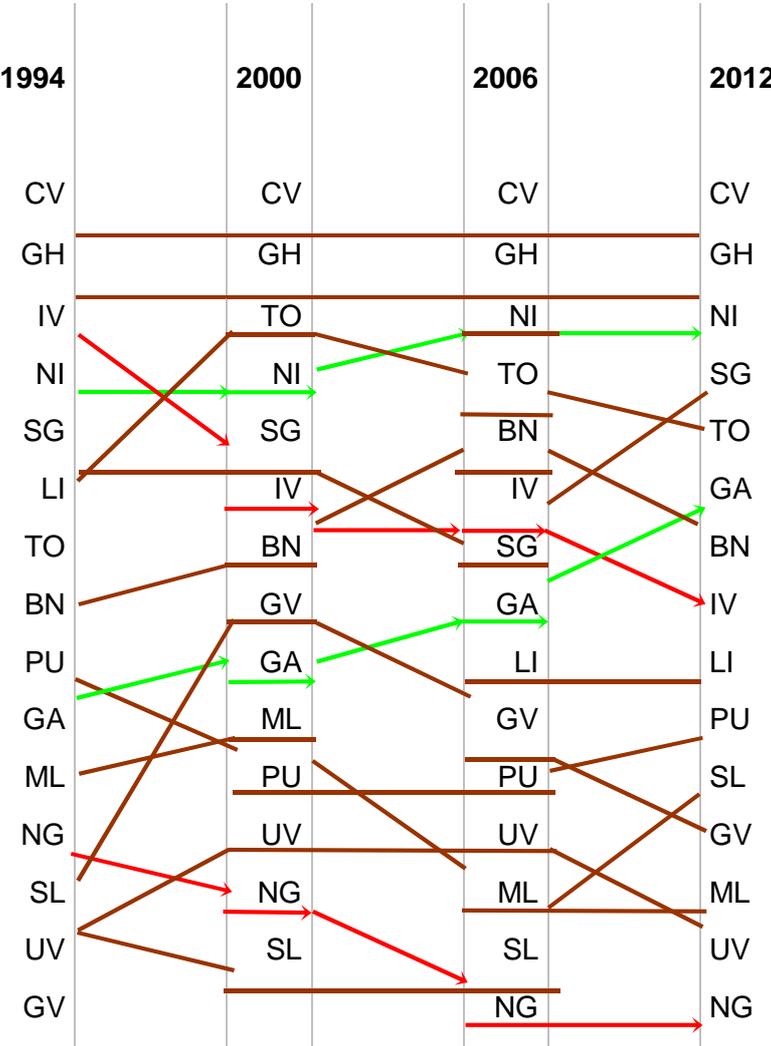
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<sup>53</sup> Available at: <http://bit.ly/1h5MUZK>

<sup>54</sup> Available <https://www.cia.gov/library/publications/the-world-factbook>

<sup>55</sup> Available <http://www.africaneconomicoutlook.org/en/data-statistics/>

In concentrated form, we see the situation in individual ECOWAS member states in Fig. 1, the ladder graph, which presents the relative position of countries within this group, the index of human development and its development between 'key' years 1994, 2000, 2006 and 2012.



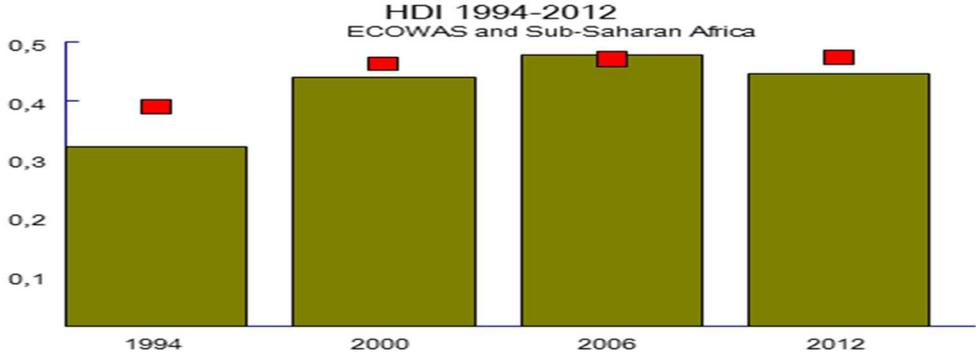
**Fig. 1: ladder graph of the relative position of ECOWAS countries in the HDI**

Fig. 1 shows only Cape Verde and Ghana with a stable position on the first two positions. Systematically monotonically non-increasing position in the selected period 1994-2012 shows Ivory Coast and Niger. Monotonically non-decreasing systematically observe the position of conversely in Nigeria and Gambia. There were fluctuating position in both directions for other countries. There were no data for Liberia in the year 2000.

ECOWAS member states over the years have recorded low in HDI as confirmed in Fig. 2, where the values of ECOWAS<sup>56</sup> (columns) were compared with HDR published HDI value for

<sup>56</sup> These have been determined as a weighted arithmetic average of indices for individual countries, where the weights are the numbers of their inhabitants. The same procedure was used for the following indicators, GDP, LEB and ALR. This is of course only possible procedure (using the simple average is not an option). However, due to quite extreme large population of Nigeria, the result of ECOWAS member countries is valid mainly to the developments in this country.

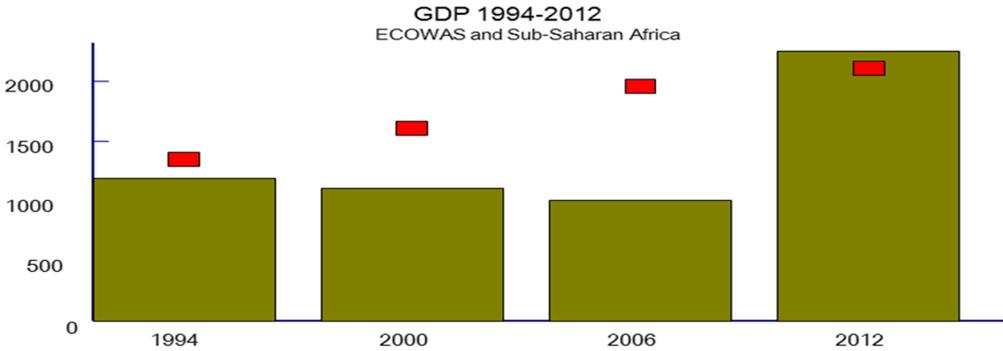
the group of countries in SSA (red marks). It is evident that the community is below (perhaps with the exception of 2006) SSA average in human development, one of the most troubled regions of the world - SSA as a whole. Due to changes in HDI methodology, it is to some extent meaningless using these comparisons over time. The key or best way was to compare values for ECOWAS and SSA in each of the monitored years.



**Fig. 2: Human Development Index in ECOWAS and Sub-Saharan Africa**

**3.2 Comparison of ECOWAS and Sub-Saharan Africa in the traditional components of HD**

Due to the time changes in HDI methodology, there were changes in the method for the determination, thus avoiding the possibility of comparing the values of HDI in time, the remaining indicators (i.e., GDP, LEB and ALR) in time are entirely comparable. From Fig.



**Fig. 3: GDP (in US\$ per capita, PPP) in ECOWAS countries and Sub-Saharan Africa**

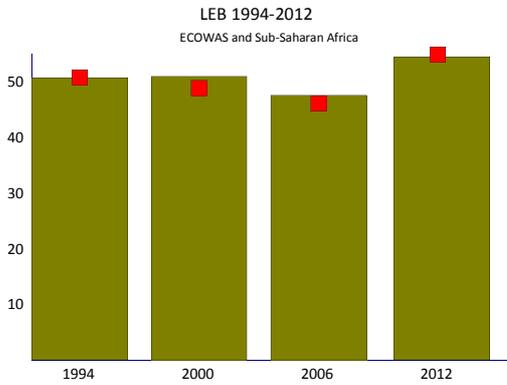
3, 4 and 5, it is possible to evaluate the dynamics of the indicators and compare values for ECOWAS and countries in SSA in individual years.

GDP represents (or rather represented until its replacement with indicator GNI) standard of living as an integral component and condition of human development. In the framework of ECOWAS' economic leaders in terms of GDP per capita, PPP are the tiny Cape Verde, Ghana,

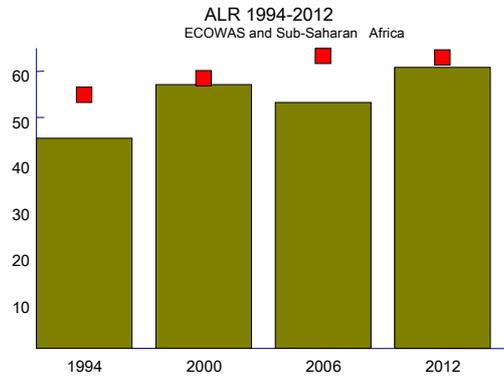
and Nigeria. Whereas, Liberia, Niger, Mali, and Togo are shown at the opposite end of the categories (below \$1,000 or just around this value).

Fig. 3 shows SSA with a monotonic increasing development (in the period between 1994 and 2012 by 55.6 %) of the ECOWAS member states, followed by a step increase (in 2012 the value of GDP for even for ECOWAS was even higher) after years of stagnation (more precisely, a slight decrease). Purely, formal GDP growth in both cases is very significant, but the result is vastly different in terms of development. It, therefore, means that, GDP growth rate is not proportionately translated into development within the regions of the community.

Analogical information we get from Fig. 4 and 5, in terms of the life expectancy result, the highest was Cape Verde, followed by Ghana, Liberia, and Togo. While Guinea - Bissau and Sierra Leone have lower life expectancy (below 50 years). Cape Verde also recorded highest in the literacy of the adult population, followed by Ghana. While countries like Mali, Niger and Burkina Faso were recorded with extremely low literacy rates (below 30 %). For life expectancy, both within ECOWAS, as well as SSA can be described as a period of stagnation followed by a slight increase in the last period. In the case of literacy of the adult population, it is also a very dynamic development. The results in both instances were below expectations.



**Fig. 4: LEB (in years) in the countries of ECOWAS and SSA.**



**Fig. 5: ALR (in %) ECOWAS and SSA**

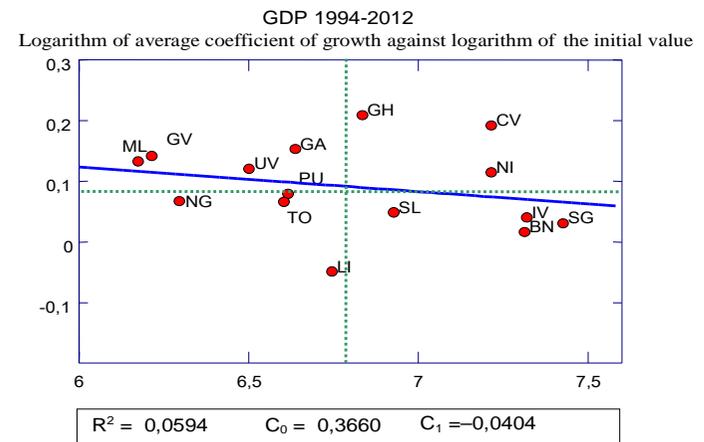
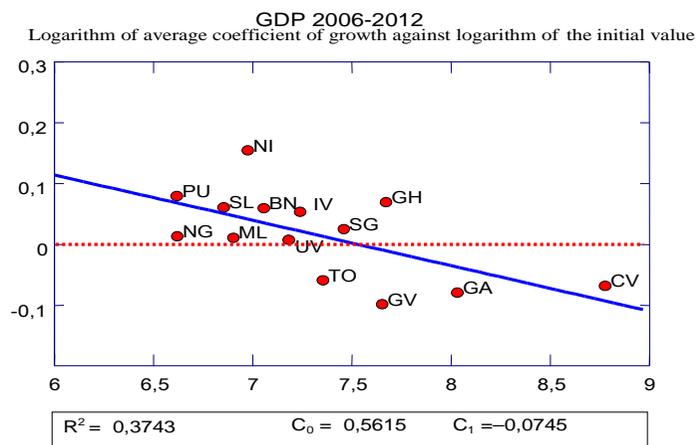
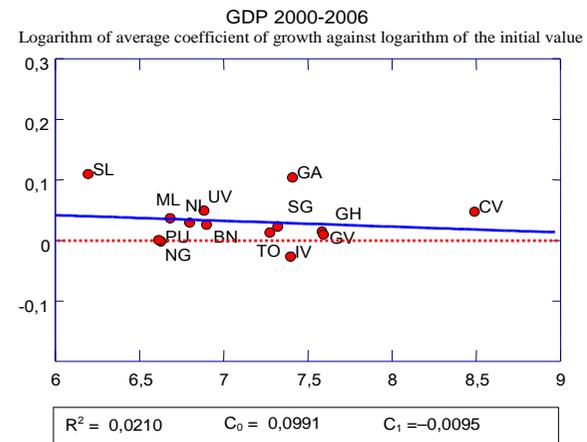
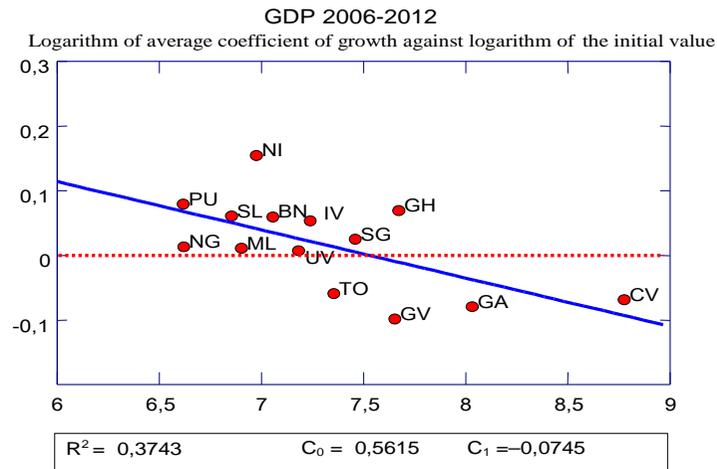
We certainly cannot say that ECOWAS as a community has deviated from being successful in terms of development of the region, which majority of its members are part of Sub-Saharan Africa (SSA). While life expectancy in particular (the area with the predominant Islamic population is unlike South Africa is significantly less vulnerable to HIV infection and AIDS) would be expected to have a better result. The literacy rate of the adult population has reduced, in particular, the sprawling desert States (Niger, Mali, Burkina Faso) with the specific character of the settlement, including the vast areas of transhumance and the significant difference between male and female literacy (to the detriment of women), which is typical of the population that adhere to Islam.

**3.3 The Convergence Process of Observed Indicators in the Context of ECOWAS**

One of the motivating factors of standing "in the cradle" of the international economic community is undoubtedly the expectation that they will be committed to the processes leading to the convergence of levels of member countries, which will in turn, translates to the elimination or reduction of disparities within regions. At the beginning of convergence

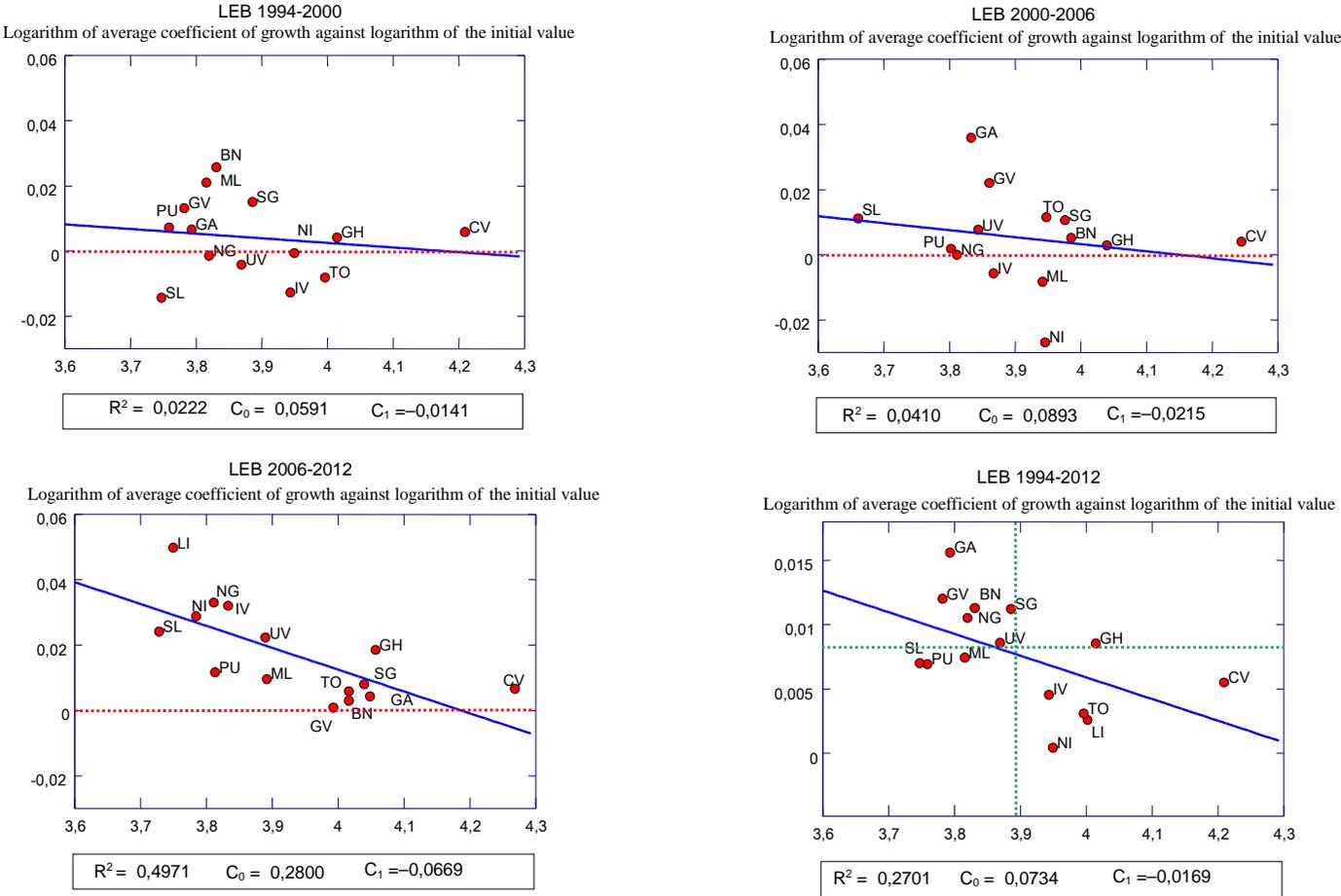
processes, which are characterized by the fact that, countries with a lower initial value experience faster growth than countries with higher starting values. It gradually leads to reducing the variability of the observed indicators. The first concepts are called beta-convergence, the second is implemented through sigma-convergence.

The results of the beta-convergence examined are graphically represented in Fig. 6, 7 and 8 for each of the three sections (six year per section) and for the whole period (1994-2012) under study. Finally, the last four images are represented by the average of the value, which allows for countries to be classified into 4 groups according to the level growth rate indicator. The results of this classification are expressed in cartograms in Fig. 9, 10 and 11.

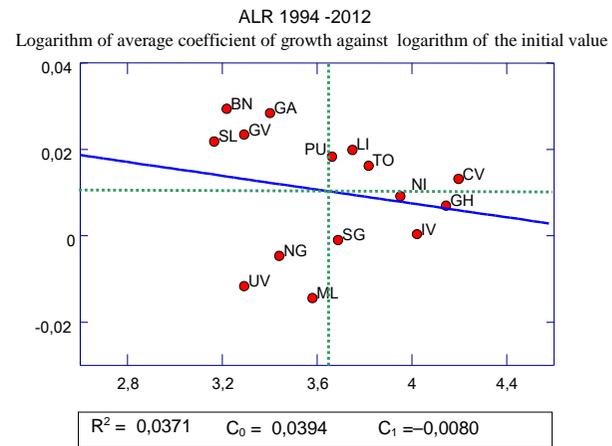
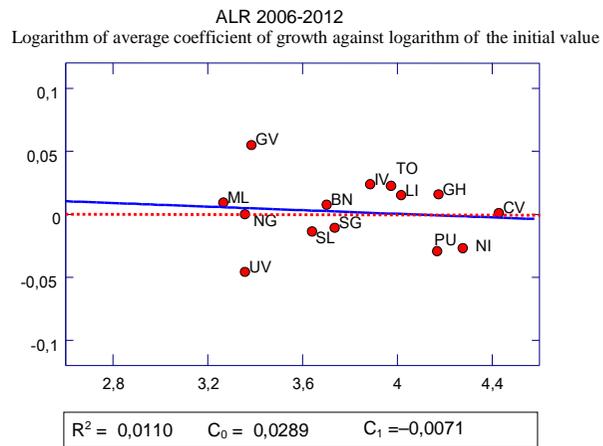
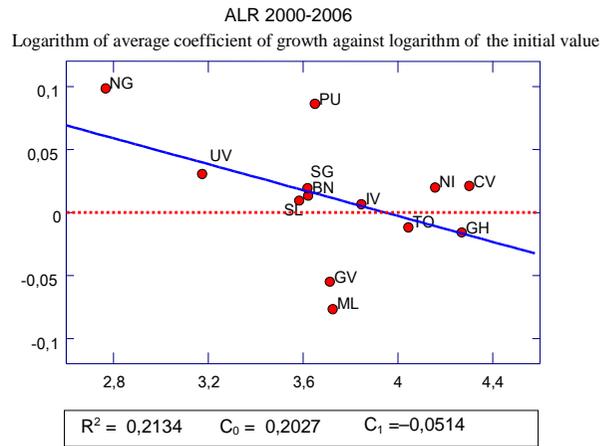
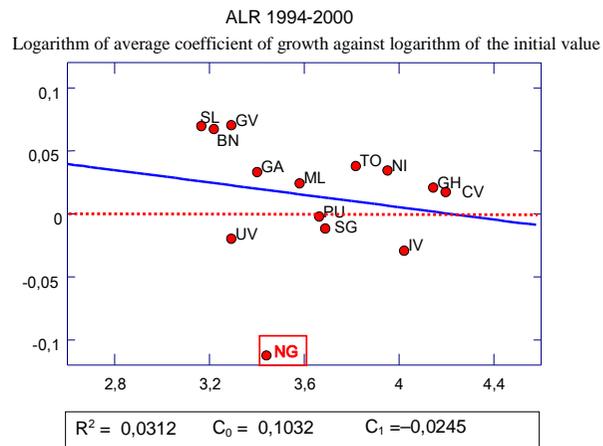


**Fig. 6: Beta-convergence indicator, GDP per capita, PPP in parts and for the whole period**

**Note:** Two-letter are, used in CIA Yearbook to indicate individual country: BN (Benin), UV (Burkina Faso), IV (Cote ivory), CV (Cape Verde Islands), GA (Gambia), GH (Ghana), GV (Guinea), LI (Liberia), ML (Mali), NG (Niger), NI (Nigeria), PU (Guinea-Bissau), SG (Senegal), SL (Sierra Leone), TO (Togo).



**Fig. 7: Beta-convergence indicator LEB in parts and for the whole period**



**Fig. 8: Beta-convergence indicator ALR in parts and for the whole period**

**Note:** Significantly disparity Niger position during 1994-2000 (highlighted) is probably because, in 1994, this indicator was reported unrealistically high.

The acquired characteristics of the beta-convergence show low in all cases and statistically insignificant trend towards convergence, which cannot lead to substantial convergence. Practically, the convergence almost not reflected in GDP in the period between 2000 and 2006 and for LEB indicator in the periods 1994 -2000 and 2000-2006. In contrast, the ALR indicator appears critical in the periods 1994-2000 and 2006-2012. The results reveal a particular convergence for the GDP indicator in the period between 2006 and 2012 (the coefficient of determination is slightly above 37%). In the same period, the indicator showed the LEB beta – convergence with the identification of the highest ever (almost 50%). Overall, the weakest of convergence is witnessed in ALR indicator.

From Fig. 6, 7 and 8 can also be seen that at certain times in some countries and indicators leading to negative growth (decline). This applies to countries that lie below the horizontal dotted line that represents the border of zero growths. The results further indicate similar tendency for the whole period as shown in picture (bottom right). The greatest convergence in life expectancy, the smallest in the literacy of the adult population. Alarmingly, however, is unusually weak convergence and therefore shows only slight convergence of the economies of member countries at the community level. Negative growth (decrease) over the period between 1994 and 2012 is rather exceptional and applies only to Liberia in GDP indicator and three countries in the ALR indicator. For life expectancy, none of the countries witnessed negative growth within the time analyzed.

The results of beta convergence were verified using sigma - convergence. Tab. 1 shows the standard deviation of the logarithms of the values of the four analyzed indicators related to human development in four "core" years in the study period 1994-2012.

**Tab. I: Results 1 sigma-convergence countries of ECOWAS**

	<b>1994</b>	<b>2000</b>	<b>2006</b>	<b>2012</b>
<b>GDP</b>	0,4199	0,5746	0,5863	0,5153
<b>LEB</b>	0,1255	0,1359	0,1489	0,1075
<b>ALR</b>	0,3380	0,4131	0,3793	0,3808

As presented in Table 1, the standard deviations show that the slight sigma-convergence reveals for the indicators GDP and LEB in the period 2006-2012, which is in confirmation with the conclusions of the beta-convergence. If, therefore, as one of the tasks of the community has seen convergence indicators in the Member countries, then it can be concluded that this phenomenon has been observed only in a very limited and without statistical significance.

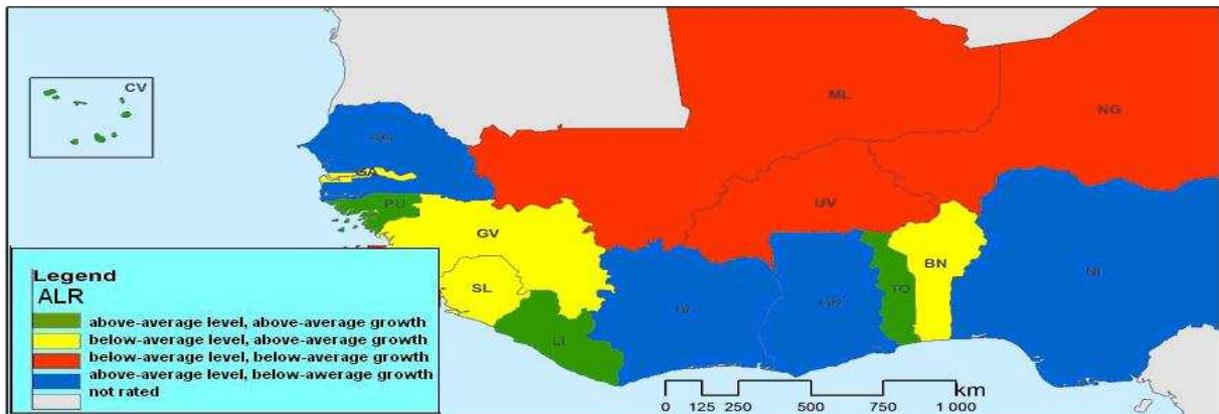
As shown in cartograms in Fig. 9, 10 and 11, the distribution of member states into the groups according to the initial level and growth rate of GDP, LEB and ALR for the whole period 1994-2012. In Fig. 6, 7 and 8 lie in the first quadrant of countries, with above-average levels and an above-average rate of growth (i.e., those that tend to be in the positive sense of progress). In the second quadrant are the countries with below-average initial levels and above-average growth rate (i.e., those that have the tendency of moving towards the first quadrant). In the third quadrant of the country, which lies below the initial level and also below-average growth rate and tend to lag behind other countries. Finally, in the fourth quadrant are the countries with above-average initial levels but lower than the average growth rate, which in the long term might tend to assume the direction of the third quadrant.



**Fig. 9: Cartogram to the diagram in Fig. 6 (GDP, 1994-2012)**



**Fig. 10: Cartogram to the diagram in Fig. 7 (LEB, 1994-2012)**



**Fig. 11: Cartogram to the diagram in Fig. 8 (ALR, 1994-2012)**

#### 4. Summary and Conclusion

The results of the analysis carried out did not show a huge success in the ECOWAS member states during the period examined (1994-2012). Aside from very problematic countries like Liberia, Mali, and Sierra Leone, which experienced civil wars. However, Cape Verde is an exception (which, of course, due to the small size and population, do not have any adverse effects on the overall results), relatively quiet and the success of Ghana, to talk about the human development of the Member countries and its components are too positive. Due to Nigeria's massive and rapid population growth, the results of the state when calculating values for the entire community (see Fig. 2-5) has, conversely, a decisive influence.

If you change the values of HDI (due to changes in methodology for calculation) and focus on the order of the community member states in the world ranking, it should be noted that, practically, half of the member countries within the framework of the last sequence shows a decile. None of the years examined (1994, 2000, 2006 and 2012) shows better results for ECOWAS than for the SSA.

In order of HDI ranking, Cape Verde and Ghana have steadily maintained first and second positions in within the framework of ECOWAS member states. The most significant progress to note is Gambia, the country has moved from 10th to sixth place. By contrast, Ivory Coast recorded the biggest decline, moves from third to eighth position. While, Niger declines from 12 to 15 to become the last position in the order of HDI ranking within the community.

The GDP indicator showed ECOWAS (after many years of economic stagnation) with a better result than that of SSA as a whole for years examined. Comparable results showed both groups of countries in indicators of life expectancy and literacy of the adult population.

We can identify certain periods and indicators, where the tendency is to measure convergence, the results for the entire period 1994-2012 were not as expected. Some member countries such as Liberia, Niger, Togo and Guinea-Bissau are economically lagging behind. Sierra Leone, Mali and Guinea – Bissau are slightly lagging behind in terms of life expectancy indicator. While Mali, Niger, and Burkina Faso are somewhat lagging behind from literacy in the adult population indicator. As presented in Fig. 9, 10 and 11, the cartograms show countries in red, which are combined with below average initial level and below average growth rate.

In a positive direction, the opposite pole of the spectrum shows that countries like the Cape Verde Islands, Nigeria and Ghana are economically (see GDP indicator Fig. 6, part of the bottom right) above average levels. The remaining indicators (see Fig. 7 and 8) were not similar to the trends recorded in all (LEB) or only in negligible rate (ALR).

The overall evaluation of ECOWAS shows that the community does not significantly improved in terms of human development. This is partly because, the community is facing several socioeconomic and environmental challenges that are hindering it from moving towards sustainable human development or improving peoples' wellbeing. As a result, it has been gradually affecting individual member states.

#### Acknowledgement:

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# Wheat production in the Slovak republic with relevance to production technologies, external environment factors and economic conditions

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Lucia SVORADOVÁ<sup>3</sup>

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## Abstract

The object of this paper is the cultivation of wheat production in the economic conditions of the SR. The paper is focused on the development of areas, prices, wheat production and labor costs incurred in the cultivation of wheat. The sales per 1 ha that are posed by the product of the harvest and the exercise price per 1 ha of agricultural land for the average data by user SR years were rated. The paper further evaluates:

- Economics of wheat with and without the implementation of the subsidies,
- Percentage of subsidies to cover the cost of 1 ha,
- Relations between own cost of 1 ha of agricultural land and labor costs,
- Development of own labor cost per 1 ha of agricultural land with the prediction for 2 years,
- Relations between total own cost per 1 ha of agricultural land and total labor costs in the production of wheat.

## Keywords:

Labor cost, wheat production, agricultural land, subsidy

## Introduction:

Cereals are a major component of food for mankind and a large proportion of humans not getting the required amount, thus cereals are becoming a strategic raw material. In addition to food for mankind is further used as a source of livestock feed, ethanol production, manufactures of straw, etc.. According production areas, cereals, in the structure of their crop production, falls 50-65% of the arable land in the Slovak Republic. Wheat (*Triticum*) is the most important cereal grown in Slovakia (30% of arable land). It is an essential raw material in the production of bread and other bakery products.

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## **Methodology:**

We obtained information of the defined problem from the statistics of the Research Institute of Agricultural and Food Economics (hereinafter "RIAFE"), which are regularly published annually as the resulting calculation of agricultural products. In this paper we evaluated the evolution of the time period 15 years (1998-2012). Uniform methodology is based on Law no. 563/1991 Coll. Accounting, which establishes binding procedures for the valuation of own production, and at his own expense. It follows that the resulting calculations, from which we drew data are compiled according to a uniform methodology calculations own costs of agricultural products.

Economic indicators cost-effectiveness without subsidies and cost-effectiveness with subsidies for the production of cereals per 1 ha were evaluated. In this paper were not only used mathematical-statistical methods but also analysis, synthesis and comparative analysis to compare the values economics of wheat to the implementation of a free implementation of grants and percentage of grants to cover the cost of 1 ha.

When evaluating the difference between the total conversion cost and direct wages and social costs per 1 ha, we investigated the dependence of one variable of the other variables. On the basis of our analyses, we found dependence how the changing value of the total production cost in changing wages, including social costs for us as assessed agricultural commodities - wheat, where the correlation method was used.

Using time-series analysis, we evaluated the prediction of the expected future development of the total production cost and total cost of the work.

## **Results:**

Economic efficiency indicators reflect the profitability of business activities, we call them ratios. Economic efficiency of products and services reflects the difference between the strike price and the full cost of their own production. Particular output is profitable, if achieved revenues exceed the total costs of the product, respectively service. If the strike price of the output is below cost, there is a loss. Analysed period where the efficiency of production of wheat is calculating evaluated covers the years 1998 to 2012.

Resulting calculations of the sample are processed according to a uniform methodology in accordance with the Act. 563/91 Coll. Accounting, this means that corporate calculations are mutually comparable.

**Tab. 1: Development of harvested area, yield, subsidies for 1 ha and average exercise price of wheat in the Slovak Republic**

Year	Harvested area (thousand. ha)	Harvest <sup>-1</sup> (t.ha )	Subsidies per ha	Average exercise price (€·t <sup>1</sup> )	Total own cost per ha
					Total SR
1998	429,00	4,72	66,49	121,16	508,60
1999	298,00	4,25	65,10	116,81	517,89
2000	405,25	3,38	133,2	131,15	514,80
2001	488,88	4,45	50,95	141,88	573,72
2002	405,83	4,03	45,81	132,41	580,23
2003	306,90	3,03	57,89	143,03	584,28
2004	367,80	4,80	132,2	127,83	625,01
2005	373,00	4,31	157,6	124,38	620,23
2006	349,10	3,85	132,2	129,42	661,72
2007	360,70	3,82	148,2	181,60	689,84
2008	373,70	4,87	127,1	188,87	794,66
2009	379,20	4,00	144,9	115,12	716,48
2010	342,10	3,46	142,4	147,84	641,00
2011	362,80	5,05	158,5	161,61	742,65
2012	388,10	3,72	175,7	198,63	755,49

Source: RIAFE

In Table 1 there are presented the harvest area, harvest, exercise prices and own cost in evaluated years. The harvested areas and yields per hectare exhibit considerable variability in the evaluated period. The highest harvested areas of wheat were in 2001, representing 88.88 thousand hectares, the lowest harvested area of wheat was in 1999, representing 298 thousand hectares.

After joining the EU since 2004, cropland have stabilized at 360-380 thousand hectares. Hectare yields are fluctuating from the lowest in 2003 (3.03t.ha<sup>-1</sup>) to the highest achieved in 2011 (5.05t.ha<sup>-1</sup>). Exercise price of wheat rises, the highest was recorded in 2012 (198.63€·t<sup>1</sup>) and the lowest price was recorded in 1999 (116.81€·t<sup>1</sup>).

Subsidies for the commodity wheat recorded fluctuating tendency in the years 1998-2003, when the lowest paid subsidies on the cultivation of wheat were in 2002 (45.81 €·t<sup>1</sup>) and the highest subsidies were granted in 2012 (175,79 €·t<sup>1</sup>). In 2000, a significant increase in subsidies was caused by drought. State tried to reduce the shortfall in revenues in commodities by providing disposable subsidy. If we evaluate subsidies without year 2000, which we have interpreted above, we can generally say that subsidies for wheat production stood at 50 to 66.49 €. ha<sup>-1</sup> for the period 1998 - 2003. After 2003, we can state a significant increase in subsidies, due to EU subsidy policy. The bulk of subsidies are allocated into area (on 1 ha of cultivated land) under the Accession Treaty. In general we can say that in the years 2004-2012, after joining the EU, was recorded 33% increase over aid for 1 ha (from 132,21 €. ha<sup>-1</sup> for 175,79 €. ha<sup>-1</sup>).

**Tab. 2: Revenues, profit / loss without subsidies, profit / loss with subsidies, Percentage of subsidies on the cost for 1 ha**

Year	Revenues.ha <sup>-1</sup>	Profit / Loss (€·ha <sup>-1</sup> )		Effectiveness of costs		Percentage of subsidies for 1 ha
		without subsidies	with subsidies	without subsidies	with subsidies	
1998	571,88	63,29	129,78	0,12	0,26	13,07
1999	496,46	-21,44	43,66	-0,04	0,08	12,57
2000	443,30	-71,51	61,71	-0,14	0,12	25,88
2001	631,35	57,62	108,58	0,10	0,19	8,88
2002	533,63	-46,60	-0,79	-0,08	0,00	7,89
2003	433,38	-150,90	-93,01	-0,26	-0,16	9,91
2004	613,58	-11,42	120,79	-0,02	0,19	21,15
2005	536,08	-84,15	73,52	-0,14	0,12	25,42
2006	498,27	-163,45	-31,24	-0,25	-0,05	19,98
2007	693,71	3,88	152,09	0,01	0,22	21,48
2008	919,80	125,13	252,32	0,16	0,32	16,01
2009	460,48	-256,00	-111,07	-0,36	-0,16	20,23
2010	511,53	-129,47	12,93	-0,20	0,02	22,22
2011	816,13	73,48	231,98	0,10	0,31	21,34
2012	738,90	-16,59	159,20	-0,02	0,21	23,27
<b>Average</b>	593,23	-41,88	74,03	-0,07	0,11	23,31

Source: RIAFE, own calculations

If we evaluate the increase in subsidies for 1 ha between 1998 to 2012, we can say there is 264% increase over (1998 € 66,49 €. ha<sup>-1</sup>, in 2012 175,79 €. ha<sup>-1</sup>). Own costs fell significantly in 2010, which was caused by economic crisis. During the reported period of 15 years, own cost average grows annually by 16,5 €. ha<sup>-1</sup>. In 1998, the cost of 1 ha of wheat was 508,60 €. ha<sup>-1</sup>. In 2012, the cost of 1 ha of wheat achieved 755,49 €. ha<sup>-1</sup>, which represents 49% increase.

In Table 2 we evaluated the sales per 1 ha that are representing multiplication of the harvest and wheat prices expressed in €. ha<sup>-1</sup>. In general we can say there is a significant increase in sales, which was influenced by yield per hectare and the exercise price of wheat in each years. In terms of development of sales, their development is specific in 2008, when the economic crisis begins and commodity prices have grown rapidly, as shown by the sales revenue of 1 ha at 919.80 €. ha<sup>-1</sup>. In 2009, we can noted the onset of the economic crisis, which was significant in reduction of commodity prices. The sales of 1 ha were decreased by 50% compared to 2008, which is in real terms 460.48 €. ha<sup>-1</sup>. After 2009, the sales are gradually recovering from the previous price shock.

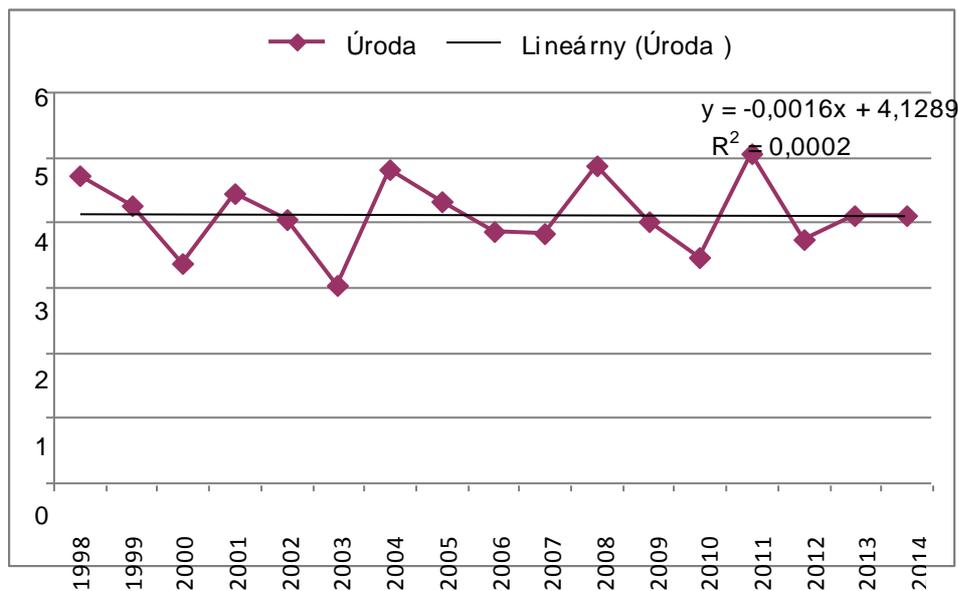
Profit or loss in the evaluation of wheat represents the difference in revenues and total cost of 1 ha of wheat. In rated period of 15 years, there was achieved profit in the production of wheat without the implementation of subsidies in five years (1998, 2001, 2007, 2008 and 2011). Loss was achieved without implementation of subsidies in the other evaluated years. After counting in subsidies for 1 ha we can generally state the improvement the economic state of cultivation. Loss from the production of wheat with implementation of subsidies was reported in four years (2002, 2003, 2006 and 2009). Earnings per 1 ha were reported in the other years. From the above characteristics, we can state the positive impact of subsidies on

the profitability of wheat production, which is becoming economically more interesting crop as it is presented in Table 2.

Development subsidies as an instrument of economic support EU intervention conditions and the state in the cultivation of wheat, we rate the percentage of grants to cover costs. In general we can say that prior to accession (1998 - 2003), subsidies for the cultivation of wheat fluctuated around 10% of level. After accession to the EU and the introduction of the implemented supportive policies, the percentage of subsidies for costs was increased up to 23.31% in 2012. The development of subsidies is presented in Table 2.

In the economic evaluation of wheat production in period of 15 years in Slovakia, we can generally say that wheat production without subsidies was amounted an average annual loss 41.88 €. ha<sup>-1</sup> and after the implementation of the subsidy on wheat is becomes profitable crop (74.03 €. ha<sup>-1</sup>). When we evaluated the effectiveness of costs, they were negative without subsidies (-0.07) and after the implementation of subsidies, the effectiveness of costs has become positive (0.11). This means that Slovak farmer acquire 11 € with the implementation of subsidies from 100 € of deposit into production in the reporting period. Slovak farmer are losing 7 € without implementation of subsidies from 100 € of deposit into production. Coefficient of determination is  $R^2 = 0,47$ ; thus chosen regression line explains the variability of the average exercise price of approximately 47% and the regression line shows an increase in future expected price of € 3,69 per annum.

**Graph 2: Development of wheat harvest in t. ha<sup>-1</sup>**



Source: RIAFE, own calculations

The coefficient of determination is  $R^2 = 0,0002$ ; thus chosen regression line explains the variability of wheat harvest at around 0,0002 %.

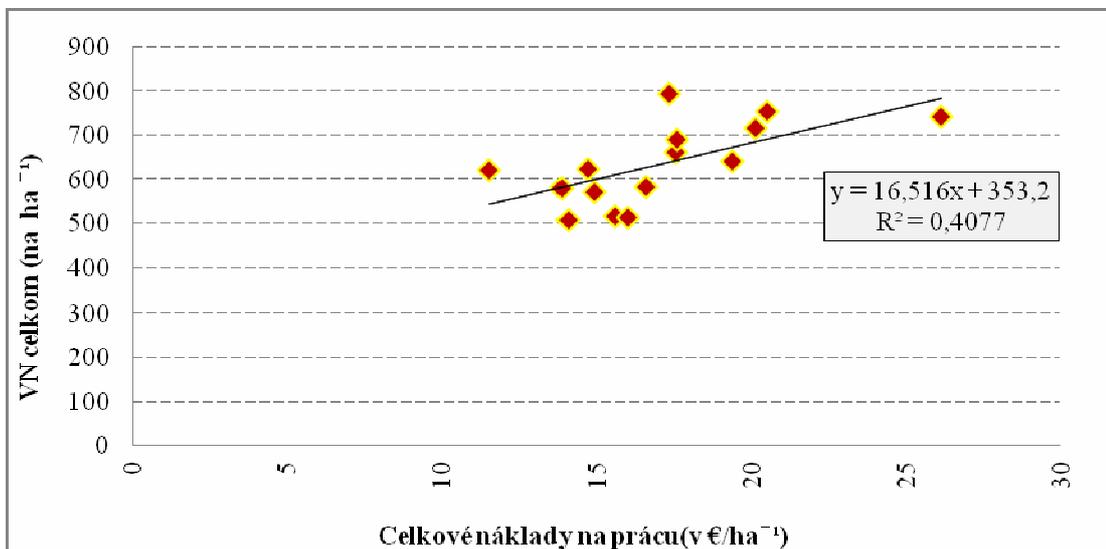
### Development of Total Costs and Labor Costs of Wheat

Based on the analysis of statistical data from RIAFE, we evaluated the total own costs ("hereinafter OC") of wheat per ha<sup>-1</sup>, their average annual growth index, an annual increase/decrease and the absolute annual increase/decrease, which was compared with the increase (decrease) of total labor cost. From the above it can be concluded that the average annual growth index of total own costs of 1 ha of wheat reached a value of 1.48 and the total cost of the work of ratio reached a value of 1.46 in the 15-year periods.

It follows that total own costs annual grew by 16.46 €. ha<sup>-1</sup>, which in relative terms represents a 2.35%. Overall labor costs amounted annual increase 0.43 €. ha<sup>-1</sup>, an increase of 1,2%. The above results show that growth in total production cost is 2.35 times faster than the growth in total labor costs.

Absolute annual increase in total production cost compared to the first and last year of the period of 15 years was 246.89 €. ha<sup>-1</sup>, which in percentage terms is increase of 48.54%. Absolute annual increase in the total labor cost amounted to an increase of 45.53%, i.e. 6.42 €. ha<sup>-1</sup>. When evaluating differences, the relationship between total own costs and total cost of the work of selected agricultural commodities was examined. The correlation method was used in order to examine the changes of the values of total own cost and total value of the total labor cost and vice versa. The correlation coefficient in the case of commodity-wheat showed a value of R = 0,64. Based on this result, we can speak of a slightly tight dependence between the total conversion cost and total cost of the work.

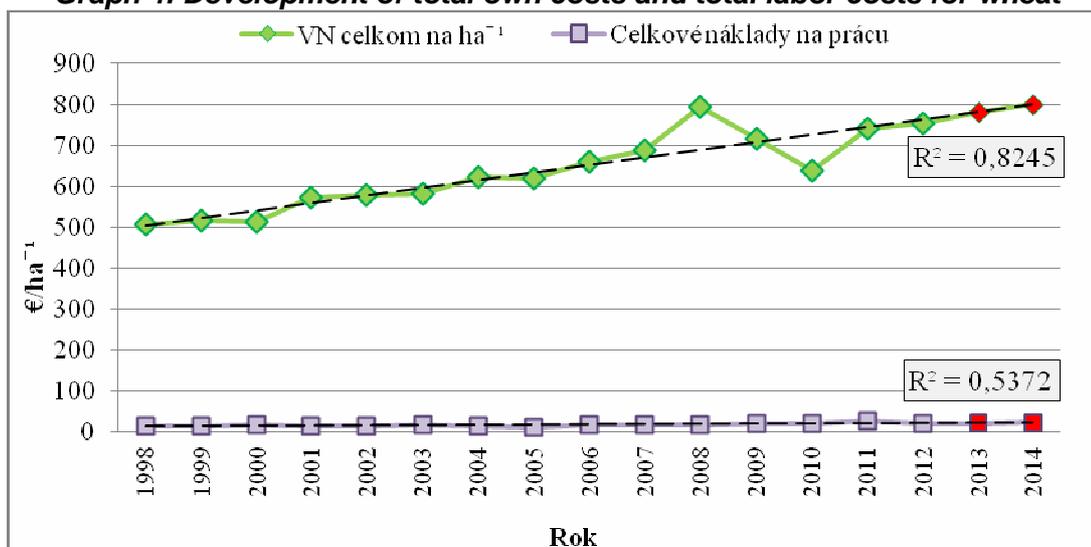
**Graph 3: Relationship between total own cost and total labor costs for wheat**



Source: RIAFE, own calculations

The graph 3 shows the form of the regression function  $y = 16,516x + 353,2$ , i.e. if the total labor cost per 1 ha of wheat increased by 1 €, so the total actual cost will increase by 16.52 €. Coefficient of determination is  $R^2 = 0.41$ ; thus chosen regression line explains the variability of the total production cost at around 41%.

**Graph 4: Development of total own costs and total labor costs for wheat**



Source: RIAFE, own calculations

### Prediction of Future Expected Cost of Wheat

Using time-series analysis, we predicted the expected future development of the total production cost and total cost of the work. Figures were not disclosed for years 2013 and 2014, when drafting and subsequent transmission of the present paper, therefore, we predicted the development costs for these two years. The total own cost should be in an amount of 782.82 €/ha<sup>-1</sup> and total labor costs should be in the value of 21.68 €/ha<sup>-1</sup> for the year 2013. Based on the prediction of the future developments it is expected that total own cost for wheat will reach value of 801.28 €/ha<sup>-1</sup> and the total labor costs will be at the limit of 22.25 €/ha<sup>-1</sup> in 2014. From the above, it can be argued that the total own costs and total labor costs rose during the reporting period and they are expected to continue to grow; however, the growth of total labor cost took place in a more moderate pace. Rise or fall in costs between each years is dependent on climatic conditions in different years evaluated, which have an impact on the number of agrotechnical operations in the cultivation of wheat. Development of the facts confirms Graph 4.

### Conclusions:

The current state of EU economies is characterized by a gradual economic rise. States are likely to have overcome the crisis period of 2008 - 2010. In general we can say that the cost of producing wheat was increasing before the economic crisis and costs began to decline after the outbreak of the crisis.

The obtained results suggest that if the value of the coefficient of determination own cost of 1 ha for wheat, we can generally conclude that the dependence of growth amounted to  $R^2 = 0,83$ , which is a very close relationship.

The total cost for the work for the wheat achieves significantly lower coefficient of determination,  $R^2 = 0,54$ .

Of these calculated trends can be generally concluded that the crop for which a high degree of field mechanization with virtually no handwork of employees exhibits a higher percentage increase in total own production cost compared to total labor costs per 1 ha, where the percentage annual growth 1,2%.

If we express the index value as a percentage, we get the growth rate, which expresses the same reality as the index, not unless in the form of coefficient, but expressed as a percentage of the level of growth. In terms of average annual growth of cost of 1 ha, achieve growth 3.24% annually.

Grain is limiting for farmers in the Slovak Republic from point of view the growing areas in Slovakia and sources of cash income. Grains show an increase of the total production cost without significant fluctuations around € 16,46 ha per year. Year-on-year growth of total labor costs (labor costs, including national insurance contributions) comprised to € 0,43 per ha.

The calculations confirm the current reality of Slovak agriculture, which continuously reduces the size of the workforce, which is caused by the production-economic dependencies in the production of various agricultural commodities, but also technological progress. In general, farmers prefer the production of such commodities (cereals), which reduce the complexity of the overall labor costs. Commodities that are reaching a higher costingness associated with constantly faster growth of total labor costs are suppressed in the economic and production conditions (livestock production, vegetable growing, and fruit). If the trend for the last 15 years will continue, agriculture will not be able to create new job opportunities.

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# The education development of population and its effect on the unemployment level in the EU

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## Abstract

Population education and qualification improvement of human capital is required not only for social country development but also for the successful application of labor market. The raising education is in the interest of each country, because the economic activity of its inhabitants has been increased.

The aim of this work was to analyze and evaluate the education development of the population the European Union, its level and variability in the set 27 member countries and the education effect on the labor market. The subject analysis was a productive part of the population aged 25–64 in the period 2000–2011. The initial data were obtained from the statistical evidence Eurostat for the analysis. The analysis was based on the chosen indicators: people percentage with at least upper secondary education, graduates percentage of lifelong learning and the unemployment rate.

The development was observed throughout the European Union. A positive development was proved on higher educational attainment for the person percentage. The growth was increased during the reporting period and men showed higher values than women. Over time, the differences decreased gradually. In the case of graduate percentage of lifelong education took a sharp increase followed by a slow decrease to 2005, while the women percentage was higher than among men. The empirical values both education indicators were aligned appropriate trendy polynomial functions such as linear and quadratic functions. The trend was also expressed in the unemployment rate as selected labor market indicators, and in this case it was a polynomial of higher degree.

The set of all the 27 member countries was evaluated in the last year that in 2011, while the selected indicators of development have belonged to the European Union as a whole unit. Due to the fact that more or less differences were occurred among the countries, they were divided into homogeneous groups and then evaluated according to the indicators of education and unemployment. The determination groups and classification countries were done using cluster analysis, namely the farthest neighbor method for Euclidean distances. The initial values were converted to standardized values of zero and unit-level variability for the application cluster analysis. 4 groups (clusters) were created based on the dendrogram and depicted in the graph of clusters including the classification individual countries. Southern European countries have showed a low level of education especially (Malta, Portugal, Italy, Spain), while the high education of the population has been achieved in the countries of Central and Eastern Europe (Lithuania, Czech Republic, Slovakia, Poland, Estonia, Latvia, Germany). The unemployment is highest in Spain.

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The set of countries of the European Union was described summarized characteristics of level and variability in terms of education and unemployment. The level was incomparable. The variability was approximately twice as large in unemployment than in education. The frequency distribution figure emphasizes the right-sided education partition versus left-sided unemployment partition.

The education quantification and its impact on the unemployment has been an important result. Indirect and very low dependence was proved in the value the correlation coefficient  $r = -0.1042$  in terms direction and degree. The regression function ( $y' = 12.09 - 0.029 x$ ) indicates a 10 % increase in population proportion of the aged 25–64 with upper secondary and tertiary education has led to reduction the unemployment by an average of 0.29 %. In the case of the group formation was proved highly significant difference among groups in the unemployment level according to standard education classification levels 0–2, 3–4, 5–6 (ISCED 1997). The dependence of the unemployment on education has been confirmed.

## Keywords

EU countries, education level, unemployment, employment, cluster analysis, analysis of variance

## Introduction

The education and intentional improvement in qualification of the population have been a prerequisite for social development. These aspects have become one of the main priorit state policy demonstrated primarily in activities of public and private educational institutions. The interest has focused on the lifelong adult education except compulsory education of youth and the subsequent possibility of further higher education. The need for education has become a general phenomenon of social life and human capital has been a significant factor in the labor market. Higher level of education enables greater economic activity and occurs also on the reduction of unemployment. The main responsibility for education of its population has belonged to individual countries, while mutual cooperation has existed with regard to the international character of economic and social processes.

This also applies for the countries of the European Union within cooperation programs in education and mobility have been developed.

The presented work aims to analyze the development of education and unemployment in the European Union, to evaluate the level and variability of selected indicators from 27 member countries and the influence level of education on unemployment.

## Materials and methods

The initial data of analysis were obtained from the statistical evidence Eurostat relating to the European Union as a whole unit and its 27 member countries. The population aged 25-64 was assessment as a productive part of the population.

As indicators of analysis were selected:

- population percentage with at least completed secondary education (upper secondary and tertiary education, upper secondary and higher education),
- population percentage who have completed life-long learning,
- unemployment rate.

The data involving the European Union as a whole unit are included in Tab. 1 and Tab. 2, the data of individual countries are showed in Tab. 3

**Tab. 1 The education of the population aged 25–64 in the EU as the whole unit**

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Upper secondary and higher education (%)												
Sum	64.4	64.9	65.8	67.2	68.4	69.4	69.9	70.7	71.3	72.0	72.7	73.4
Men	67.6	67.8	68.5	69.7	70.5	71.3	71.6	72.1	72.6	73.1	73.7	74.3
Women	61.3	62.0	63.2	64.7	66.2	67.5	68.3	69.2	70.1	70.9	71.7	72.7
Lifelong learning (%)												
Sum	7.1	7.1	7.2	8.5	9.2	9.6	9.5	9.3	9.4	9.3	9.1	8.9
Men	6.7	6.6	6.6	7.9	8.5	8.8	8.6	8.4	8.5	8.4	8.3	8.2
Women	7.6	7.6	7.8	9.0	9.9	10.4	10.4	10.2	10.2	10.2	10.0	9.6

**Tab. 2 Unemployment rate (%)**

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Sum	8.7	8.5	8.9	9.0	9.1	8.9	8.2	7.2	7.1	9.0	9.7	9.7

**Tab. 3 Selected indicators of the population aged 25–64 in the EU in 2011**

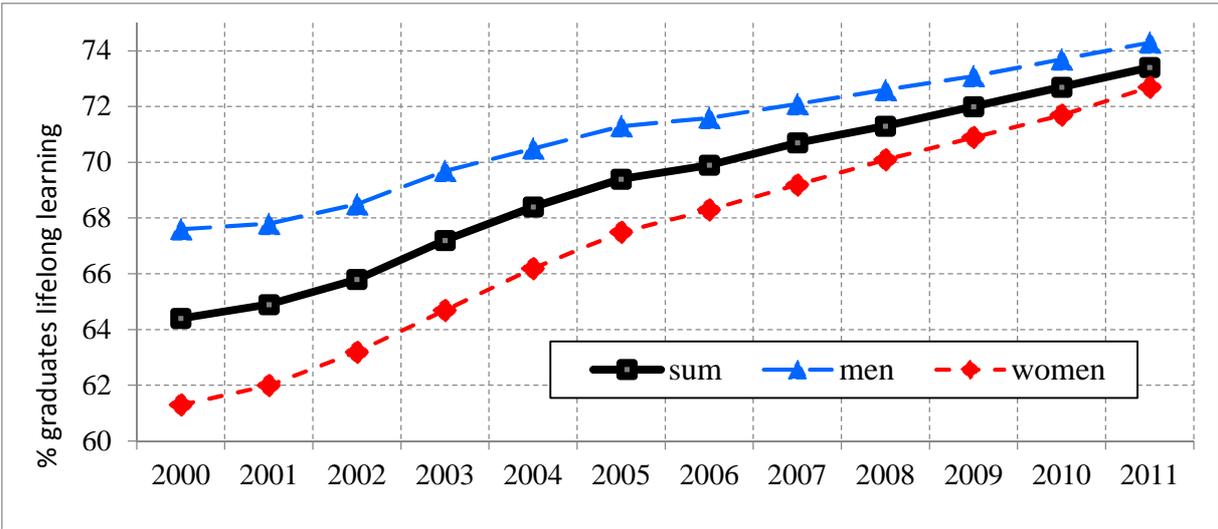
EU countries		Upper secondary and higher education (%)	Lifelong learning (%)	Unemployment rate (%)
1	Belgium	71.3	7.2	7.2
2	Bulgaria	80.2	1.2	11.3
3	Czech Republic	92.3	7.5	6.7
4	Denmark	76.9	32.5	7.6
5	Germany	86.3	7.7	5.9
6	Estonia	88.9	10.9	12.5
7	Ireland	73.4	6.7	14.4
8	Greece	64.5	3.0	17.7
9	Spain	53.8	10.8	21.7
10	France	71.6	5.0	9.6
11	Italy	56.0	6.2	8.4
12	Cyprus	75.0	7.7	7.9
13	Latvia	87.7	5.0	16.2
14	Lithuania	92.9	4.0	15.4
15	Luxembourg	77.3	13.4	4.8
16	Hungary	81.8	2.8	10.9
17	Malta	31.1	6.2	6.5
18	Netherlands	72.3	16.6	4.4
19	Austria	82.5	13.7	4.2
20	Poland	89.1	5.3	9.7
21	Portugal	35.0	5.8	12.9
22	Romania	74.9	1.3	7.4
23	Slovenia	84.5	16.2	8.2
24	Slovakia	91.3	2.8	13.6
25	Finland	83.7	23.0	7.8
26	Sweden	82.0	24.5	7.5
27	United Kingdom	76.4	19.4	8.0
The European Union		73.4	9.1	9.7

The number of statistical methods was used during processing data. The education development of the EU and the unemployment were described apart from graphic illustration

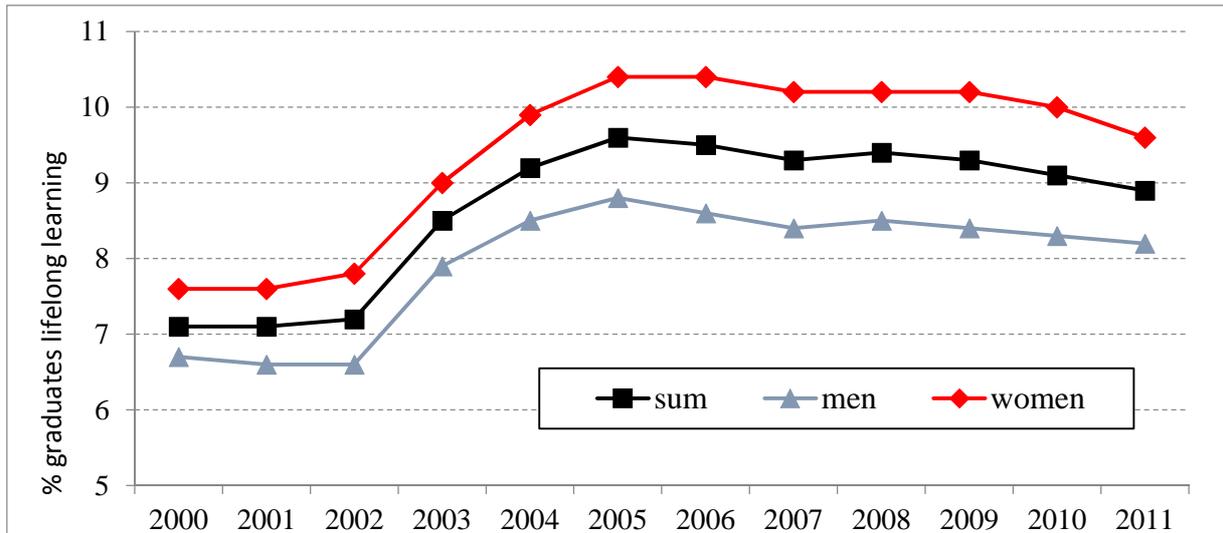
processing the empirical values trendy functions polynomic type. The furthest neighbor method using cluster analysis on Euclidean measurements distance was applied for classification countries into homogenous groups. The original values indicators were converted to a comparable standardized variables to mean zero and variance one for this purpose. The number of groups and the classification of countries presented in the graph of clusters were based on the dendrogram. Set of countries in terms of percentage proportion of people with higher education and unemployment was described the summarized characteristics and frequency distribution. The final part of the analysis was devoted to examining the impact of education on unemployment. The quantification of the relationship was expressed depending regression functions in terms of the course and correlation coefficient of the direction perspective and dependence degree. The paper is completed with the tables and graphs with regard to documentation and illustration.

**Results**

The education development is favorable in the European Union. During the period 2000-2011 a continuous growth was caused productive percentage proportion of the population aged 25-64 with at least upper secondary education. Higher levels were occurred in men than in women. The Fig. 1 shows that the differences were smaller over the years. A 6% difference had been existed but only a 2% difference was occurred at the end.



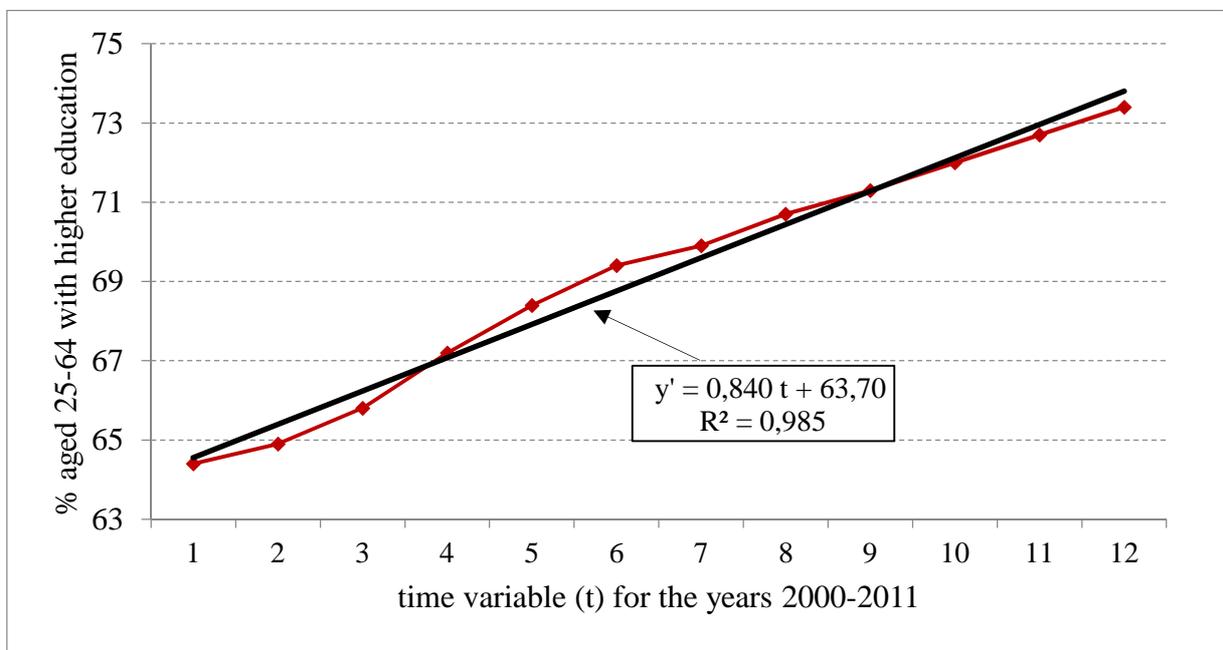
**Fig. 1 Population percentage of people aged 25–64 with at least upper secondary education in the European Union in the years 2000–2011**



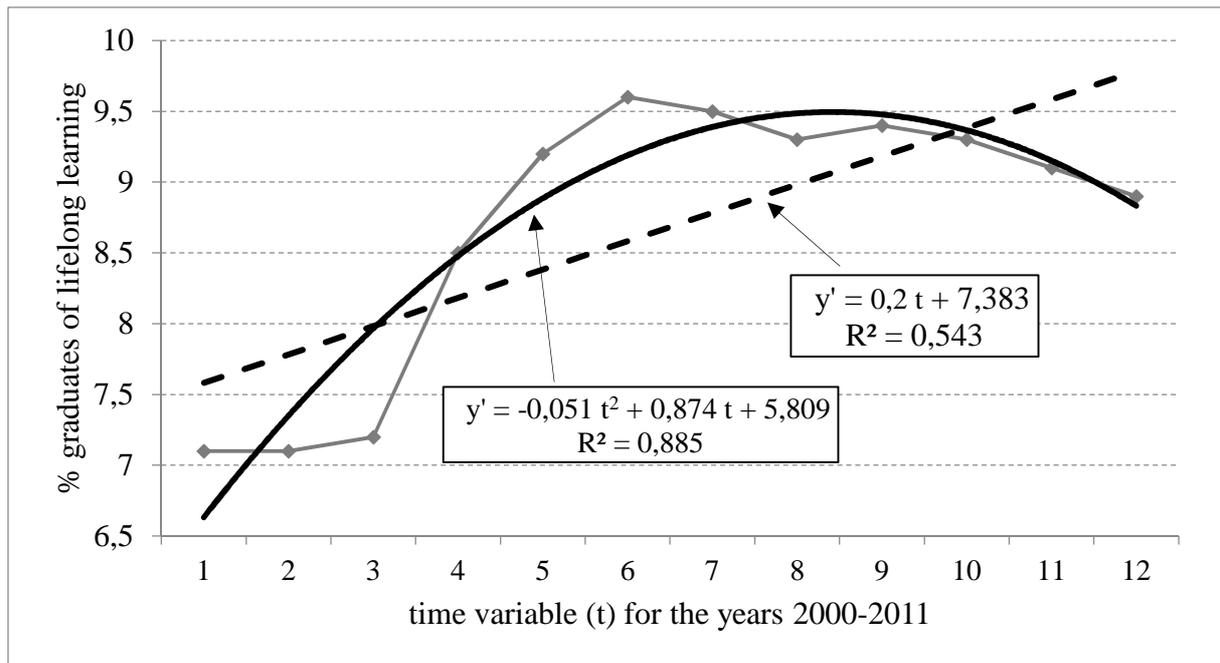
**Fig. 2 Graduates percentage lifelong education of the population aged 25–64 in the European Union in the years 2000–2011**

The development of lifelong education has been somewhat different (Fig. 2). While the graduate percentage showed a sharp increase before 2005, a slight decline occurred after this year. A higher percentage of graduates lifelong learning was found among women than men as a comparison to the classical education

The indicators development of classical and lifelong learning are described in Fig. 3 and Fig. 4 trendy functions.



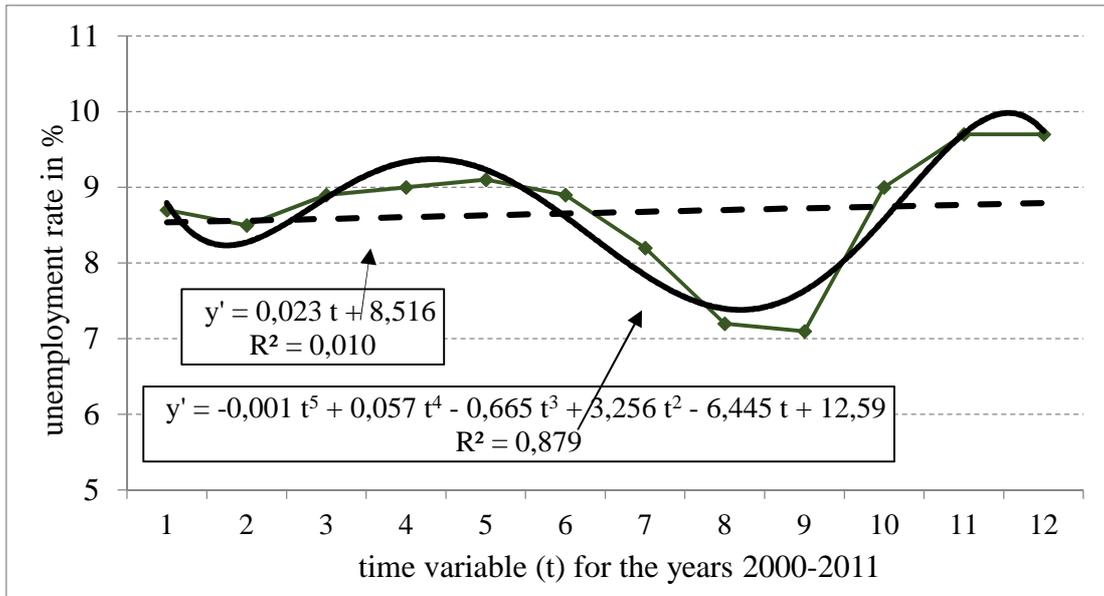
**Fig. 3 Trend (aligned values) % aged 25-64 with at least upper secondary education in the EU for the period 2000-2011**



**Fig. 4 Trend (aligned values) % aged 25-64 graduates of lifelong learning in the EU for the period 2000-2011**

The percentage of 25-64 year olds with upper secondary and tertiary education showed a linear trend given by the equation  $y' = 63.70 + 0.840 t$  with high determination coefficient  $R^2 = 0.985$ . The empirical values were proved a little difference from the theoretical values of trend. The equation showed on average the increase by 0.840% of educated population part each year. In the case of graduates percentage of lifelong learning was established more appropriate trend characterized quadratic function  $y' = -0.051 t^2 + 0.874 t + 5.809$  for the determination coefficient  $R^2 = 0.885$  due to the non-linear course. The different change was occurred due to the nonlinearity each year. Very roughly, it could be comprehensively used for the linear trend of entire period, so an average annual increase is of 0.2%.

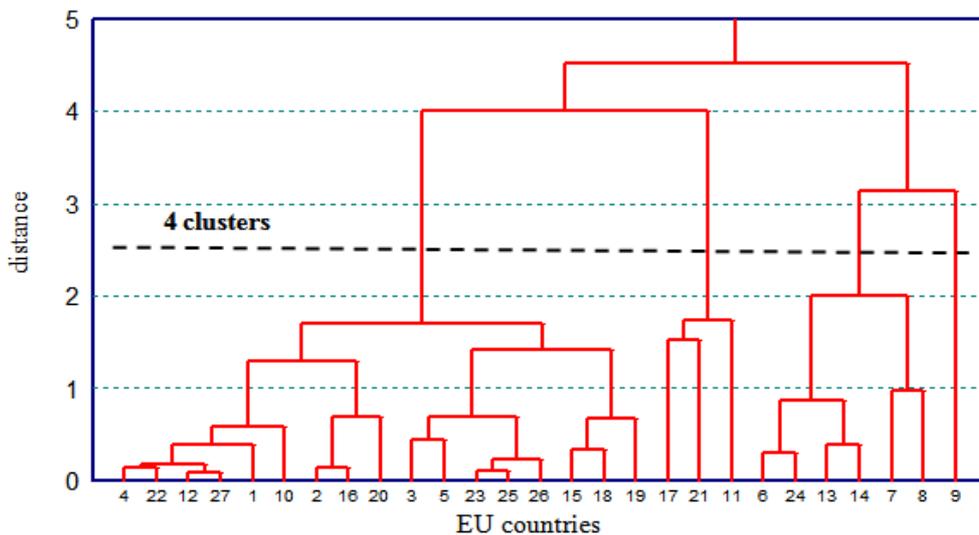
The development of unemployment rate was found out irregular, as shown in Fig. 5. A slight increase was replaced very favorable decrease in the years 2005–2008. Then the growth was occurred again, but sharper and stopped below 10% in 2010–2011. The course of trend function was expressed a polynomial of higher degree  $y' = -0.001 t^5 + 0.057 t^4 - 0.665 t^3 + 3.256 t^2 - 6.445 t + 12.59$  for the coefficient of determination  $R^2 = 0.879$ .



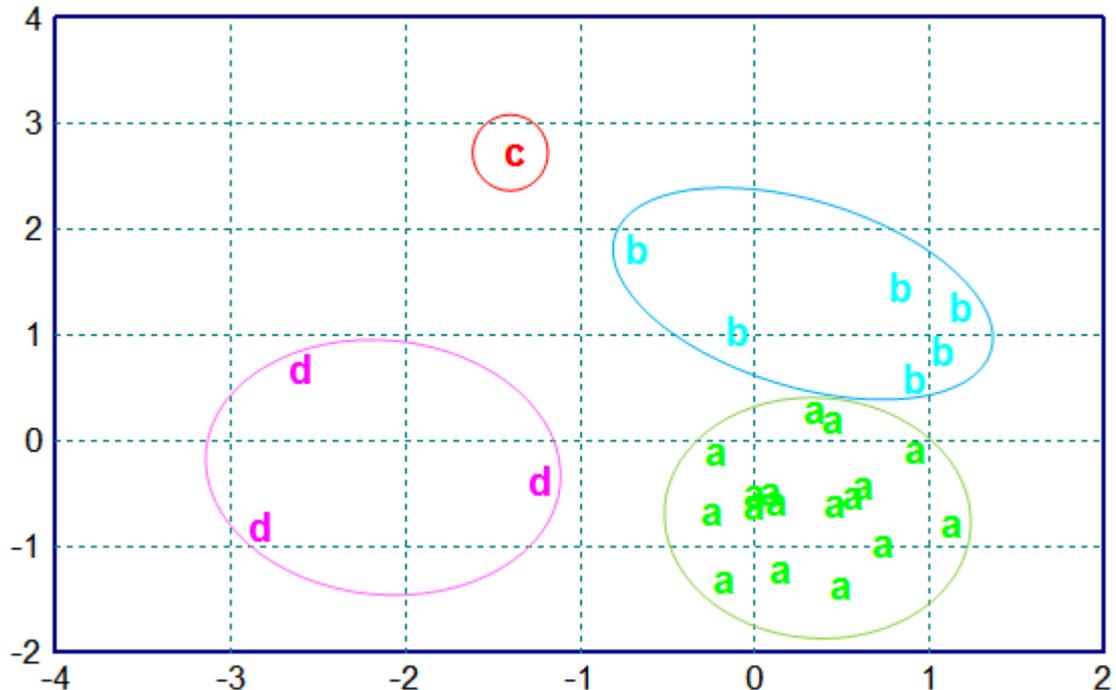
**Fig. 5: Trend (aligned values) unemployment rate 25–64 year olds in the EU for the period 2000–2011**

An important part of the analysis was done the division of the EU into homogeneous groups in which countries were closed (similar) according to selected education indicators and unemployment. For the purpose the cluster analysis was used and its farthest neighbor method in the Euclidean distance measurements. The indicators were transferred to a comparable standardized variables of zero level and unit variability, because of their different levels and variability that is  $U(0, 1)$ .

The creation groups of countries was based on the dendrogram (Fig. 6), which allows to select the appropriate number of groups (clusters) currently assigned to individual countries. The illustrative idea about clusters of countries was presented on a graph clusters (Fig. 7).



**Fig. 6 Dendrogram clusters of EU countries by education and unemployment for 2011**



**Fig. 7 Graph clusters of EU countries by education and unemployment for 2011**

Division of EU countries into groups:

Group a): average to slightly above average education, average to slightly below average unemployment

17 countries: 1–Belgium, 2–Bulgaria, 3–Czech Republic, 4–Denmark, 5–Germany, 10–France, 12–Cyprus, 15–Luxembourg, 16–Hungary, 18–Netherlands, 19–Austria, 20–Poland, 22–Romania, 23–Slovenia, 25–Finland, 26–Sweden, 27–UK

Group b): slightly below average to slightly above average education, above-average unemployment

4 countries: 7–Ireland, 8–Greece, 13–Latvia, 14–Lithuania

Group c) below average education, significantly higher than average unemployment

1 country: 9–Spain

Group d) below average to significantly below average education, average unemployment

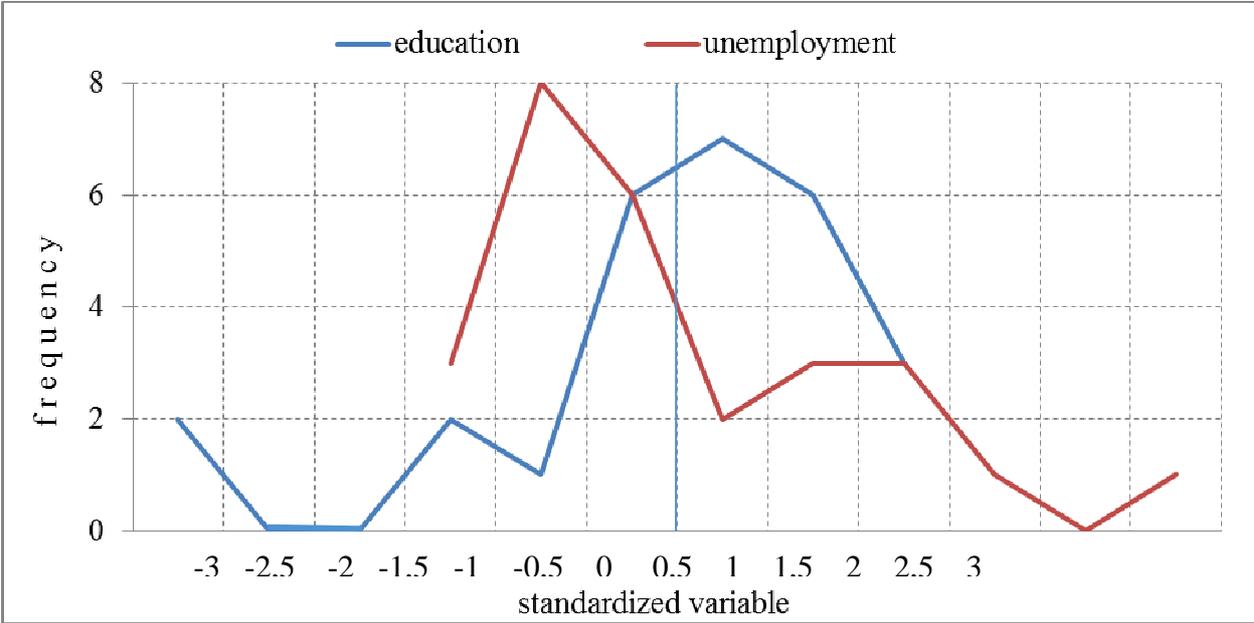
3 countries: 11–Italy 17–Malta, 21–Portugal

Summary level and variability characteristics were established for the more detailed description set of 27 EU countries (Tab. 4).

**Tab. 4 Characteristics of education and unemployment set of EU countries in 2011**

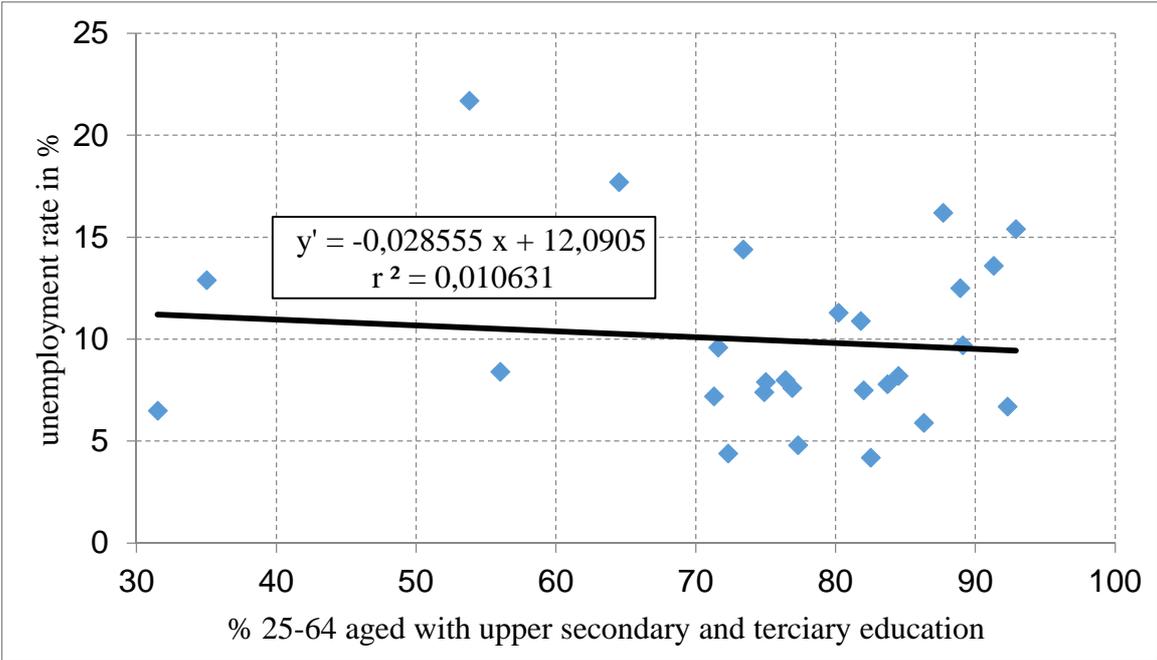
Characteristics	Percentage of 25-64 aged with higher education	Unemployment rate
Arithmetic mean	75.29	9.94
Median	77.3	8.2
Standard deviation	15.69	4.35
Variation coefficient	0.2084	0.4372
Minimum	31.1	4.2
Maximum	92.9	21.7

Variation coefficient is the only one comparable from all characteristics by which the unemployment proved roughly twice as large variability to the learning. Frequency distribution was comparable and should be based on standardized variables. The Fig. 8 shows that education is a right-sided asymmetry, the distribution of unemployment is sinistral. Modal interval education is within the limits 0 to 0.5, the unemployment rate is between -1 and -0.5.



**Fig. 8 Frequency distributions of education indicators and unemployment**

The evaluation and quantification of the expected education impact on the unemployment were also subject of the research. Scatter graphs (Fig. 9) was prepared for the graphical illustration of which the addiction should be obvious. The distribution of points, however, a greater dependence was not indicated confirmed by the course of the regression line and the value of determination coefficient.



**Fig. 9 The dependence between upper secondary and tertiary education of the population aged 25–64 and the unemployment rate in EU countries in 2011**

The results of correlation dependencies:

The determination coefficient  $r^2 = 0.010521$ , correlation coefficient  $r = -0.104$

At  $F(1,25) = 0.25863$  significance  $F = 0.6088$

	Constant	Standard error	t – statistics	Significance
Constant	12,0905	4,233625	2,85583	0,0085
Variable x	-0,028555	0,055094	-0,518296	0,6088

The results show a low no significant statistic correlation dependence. More distractions are interacting. According to the regression line  $y' = -0.0286x + 12.09$  the increase percentage of productive population aged 25–64 by 10% can be expected and reflected in a reduction in the unemployment rate by an average of 0.29%. A more appropriate way to demonstrate the education impact on unemployment is based on the analysis of variance to test differences in unemployment rates for the three groups formed according to the standard classification of education levels 0–2, 3–4, 5–6 (ISCED 1997). In this case highly significant effect can be proved.

### Conclusion:

Human capital is a prerequisite for socio-economic development of society and therefore in the interest of each country to increase its quality. The skills, ability and motivation of people are represented to use them. The basic factor for increasing qualification of human capital is education, because the education level growth of population is a fundamental task of the state policy. In recent years, the countries of the European Union has increased the population percentage with higher education, which among other things has had a positive effect on the labor market.

The presented work evaluates the development of population education and unemployment in the EU, the country division into groups according to selected indicators of education and unemployment, provides a summary of their characteristics and frequency distribution and quantifies the education effect on unemployment.

The work is the outcome of the research project No. MSM 6215648904 " Czech economy in the processes of integration and globalization and the development of the agrarian sector and the services sector in new terms of integrated European market "solved the PEF and FRRMS Mendel University in Brno.

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# Cooperation as a competitive advantage: Public private partnership in R&D

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## Abstract

This paper is aimed at evaluation the current situation of cooperation of private companies with public research organizations and it gives recommendations for improvements in this area. The main reason of low level cooperation of the university sector with enterprises is that this form of cooperation has not a long tradition in the Czech Republic and is not supported from the academic sector actively. At the present innovative enterprises cooperate on innovation especially together with suppliers and customers. Unfortunately there is not a deeper cooperation between innovative firms and public research organizations. Appropriate tools to promote collaboration between companies and public research could be tax deductions for companies that purchase results from public research organizations, innovation vouchers, or programs that promote long-term cooperation or horizontal mobility programs and counselling.

## Keywords

Cooperation, competition, enterprise, research and development

JEL: I23, O31

## Introduction

The current trend in the world economy is globalization and integration, which also leads to a rise of capital-intensive companies. The companies are forced to look for more efficient ways of utilization of its tangible and intangible capital in order to be able to confront powerful companies actively. Firms are looking for an innovative and effective alternative of business which will be able to use new technologies and simultaneously to remain cost-competitive. A complicated situation occurs in small and medium-sized businesses which have to flexibly respond to market changes and adapt to the dominant firms. In this case cooperation is one of the opportunities how to increase the competitive advantage. Partnerships are becoming a frequently used method of cooperation between enterprises. It is a low-cost tool which can be used immediately. Cooperation among enterprises can significantly contribute to the strengthening stability of participating subjects and it may help to maximization of a long-term economic profit. This paper is aimed at evaluation the current state of cooperation of private companies with public research organizations and it gives recommendations for improvements in this area.

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## Results and discussion

Generally, it can be argued that firms do not own all sources for its production or services and are therefore dependent on sources provided by suppliers. Thereby it is necessary to cooperate with them. Legally and economically independent companies are organized into larger economic units through cooperation or concentration. The motivation for establishing of co-operation is the maximization of economic profit, the enhancement of competitiveness and the improvement of the market position, the reduction of the risk by spreading the business among larger number of partners and creation of economic organizations which can better promote their common interests towards the public administration. Higher competitiveness at the microeconomic level can result in an increased competitiveness of a country which is dealt by Palát and Čeleš (2012) and Palát (2010). Wöhe (2007) assumes that cooperation is created by a voluntary clustering for implementation of one or more contracted projects or for creation of communities of interest for long-term goals fulfilment.

The cooperation of associated enterprises is performed on the basis of coordination of business functions or its exclusion to the joint management (e.g. coordination of the sales policy according to cartel agreements or by creating a common centre for research and development), (Novotný, Suchánek, 2004). The result of a cooperation agreement is a bilateral expediency and therefore a cost reduction and an increase of profit. Concentration represents the clustering of companies where the economic independence disappeared. Grega (2004) states that the process of concentration is significantly reflecting in the behaviour of individual economic entities regardless of whether they are in the market with homogeneous or differentiated products. A growing number of businesses operating in the market leads then an increase in costs.

Currently, companies try to manage such processes that lead to their high profitability and higher profits. A progressive scientific and technological development and production tasks can be secured but only in cooperation with different and also mutually competing businesses. Cooperation between enterprises is based on a contract, where one company may act as managerial company that economically and technically manages and provides its know-how to another firm that owns the factors of production and provides labour. In the case of cooperation with a foreign firm based on investment this may allow an entry into foreign markets, an increase in the safety of an investment and the firm's liquidity, but also a greater profitability than domestic businesses. The productivity keeps increasing as a result of these developments (Palát, 2011). As for cooperation based on equity participation of a foreign partner, it is then known as the joint venture. Forms of inter-company cooperation are varied and decisions about cooperation should be based on several considerations:

- Is it possible and necessary to enter the cooperation with another company?
- Which areas of business or business activities will be positively affected by this cooperative relationship?
- What is the desired intensity and form of cooperation?
- Will it be possible to agree with the partners on the definition of competences and tasks?
- How will the financing and the accounting be structured. What are the legal norms that regulate cooperation?

Based on the answers to the above questions, the companies decide what type of cooperation they choose. Cooperation between business entities leads to the creation of a business networks. In this form of cooperation stability and functional relationships between network members, a clear business plan and the possibility of further development of cooperation is required. Business network can be formed in the area:

- Production cooperation, which is direct production cooperation between businesses, where the production process is divided between various manufacturers.

- Cooperation in the field of management involves collaboration in service or sales areas, which helps to improve the market position.
- Cooperation in the financial sector can help businesses to implement capital-intensive investments or to obtain credit.
- Complex cooperation is a higher form of cooperation, which includes all previous areas of cooperation.

Cooperation between enterprises can take place by structural distribution on the horizontal level when it comes to cooperation entities of the same or a related field. The goal is to achieve higher efficiency of operations through economies of scale. Vertical cooperation is the cooperation from raw materials to the final product. In this case all stages of production, sales and research are interconnected. Conglomerate cooperation is carried out by producers in the same field and manufacturers in related fields or industries. Lateral cooperation is being realized between firms from different disciplines to exchange strategic resources (e.g. know-how, access to markets, competences).

Cooperation of the public and the business sector (Public Private Partnership, PPP) has recently been a frequent topic for the possibility of using the resources and capabilities of the private sector in the provision of public infrastructure and services (PPP,2013). Through this cooperation the quality and efficiency of public services can improve and accelerate the implementation of infrastructure projects that have a positive impact on economic development. Cooperation within the PPP is realized through projects based on long-term contracts of public and private sector whose goal is to get a better value for money for the public sector and the possibility of a long-term income for the private sector. Jurčík (2007) and Jurčík (2012) discuss economic impacts of the EC procurement policy and also legal aspects of the transparency and anti-corruption amendment). Another form of cooperation is the cooperation between two or more public entities. Mostly municipalities or associations of municipalities or government cooperation with public bodies are entering this kind of cooperation.

### **Cooperation of public and private sector in research and development**

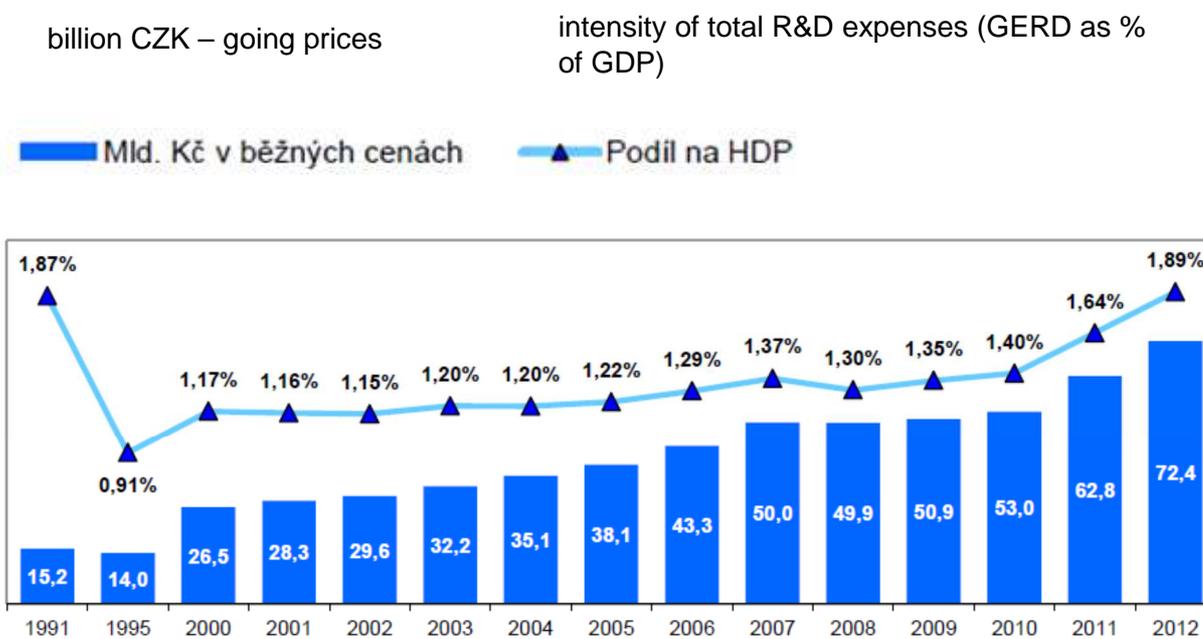
Cooperation of public and private sector in research and development was dealt by Pazour (2013). Research and development in the Czech Republic (CR) focuses on eight long-term trends, which include sustainable development, molecular biology, engineering, energy resources, material research, information technology, security and social sciences research. Trained workers are highly qualified but are no longer competitive in our conditions because of the excessively fragmented research potential and they don't have sufficient facilities for a high-quality and effective research. Resources to fund research and development in the Czech Republic are provided in two forms. Purpose-built funding provides resources for a pre-authorized purpose through agencies or ministries which lists public competitions which subjects respond proposing solutions or projects. Institutional funding is used to cover the costs of specific research institutions (such as the Academy of Sciences of the Czech Republic, the Ministry of Education and other research organizations according to achieved results).

### **Funding Sources of research and development in the Czech Republic**

Research and development (R&D) in the Czech Republic is funded from private, public, national and international sources. Private resources flow from businesses and are among the highest in comparison to the total gross expenditure on research and development. Public funds support research activities at public universities, furthermore are the funds distributed to particular ministries, the Grant Agency, Technology Agency of the Academy of Sciences and to other research institutions that are supported by the institutional support.

The indicators of R&D in the Czech Republic are described in Peroutková (2013). Fig. 1 shows total expenditure on research and development according to the indicator of GERD (Gross Domestic Expenditure on R&D). In the observed period from 1991 to 2011, the

expenditure has raised steadily, thanks also to foreign sources, which may be utilized after the EU accession. Investment in science and research is considered as a top priority by the Czech government, even if total public spending is not growing due to the economic crisis and tight budgets. Mainly governmental and academic sectors are supported by public funds. The intensity of the total R&D expenditure in observed years has a growing trend, which is influenced by the size of GDP. The increase in R&D intensity is a focused activity in the European Union with pressure on increasing the private investment.

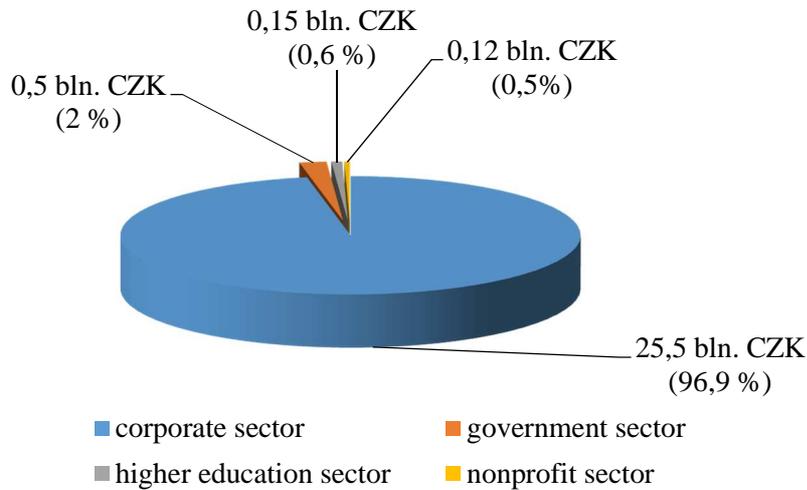


**Fig 1: The total R&D expenditure (GERD) in the Czech Republic in 1991–2012.**  
**Source: RVVI (2013)**

The smallest amount of money from public funds comes into research and development in the private sector. The state expects that companies will invest themselves into a costly research and development to maintain own competitiveness. In 2011, the proportion of total research and development funding from private funds was 46.9 % of which only 0.5 % was for research conducted in the university sector.

Fig. 2 shows a pie chart with R&D expenditure financed from private funds and divided by performing sectors. We can say that the business sector has been funding his research and development by himself and seldom enters into cooperation with the government, university or non-profit sector. The business sector in the Czech Republic provides the largest expenditure on R&D compared to other countries of the former Eastern Bloc. But in European comparison, the Czech Republic ranks in R&D expenditure in the business sector below the average of the EU-27.

### According to sectors performing R&D in 2012



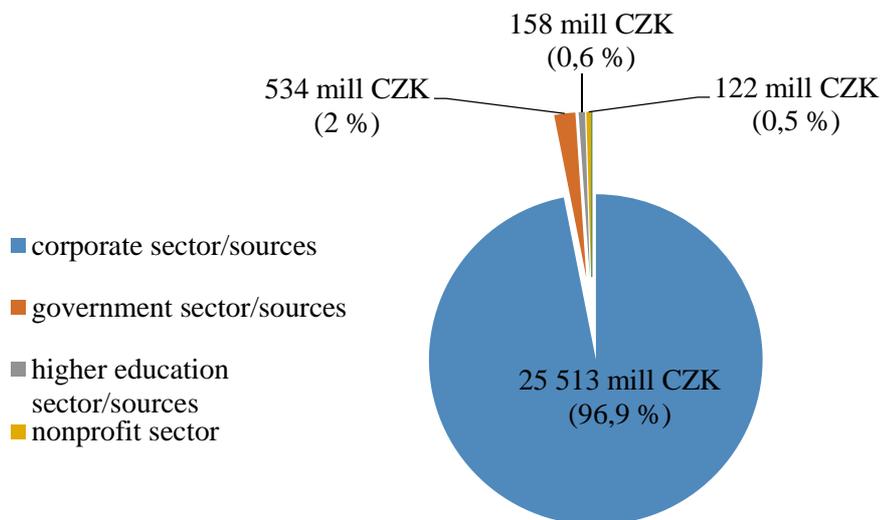
**Fig. 2: R&D expenditure financed from corporate sources according to sectors performing in the Czech Republic in 2012**

Source: RVVI (2013)

### Cooperation with the business sector

As mentioned above, the business resources make up nearly half of the total R&D funding. Fig. 3 displays the business sector as the main source for funding of research and development activities, Fig. 4 then displays the implementation sector, which is a field where research and development activities are actually carried out.

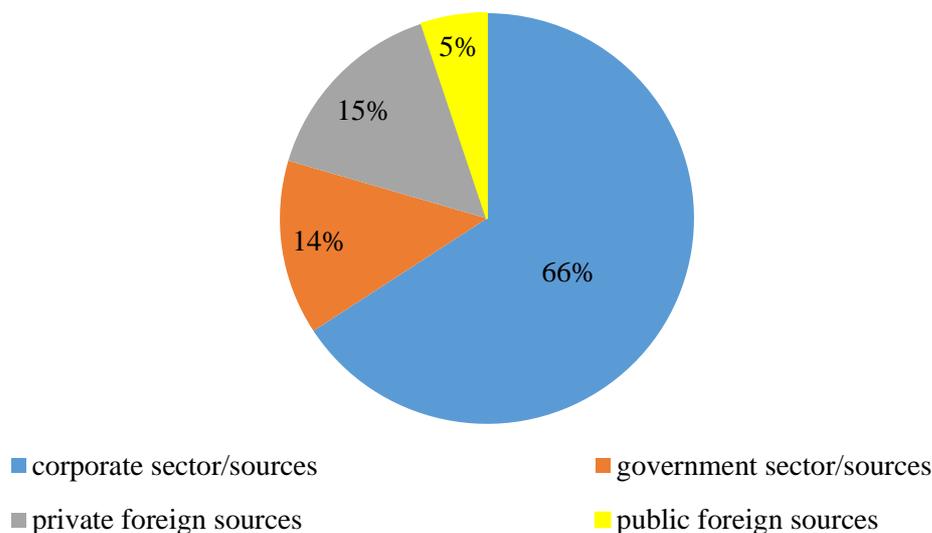
### Corporate sources 26 328 mill CZK (36,4 % from GERD)



**Fig. 3 Cooperation with corporate sector in the Czech Republic in 2012**

Source: RVVI (2013)

**Corporate sector - total 38 790 mill CZK = 53.6 % of total R&D expenditure**

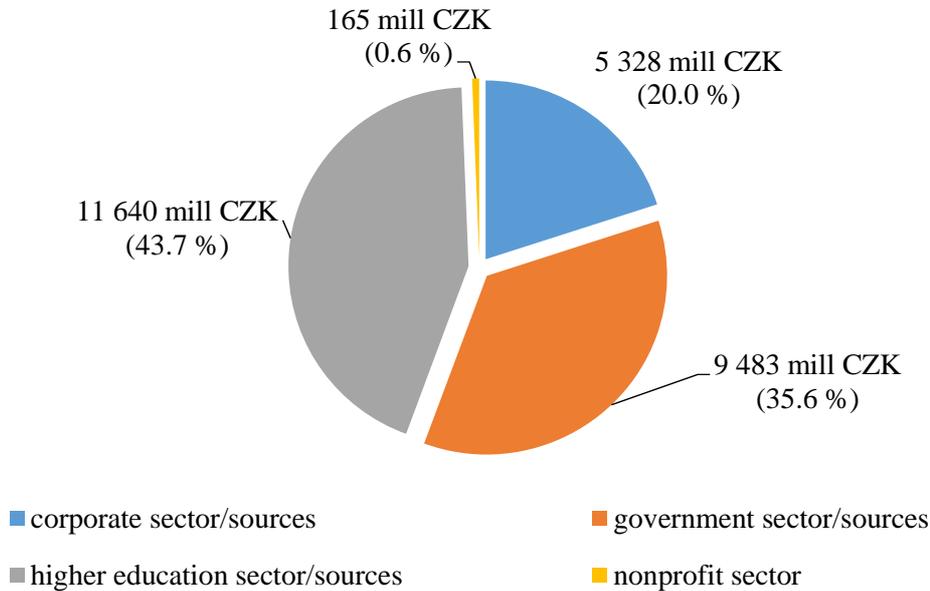


**Fig. 4 Cooperation with corporate sector in the Czech Republic in 2012**  
**Source: RVVI (2013)**

In 2012, business resources according to the Czech Statistical Office (CSO) represented CZK 26,328 million. Of this amount, 97% was utilized for research funding again in the business sector. The remaining sectors provided financial resources only minimally. Government sources accounted for CZK 534 million, university sources CZK 158 million and the private non-profit sector CZK 122 million. In the area of R&D activities the business sector used 53.6 % of total R&D expenditure. An important provider of financial sources was the government sector (14 %) and private foreign resources (15 %).

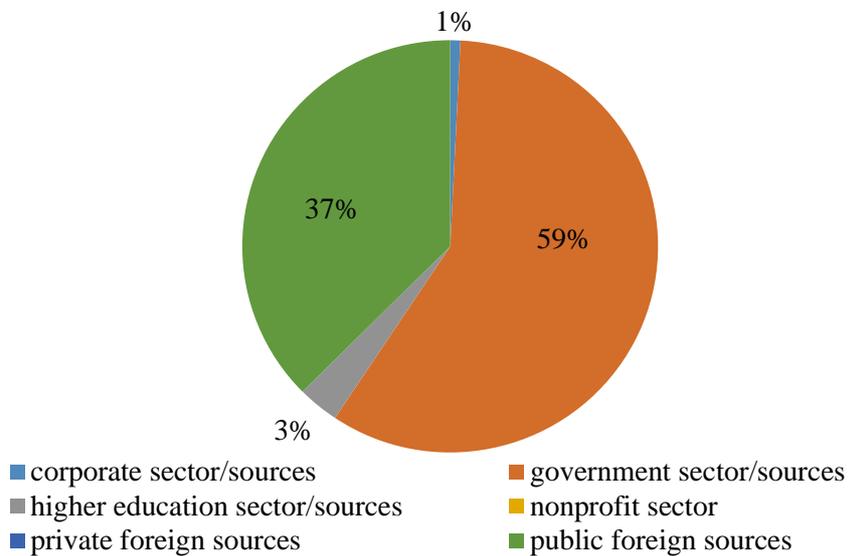
The university sector is funded from public sources which in 2012 comprised 27.5 % of all R&D expenditures in the Czech Republic. Fig. 5 shows the share of particular sectors on public resources. Nearly eighty per cent of public resources are provided to the government sector and the university sector; enterprises have been supported from the total expenditure by 20 %. Other national resources which represent own revenues of universities that make up just a negligible fraction of their income are not captured in this chart. Fig. 6 shows that the university sector in R&D is of 60 % depending on public sources, 37 % on foreign sources (projects funded by the European Union) and only 1 % are the sources from businesses. One positive aspect can be found at least in an increase in the share of foreign resources compared to previous years when they constituted less than 10 %.

**Public sources - total 26 616 mill CZK (36.8 % of GERD)**



**Fig. 5 Public sources in the Czech Republic in 2012**  
 Source: RVVI (2013)

**Higher education sector - total 19 879 mill CZK = 27.5 % of total R&D expenditure**



**Fig. 6 Cooperation with university sector in the Czech Republic in 2012**  
 Source: RVVI (2013)

The reason for a very low level of cooperation of the university sector with firms is mainly that this form of cooperation doesn't have a tradition in the Czech Republic and is not actively supported by the academia. The cooperation between universities and industry would bring much more knowledge and skills to both parties and also the motivation for students and

researchers. Currently, technically innovative enterprises cooperate on innovation especially with suppliers and customers but unfortunately there is no deeper cooperation between innovative firms and public research organizations. Different forms of financing innovations are described in ROPMS (2014).

Public universities and research organizations do not engage in cooperation primarily because of low motivation of researchers to produce results applicable in practice, the lack of infrastructure to facilitate cooperation in R&D, the lack of entrepreneurial education on faculties of science and engineering. The incentives made by private companies do not come to work primarily because of ignorance and disregard of public research organizations but also because of the demand rather for the finished results of R&D than for patents and theoretical knowledge. Appropriate tools to promote cooperation between companies and public research could be tax deductions for companies that purchase results from public research organizations, innovation vouchers, or programs that promote long-term cooperation or horizontal mobility programs and counselling.

## **Conclusion**

Currently we search for an innovative and effective alternative of business that will be able to use new technologies and remain price competitive. One of the ways to increase the competitive advantage of the company is the cooperation where the most used way of cooperation between enterprises is on the basis of partner relationships. It is a low-cost tool that can be used immediately. The companies that were economically and legally independent become organized into larger economic units through cooperation or concentration. The aim of businesses is to attempt to control such processes that lead to their high cost-effectiveness and higher profits. A Progressive scientific and technological development and production tasks can be arranged but only in cooperation with scientific research organizations or even different competing businesses.

The research and development in the Czech Republic is funded from private, public, national and international sources. Private resources flow from businesses and are among the highest in comparison to the total gross expenditure on research and development. The smallest amount of money comes from public funds in research and development in the private sector. The state expects that companies will invest themselves in a costly research and development to maintain their competitiveness. The business sector has been funding research and development by himself and enters only minimally into cooperation with the government, university or non-profit sector. But compared to other countries of the former Eastern Bloc, the business sector in the Czech Republic provides the largest share of expenditure on R&D. In international comparison, the Czech Republic ranks in R&D expenditure in the business sector to the average of the EU27.

The university sector in R&D is factually dependent on public sources, the sources of business account for only 1%. A low level of cooperation of the university sector with firms is mainly because this form of cooperation has no tradition and is not actively supported by the academia. The cooperation between universities and industry would bring much more knowledge and skills to both parties and also the motivation for students and researchers. Currently, technically innovative enterprises cooperate on innovation especially with suppliers and customers but unfortunately there is no deeper cooperation between innovative firms and public research organizations. Appropriate tools to promote cooperation between companies and public research could be tax deductions for companies that purchase results from public research organizations, innovation vouchers, or programs that promote long-term cooperation or horizontal mobility programs and counselling.

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# IT-supported teaching of Microeconomics

Martin FAJKUS<sup>1</sup>

## Abstract

In the presented paper a computer program which demonstrates basic economic characteristics like costs, demand, Cobb-Douglas function etc. is described and discussed. The program, written by the author in the *Mathematica* software, has three modules.

The first module deals with the costs, revenue and profit, the second module is oriented to demand and supply issue and the third module displays the Cobb-Douglas production function with the isoquants selected by the user.

The whole program is very user friendly and intuitively to control. It is suitable both for demonstrations and explorations of the behavior of the economic characteristics.

## Keywords

microeconomics, economic functions, Mathematica, IT in teaching

## Introduction

The purpose of the work was to create a program which could be used by teachers to demonstrate certain economic phenomena and students to explore some characteristics of economic functions.

All of the in abstract mentioned characteristics which are used especially in microeconomics are functions of one or more variables. The program allows the user to set his own functions, their domain and range in the first and second module and appropriate constants in the third module. After that selected graphs and other characteristics could be viewed.

## 1. The program code

As the purpose of this article is to describe the program from the user's point of view, the program code will be mentioned very briefly.

In each module there are default settings for every function. Then other functions are calculated according to the equations shown below in the text in the appropriate section. Visualization is made mainly using the command *Manipulate*. Except of the main panel with the visualization window, there are some interactive elements like dialog boxes, checkboxes and sliders, so the appropriate commands are used.

Because the user may change many inputs, some variables should be considered as local and so a command *Dynamic* or *Dynamic Module* is needed.

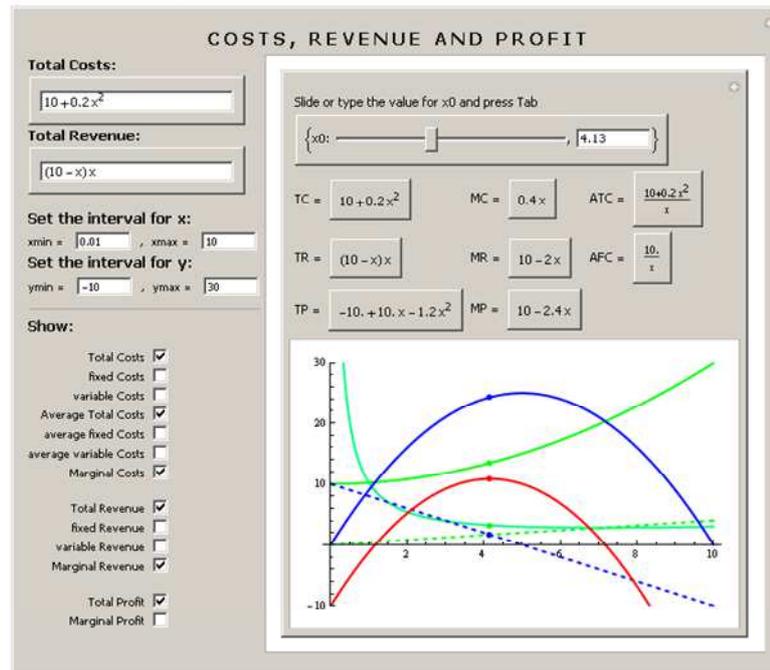
## 2. Costs, revenue and profit

After the start of the first module, oriented on costs, revenue and profit functions, the user sees a panel like on the Pic. 1. The panel has two major parts: on the left hand side there are dialog boxes for setting the inputs (the total costs and the total revenue functions together with the interval for  $x$  and  $y$  values) and checkboxes which serve to control the appearance of the output graphs. On the right hand side there is a slider, small panels with equations of the set and calculated functions and a window in which the desired graphs are displayed.

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Default settings for the total costs (TC) and the total revenue (TR) functions as well as for intervals of domain, usually the number of products (x-axis) and of range, usually the price or amount of money in general (y-axis) are used. Both of the functions and both of the intervals may be changed by the user directly by typing the equations or values into the dialog boxes in the upper left hand part of the main panel.



**Pic. 1 A sample of a panel from the first module**

Once the functions of TC and TR are set (whether by default or by the user) the following functions are calculated and their equations (not graphs) are displayed on small panels in the upper right hand part of the main panel:

$$\text{Fixed costs: } FC = TC(0) \quad (1)$$

$$\text{Variable costs: } VC(x) = TC(x) - FC(0) \quad (2)$$

$$\text{Average total costs: } ATC(x) = \frac{TC(x)}{x} \quad (3)$$

$$\text{Average fixed costs: } AFC(x) = \frac{FC(x)}{x} \quad (4)$$

$$\text{Average variable costs: } AVC(x) = \frac{VC(x)}{x} \quad (5)$$

$$\text{Marginal costs: } MC(x) = \frac{dTC(x)}{dx} \quad (\text{the first derivative of TC}) \quad (6)$$

$$\text{Fixed revenue: } FR = TR(0) \quad (7)$$

$$\text{Variable revenue: } VR(x) = TR(x) - FR(0) \quad (8)$$

$$\text{Marginal revenue: } MR(x) = \frac{dTR(x)}{dx} \quad (\text{the first derivative of TR}) \quad (9)$$

$$\text{Total profit: } TP(x) = TR(x) - TC(x) \quad (10)$$

$$\text{Marginal profit: } MP(x) = \frac{dTP(x)}{dx} \quad (\text{the first derivative of TP}) \quad (11)$$

To display a graph of some desired function the user has to check the appropriate checkbox in the left hand part of the main panel. The graph will immediately appear in the window situated in the bottom right hand part of the window.

On the top of the right hand side there is a slider. Changing the position on this slider using the mouse or typing a value of  $x_0$  into the dialog box next to the slider, on each of the displayed graphs a point with the  $x_0$  co-ordinate appears.

Displaying single graphs or using the slider to shift the point in different positions and displaying different graphs at the same time many economic relationships can be shown and explained. E.g.:

## 2.1 Curve characteristics

Once a single graph of a function is shown, one can see the monotonic properties and the flexion. Fixed costs and fixed revenue are constant functions. Total costs and variable costs are usually increasing functions and can be either concave up or concave down. Some functions may have in some cases a limit when their argument approaches infinity. This can be seen e.g. for the average total costs function, in case of linear total costs.

On the other hand, displaying more than one graph e.g. the total costs, variable costs and fixed costs at the same time, it can be seen that the total costs function is the sum of the two latter. The variable costs curve is simply shifted up by the fixed costs value. The same is true for the total revenue, variable revenue and fixed revenue.

## 2.2 Special points

### 2.2.1 BEP

BEP is the abbreviation for the Break Even Point. From the mathematical point of view it is usually an x-intercept of a curve. So if the BEP for the total profit function, for example, should be shown, the user may, using the slider, shift the displayed point to the position (or positions) where the graph of the TP function crosses the x-axis.

Let's sign  $BEP = x_0$ . Then, because in this case  $TP(x_0) = 0$  and  $TP = TC - TR$ , it implies that for  $x_0$  we get  $TC(x_0) = TR(x_0)$ . So if three graphs, namely for TP, TC and TR are displayed and using the slider a point is shifted to the position where  $TP = 0$ , the appropriate points for TC and TR will fuse into one point in the position where the TC-curve intersects the TR-curve.

### 2.2.2 Minimal average total costs

a) in case of linear total costs i.e.  $TC(x) = ax + b$ , the average total costs are

$ATC(x) = \frac{TC(x)}{x}$  (see 3). Combining these two equations follows  $ATC(x) = \frac{ax + b}{x}$  which is an equation of hyperbola. The minimal value does not exist, but from the asymptotic behavior it is obvious that ATC will be minimal for as big  $x$  as possible. In other words: in case of linear total costs, the average total costs decrease if more and more amount of good is produced.

To show this fact, the user should set linear total costs first, then check the "total costs" and "average total cost" checkboxes on the left hand side part of the main panel. Using a slider, the points move along the curves and one can see the value of ATC decreases.

b) if  $x_0$  is the amount of products by which in case of nonlinear total costs the minimal average costs are achieved, then marginal costs for  $x_0$  are equal to minimal average total costs for  $x_0$ . To prove this fact mathematically, we recall that to calculate an extreme (either minimum or maximum) of a function  $f$ , the derivative of that function (i.e.  $\frac{df}{dx}$  or simply  $f'$ ) should be calculated and subsequently the equation  $f'=0$  must be solved. If now, instead of  $f$  the ATC function is put, it follows:

$ATC \rightarrow 0$  but because according to (3)  $ATC = \frac{TC}{x}$  the equation changes to

$$\left(\frac{TC}{x}\right)' = 0 \quad \text{and so the derivative of a ratio should be calculated:}$$

$$\frac{TC'.x - TC.1}{x^2} = 0$$

Solving this equation step by step we obtain:

$$TC'.x - TC = 0$$

$$TC'.x = TC$$

$$TC' = \frac{TC}{x}$$

and now according to (3) and (6) we finally get:

$$MC = ATC$$

So far the mathematical proof.

But to demonstrate it graphically using the program, the user can simply enter a nonlinear total costs function, check the checkboxes for displaying TC, ATC and MC and using the slider shift the point to the minimum of TC. At the same time the appropriate points for ATC and MC will fuse into one point in the position where the ATC-curve intersects the MC-curve.

### 2.2.3 Maximal profit

How to prove and display another fact that maximal profit occurs when marginal revenue is equal to marginal costs?

In the previous section it was mentioned how to calculate an extremum of a function. Taking that into account it may be written:

$$TP \rightarrow \max .$$

$$TP' = 0$$

$$(TR - TC)' = 0$$

$$TR' - TC' = 0$$

$$TR' = TC'$$

$$MR = MC$$

but because according to (10)  $TP = TR - TC$  the equation changes to as the derivative of subtraction is a subtraction of derivatives we have:

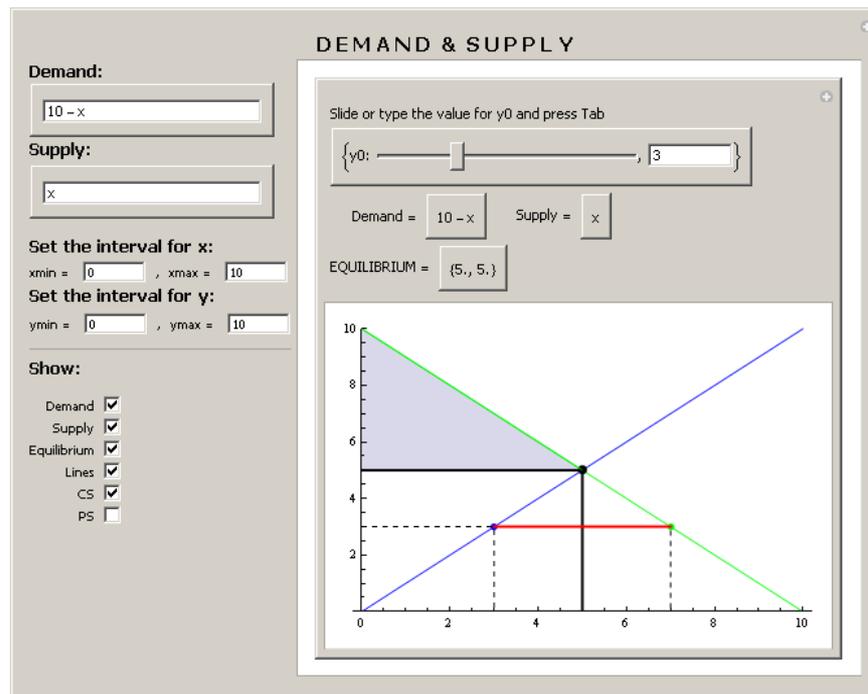
and now according to (6) and (9) we finally get:

Again, to demonstrate it graphically using the program, the user has to enter a total costs and a total revenue functions, check the checkboxes for displaying TP, MR and MC and using the slider shift the point to the maximum of TP. At the same time the appropriate points for MR and MC will fuse into one point in the position where the MR-curve intersects the MC curve.

The above mentioned examples are only a sample of possible issues. Certainly there are many more of them to explore.

### 3. Demand and supply

Launching the second module, which deals with the demand and supply, a panel like on the Pic. 2 appears. Similarly to the previous module the panel has two major parts: on the left hand side there are dialog boxes for setting the inputs (the demand and the supply functions together with the interval for  $x$  and  $y$  values) and checkboxes which serve to control the appearance of the output graphs and other characteristics. On the right hand side there is a slider, small panels with equations of the set demand and supply functions and calculated market equilibrium point and, again, a window in which the desired graph and characteristics are displayed.



**Pic. 2 A sample of a panel from the second module**

Default settings for the demand ( $D$ ) and the supply ( $S$ ) functions as well as for intervals are used, but may be, of course, changed by the user directly by typing the equations or values into the dialog boxes in the upper left hand part of the main panel.

Checking the checkboxes “Demand” and “Supply” will result into displaying the graphs of the appropriate functions. As in the previous module the graphs will immediately appear in the window situated in the bottom right hand part of the window.

Checking the other, not yet mentioned checkboxes, and using the slider on the top of the right hand side to shift the point(s) on the curves in different positions allows to display other interesting economic relationships connected with the demand and supply functions. E.g.:

#### 3.1 The market equilibrium

To display the point of equilibrium, the user has to check the “Equilibrium” checkbox on the left hand side. If done, a black point – intersection of the demand curve and supply curve appears in the window in the bottom right hand side. Also horizontal and vertical lines connecting this point with its  $y$  and  $x$  coordinates respectively are shown. The  $y$  co-ordinate represents the equilibrium price while the  $x$  co-ordinate the equilibrium amount. The appropriate values are displayed on a small panel situated above the graphs.

### 3.2 The shortage and the surplus

Checking a checkbox named “Lines”, some black dashed and one red line segment are displayed in the output window. The position of the horizontal line is set by the user. Moving a slider in the upper right hand part or typing the value into the dialog box just on the right hand side of it, the user changes the  $y$  co-ordinate of the horizontal line. The dashed lines connect the points which are the intersection points of the horizontal line and the demand and supply curves. The red line segment connects these two points.

Because the  $y$  co-ordinate represents the price, in case of no market equilibrium the length of the red line segment (the difference between the  $x$ -values corresponding to the  $y$ -value) corresponds with the surplus of a good (if the price is higher than the equilibrium price) or with its shortage (if the price is less).

### 3.3 The consumer surplus and the producer surplus

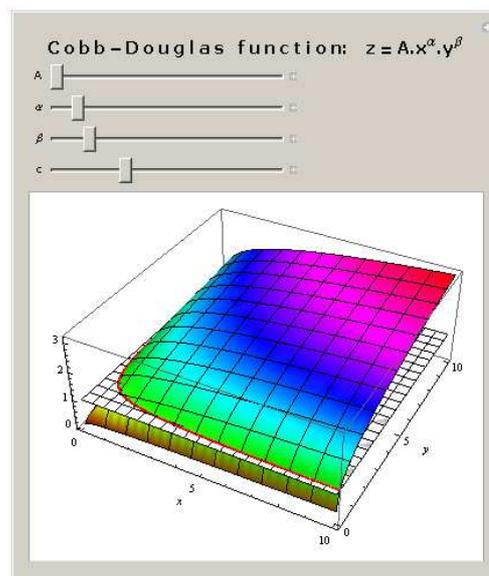
Finally the areas which represent the consumer surplus or the producer surplus can be displayed using the checkboxes “CS” and “PS” respectively. These surpluses graphically are the areas between the graph of the demand function and the equilibrium price line or between the equilibrium price line and the supply function respectively. If the appropriate checkboxes are checked, the areas are shaded with different colors.

## 4. The Cobb-Douglas function

The Pic. 3 shows a panel which appears when the third module is started. A graph of a Cobb-Douglas function  $z = A \cdot x^\alpha \cdot y^\beta$

is already displayed. Moving the appropriate sliders the user may change all of the three constants  $A$ ,  $\alpha$  and  $\beta$ . To display different isoquants, the user has to change the value of another constant  $c$ . From the mathematical point of view, the equation  $z = c$  in 3D

graphically represents a plane. The intersection of this plane with the graph of the Cobb-Douglas function is in economy called an isoquant and in the output window is displayed in a red colour. Using the mouse the whole picture can be rotated, so both the function and the isoquant can be viewed from different angles.



**Pic. 3 A sample of a panel from the third module**

## Conclusion

The program described in the presented article is suitable for lecturers to demonstrate various economic functions, characteristics and mutual relations. It could be useful for students of economy to deepen their theoretical knowledge by exploring the behavior of described economic functions when different conditions are changed. It may be also used by any user as an aid in the study of microeconomics.

The possible disadvantage of the program is that the use of it requires the *Mathematica* software. If, because of any reason, the user cannot install or use it, the problem could be solved by using *Mathematica Player* only which is free of charge.

On the other hand the intuitive control and lucidity of the program are its distinct eligibility.

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# **Analysis of motivation factors of students in a selected subject at the Faculty of Economics and Management, Slovak University of Agriculture in Nitra**

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**Ivana VÁRYOVÁ<sup>3</sup>**

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## **Abstract**

One of the main tasks of education should be the increase in student's motivation to learn. Internal motivation, teacher's personality, education methods, education environment and other incentives belong to motivation factors influencing the student's learning. The article focuses on the assessment of student's motivation in the subject of Basics of Accounting at a bachelor study, as well as the determination of motivation factors affecting students. The basic information source of article's content solution represents a questionnaire survey aimed to confirm or refute the hypothesis of the survey. The survey was conducted on a representative sample of respondents created by available and random selection, representing 87 students of the first year of full-time bachelor study at the Faculty of Economics and Management, Slovak University of Agriculture in Nitra. Standard methods of scientific work as selection, analysis, synthesis and deduction are used in the article. Individual items of scale questionnaire and the differences between these items were assessed by means of selected statistical methods, namely the selection of descriptive characteristics such as point and interval estimation of average, standard error of estimate of mean and standard deviation, as well as non-parametric tests: Mauchly's sphericity test and Friedman test to determine the significance of differences between items of the questionnaire. Based on the statistical assessment of the questionnaire outcome, it results that previously acquired knowledge and skills from completed basic economic subjects partially helped students in the study of accounting, and furthermore students used their skills and talents in the study. The subject Basics of Accounting was studied without adequate motivation and as a last resort. Lectures on and exercises in accounting, its scope and content were partially motivating for students. Students' interest in accounting was partially conditioned by the teacher's personality. Students seek information from other than recommended literary sources, as well use expert advice for the study of accounting. Attending the subject Basics of Accounting is for students a motivation with respect to their future position. Students should partially decide to pass this subject again. Based on the obtained results we conclude that the hypothesis is partially confirmed by the survey. The results of testing the differences between individual questionnaire items showed that there were statistically significant differences between these items and thus dependence was found between them. The essential condition for learning is the motivation that affects the results of learning in different situations. Motivation determines intrinsic activation of students resulting from their needs and is relevant to their claims. Motives present the intrinsic

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motives or incentives, activities designed to achieve a specific objective. They can be considered as the reasons for student's behaviour. For each individual there are many different motives that are interrelated and constitute a form of hierarchy. It is important to choose a correct school for a successful study. The student should choose a school based on how he/she may develop and on factors which may satisfy his/her needs for self-realization. An important motivating factor for the choice of school and future job are skills and talents of student, interest in an area and the perspective of a future career in a department.

### **Keywords:**

motivation, student, motivation factor, education, questionnaire survey

### **Introduction**

Motivation is the summary of power moving, incentives, which set an individual to certain direction, as well determine the power of its direction. Individual powers might have the form of instinct, needs, interests, values, attitudes, ideas, and ideals, (Mikuláščík, 2006).

A man is never motivated by one motive. It is always a complex, in which the motives are linked and influence each other. Under the term motive, the authors Boroš – Ondříšková – Živčicová (1999) understand something what motivates someone to an activity or something what confirms and gives directions to the man's activity. Relatively small summary of motives can be characterized for each individual. It is determined as an incentive system of personality. It is organized hierarchically, individual motives do not have the same weight in it, some of them come to the fore - it depends on their relationship to the centre of personality. The incentive system is created during an individual's lifetime and is not entirely consistent, there are also differences. The behaviour of each personality therefore may show considerable fluctuations.

Man's motivation is based on different factors, it is the aim which is at the end of it and we must realize that the scale of values is different for every person, (Adair, 2004). Each person is motivated differently. Undoubtedly the psychological aspect plays a role; it explains the reasons for human behaviour, because different people behave differently in different situations and according to how they achieved their aims in certain situations.

Economic education has two aspects: informative and formative. Informative aspect of economic education corresponds to its educational function, while formative aspect corresponds to educational site. Both sites form a unity and are implemented in the education process of economic subjects. According to Koudela et al. (1984) educational function of economic subjects can be judged from a dual perspective. On the one hand, these subjects serve to spreading and deepening of a polytechnic education, on the other hand they act as professional education. Economic function of education is elaborated to the objectives to be achieved in teaching of economic subjects. Educational targets are aimed to certain system of knowledge, skills and habits in individual economic subjects.

Constantly increasing demands on the education of individuals due to the requirements of dynamically developing science and technology, force didactics both to reviewing of several existing knowledge (for example, drafting the curriculum, reassessment of teaching methods and review of efforts to promote creative teaching methods into a real educational experience, approaches to student's assessment, etc.), but also find other new approaches, which are characterized by concepts: modern, progressive, unconventional, innovative, and so on, (Petlák et al., 2005).

Škorecová (2003) notes that accountants should meet the requirements of the three areas in the content of professional accounting education prior to their entry into the profession, these are namely the acquisition of organization knowledge, business information systems and information technology, accounting and related disciplines.

Záhorec, J. – Hašková, A. – Bílek, M. (2014) focus on aspects of the specification determining the optimization and innovation of individual curricula forming part of the study programs of the first stage in tertiary education in the Slovak Republic regarding the ever

growing and changing demands of practices and the labour market of the European Union on students' knowledge in the context of their study profiling.

## Methodology of Research

The article aims to assess motivation factors affecting students of 1<sup>st</sup> year in full-time bachelor study at the Faculty of Economics and Management, Slovak University of Agriculture in Nitra, who complete a compulsory subject the Basis of accounting. The achievement of that task was conditioned by the realization of the questionnaire survey and its assessment by means of selected statistical methods. The aim of the questionnaire survey was to verify the hypothesis on the sample of survey respondents, representing 87 students. The questionnaire consists of 13 closed questions providing alternative responses ranging from 3 to 1. Individual positions on a scale are attributed numerical values (3 – yes, 2 – partially, 1 - no).

The basic methodological approach of the article processing represents the method of selection, analysis, synthesis and deduction. In connection with the assessment of a questionnaire survey conducted on the sample of respondents the questionnaire items and the differences between them are measured through selected statistical methods.

Selected descriptive statistics were calculated for the presentation of the results - point and interval estimation of average, standard error of estimate of the mean and standard deviation, which is a measure of dispersion. The point estimate is performed by a single value and interval estimation by numerical interval, which covers entry with a specified confidence (95% confidence interval).

The most widespread of averages is the average  $\bar{x}$  which is calculated from the observed values  $x_1, x_2 \dots x_n$ , as follows:

$$\bar{x} = \frac{x_1 + x_2 + \dots + x_n}{n} = \frac{\sum_{i=1}^n x_i}{n}$$

From the characteristics of variability the measure of dispersion is the most important  $s^2$ :

$$s^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n} = \frac{\sum_{i=1}^n x_i^2 - \bar{x} \sum_{i=1}^n x_i}{n} = \bar{x}^2 - \bar{x}^2$$

The variability of statistical character in the original measurement units is often described using positive square root of the variance, which is called standard deviation  $s$ :

$$s = \sqrt{s^2} = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n}}$$

Standard error of the estimate of the sample average  $s(\bar{x})$  is calculated by the unknown standard deviation of basic sample  $\sigma$  a of a range sample  $n$ :

$$s(\bar{x}) = \frac{s}{\sqrt{n-1}}$$

In order to test the differences between the questionnaire items using parametric tests the underlying assumptions of these methods must be met:

- normality distribution
- constancy of variance.

The fulfilment of these assumptions is commonly verified by using test procedures. Considering the failure of these assumptions non-parametric tests are used to test differences in mean values of items. The differences in variance are identified whether they are only random or statistically significant.

The assumption of normal distribution and condition of covariance matrix sphericity - equal variances and covariance in the covariance matrix must be met to use tests. Mauchly's sphericity test is used to verify the assumption of analysis use of variance for repeated measures with more than two levels.

For comparison, we also selected the non-parametric equivalent of analysis of variance for repeated measures - Friedman's test. Testing statistic of Friedman's test:

$$F = \frac{12.m}{n.(n+1)} \cdot \sum_{j=1}^n \left[ \sum_{i=1}^m T_{ij} - \frac{n+1}{2} \right]^2$$

allows to test the hypothesis that  $m$  – dependent samples with ranges  $n_1, \dots, n_m$  come from the same distribution. All values from  $m$  choices are ranked in a single sequence and the ranking of each item is determined (the same average ranking are assigned to the same values). The serial numbers of individual observations for each selected set are calculated and totals are marked  $T_1, T_2, \dots, T_m$ .

P-value is used in the assessment of the testing procedures (theoretical significance level), which is compared with the selected significance level  $\alpha$  (0,05; 0,01).

If the p-value is higher than 0,05, the null hypothesis cannot be refuted with the 95% confidence, i.e. hypothesis is accepted. This is a statistically non-significant difference in the analysed items.

If the p-value is lower than 0,05, the null hypothesis is refuted with the 95% confidence, i.e. alternative hypothesis is accepted. There exists a statistically significant difference between items.

Multiple comparisons determine which items statistically and significantly differentiate from each other by mean. These tests are applied if the null hypothesis is refuted.

## Results and Discussion

To express the assessment results of students responses to each question of scaled questionnaire aimed at detecting motivation factors for the subject Basics of Accounting and significance of differences between the questionnaire items, we selected the calculation of selected descriptive characteristics and 95% confidence intervals, namely we calculated point and interval estimation of average, standard estimation error of the mean and standard deviation.

Based on the calculated results of mean and 95% confidence interval (tab. 1) for assessment of responses to question 1, we found that already acquired knowledge and skills from other economic subjects partially helped respondents in the study of accounting. Mean is the value that is in the range close to the position partially that corresponds to the numerical value 2. The standard deviation is the average difference between the values from the actual parameter values. While the sample of respondents is higher, the standard error of mean estimate is lower. Achieved mean value and confidence interval for the assessment of responses to question 2 demonstrate that in the study of accounting students partially use and rather use their abilities and aptitudes (average with 95% confidence ranges in interval from 2,12 to 2,56). Based on mean values and 95% confidence interval for assessment of the response to question 3, we note that respondents are partially studying the subject Basics of Accounting without adequate motivation and as a last resort. We assume that students are still not familiar with the study objectives and probably consider this subject with regard to their further study and application in practice as

unnecessary. The above is closely related to the intrinsic motivation of students, particularly their interest in the issue.

From the calculated values of mean and confidence interval (tab. 1) to assess the response to question 4, we found that lectures on accounting partially motivate students and more do not motivate (average with 95% confidence interval ranges from 1,49 to 1,88). Average values of the responses to question 5 note that the content of accounting exercises is partially interesting for students. The achieved values of the average level of responses with 95% confidence to question 6 are providing the fact that the range of exercises for understanding the accounting is partially sufficient for students.

Based on the calculated mean values (tab. 1) for assessment of responses to question 7, we found that students' interest in accounting partially influenced the positive characteristics of teachers. Achieved mean value and 95% confidence interval for the assessment of the response to question 8 note that student interest in accounting is influenced by the negative characteristics of teachers, in this case a higher extent in comparison with the positive characteristics of teachers.

**Tab. 1 Selected descriptive characteristics for responses of the questionnaire**

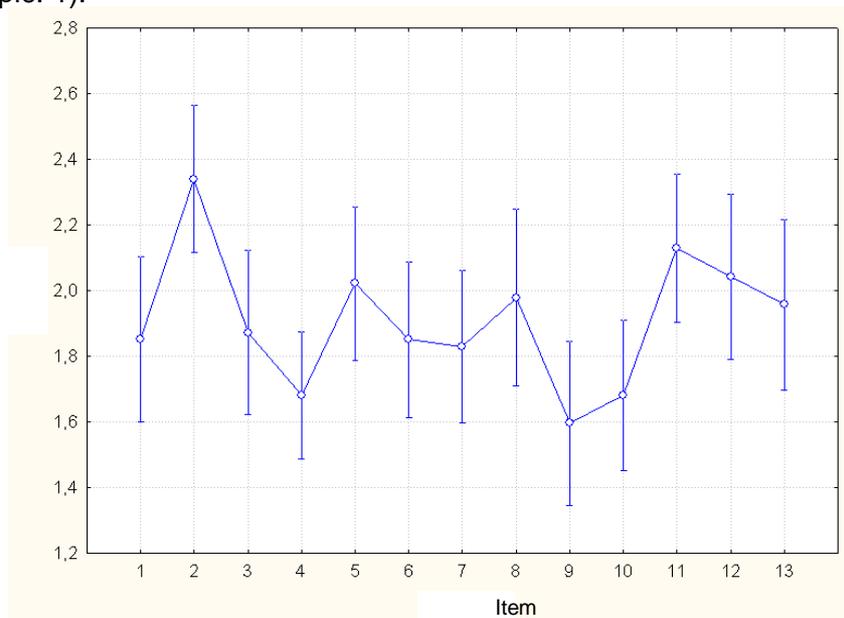
Item	Mean	Standard deviation	Standard error	Confidence interval of average	
				- 95.00%	95.00%
Did the acquired knowledge and skills of economic subjects help you in the study accounting? (1)	1.851064	0.859189	0.125326	1.598797	2.103331
Do you use abilities and aptitudes in the study of accounting? (2)	2.340426	0.759765	0.110823	2.117350	2.563501
Do you study this subject without adequate motivation and as a last resort? (3)	1.872340	0.849988	0.123983	1.622775	2.121906
Are the lectures on accounting sufficiently motivating for you? (4)	1.680851	0.662879	0.096691	1.486223	1.875479
Is the content of accounting exercises interesting for you? (5)	2.021277	0.793708	0.115774	1.788235	2.254318
Is the range of exercises sufficient for understanding this subject? (6)	1.851064	0.807000	0.117713	1.614120	2.088008
Did the characteristics of teachers influence your interest in accounting, which are positive according to you? (7)	1.829787	0.789032	0.115092	1.598119	2.061456
Did the characteristics of teachers influence your interest in accounting, which are negative according to you? (8)	1.978723	0.920524	0.134272	1.708448	2.248999
Do you acquire the information regarding the accounting also by means of studying the professional literature not recommended to you? (9)	1.595745	0.851075	0.124142	1.345860	1.845630
Do you use the expert advice in your study and are they motivating for you? (10)	1.680851	0.783148	0.114234	1.450910	1.910792
Is the attending of this subject motivating for further professional development? (11)	2.127660	0.769444	0.112235	1.901742	2.353577
Are prospectively higher earnings motivating in the study of accounting for you? (12)	2.042553	0.858650	0.125247	1.790444	2.294662
Would you decide for this subject again? (13)	1.957447	0.883605	0.128887	1.698011	2.216883

Based on the calculated values of mean and confidence interval (tab. 1) to assess the response to question 9, we note that students partially acquire and rather do not receive

information regarding accounting from other literature recommended to them (average with 95% confidence ranges in the interval 1,35 to 1,85). In this context, the interests and attitudes of students to selected study are important. The average values with 95% confidence for the assessment of responses to question 10 determine that the respondents in the study of accounting partially use and rather not use expert advice (average with 95% confidence interval ranges from 1,45 to 1,91). The basic assumption for motivating is students' interest in the issue. If students are interested in something, they ask for expert advice. It can be concluded that few students use set hours for consultation. Under the term consultation, it is considered the tutoring, often only with the aim to achieve the credit or pass the exam. However the credit or exam should not be a motive for students, but the achievement of certain knowledge, habits and skills of the subject, which will be used in the future.

Based on the calculated results of mean and 95% confidence interval (tab. 1) for the assessment of responses to question 11, we found that the students' attending of Basics of Accounting is partially motivating for their further professional development. The obtained values of mean and confidence interval for the assessment of responses to question 12 document the fact that higher earnings are partially motivating in the study of accounting. The surprising finding is that our respondents are only partially motivating by higher earnings in their future career and the prospect of success in the area, whereas based on well-known survey these are critical attributes. Regarding the average values with 95% confidence for the assessment of responses to question 13, we conclude that the students could partially decide to pass the subject Basics of Accounting again.

Point and interval mean estimation of the individual questionnaire items is visualized graphically (pic. 1).



**Pic. 1 Mean and confidence interval for questionnaire items**

Questionnaire was formulated with respect to the hypotheses of the survey, while hypothesis 1 relates to the questions 1 to 3, hypothesis 2 to questions 4 to 6, hypothesis 3 to questions 7 and 8, hypothesis 4 to questions 9 and 10, the hypothesis 5 to questions 11 to 13. The means of responses to the questionnaire within the individual hypotheses reached almost identical values. The most significant difference is determined in item 2 in the mean of the responses to each question, in comparison with the items 1 and 3 under the hypothesis 1.

Following the obtained results of descriptive statistics we concluded the further assessment of survey hypotheses:

Hypothesis 1 partially confirmed that the acquired knowledge and skills from other economic subjects partially helped the students in the study of accounting and also the students used partially and more their skills and abilities.

Hypothesis 2 partially confirmed that the lectures on accounting students were partially motivating and non-motivating, sufficient range and interesting content of exercises in accounting was a partial motivation.

Hypothesis 3 partially confirmed that the student's interest in accounting was partially influenced by positive and negative teachers' characteristics.

Hypothesis 4 partially confirmed that the students partially acquired the information in the study of accounting and rather did not acquire from other than recommended literature and also partially used and rather did not use the expert advice.

Hypothesis 5 partially confirmed that the attending of the subject Basics of Accounting was partially motivating for student to their further professional development and higher earnings.

The most appropriate analysis for testing the significance of differences between individual questionnaire items is one dimensional, respectively multivariate analysis of variance (ANOVA/MANOVA), respectively analysis of variance for repeated measures (ANOVA repeated measures). In order to use significance tests, the assumption of normality (normal distribution of variables) and the assumption of equal variances, respectively covariance matrix sphericity condition - equal variances and covariance in the covariance matrix must be met.

The null hypothesis is set for each significance test, which is refuted or not refuted, depending on the achieved values of significance (p-value). We find that the differences between the variances of the questionnaire items are random or statistically significant.

The assumption of variance analysis with repeated measures is the equality of variance and covariance in the covariance matrix for repeated measurements. This assumption is called sphericity condition covariance matrix. If Mauchly's sphericity test (tab. 2) is significant, then we conclude that the assumption is violated. The null hypothesis assumes that there is no statistically significant difference in the variance and covariance between the questionnaire items.

The null hypothesis of equal variances and covariance in the covariance matrix is refuted since the assumption was violated. Coloured value of significance is less than 0,05, i.e. the null hypothesis is refuted with 95% confidence and the alternative hypothesis is accepted. In this case there is a statistically significant difference of variance and covariance between the individual questionnaire items.

**Tab. 2 Mauchly's sphericity test**

	W	Chi-Sqr.	df	p
Item	0,008996	196,9449	77	<b>0,000000</b>

Regarding the violated assumptions of validity analysis of variance for repeated measurements we use non-parametric Friedman's test to test the difference between items (tab. 3). The null hypothesis assumes that there is a statistically significant difference between the variances of the questionnaire items.

**Tab. 3 Friedman's test**

	df	N	Chi-Sqr.	p
Item	12	87	40,44094	<b>0,00006</b>

Null hypothesis with 95 % confidence is refuted (p-value < 0,05), difference between individual items is statistically proven and there exists the dependence between them.

Multiple comparisons are used to compare all pairs when the global hypothesis is refuted; it claims that there is no statistically significant difference between the individual questionnaire items. In this case, we set the null hypothesis, between which questionnaire items there is the statistically significant difference. There are identified statistically significant differences between two homogeneous groups (tab. 4) between 2 and 4, 2 and 9, 2 and 10 questionnaire items.

**Tab. 4 Multiple comparison – identification of homogeneous groups**

Item	Mean	1	2
9	1.595745	****	
10	1.680851	****	
4	1.680851	****	
7	1.829787	****	****
1	1.851064	****	****
6	1.851064	****	****
3	1.872340	****	****
13	1.957447	****	****
8	1.978723	****	****
5	2.021277	****	****
12	2.042553	****	****
11	2.127660	****	****
2	2.340426		****

Based on the general stated knowledge of the available literature resources and the obtained results, we formulate the following suggestions for solving of substantive issues. Motivation is manifested in the active work of students and should meet the universal needs of students in the educational process. The interests and attitudes are included in the motivation factors affecting student performance; they depend on many factors of the educational process. Generally, it is known that the students with a positive attitude towards a subject obtain better results at the acquiring of knowledge. Interest in the issue is conditioned by its use in the future, the existence of the aimed state vision, understanding the importance of the subject matter for future career. If the teacher is able to respect individual differences in learning of students and is able to adapt to the requirements of students with respect to their individual needs, there is a space for motivation. Students have to know what help them to achieve their objectives, which should be easy, but not difficult to reach. Another motivation factor is the intrinsic motivation of students, which includes the learning of self-interest and conviction, and is not based on coercion and commands. Students are not motivated when the explaining of curriculum is boring, less interesting, stereotyped, often monotonous, and etc The teaching methods are included in the motivation factors; also their proper selection and rotation within the lesson can affect the attention and activity of students. Learning situation should be meaningful to students and useful to learn the context in which the situational learning is performed. The effective method is a method of problem teaching when students need to think creatively, to find

the right solution and to apply it in practice. The motivation factor is the teacher's personality, which should create a positive working atmosphere, which helps to favourable attitudes and efforts to learn and to take the attention of students using teaching aids, didactic techniques. Students know that if they can handle some knowledge; achieve recognition and positive assessment of teacher, so the motivation factors include incentives, i.e. rewards. Teachers develop a learning motivation by preferring an individual relational norm that assesses student's progress. If a student receives a feedback on how to improve his/her performance, then he/she can experience success and strive to achieve good results. Each student responds to the assessment and classification differently, after granted compliment or encouragement less successful students increase their performance, while successful students take it for granted. Therefore the assessment directs the student's activity, whether positive or negative, but the motivation factor is the knowing how to assess the student positively. The main motive should not be an exam, because it changes from a means to achieve a specific goal to the aim itself, the students learn because of exams, and not to acquire knowledge and interest in the issue.

### **Conclusions:**

The article focuses on the assessment of student's motivation in the selected subject, as well as the identification of motivation factors influencing the students through questionnaire survey conducted on the sample of respondents. Individual items of scale questionnaire and the differences between them were assessed by means of selected statistical methods. Based on the obtained results it can be concluded that learning objectives are not clear to students, who probably assume that the subject is not needed for their further study and professional application. Their attitudes expressed in the responses can be described as buck-passing. Another fact is that many students who are graduates of secondary schools reached average results and results below average during their secondary school study. We also assume that students in their secondary school study were not motivated to achieve better results, as well when the choice of study and college was realized. Insufficient role is played by high school career advisers who should be more interested in and cooperate with universities. Students are often not familiar with the assumptions for successful management of the study and are asking for more information on specific subjects which form the basis of study. Under certain assumptions it is only possible to increase the motivation, in particular interest in study by the students. Despite increased efforts set by university teachers, to achieve adequate motivation for some students is failing. Regarding the solved issue, the results can be used in teaching of a particular subject, as well as to develop further deepening and additional areas that have not been sufficiently implemented.

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# Social Capital as a Measure of Performance for regional Development Projects

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## Abstract

The regional development programs promoted by the national governments and international multilateral agencies, like the World Bank and the Inter American Development Bank, are oriented to public policies under which public goods, like public services and infrastructures, are supplied to underdeveloped regions, many in Latin America. More and more evidences are pointing to the fact that success of these programs depends in a good part of externalities, which are related to the changes in the form of networking and values among the stakeholders in the territory. These externalities are defined as the Social Capital.

As externalities, they are not directly evaluated in the projects economic and social impact, but accepted to exist and the planners of the projects do acknowledge the importance of social networking, although never assessed.

The spatial effect over the rural territories regulates the employment as much as other production factors for the industry. The population will journey to the areas where work is more available but that movement is limited by the local geography. Technology and geography are key factors in the employment evolution, and by that of economical growth.

The objective of the research project described in this paper is to measure and assess the social capital of a given regional development project, and to compare the social capital results with those of the benefits according to the drafted project framework agreed upon the multilateral agencies and the region authorities.

The regional program selected is the "Programa de Desenvolvimento da Zona da Mata" (PROMATA) in the State of Pernambuco Brazil, under the sponsor of the Inter American Development Bank.

The PROMATA project, ended in 2010, was big (over \$ 100 M) and was designed to induce development in which community resources were to be mobilized, with the intention of getting the stakeholders involved as proponents and protagonists of social change in their territories. That social based bottom-up framework was a very interesting opportunity to observe the social capital component given the profile of the project.

The research was carried out with the project just finished, so permanent changes in the social network and values could be observed. Some difficulties still present precluded the use of a large interview sampling, so intentional interviews had to be implemented with a reduced number of people in the region. In that case, a questionnaire capable of measuring the opinion, versus the traditional tally recording, was implemented using the Item Response

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Theory and the Guttman scale. The social capital was intended to be analyzed using scaled Woolcock matrix.

Woolcock uses two strategy matrix (2x2), one for the Macro relations (state- society) and other for the Micro relations (society-community). Each scale in the matrix is normalized from zero to one.

The results were obtained using Multiple Correspondence Analysis and Principal Components, producing the needed scales to measure the social capital according to Woolcock matrix.

PROMATA, is considered a success case in Brazil, in part because of its social networking approach. However when the social capital was analyzed there were areas of state-society and society-community relations not in agreement with the results reflected by the economic-social benefits evaluation at the end of the project. Secondary research like expert interviews proved the social capital results not to be mistaken. This unforeseen externality is the social capital effect.

### **Keywords:**

Social Capital, Woolcock Social Capital Model, IDB Regional Development Projects, Brazil, Guttman Scale, Multiple Correspondence Analysis.

### **Introduction**

Local Development, according to the World Bank (2001) allows the implementation of collaborative solutions that will foster the productive potential of the regions as a way to produce growth in both social development and economic terms. Therefore, local development with respect to regional resources endowment can be considered the strategic way to bring them to fulfillment. There are three dimensions to it:

Economic. As the measure of the capacity of local industry to organize the production factors to the level of productivity allowing them to compete in the market.

Social. As the values and the local institutions can be the base for development, and in turn can be strengthened during the process.

Political. In the measure that local authorities are able to induce a stimulant environment which favors the development of the local social and economical potential, facing and solving the problems arising from administrative bureaucracy, existent policies, dysfunctional economic models, all linked to traditional practices from the past.

For the groups in the society to assume the central role in this process, it is necessary to have people capable of assuming responsibilities, taking initiatives, start business and to bet for a new direction, which can only happen under a participative and democratic process [Franco 2000].

From the 90's It was started in Brazil a collaborative planning processes where the community gained importance in the drafting of needed solutions, and the local development was framed by the integration of social capital, local authorities and local actors. The process has been recently extended to include sustainability, once that natural resources are not endless and cannot be used without disposition.

The concept of social capital [Putman 1995] [Coleman 1990] [Woolcock, Naraya 2000] [Melo Nieto, Froes 2002] became an important theoretical instrument for the analysis of development processes, previously based in cost-benefit models, when the interrelation between social capital and development was taken into account. Social capital in Melo Nieto

(2002) work was inclusive of concepts such as; confidence, solidarity, cooperation, participation, initiative, organization, networking.

According to Nahapiet and Ghoshal (1998) the social capital appears as a resource that in conjunction with others, under favorable conditions, allows the local communities the possibility to build sustainable development projects, which enhance their live hood, based on their own capacities and potentialities.

The impact evaluation of local development projects is oriented to highlight the results produced by the development program intervention, in the people, the institutions and the environment. Such evaluation provides insight of the intended effects, planned or unplanned, positive or negative [Aedo 2005] [Baker 2000] [Silva 2001].

Project PROMATA was launched in 2002 with the Inter-American Development Bank support (IDB) with a budget over 100 Mill USD, and finished in 2012 with 2 years delay. The project aim was to bring development into an economically depressed region in Pernambuco called "La Mata". The cause of the economic decline was the long crisis of sugarcane industry, which was the main cultivation in the region. The project scope had two objectives, one at municipality level and other at regional level. The methodology was based on the collective participation of population using an induction process for the development. However, this approach was not without faults, as it was open to manipulation of the participation process because of relations in the community were under asymmetric empowerment.

The design and evaluation of the results from the programs in this type of projects, rooted in community participation, is largely difficult. The traditional post implementation evaluation only evidence the budget overrun and the quantifiable objectives achievement, but not the real change in the future of people lives within the region, principal and overall objective of the project.

In the other side, social capital offers a framework to evaluate the real impact in the community of the development project. If social capital objectives were placed in the development project planning, they will open a new scheme where government-citizen relations or community-person relations will be the changing force for development.

The scope of the research here described is to analyze and evaluate a social capital framework with a large socially oriented development project, such as PROMATA, used as a base test.

Woolcock (1998) social capital model has been selected as a framework. This model as described by Montoya (2001) deploy two strategic matrices one for government-citizen relations (Macro) and other for community-person relations (Micro) which provide a classification and grading of the social capital analysis, well suited for high level evaluation of local development projects.

To build the Woolcock social capital matrices, information about the real change in the community has to be obtained. For that purpose a series of field interviews were carried out and information recorded in a specially designed questionnaire. The categorical information gathered was statistically processed and converted into scales capable of been represented in the two Woolcock matrices, before final classification could be performed.

### Woolcock social capital model

As already mentioned Woolcock (1998) social capital model has been selected as most appropriate for the analysis of local development projects, particularly those with large investments behind.

This model considers two types of relations, government to citizens or Macro level, and community to person or Micro level. Those levels or directional “axes” are analyzed by two strategy matrices, which also have two scaled attributes each. The four attributes result in eight scenarios, which do describe the patterns of relations associated to the perceived social capital [Montoya 2001].

The attributes associated to the Macro level are:

- **Integrity.** Government commitment with collective well being. Efficient operation of public and private administration.
- **Synergy..** Collaborative relations government-citizens. Private-public cooperation in the economic development.

The attributes associated to the Micro level are:

- **Linkage.** Commitment of people in the communities with change. Collaborative relations with other communities (intra-community).
- **Integration.** Collaborative relations within the community (inter-community).

The eight social capital scenarios resulting from the Macro and Micro level are presented in the following, table following Montoya (2001).

	Integrity (Low)	Integrity (High)	Integration (Low)	Integration (High)
Synergy (Low)	Collapse States (Anarchy)	Inefficient States		
Synergy (High)	Predator States (Statism)	Efficient Cooperation		
Linkage (Low)			Amoral Individualism	Amoral Familism
Linkage (High)				Anomie Opportuni

From these scenarios, only those resulting from the evaluation of the social capital of PROMATA will be described in a further point if this work.

### Social capital information gathering

To analyze post-project PROMATA´s social capital, information was gathered by means of interviews to selected people of “La Mata” across the different villages. Due to the political nature of the project previous authorization was requested for the interviews, and intentional sampling was used for the purpose, collecting 54 records.

The questionnaire used in the interviews had 9 sections. Sample of the section A is shown in the following display.

<p><b>A - DIMENSÃO DE IMPACTO:</b></p> <p><b>1 - SUSTENTABILIDADE SOCIAL</b></p> <p>1.1 - A partir do PROMATA, os governos federal, estadual e municipal passaram a atuar de forma integrada e articulada, objetivando a solução de problemas relativos ao município, bem como para a melhoria geral das condições de vida da população, solucionando problemas relativos aos municípios. [ ] concordo ..... [ ] discordo ..... [ ] não concordo e nem discordo</p> <p>Comente: _____</p> <p>1.2 - A partir do PROMATA, os programas setoriais municipais foram executados de maneira articulada e integrada na perspectiva de compatibilização com o Plano de Investimento Municipal. [ ] concordo ..... [ ] discordo ..... [ ] não concordo e nem discordo</p> <p>Comente: _____</p> <p>1.3 - A partir do PROMATA, percebe-se um envolvimento e apoio do governo local nas iniciativas comunitárias. [ ] concordo ..... [ ] discordo ..... [ ] não concordo e nem discordo</p> <p>Comente: _____</p>
--

Due to the fact, that the sample variables are categorical the statistical analysis have to consider those. The attributes in Woolcock matrices are numerical, thus the categorical variables have to be converted to interval variables either by optimal scaling [Tenehaus, Young 1985] or by other processes allowing this scaling conversion.

The questionnaire is driving the measure of the social capital. As the number of interviews are limited (sample records) and there is the need to extract as much as accurate opinion about the social impact of the project for the evaluation, Item Response Theory [Hambelton 1985] has guided the design of the questionnaire and the Guttman scale implemented in it [Dun-Rankin 1983] [Greenacre 2007]. This provided each section of the questionnaire with an item set organized according to the scale. In the above display of Section A, it can be noticed that questions (items) are graded from a very ample scope to a narrower one, which is the buildup of a Guttman scale.

The sections of the questionnaire are the following:

- Social Sustainability
- Economic Sustainability
- Institutional Sustainability
- Environmental Sustainability
- PROMATA process Sustainability
- Participation
- Confidence
- Cooperation
- Networking

One aspect to consider for the accuracy of the opinions emerging from the questionnaire is the reliability of the information provided by the items of each section. Because of several causes, the responses to the items can introduce a lack of internal coherence that affects the accuracy of the opinion linked to a given section. This item reliability is measure using the coefficient Alpha [Cronbach 1951] [Cortina 1993].

The item response model for reliability analysis is the following. Given k items with additive scale values (Likert or Guttman type), and N responses (records) to the items, where  $X_{ij}$  refers to the scale value response to item i in record j, then, the model can be represented by the table:

I1	I2	-----	Ik	
X11	X12		X1k	P1
X21	X22		X2k	P2
-----	-----	Xij	-----	-----
XN1	X2N		XNk	PN
T1	T2	-----	Tk	G

$$P_j = \sum_i X_{ij} \text{ summary value response } j$$

$$T_i = \sum_j X_{ij} \text{ summary value item } j$$

$$G = \sum_i \sum_j X_{ij} \text{ Total value}$$

$$\bar{T}_i = \frac{T_i}{N}, \bar{G} = \frac{G}{kN}, \bar{P}_j = \frac{P_j}{k}$$

$$M = \frac{G}{N} \text{ average scale value}$$

Chronbach Alpha coefficient is defined as follows

$$\alpha = \frac{k}{k-1} \left( 1 - \frac{\sum S_i^2}{S^2} \right)$$

Where  $S^2$  is the total variance from all response and  $S_i^2$  is the variance from item  $I_i$ .

Values of Alpha below 0,5 are consider not acceptable and below 0,6 poor.

For example, the reliability analysis of Section A is presented in the following table:

There are three item (AQ1, AQ2, AQ3), and the analysis includes the effect for each item of removing it from Section A questionnaire set. This effect is resented in the last two columns with the correlation change and the coefficient Alpha change. It can be noticed that AQ1.2 has a poor correlation with the other questions, and if removed, the Alpha increases to 0,63 which is better.

#### Estadísticos total-elemento

	Media de la escala si se elimina el elemento	Varianza de la escala si se elimina el elemento	Correlación elemento-tot al corregida	Correlación múltiple al cuadrado	Alfa de Cronbach si se elimina el elemento
AQ1.1	3,23	1,563	,347	,218	,395
AQ1.2	2,72	1,476	,215	,063	,636
AQ1.3	3,19	1,387	,463	,256	,206



### Synergy

		Frecuencia	Porcentaje	Porcentaje válido	Porcentaje acumulado
Válidos	1,00	34	64,2	64,2	64,2
	2,00	19	35,8	35,8	100,0
	Total	53	100,0	100,0	

### Link

		Frecuencia	Porcentaje	Porcentaje válido	Porcentaje acumulado
Válidos	1,00	12	22,6	22,6	22,6
	2,00	41	77,4	77,4	100,0
	Total	53	100,0	100,0	

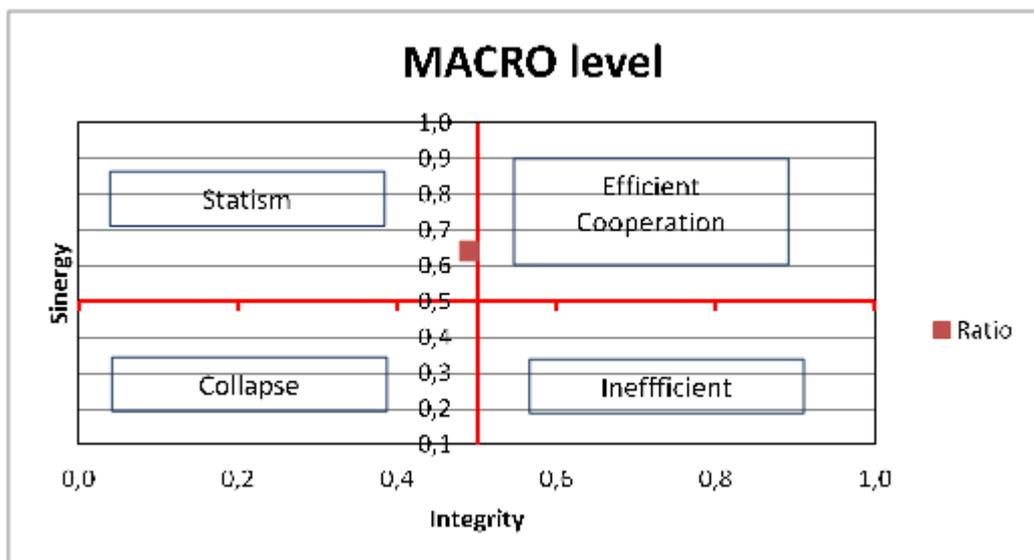
### Integration

		Frecuencia	Porcentaje	Porcentaje válido	Porcentaje acumulado
Válidos	1,00	32	60,4	60,4	60,4
	2,00	21	39,6	39,6	100,0
	Total	53	100,0	100,0	

### Woolcock post-project social capital analysis

With the resulting attribute values calculated, from the data of the interviews to people in “La Mata” region after the PROMATA project finished, the Woolcock Marco and Micro matrices can be drawn.

The Macro matrix is the following.



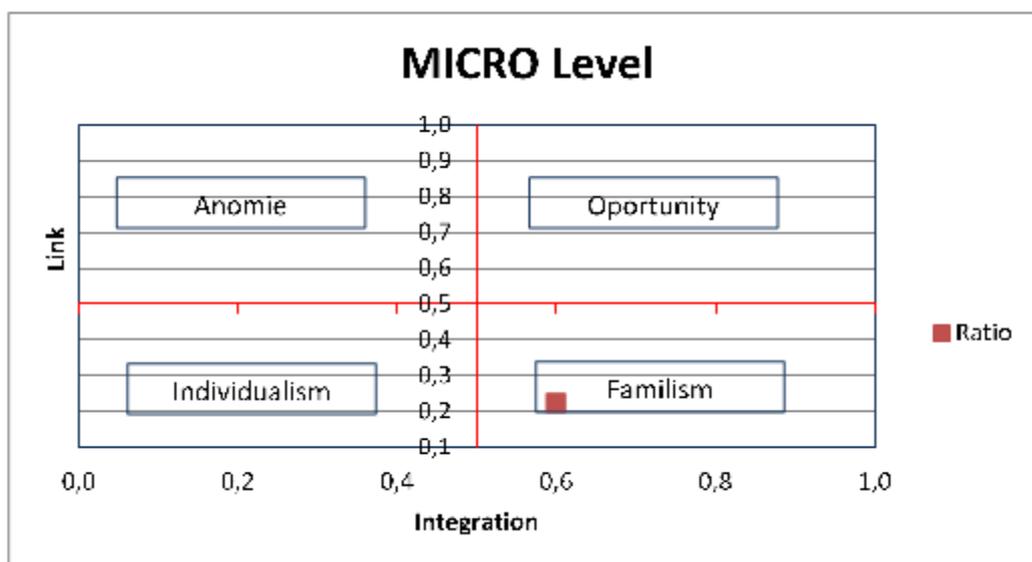
It can be notice that the classification lays between Statism and Effient Cooperation, but with integrity =0,49, it is more slightly sided to Statism.

According to Woolcock classification, Statism corresponds to regions or states where the government institutionally is well established, but the functioning of the public administration is bureaucratic and not competent, with tendency to corruption and power abuse (strong asymmetry of government-citizen relations).

However, the Efficient Cooperation is an institutional structure favorable to development, where regional and state governments well established, have implemented formal channels of collaboration and consultation with the civil society.

The Macro social capital outcome of PROMATA shows a good development in the government-citizen level as result of the PROMATA programs. However the middle position between Statism and Efficient Cooperation indicates that the Macro level it is not the same in the entire region.

The Micro matrix is the following.



According to Woolcock classification, in Familism the confidence between the members of the community is restricted to those with stronger links of friendship or family. It favors the relations in a close group and limits the social mobility and intra- community relations.

In contrast with the Macro level, it shows that the programs related to build a more dynamic community based on people strong collaboration have no worked very well, as Familism is a traditional form of relation in static agrarian communities. The low value on Link=0,22 shows that inter-community collaborations have been not developed.

To analyze the causes of the low performance of the Micro Level, it is needed to look into the PROMATA programs and the project reports.

## Conclusions

The aims of the research to evaluate the social capital post-implementation of large local development projects have been covered successfully. And, it opens a new sustainable form to evaluate the results and high level causes for the success and failure of part of the projects.

The social capital model selected, Woolcock, has proved very useful and flexible to work with, and capable of supporting different methods of data gathering for the social capital evaluation using the Macro and Micro matrices.

Further research is needed to have a robust system to evaluate the local development projects using the social capital model.

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# The Role of Agriculture for Poverty Reduction in Latin America

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## Abstract:

Especially in the last decade there is a growing attention devoted to the role of agriculture for poverty reduction and the importance of this sector for poverty alleviation is emphasised. Dealing with this role there are many questions, which bring attention of individual authors. Among the most important belong whether the growth of agriculture is more contributory to poverty reduction than the economic growth of other sectors of economy; what is efficiency of growth of primary, secondary and tertiary sector for poverty alleviation; whether it is better to support agricultural, manufacturing or services sector development to reduce poverty; what is the difference in growth elasticity of poverty reduction depending on initial level of economic development, poverty level and inequality of income distribution; or what is the contribution of agriculture for reducing of income inequality.

The article is focused on evaluation of different contribution of agriculture, industry and the sector of services for poverty alleviation. Growth elasticity of poverty reduction of these sectors in continental countries of Latin America is calculated. Relatively important factor of the size of this contribution to poverty alleviation, which is also analysed in this article, is structure of domestic economy.

## Key words:

Agriculture, rural poverty, developing countries, growth elasticity of poverty, sectoral growth elasticity of poverty.

## Introduction and objectives

According to the International Fund for Agricultural Development almost 64% of the rural population in Latin America and the Caribbean live below the poverty line and, over the last two decades, the number of poor people in rural areas has increased in both absolute and relative terms. Poverty reduction is therefore one of the major current challenges facing the

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region. Agriculture and rural economic activities are major sources of employment in Latin America and the Caribbean - more than 30% of the labour force working in agriculture - and are of critical importance in terms of eradicating poverty.

From Second World War until early 1970s the majority of countries in the Latin American region followed a growth strategy known as import substitution industrialization, as they tried to change their focus from primary to secondary sector, i.e. from agriculture to manufacture. 80s of the last century is usually considered as the 'lost decade', a period of stagnation. The stabilization and structural adjustment policies implemented by governments in the 80s and early 90s had a profound effect on economy. In spite of the fact, that overall economic situation in Latin America improved somewhat in the 90s, these gains did not generally reflect on the living conditions of the poor.

Since 1997, the losses caused by natural disasters and several international economic crises, have stunted the region's economic growth, limited its short- and medium-term development prospects and significantly increased rural poverty (IFAD, 2002). In the rural areas of Latin America poverty represents a multidimensional phenomenon that is influenced by cultural, social and economic factors.

According to Valdés and Mistianen (2001), "in general, poor people living in rural areas of Latin America share several characteristics including: low levels of educational attainment; a relatively large number of children; relatively low access to material resources, social and physical infrastructure; and higher susceptibility to community-wide exogenous shocks. Because most people in rural developing areas are poor, if we understand the economics of rural development we would know much of the rural poverty economics that really matters. Moreover, the rural poor earn the vast majority of their income from activities related to agriculture. Thus, if we understand the economic role of agriculture we would know a great deal of the economics of rural poverty and rural development".

These facts brought our attention to the question, whether economic growth of agriculture is more efficient for poverty alleviation than growth of other sector of domestic economies in individual Latin American countries. Respectively we would like to find an answer to the question what is efficiency of the growth of primary, secondary and tertiary sectors for reducing of poverty in this world region. Which strategy of government interference aimed on poverty alleviation seems to be the most promising – support of primary, secondary or tertiary sector?

## **Literature review**

The majority of the world's poor still live in rural areas and depend crucially on agriculture for their livelihoods (IFAD, 2002).

Cervantes-Godoy, D., Dewbre, J. (2010) looked for shared characteristics of developing countries posting exceptional success in reducing extreme poverty over in period 1980 – 2005. They analyses twenty five developing countries from Africa, Asia and Latin America, which exhibited an initial USD 2.00 per day and a poverty rate of more than 10% and posted reductions in that rate over the entire range within observed period. They concluded, that successful macroeconomic performance is, if not strictly causal, a necessary pre-condition to success in combating poverty. At the same time, they found that while economic growth generally was an important contributor to poverty reduction, the sector mix of growth mattered substantially. They also identified the great importance of agricultural sector growth for poverty reduction in a majority of the selected countries.

Ravallion and Datt (1996) found that in India the growth of agricultural sector has been most effective in reducing poverty. They showed that 85 percent of the reduction in poverty in India was due to agricultural growth. Similarly DeJanvry and Sadoulet (2009) found that rapid growth in agriculture in Vietnam contributed to poverty alleviation of farming households.

Irz, X., Lin, L., Thirtle, C., Wiggins, S. (2001) evaluated importance of agricultural growth for poverty reduction on the sample of 40 countries from Latin America, Africa, Asia, and Europe. They concluded strong poverty-alleviating effects of agricultural growth. Indeed, the

strength of these is potentially remarkable. It seems, for example, that a yield increase of one-third might reduce the numbers in poverty by a quarter or more. In particular, it is likely that the ability of agriculture to generate employment, to stimulate the rural economy through linkages, and to reduce the real cost of food accounts for much of the poverty-reducing effects observed.

DeJanvry and Sadoulet (2000) found that agriculture related variables do not affect urban poverty in Latin American countries and that growth in the service sector is important in reducing urban poverty, but growth in agriculture or manufacturing is not.

According to Sarris (2001) it appears that the evidence reviewed suggests that agricultural development is associated with overall and rural poverty reduction, but the relationship maybe conditioned by initial asset and income distribution, as well as country characteristics.

Bourguignon and Morrisson (1998) concluded, that „in many countries increasing the level of productivity in traditional agriculture may have become the most effective way of reducing inequality and poverty“.

Ligon and Sadoulet (2008) estimated regression coefficients connecting consumer expenditures by decile to agriculture and non-agriculture GDP. Their findings are consistent with claims that agricultural sector growth is substantially more important than non-agricultural sector growth for those households in the lower deciles of the expenditure distribution, i.e., the poorer segments of the population. For richer households they found, that the expenditure elasticity of non-agricultural growth is much higher than for agricultural growth, which brought them to the conclusion that their findings are consistent with claims that agricultural sector growth is pro-poor.

While the direct growth contribution of agriculture is on average likely to be smaller, this is often likely to be compensated by its contribution to non-agriculture growth through the linkage effects which tends to be at least as large as the reverse feedback effect. In evaluating the potential growth contribution to poverty reduction from investment in agriculture in a particular country, it is thus critical to account for both the contemporaneous direct effects as well as the lagged indirect effects (Christiaensen, L., Demery, L., Köhl, J., 2006).

Christiaensen and Demery (2007) found that growth originating in agriculture is on average significantly more poverty reducing than growth originating outside agriculture and that the contribution of economic growth to poverty reduction might differ across sectors because the benefits of growth might be easier for poor people to obtain if growth occurs where they are located.

According to FAO (2000), pro-poor income growth is a necessary but often insufficient condition to reduce hunger within a reasonable timespan. Without direct public measures to alleviate the most pressing and transient problems, income growth will only gradually solve the problem of hunger. And the same source presents, that “economic growth originating in agriculture, when coupled with growth in rural non-farm incomes, is likely to be strongly poverty reducing, provided that it does not occur against a backdrop of extreme inequality in asset ownership, especially of land.“

Warr and Wang (1999) found that in Taiwan it is the growth of the industrial sector which has the largest impact on poverty reduction.

By pooling the data from Thailand, Indonesia, Malaysia, and the Philippines Warr (2002) found that it is the growth of the services sector which accounts for the largest reduction in poverty in these countries. Also Suryahadi, A. and Hadiwidjaja, G. (2011) shown that the growth of services sector appears to have the highest impact in reducing poverty in Indonesia for both urban and rural areas. This result holds for both the pre and post Asian financial crisis eras. The role of agricultural sector growth nevertheless remains important in reducing poverty in rural areas, however this impact slightly declines.

Ravallion, M., Datt, G., (2002) found that „It is widely agreed that economic growth is not sufficient for poverty reduction. A number of other factors influence whether the growth is more or less poverty reducing.“ They also found that rural and human resource development and a more egalitarian distribution of land appear to be strongly synergistic with poverty reduction

though an expanding non-farm economy, and that to matter significantly to prospects for pro-poor growth is the role played by literacy.

Rural non-farm sector offers a relatively easy escape route from poverty. But anyone who thinks of supplying these goods and services runs into a demand bottleneck. Because they are effectively non-tradable in most circumstances, they can only be sold locally. There is not much local demand for them in a stagnant rural economy and, until the economy is created, there is no point in expanding output. But if agricultural productivity and hence the incomes of those who own land can be increased and if they spend this extra income on goods and services provided by the rural non-farm sector then the bottleneck to the rural non-farm sector's expansion can be cleared and it can grow and provide important benefits for the poor. Even landless agricultural labourers and others not directly employed in this sector benefit since their power to bargain for higher wages goes up if alternative sources of employment are available (FAO, 2000).

### Data and methodology

For the data were used World Bank national accounts data, and OECD National Accounts data files in period from 1991 to 2013. Missing data were amended by central characteristics of surrounding data file, concretely by arithmetic average. Missing outlying values were amended using linear trend of the data file.

Evaluation of the role of agriculture for poverty reduction in continental Latin American countries is based on the concept of the growth elasticity of poverty.

The growth elasticity of poverty indicates how efficiently growth has translated into poverty reduction. The total growth elasticity of poverty is the percentage change in poverty with respect to a one percent change in capita GDP:

$$\varepsilon = \frac{\partial P}{\partial Y} \frac{Y}{P}$$

where  $P$  is any of Foster-Greer-Thorbecke (TGF) poverty measures but usually the headcount index, and  $Y$  is per capita GDP, income, or expenditure (WB, 2013).

Growth elasticities of poverty vary across sectors; one can estimate sectoral growth elasticities of poverty (Ravallion, Datt, 2002).

To evaluate impact of basic sectors of economies in analysed countries, i.e. agriculture, industry and services, first conditional sectoral elasticities of poverty alleviation  $\hat{\varepsilon}_{i,j}$  for each sector in each country were calculated:

$$\hat{\varepsilon}_{i,j} = \frac{P_j^t - P_j^{t-1}}{P_j^{t-1}} * \Delta \frac{L_j^t}{Y_{i,j}^t} * \frac{Y_{i,j}^{t-1}}{L_j^{t-1}},$$

where  $P_j$  is poverty headcount ratio at \$2 a day, which is the percentage of the population living on less than \$2a day,  $Y_{i,j}$  is value added in sector  $i$  of country  $j$ , and  $L_j$  is midyear population in country  $j$ . First term of the equation is percentage change in poverty  $\% \Delta P$ , and the second term represents reversed value of percentage change of sectoral value added per capita  $\% \Delta \hat{Y}$ . These represent the elasticity of poverty with respect to growth that would characterize individual countries if the whole economy would grow as corresponding sector. Conditional sectoral elasticities of poverty we calculated for periods 1991-1996, 1997-2002, 2003-2008, and 2009-2012.

For realistic evaluation of the contribution of individual economic sector these conditional sectoral elasticities of poverty were weighted by the share of agricultural, industrial and services sectors in gross domestic product of the whole economy. Realistic sectoral growth elasticities of poverty  $\varepsilon_{i,j}$  were calculated for all countries:

$$\varepsilon_{i,j} = \hat{\varepsilon}_{i,j} * s_{i,j}^t,$$

where

$$s_{i,j}^t = \sum_{k=1}^n \hat{Y}_{i,j,k} * \frac{1}{n},$$

where  $\hat{Y}_{i,j,k}$  is sectoral value added per capita in sector  $i$ , country  $j$ , and year  $k$ ;  $n$  is length of considered period.

## Results and discussion

For calculation of conditional sectoral growth elasticities of poverty  $\hat{\varepsilon}_{i,j}$  were used sectoral GDP growth data in form of value added in sector of agriculture, industry and services as a percentage of the overall GDP of the country. However interpretation of these coefficients is not straightforward. For evaluation of contribution of economic growth of individual sectors for poverty alleviation in individual countries, sectoral economic growth was weighted by the share of these sectors in GDP. Resulting realistic sectoral growth elasticities of poverty  $\varepsilon_{i,j}$  indicate the percentage change in poverty in the country as a result of economic growth by one percent in sectors of agriculture, industry, respectively services, reflecting existing share and economic importance of these sectors within the structure of domestic economies.

**Tab. 1 Conditional and realistic agriculture growth elasticity of poverty**

	1991-1996		1997-2002		2003-2008		2009-2012	
	$\hat{\varepsilon}_{i,j}$	$\varepsilon_{i,j}$	$\hat{\varepsilon}_{i,j}$	$\varepsilon_{i,j}$	$\hat{\varepsilon}_{i,j}$	$\varepsilon_{i,j}$	$\hat{\varepsilon}_{i,j}$	$\varepsilon_{i,j}$
<b>Argentina</b>	-21,2	-1,2	3,7	0,2	-49,4	-4,2	-3,0	-0,2
<b>Belize</b>	4,8	0,8	-0,7	-0,1	3,1	0,5	-3,2	-0,4
<b>Bolivia</b>	9,4	1,6	-1,8	-0,3	-60,5	-8,6	-8,0	-1,0
<b>Brazil</b>	1,2	0,1	-0,3	0,0	22,4	1,4	-7,7	-0,4
<b>Chile</b>	2,0	0,2	19,2	1,1	5,8	0,2	-7,0	-0,2
<b>Colombia</b>	-2,4	-0,4	0,3	0,0	-191,7	-15,8	14,2	1,0
<b>Costa Rica</b>	-3,6	-0,5	0,2	0,0	-100,8	-8,6	6,8	0,4
<b>Dominican R.</b>	1,4	0,2	-3,1	-0,2	-2,5	-0,2	-10,7	-0,7
<b>Ecuador</b>	109,7	24,3	-0,6	-0,1	15,5	1,6	-32,5	-3,2
<b>El Salvador</b>	27,5	4,1	0,1	0,0	-1,5	-0,2	11,1	1,3
<b>Guatemala</b>	0,2	0,0	-3,1	-0,5	7,7	1,0	12,0	1,4
<b>Guyana</b>	0,1	0,0	-0,4	-0,1	2,9	0,8	-9,0	-1,7
<b>Honduras</b>	-4,1	-0,9	-0,3	-0,1	-3,1	-0,4	-3,5	-0,5
<b>Mexico</b>	-2,0	-0,1	2,3	0,1	-52,9	-1,8	-11,8	-0,4
<b>Nicaragua</b>	-3,1	-0,7	1,5	0,3	-4,2	-0,7	-7,3	-1,3
<b>Panama</b>	2,2	0,2	-0,4	0,0	7,6	0,5	-4,5	-0,2
<b>Paraguay</b>	-0,7	-0,1	-1,0	-0,2	-1,9	-0,4	-2,2	-0,5
<b>Peru</b>	-1,6	-0,2	-17,0	-1,5	-3,2	-0,2	-8,5	-0,6
<b>Surinam</b>	0,0	0,0	0,0	0,0	-3,1	-0,2	12,1	0,9
<b>Uruguay</b>	-1,5	-0,1	-65,9	-4,9	-3,3	-0,4	-3,4	-0,3
<b>Venezuela, RB</b>	-2,0	-0,1	-1,5	-0,1	-1,5	-0,1	2,6	0,1

From realistic agricultural growth elasticity of poverty  $\varepsilon_{i,j}$  in Tab. 1 is obvious, that within analysed period number of countries with positive effect of growth of agriculture on reduction of poverty has been increasing. Among countries with elastic reaction of poverty alleviation on

growth of agriculture belong Bolivia, Ecuador, Guyana, and Nicaragua. Simultaneously in all of these countries is relatively very high share of agriculture on overall GDP. Agricultural sector in all of these countries creates more than 10%. On the other hand negative or at least disputable is impact of the growth of agriculture on poverty reduction especially in Colombia, Costa Rica, El Salvador, Guatemala, Surinam, and Venezuela. Consistent positive impact of growth of agriculture on poverty alleviation during the whole followed period may be observed in Honduras, Paraguay, Peru, and Uruguay.

**Tab. 2 Conditional and realistic industry growth elasticity of poverty**

	1991-1996		1997-2002		2003-2008		2009-2012	
<b>Argentina</b>	-17,3	-4,8	-21,6	-5,3	-1,9	-0,6	-14,9	-4,5
<b>Belize</b>	5,3	1,1	-0,1	0,0	-2,2	-0,4	6,5	1,4
<b>Bolivia</b>	9,2	3,0	-8,6	-2,5	-1,6	-0,5	-4,1	-1,6
<b>Brazil</b>	1,3	0,4	-1,5	-0,4	-4,5	-1,3	-32,8	-8,8
<b>Chile</b>	-0,8	-0,3	1,9	0,7	-2,3	-0,9	-10,0	-3,8
<b>Colombia</b>	-3,6	-1,2	4,3	1,3	-2,2	-0,7	-3,8	-1,4
<b>Costa Rica</b>	-3,2	-1,0	-0,4	-0,1	-4,2	-1,2	-25,2	-6,5
<b>Dominican R.</b>	-0,7	-0,2	1,0	0,3	-3,8	-1,1	-10,1	-2,8
<b>Ecuador</b>	2,5	0,7	1,1	0,3	-1,6	-0,6	-3,1	-1,2
<b>El Salvador</b>	-0,8	-0,2	-0,1	0,0	59,0	17,4	-20,7	-5,6
<b>Guatemala</b>	-0,1	0,0	2,6	0,8	-7,0	-2,1	-17,8	-5,2
<b>Guyana</b>	0,1	0,0	-0,3	-0,1	-2,8	-0,8	-3,4	-1,2
<b>Honduras</b>	-0,7	-0,2	4,0	1,2	-6,1	-1,8	-25,3	-7,0
<b>Mexico</b>	2,8	0,9	50,5	17,1	-4,7	-1,7	-8,7	-3,1
<b>Nicaragua</b>	-1,3	-0,3	-0,8	-0,2	-2,9	-0,7	-1,7	-0,5
<b>Panama</b>	-0,7	-0,1	0,4	0,1	-1,1	-0,2	-3,3	-0,7
<b>Paraguay</b>	3,4	1,2	8,9	3,3	9,4	3,2	-9,1	-2,7
<b>Peru</b>	-1,5	-0,5	69,7	22,1	-1,5	-0,6	-2,8	-1,1
<b>Surinam</b>	0,0	0,0	0,0	0,0	-0,6	-0,2	-11,8	-6,1
<b>Uruguay</b>	4,6	1,4	-4,2	-1,1	-3,1	-0,8	-4,5	-1,1
<b>Venezuela, RB</b>	-2,9	-1,4	-2,5	-1,2	-1,2	-0,7	-3,0	-1,5

Growth elasticity of poverty of industry sector in Tab. 2 shows, that within analysed period number of countries with positive effect of growth of industry on reduction of poverty has been significantly increasing. In last followed period there was the only exemption Belize with negative impact of the growth of industry on poverty reduction. Among countries with elastic reaction of poverty alleviation on growth of industry belong Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Mexico, Paraguay, Peru, Surinam, Uruguay, and Venezuela. On the other hand negative or at least disputable is especially in Colombia, Costa Rica, El Salvador, Guatemala, Surinam, and Venezuela. Consistent positive impact of growth of industry on poverty alleviation during the whole followed period may be observed in Argentina, Costa Rica, Nicaragua, and Venezuela.

**Tab. 3 Conditional and realistic services growth elasticity of poverty**

	1991-1996		1997-2002		2003-2008		2009-2012	
<b>Argentina</b>	4,5	3,0	-7,4	-5,2	-2,5	-1,5	-4,1	-2,6
<b>Belize</b>	2,6	1,6	-0,1	-0,1	-31,5	-20,7	-112,3	-73,1
<b>Bolivia</b>	2,6	1,3	2,5	1,4	-64,7	-33,7	-7,3	-3,6
<b>Brazil</b>	-0,9	-0,5	3,8	2,6	-4,0	-2,6	-7,0	-4,7
<b>Chile</b>	-0,7	-0,4	-1,1	-0,7	-7,7	-4,4	-4,1	-2,4
<b>Colombia</b>	0,8	0,4	-2,9	-1,7	-5,3	-3,1	-7,5	-4,3
<b>Costa Rica</b>	-1,9	-1,1	-0,2	-0,1	-3,8	-2,3	-5,0	-3,4
<b>Dominican R.</b>	-0,5	-0,3	0,5	0,3	-3,1	-1,9	-5,6	-3,7
<b>Ecuador</b>	-3,1	-1,6	45,6	24,8	-20,1	-11,1	-10,6	-5,6
<b>El Salvador</b>	-1,0	-0,5	-0,2	-0,1	-6,2	-3,7	-12,3	-7,5
<b>Guatemala</b>	-0,1	0,0	1,2	0,7	-5,6	-3,2	-13,8	-8,1
<b>Guyana</b>	0,2	0,1	0,1	0,0	-14,2	-6,2	-4,2	-1,9
<b>Honduras</b>	10,9	5,3	0,6	0,3	-3,1	-1,8	-17,8	-10,4
<b>Mexico</b>	-17,6	-11,2	-3,8	-2,4	-14,8	-9,0	-11,2	-6,9
<b>Nicaragua</b>	6,6	3,8	-1,0	-0,6	-7,1	-4,2	-155,1	-84,1
<b>Panama</b>	-2,8	-2,1	-0,4	-0,3	-2,5	-1,9	-2,8	-2,1
<b>Paraguay</b>	-1,4	-0,6	-1,4	-0,7	-4,4	-2,0	-3,5	-1,7
<b>Peru</b>	-4,5	-2,6	30,7	18,2	-4,2	-2,3	-4,9	-2,6
<b>Surinam</b>	0,0	0,0	0,0	0,0	2,3	1,2	-2,8	-1,1
<b>Uruguay</b>	-0,5	-0,3	-7,3	-4,9	-2,9	-1,8	-4,0	-2,6
<b>Venezuela, RB</b>	2,6	1,2	-3,5	-1,7	-1,7	-0,7	6,6	2,9

From Tab. 3 is apparent, that growth of services as a sector is the most contributory to poverty alleviation in Latin America. All countries show elastic reaction of poverty reduction on growth of services sector. For countries like Chile, Costa Rica, El Salvador, Mexico, Panama, Paraguay, Uruguay, and Venezuela is this characteristic for the whole observed period from 1991 to 2012.

## Conclusion

This paper wanted to answer the question what is the role of agriculture for alleviation of poverty in continental Latin American countries, respectively whether the growth of this sector is the most effective in poverty reduction. Results show that agriculture is not the most effective sector. The growth of industry sector and especially growth of services sector appear to have higher impact on reducing poverty.

Because estimation of sectoral growth is weighted by the importance of the sector in national economy, i.e. by GDP share, services sector contributes the most to poverty alleviation and outplays agricultural sector in its capacity to reduce poverty.

For further analysis of sectoral contribution to alleviation of poverty would be worthwhile to consider especially urban and rural areas and contribution of individual economic sectors within these areas; changing consumption of those living in these areas; impact of growth of agriculture, industry and services on income distribution; changes of employment and wages in individual sectors; sectoral labour productivity; life quality; as well as institutional factors and political stability.

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# Indebtedness and prosperity determinants of agricultural companies in Slovakia

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## Abstract

The aim of the scientific article is review an influence of debt burden on the prosperity to agriculture companies while the prosperity is measured by the return of equity. In the paper we present data about empirical verification of validity the theoretical conclusions of leverage, according to the level of achievement the return on capital invested in the business of an enterprise is determined by the leverage. The subject of analysis are financial data from the set of agricultural companies of selected region in the Slovak republic in the period 2008-2012 obtained from balance sheets and profit and loss statements of each analysed companies. From the basic set of 46 companies, we selected 25 companies that have farmed continuously throughout the analysed period. Under the effect of financial leverage, we understand a change in the return on equity influenced by amount of liabilities and cost of borrowed capital influenced by interest expense. In the group of agricultural farms are included primarily cooperatives and limited companies. Our task is to consider the degree of determination the return on equity calculated from profit before tax. The rate of determination was quantified through functional method of analysis the return on equity

based on the equation 
$$\frac{EAT}{VK} = \frac{EBIT}{T} \times \frac{EBT}{EBIT} \times \frac{EAT}{EBT} \times \frac{T}{A} \times \frac{A}{VK}$$

When quantifying the econometric model we used panel data, specifically the fixed effect model (FEM). We come out from the equation:

$$\ln(\text{ROE})_i = \alpha_i + \ln \alpha_1 \left( \frac{EBIT}{T} \right) + \ln \alpha_2 \left( \frac{EBT}{EBIT} \right) + \ln \alpha_3 \left( \frac{EAT}{EBT} \right) + \ln \alpha_4 \left( \frac{A}{VK} \right) + u_i$$

For the quantification of the parameters of the econometric model we will use econometric software Gretl, which is publicly available on the internet.

Based on the analysis results, we can conclude, the indebtedness of agricultural companies analysed region of Slovak Republic increased return on equity. With the increasing indebtedness is increasing return on equity. The average values for the five years confirmed, that from total set of companies leverage worked in seven companies negatively (i.e. 28 % of total enterprises) and in eighteen (i.e. 72 %) worked positively. The five- year average change of leverage increased average value of return on equity by 0.10 EURO of profit after taxes to 100 EURO accounting value of equity. Based on the analysis results of panel data we can conclude, that increase in leverage by 1 % brings increase ROE by 0.88 %. Reduction of interest profit also increase ROE by 0.59 % and increase the share of sales of assets by 1 % increase ROE of 0.90 %.

## Key words

return of equity, leverage, return on capital invested, indebtedness, agricultural companies.

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## Introduction

Scientific article deals with assessment of the financial-economic status set of agricultural companies of selected region in the Slovak republic. The aim of analysis is focused on the impact of valorisation of the debt burden on agricultural companies' prosperity. The prosperity of agriculture companies is expressed by synthetic indicator of financial performance, which is the return of equity.

The aim of the article is empirical verification of validity theoretical conclusions of financial leverage, according which is the level of profitability determined by the financial leverage. Under the effect of financial leverage, we understand a change in the return on equity influenced by amount of liabilities and cost of borrowed capital influenced by interest expense. In the group of agricultural farms are included primarily cooperatives and limited companies. The group of selected companies does not include stock companies and therefore the determination effect of corporate debt is expressed by return of equity as a profit before tax and return on equity in accounting value ratio.

## Materials and Methods

The objects of analysis are farms of selected region in Slovak republic in the period 2008 to 2012. Financial data was obtained from balance sheets and profit and loss statements of each analysed companies that have been granted by the Research Institute of Agricultural and Food Economics in Bratislava. In one particular year we obtained from 44 to 46 companies per year. We selected companies that have farmed continuously throughout the analysed period. From the dataset were also excluded companies whose business activities are directly unrelated to agricultural land (wine producers, high-capacity feedlot, distilling business and others). Overall, analysis includes 25 companies.

## Influence of analytical indicator change on the return on equity change - Functional method

For calculating, we came out from the equation:

$$\frac{EAT}{E} = \frac{EBIT}{S} \times \frac{EBT}{EBIT} \times \frac{EAT}{EBT} \times \frac{S}{A} \times \frac{A}{E}$$

EAT.....Earnings after Taxes

E.....Equity

EBIT.....Earnings before Interest and Taxes

S.....sales

A.....assets

Influence calculation process of time changes in individual determinants on synthetic indicator return on equity ( $\Delta EAT / E$ ) is as follows:

Impact ( $\Delta EBIT/S$ ) to change  $EAT/E$ :

$$\frac{\Delta \frac{EAT}{E}}{\Delta \frac{EBIT}{S}} = EAT_0/E_0A \left( 1 + \frac{B+C+D+E}{2} + \frac{BC+BD+BE+CD+DE+CE}{3} + \frac{BCD+BCE+BDE+CDE}{4} + \frac{BCDE}{5} \right)$$

Impact ( $\Delta EBT/EBIT$ ) to  $EAT/E$  change:

$$\frac{\Delta \frac{EAT}{E}}{\Delta \frac{EBT}{EBIT}} = EAT_0/E_0B \left( 1 + \frac{A+C+D+E}{2} + \frac{AC+AD+AE+CD+DE+CE}{3} + \frac{ACD+ACE+ADE+CDE}{4} + \frac{ACDE}{5} \right)$$

Impact ( $\Delta EAT/EBT$ ) to EAT/E change:

$$\Delta \frac{EAT}{E} / \Delta \frac{EAT}{EBT} = EAT_0/E_0 C \left( 1 + \frac{A+B+D+E}{2} + \frac{AB+AD+AE+BD+DE+BE}{3} + \frac{ABD+ABE+ADE+BDE}{4} + \frac{ABDE}{5} \right)$$

Impact ( $\Delta T/A$ ) to EAT/E change:

$$\Delta \frac{EAT}{E} / \Delta \frac{T}{A} = EAT_0/E_0 D \left( 1 + \frac{A+B+C+E}{2} + \frac{AB+AC+AE+BC+BE+CE}{3} + \frac{ABC+ABE+ACE+BCE}{4} + \frac{ABCE}{5} \right)$$

Impact ( $\Delta A/E$ ) to EAT/E change:

$$\Delta \frac{EAT}{E} / \Delta \frac{A}{VK} = EAT_0/E_0 E \left( 1 + \frac{A+B+C+D}{2} + \frac{AB+AC+AE+BC+BD+CD}{3} + \frac{ABC+ABD+ACD+BCD}{4} + \frac{ABCD}{5} \right)$$

legend:

$$x_0 = \frac{EAT_0}{E} \quad A = \frac{\Delta \frac{EBIT}{S}}{\frac{EBIT_0}{S_0}} \quad B = \frac{\Delta \frac{EBT}{EBIT}}{\frac{EBT_0}{EBIT_0}} \quad C = \frac{\Delta \frac{EAT}{EBT}}{\frac{EAT_0}{EBT_0}} \quad D = \frac{\Delta \frac{S}{A}}{\frac{S_0}{A_0}} \quad E = \frac{\Delta \frac{A}{E}}{\frac{A_0}{E_0}}$$

### Impact factors of return on equity quantification by analysis of panel data

During quantifying the econometric model we used panel data, specifically the fixed effect model (FEM). This model (FEM) unlike the united regression model supposes diversity cross-sectional units in absolute members. The time component is referred as  $t$  and cross-sectional is referred as  $i$ . In our case, we were monitoring selected agricultural companies of region is Slovak republic, which is a cross-sectional component  $i=1, \dots, N$  ( $N$  is 24 companies in every monitored year). Those observations are for a certain period of time  $t=1, \dots, T$  (years 2008 – 2012). Using marking introduced in the previous model, if we label T-dimensional vector units  $i$ , the model can be written in a compact form:

$$y_i = i\alpha_i + X_i\beta + u_i$$

We came out from the equation:

$$\ln (ROE)_i = \alpha_i + \ln \alpha_1 \left( \frac{EBIT}{S} \right) + \ln \alpha_2 \left( \frac{EBT}{EBIT} \right) + \ln \alpha_3 \left( \frac{EAT}{EBT} \right) + \ln \alpha_4 \left( \frac{A}{E} \right) + u_i$$

Dependent variable of econometric model:  $ROE = \frac{EAT}{E}$

Independent variables of econometric model:

$$\text{Return on sales} = \left( \frac{EBIT}{S} \right)$$

$$\text{Interest reduction of profit} = \left( \frac{EBT}{EBIT} \right)$$

$$\text{Tax reduction of profit} = \left( \frac{EAT}{EBT} \right)$$

$$\text{Leverage} = \left( \frac{A}{E} \right)$$

For the econometric model parameter quantification we will use econometric software Gretl, which is publicly available on the internet.

## The research results

Currently, when the countries are affected by the economic crisis, the assessment of the financial health of a company is becoming increasingly important. Indebtedness of business and its impact on the synthetic efficiency indicators, which are return of assets and return of equity is considered for essential components of financial equilibrium and in conjunction with them an important determinant of recovery of capital employed business owners consider leverage.

### Return of assets

Through the data in table 1, we can convince the average return of assets of the set of companies for a period of five years oscillated around 4.8%. The indicator was calculated as EBIT/total assets. Median of all 125 values (5 years x 25 companies) was 4.5 %. The lowest value was reported in one of the monitored enterprises in 2008 (-43.23 %) and the highest in 2011 (48.26 %).

**Table 1 The average return of total capital value calculated from EBIT**

Indicators	2008	2009	2010	2011	2012	Average	Index 12/08	Average annual increase
<b>Arithmetic Average</b>	4,0	-5,0	3,9	10,5	4,3	4,8	1,08	4,9
<b>Median</b>	4,31	-5,52	2,62	9,27	2,98	4,50	0,39	3,4
<b>Minimum</b>	-43,23	-40,41	-13,59	-28,48	-26,13	-19,18	-7,17	15,3
<b>Maximum</b>	26,02	5,82	24,42	48,26	35,29	29,33	63,38	19,0

Source: Data from the database Research Institute of Agricultural and Food Economics in Bratislava, calculated by authors

The lowest average return of total capital value was measured in 2009 (-5.0 %), the median was also the lowest (-5.52 %). In 2009, the second lowest minimum measured during the entire period (-0.41%) and the maximum measured value of the return of total capital in this year was the lowest of all years of the monitoring period (5.82 %).

Our analysis shows, on average 20 companies, i.e. 80% of the 25 enterprises achieved return on equity in the range from 0.01% to 2.99%. On average 5 enterprises (20%) achieved return of total capital less than zero, but no lower than -2.99%. These figures indicate that the year 2009 was the worst in the set of enterprises. Negative indicator shows up to 15 companies from the 25.

**Table 2 Development of the number of enterprises by intervals achieved profitability as a percentage of total capital**

Interval	2008		2009		2010		2011		2012		Average	
	num ber	%										
< - 5,00			1	4,0								
- 4,99 to - 3,00												
- 2,99 to 0,00	5	20,0	14	56,0	3	12,0	2	8,0	2	8,0	5	20,0
0,01 to 2,99	19	76,0	10	40,0	21	84,0	22	88,0	22	88,0	20	80,0
3,00 to 4,99					1	4,0						
5,00 to 9,99	1	4,00							1	4,0		
10,00 <							1	4,00				
<b>Total</b>	<b>25</b>	<b>100</b>										

Source: Data from the database Research Institute of Agricultural and Food Economics in Bratislava, calculated by authors

### Return on equity

Return on equity was quantified as Earnings before Taxes/Equity. That quantified indicator is comparable with indicator return on investment calculated from EBIT. Another reason of this methodology of calculation was elimination of the impact of fiscal policies when comparing across time and space.

**Table 3 Average values of return on equity calculated from the EBT**

Indicators	2008	2009	2010	2011	2012	Average	Index 12/08	Average annual increase
<b>Arithmetic Average</b>	5,3	-9,2	5,0	14,2	5,4	4,9	1,02	6,7
<b>Median</b>	7,25	-11,43	2,39	17,55	3,67	4,56	0,32	6,8
<b>Minimum</b>	-56,63	-1 468,95	-638,89	-386,81	-180,85	-136,05	-43,24	-278,7
<b>Maximum</b>	130,72	41,85	46,26	80,24	57,31	29,45	102,37	-56,2

Source: Data from the database Research Institute of Agricultural and Food Economics in Bratislava, calculated by authors

Average return on total capital for all companies for five years is 4.9 % and its dynamics measured by the index 2012/2008 is 1.02, which confirms the increase. Average annual growth of the indicator is 6.7 %. Median calculated from 125 data (25 companies x 5 years) is 4.56 %. This indicator has a fluctuating development. When comparing the values of the first and last analyzed year, we establish its decrease from 7.25 to 3.67 %.

It is surprising, that in 5 years, 7 of the 25 companies reported an average return on equity more than 15%. Immediately, behind this set of enterprises followed 6 subjects, which ranged ROE from 0.01 to 4.99 %. The third largest group are 5 businesses that achieve ROE less than -10 %. Up to 13 businesses in 2011 amounted ROE higher than 15%. The 2012 ROE reached the range from 0.01 to 4.99% up to 11 enterprises.

**Table 4 Development of the number of enterprises according to the achieved return on equity as a percentage of EBT**

Interval	2008		2009		2010		2011		2012		Average	
	amount	%	amount	%								
< - 10,00	4	16,0	14	56,0	2	8,0	2	8,0	1	4,0	5	18,4
- 9,99 to - 5,00	1	4,0	1	4,0	2	8,0					1	3,2
- 4,99 to 0,00		0,0	8	32,0					1	4,0	2	7,2
0,01 to 4,99	7	28,0			11	44,0	2	8,0	11	44,0	6	24,8
5,00 to 9,99	3	12,0	2	8,0	1	4,0	5	20,0	3	12,0	3	11,2
10,00 to 14,99	3	12,0			2	8,0	3	12,0	2	8,0	2	8,0
15,00 <	7	28,0			7	28,0	13	52,0	7	28,0	7	27,2
Total	25	100	25	100	25	100	25	100	25	100	25	100

Source: Data from the database Research Institute of Agricultural and Food Economics in Bratislava, calculated by authors

### Financial leverage and its influence on the return on capital

Financial leverage expresses the ratio between the total accounting value of capital and equity. In other words, how many times is total capital greater than return on equity? Increase the debt has a positive effect to return on equity (ROE) only if the overall assessment of the company's capital (ROI), which includes the borrowed capital is higher than the interest expense (IX).

Effect of financial leverage in the enterprise:

- Positive effect - total capital, the business capital employed is higher than the cost of borrowed funds, respectively growth of foreign capital may increase ROE. ( $ROI > IX \Rightarrow ROE$  will increase)
- Negative effect - total capital, the business capital employed is lower than the average interest rate on borrow funds ( $ROI < IX \Rightarrow ROE$  is reduced)
- Zero leverage ( $ROI = IX \Rightarrow ROE$  unchanged)

In 2008 leverage increased level of ROE in 18 enterprises. In seven companies we had negative impact, including the company No. 24 has been reported the loss, while the value of equity was negative. The value of ROE in the enterprise was positive, but this status cannot be assessed positively.

Data from 2009 confirm our previous findings. This year was barren and in the most of entities showed the loss. It was showed in the negative impact of financial leverage of return on equity. Up to 76 % enterprises in 2009 showed a negative effect.

In 2010, leverage has a positive impact on the development of return on equity of fifteen enterprises (60 % of total). The negative impact was reported in ten enterprises.

In 2011, in more enterprises came significantly improvement of financial and economic situation, which was showed not only to an increase level of profit, but also the positive impact of financial leverage to the development of return on equity. Only three companies have shown us positive effect, which represents 12 % of the total number of enterprises.

In 2012, in six enterprises leverage influenced to development of ROE negative, it means, that positively influenced the 76 % of companies.

In table 6 we bring comparing five-year average ROA, ROE and IX for each business entity. We present a procedure for calculating of return on equity, which is calculated as following:

$$ROE = \frac{\sum_1^n EBT}{\sum_1^n E}$$

EBT = Earnings Before Taxes

E = Equity

n = number of monitored years, in our case 5 years.

The average values for five years (Table 6) were confirmed to us, in seven from 25 enterprises leverage worked negative and positive in eighteen companies.

**Table 5 Impact development of financial leverage of return on equity for the period**

Enterprises	2008			2009			2010			2011			2012												
	EBT/E	EBIT/A	IX	EBT/E	EBIT/A	IX	EBT/E	EBIT/A	IX	EBT/E	EBIT/A	IX	EBT/E	EBIT/A	IX										
1.	0,109	>	0,047	>	0,027	<b>-0,308</b>	<	<b>-0,053</b>	<	<b>0,056</b>	0,006	<	0,034	<	0,053	0,425	>	0,209	>	0,052	0,131	>	0,07	>	0,035
2.	0,01	>	0,008	>	0	<b>-0,213</b>	<	<b>-0,156</b>	<	<b>0,001</b>	-0,009	<	-0,007	<	0,001	0,006	>	0,005	>	0	0,019	>	0,017	>	0,003
3.	<b>-0,12</b>	<	<b>-0,063</b>	<	<b>0,021</b>	<b>-0,182</b>	<	<b>-0,087</b>	<	<b>0,015</b>	0,011	<	0,013	<	0,019	0,175	>	0,131	>	0,034	0,097	>	0,076	>	0,016
4.	0,061	>	0,048	>	0,012	0,007	>	0,007	>	0,007	0,013	>	0,011	>	0,005	0,117	>	0,09	>	0,004	0,027	>	0,022	>	0,001
5.	0,024	>	0,022	>	0,018	<b>-0,291</b>	<	<b>-0,156</b>	<	<b>0,011</b>	0,022	>	0,017	>	0,014	0,255	>	0,169	>	0,018	<b>-0,026</b>	<	<b>-0,009</b>	<	<b>0,016</b>
6.	<b>-0,268</b>	<	<b>-0,215</b>	<	<b>0,002</b>	<b>-0,125</b>	<	<b>-0,091</b>	<	<b>0</b>	0,148	>	0,118	>	0	0,192	>	0,153	>	0	0,002	>	0,002	>	0
7.	0,099	>	0,061	>	0,021	<b>-0,125</b>	<	<b>-0,055</b>	<	<b>0,022</b>	0,034	>	0,026	>	0,018	0,132	>	0,093	>	0,019	<b>0</b>	<	<b>0,004</b>	<	<b>0,012</b>
8.	<b>0</b>	<	<b>0,005</b>	<	<b>0,029</b>	<b>0,009</b>	<	<b>0,011</b>	<	<b>0,058</b>	0,011	>	0,01	>	0,009	0,119	>	0,093	>	0,013	0,037	>	0,029	>	0,011
9.	<b>0,019</b>	<	<b>0,02</b>	<	<b>0,036</b>	<b>-0,076</b>	<	<b>-0,059</b>	<	<b>0,025</b>	<b>0,001</b>	<	<b>0,001</b>	<	<b>0,004</b>	0,051	>	0,042	>	0,002	<b>0,008</b>	<	<b>0,009</b>	<	<b>0,02</b>
10.	<b>-0,088</b>	<	<b>-0,046</b>	<	<b>0,032</b>	<b>-0,114</b>	<	<b>-0,065</b>	<	<b>0,02</b>	<b>0,016</b>	>	<b>0,016</b>	>	<b>0,015</b>	0,064	>	0,05	>	0,013	0,034	>	0,027	>	0,011
11.	0,285	>	0,17	>	0,006	0,005	>	0,003	>	0,001	<b>0</b>	<	<b>0,001</b>	<	<b>0,002</b>	0,247	>	0,155	>	0	0,024	>	0,014	>	0,002
12.	0,004	>	0,003	>	0	<b>-0,185</b>	<	<b>-0,158</b>	<	<b>0</b>	0,369	>	0,244	>	0	0,344	>	0,237	>	0	0,245	>	0,214	>	0
13.	0,269	>	0,242	>	0,027	0,06	>	0,056	>	0,048	0,284	>	0,235	>	0,001	0,343	>	0,306	>	0	0,172	>	0,162	>	0
14.	0,072	>	0,043	>	0,032	<b>0,019</b>	<	<b>0,026</b>	<	<b>0,041</b>	0,183	>	0,105	>	0,034	0,06	>	0,055	>	0,029	<b>0,011</b>	<	<b>0,021</b>	<	<b>0,035</b>
15.	<b>-0,566</b>	<	<b>-0,044</b>	<	<b>0,016</b>	<b>-14,689</b>	<	<b>-0,404</b>	<	<b>0,016</b>	0,463	>	0,155	>	0,109	0,268	>	0,147	>	0,015	0,474	>	0,313	>	0,087
16.	0,118	>	0,077	>	0,05	<b>0,009</b>	<	<b>0,031</b>	<	<b>0,057</b>	<b>0,024</b>	<	<b>0,036</b>	<	<b>0,052</b>	<b>0,01</b>	<	<b>0,033</b>	<	<b>0,057</b>	<b>0,014</b>	<	<b>0,03</b>	<	<b>0,045</b>
17.	0,412	>	0,246	>	0,046	<b>-0,435</b>	<	<b>-0,133</b>	<	<b>0,046</b>	0,394	>	0,19	>	0,037	0,312	>	0,128	>	0,021	0,068	>	0,067	>	0,017
18.	0,257	>	0,096	>	0,032	<b>-0,232</b>	<	<b>-0,042</b>	<	<b>0,023</b>	<b>-0,045</b>	<	<b>0,004</b>	<	<b>0,023</b>	0,599	>	0,282	>	0,023	0,261	>	0,139	>	0,017
19.	0,116	>	0,054	>	0,003	<b>-1,711</b>	<	<b>-0,249</b>	<	<b>0,015</b>	<b>-6,389</b>	<	<b>-0,136</b>	<	<b>0,022</b>	0,802	>	0,062	>	0,016	0,369	>	0,032	>	0,008
20.	0,019	>	0,016	>	0,014	<b>0,005</b>	<	<b>0,013</b>	<	<b>0,03</b>	<b>0,039</b>	>	<b>0,036</b>	>	<b>0,045</b>	0,066	>	0,045	>	0,02	0,068	>	0,047	>	0,014
21.	0,336	>	0,26	>	0,002	0,026	>	0,019	>	0	0,09	>	0,07	>	0	0,204	>	0,176	>	0	0,108	>	0,096	>	0
22.	0,042	>	0,037	>	0,031	<b>-0,463</b>	<	<b>-0,262</b>	<	<b>0,033</b>	<b>-0,156</b>	<	<b>-0,082</b>	<	<b>0,027</b>	<b>-0,589</b>	<	<b>-0,237</b>	<	<b>0,028</b>	<b>-1,809</b>	<	<b>-0,261</b>	<	<b>0,028</b>
23.	0,229	>	0,12	>	0,005	<b>0,097</b>	>	<b>0,058</b>	>	<b>0,004</b>	0,189	>	0,118	>	0,001	0,087	>	0,043	>	0,001	0,003	>	0,001	>	0
24.	<b>1,307</b>	<	<b>-0,432</b>	<	<b>0</b>	<b>0,419</b>	<	<b>-0,263</b>	<	<b>0</b>	0,1	>	0,022	>	0	<b>-3,868</b>	<	<b>-0,285</b>	<	<b>0</b>	0,573	>	0,353	>	0
25.	0,3	>	0,211	>	0	0,022	>	0,018	>	0	0,248	>	0,206	>	0	0,58	>	0,483	>	0	0,26	>	0,213	>	0
Arithmetic average	<b>0,053</b>	>	<b>0,04</b>	>	<b>0,021</b>	<b>-0,092</b>	<	<b>-0,05</b>	<	<b>0,022</b>	<b>0,05</b>	>	<b>0,039</b>	>	<b>0,024</b>	<b>0,142</b>	>	<b>0,105</b>	>	<b>0,02</b>	<b>0,054</b>	>	<b>0,043</b>	>	<b>0,017</b>

Source: Data from the database Research Institute of Agricultural and Food Economics in Bratislava, calculated by authors

**Table 6 Effect of leverage on the development of return on equity - an average of 2008 - 2012**

Enterprises	EBT/E		EBIT/A		IX
1.	0,108	>	0,079	>	0,048
2.	<b>-0,047</b>	<	<b>-0,034</b>	<	<b>0,001</b>
3.	0,034	>	0,021	>	0,020
4.	0,043	>	0,035	>	0,005
5.	0,018	>	0,015	>	0,015
6.	0,063	>	0,003	>	0,000
7.	0,035	>	0,033	>	0,018
8.	0,045	>	0,038	>	0,019
9.	<b>-0,003</b>	<	<b>0,004</b>	<	<b>0,012</b>
10.	<b>0,000</b>	<	<b>-0,008</b>	<	<b>0,015</b>
11.	0,075	>	0,061	>	0,001
12.	0,108	>	0,096	>	0,000
13.	0,237	>	0,202	>	0,005
14.	0,066	>	0,062	>	0,035
15.	0,141	>	0,069	>	0,039
16.	<b>0,009</b>	<	<b>0,031</b>	<	<b>0,049</b>
17.	0,130	>	0,121	>	0,027
18.	0,236	>	0,126	>	0,021
19.	<b>-0,596</b>	<	<b>-0,024</b>	<	<b>0,013</b>
20.	0,046	>	0,039	>	0,026
21.	0,213	>	0,151	>	0,000
22.	<b>-0,479</b>	<	<b>-0,192</b>	<	<b>0,029</b>
23.	0,093	>	0,070	>	0,001
24.	<b>-1,360</b>	<	<b>-0,181</b>	<	<b>0,000</b>
25.	0,294	>	0,293	>	0,000
<b>Arithmetic average</b>	<b>0,047</b>	<b>&gt;</b>	<b>0,038</b>	<b>&gt;</b>	<b>0,021</b>

Source: Data from the database Research Institute of Agricultural and Food Economics in Bratislava, calculated by authors

How can we convince, the Table 7 and 8, the largest negative change of return on equity calculated from the net profit was in 2009 representing 0.128 EURO of profit for 1 EURO equity. Return on sales decreased ROE by 0.133 EURO. We can say, that the return on sales is an indicator, which change impact significantly to change of synthetic indicator ROE. In 2010 this indicator increased by 16.20 EURO sales and it increased ROE by 0.110.

If we make average from the individual annual determination, we find that for four years (2009-2012) the highest positive impact for the development of ROE had change of interest of reduction profit, which on average during the analysed period increased ROE to 100 EUR of equity.

The highest negative impact had return on sales, which decreased net profit attributable to 100 EURO of equity by 0.40 EURO. Leverage decreased return on assets in 2009 (-0.001 EURO) and in 2011 (-0.006 EURO). The five-year average change of financial leverage increased average value of changes return on equity by 0.10 EURO of profit after taxes to 100 EURO carrying value of equity.

### **Impact of changes on return on capital in selected analytical factors**

How can we convince from the table 7 and 8, the largest negative change of return on equity calculated from net profit was in 2009, represented 0.128 EURO of profit to 1 EURO of equity. Return on sales decreased ROE by 0.133 EURO. We can say, that the return on sales is an indicator, which change the most significantly impact to change of synthetic indicator ROE. In 2010 this indicator increased by 16.20 EURO to 100 EURO of sales and this change increased ROE by 0.110.

If we make average from individual annual determination, we find, that for four years (2009-2012) the highest positive impact to the development of ROE had change of interest of reduction profits, which on average during the analysed period increased ROE by 0.80 EURO to 100 EURO equity.

The highest negative impact for return on sales has sales profitability, which decreased net profit attributable to 100 EURO equity by 0.40 EURO. Leverage decreased return on assets in 2009 (-0.001 EURO) and in 2011 (-0.006 EURO). The five-year average change of leverage decreased average value of change of return on equity by 0.10 EURO profit after taxes to 100 EURO accounting value of equity.

**Table 7 Pyramid system of indicators development, decomposition indicators of return on equity**

Period	Annual changes of indicators					Δ EAT/E
	EBIT/S	EBT/EBIT	EAT/EBT	S/A	A/E	
2009-2008	-0,156	0,301	0,420	-0,145	-0,050	-0,128
2010-2009	0,162	-0,310	-0,237	0,081	0,097	0,135
2011-2010	0,106	0,125	0,028	0,010	-0,106	0,078
2012-2011	-0,106	-0,062	-0,090	0,034	0,009	-0,078
<b>Average</b>	<b>0,040</b>	<b>0,849</b>	<b>0,770</b>	<b>0,763</b>	<b>2,780</b>	<b>0,002</b>

Source: Data from the database Research Institute of Agricultural and Food Economics in Bratislava calculated by authors

**Table 8 Average quantified effects of determinants to change ROE**

Period	Influence of indicators changes					Δ EAT/E
	EBIT/S	EBT/EBIT	EAT/EBT	S/A	A/E	
absolute value						
2009-2008	-0,133	0,008	-0,008	0,006	-0,001	-0,128
2010-2009	0,110	0,024	0,003	-0,002	0,001	0,135
2011-2010	0,073	0,006	0,003	0,001	-0,006	0,078
2012-2011	-0,066	-0,007	-0,009	0,004	0,000	-0,078
<b>Average</b>	<b>-0,004</b>	<b>0,008</b>	<b>-0,003</b>	<b>0,002</b>	<b>0,001</b>	<b>0,002</b>
percentage value, if annual chase EAT/VK = 100 %						
2009-2008	-104,07	6,27	-6,43	4,74	-0,52	-100,00
2010-2009	81,10	17,61	2,37	-1,72	0,65	100,00
2011-2010	94,16	8,18	3,63	1,74	-7,70	100,00
2012-2011	-85,25	-9,61	-10,97	5,22	0,61	-100,00
<b>Average</b>	<b>-240,55</b>	<b>439,05</b>	<b>-153,50</b>	<b>130,47</b>	<b>-75,48</b>	<b>100,00</b>

Source: Data from the database Research Institute of Agricultural and Food Economics in Bratislava calculated by authors

### Quantification of the influence of selected determinants on the return on equity through the analysis of panel data

For assess the impact of selected indicators on return on equity, we used panel data of companies of selected region in Slovak republic, which we have already described in the methodology of work. The most appropriate econometric model was confirmed logarithmic model:

$$\ln(\text{ROE})_i = \alpha_i + \ln \alpha_1 \left( \frac{\text{EBIT}}{S} \right) + \ln \alpha_2 \left( \frac{\text{EBT}}{\text{EBIT}} \right) + \ln \alpha_3 \left( \frac{\text{EAT}}{\text{EBT}} \right) + \ln \alpha_4 \left( \frac{A}{E} \right) + u_i$$

While examining the dependence we have implemented a number of model approaches with different explanatory factors. We present a model that had the highest statistical significance.

Characteristics and results of the model are following:

Model: Fixed effects, using the 76 observations

Included 24 cross-sectional units

Length of time series: minimum 2, maximum 4 year

**Table 9 Output data model**

<i>Dependent variable</i>	<i>Coefficient</i>	<i>Standard error</i>	<i>t-share</i>	<i>p-value</i>	<i>statistical evidence</i>
<b>Constant</b>	-0,319846	0,246513	-1,2975	0,20067	
<b>EBIT/S</b>	1,04106	0,0770989	13,5029	<0,00001	***
<b>A/E</b>	0,877783	0,350057	2,5075	0,01559	**
<b>EBT/EBIT</b>	0,592996	0,112784	5,2578	<0,00001	***
<b>S/A</b>	0,896028	0,23943	3,7423	0,00049	***

Mean value of the dependent variable	-3,217378	Standard deviation of dependent variable	1,947302
Sum of squares of residues	12,69749	Standard error of regression	0,514326
Coefficient of determination	0,955353	Adjusted coefficient of determination	0,930239
F(27, 48)	38,04097	P-value (F)	4,84e-24
Logarithm of assurance	-39,84483	Akaiko criterion	135,6897
Schwarz criterion	200,9502	Hannan-Quinn criterion	161,7709
rho (autocorrelation coefficient)	-0,360517	Durbin-Watson statistic	1,667367

Based on the analysis of panel data, we can conclude, that if the return on sales increases by 1 %, the dependent variable - return on equity will increase by 1.04 %. A leverage increase ROE by 0.88 %, reduction of interest income also increases ROE by 0.59 % and increases the share of sales of assets by 1 % increases ROE by 0.90 %.

### Conclusions:

Based on the analysis results, we can take the following conclusion:

1. Indebtedness of agricultural companies of analysed region increased return on equity.
2. With the increasing indebtedness is increasing return on equity.

The reasons for the conclusions are following:

- In 2008, leverage increased level of ROE in 18 companies of the 25 enterprises.
- The year 2009 was weak and in most cases achieved a negative profit, respectively profit was lower than the cost of capital. It was also reflected in a negative evaluation of financial leverage to return on equity. Up to 19 companies, i.e. 76 %, the interest rate and leverage determined development of return on equity negatively.
- In 2010, leverage affected development of ROE negatively in 10 enterprises. 15 companies, i.e. 60 % of total set, leverage influenced ROE positively.

- In 2012 leverage worked in six enterprises to the development of ROE negatively. Positively influenced 76 % of enterprises.
- The average values for the five years confirmed, leverage worked in seven companies from set negatively and in eighteen positively.
- Based on the analysis of changes was found in the analytical determination a change of the synthetic indicator - ROE, in 2009 leverage decreases return on assets (- 0.001 EURO) and in 2011 (-0.006 EURO). The five-year average change of leverage increased average value of return on equity by 0.10 EURO of profit after taxes to 100 EURO carrying value of equity.
- Based on the analysis results of panel data we can conclude, that increase in leverage by 1 % brings increase of ROE by 0.88 %. Reduction of interest profit also increases ROE by 0.59 % and increase the share of sales of assets by 1 % increases ROE of 0.90 %.

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# Solving the Economic Models by Using the Tools of Excel and VBA Language

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## Abstract:

Models in economics have the wide range of forms including graphs, diagrams, and mathematical models. Economists use these models in different purposes; it depends on many factors such as what type of raw data they have or how they can represent the data. Appropriate tool, which is available to all and is a very comprehensive, is Microsoft Excel. This availability eliminates the task of seeking funding for the purchase and support of specialized software packages. In addition, spreadsheet software is relatively easy to use, and its flexibility makes it useful in many different courses at all levels of the traditional economics curriculum. Spreadsheet programs may be used to assist with such core learning activities as exploring and analysing data, estimating and plotting regression lines, solving complex systems of equations numerically, creating large tables of simulation data, solving optimization problems or conducting statistical analysis. In combination with Visual Basic for Applications (VBA) we can create economic models that can serve as study materials for students of economic schools and help them understand the essence of economic processes taking place in enterprises.

This paper uses spreadsheet software to explore some chosen economic models. The paper also illustrates how spreadsheets can make some advanced topics more accessible to students, thereby helping to bridge the gap between undergraduate and graduate education in economics.

## Key words:

Economic models, Microsoft Excel, Visual Basic for Applications

## Introduction

The basis of the economic prosperity of the state is particularly well-functioning enterprises. For a thriving enterprise is essential to know economic processes, which taking place in enterprise. Knowledge about the functioning of enterprises provides many educational materials, whether in book form or an electronic form. But often is very difficult for students to understand some economic models. According definition (Kaewsuwan, 2002) a model is a simple description of a system which used for explaining how something works or calculating what might happen. Key word in this definition is simple, and Excel and VBA can make economic models simple for students. Spreadsheets help make the concepts more accessible while allowing students to explore the ideas in more depth (Cahill & Kosicki, 2000). Visual Basic for Applications is a computer programming language developed by Microsoft which allows the development of user-defined functions and the automation of certain processes and calculations. Visual Basic for Applications is a standard feature of Microsoft Office products. In this paper will be explained IS-LM model with Excel. The IS-LM model (Investment Saving-Liquidity Preference Money Supply) is a macroeconomic tool that demonstrates the relationship between interest rates and real output, in the goods and services market and the money market. The intersection of the IS and LM curves is the "general equilibrium" where

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there is simultaneous equilibrium in both markets (Gordon, 2009). IS-LM model has an extension. It is a Mundell-Fleming model. This model is a close relative of the IS-LM model. Both models assume that the price level is fixed and then show what causes short-run fluctuations in aggregate income. The key difference is that IS-LM model assumes a closed economy, whereas the Mundell-Fleming model assumes an open economy (Flodén, 2010).

Methodological part of this paper will be explaining of chosen model on theoretical base and then application of this theory to Excel. Writing spreadsheet applications does take considerable time and effort. While it is often easy to show someone how to perform a certain operation, writing the sequence of commands can be difficult. The result will be a complete model created in Excel, where it will be possible to change the values, so that the student can see the model from different viewpoints. Also this model will be explained step by step. In combination with elements of VBA model will operate by pressing one key.

### Methodology and explanation of the IS-LM model

As was mentioned above, the IS-LM model is a business cycle model based on the assumption that there are barriers to the instantaneous adjustment of nominal prices. Typically the price level is fixed and lies above the general market clearing value. The excessive price level leads to an excess supply of goods. The set-up of the typical IS-LM begins by directly specifying relationships among aggregate variables, i.e. between aggregated production, consumption, investment, government spending, money supply... In a simple version of the IS-LM model these relationships are static. The model is described by two equations containing two endogenous variables, namely real income and interest rate. Under normal assumptions, there is only one solution, which, when graphic representation is located at the intersection of these curves:

$$(IS) \quad Y = C(Y-T) + I(r,Y) + G \quad (1)$$

$$(LM) \quad M/P = L(Y,i) \quad (2)$$

$$r = i - \pi \quad (3)$$

In a closed economy, the equilibrium condition in the market for goods is that production (Y) is equal to the demand for goods, which is the sum of consumption, investment and public spending. In an open economy, the equilibrium condition in the market for goods is that production (Y), is equal to the demand for goods, which is the sum of consumption, investment, public spending and net exports. This relationship is called IS.

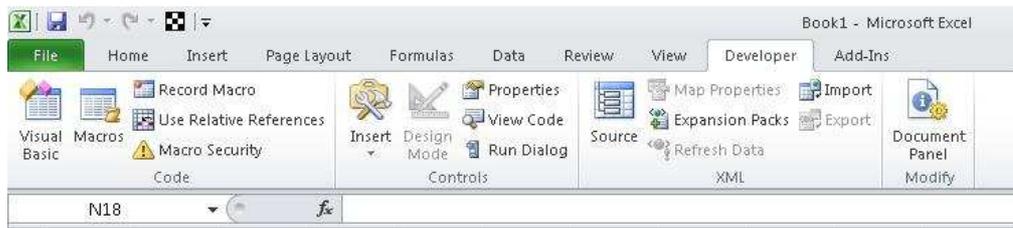
The LM curve represents the relationship between liquidity and money. In a closed economy, the interest rate is determined by the equilibrium of supply and demand for money: considering M the amount of money offered, Y real income and I real interest rate, being L the demand for money, which is function of I and Y. It is a similar in an open economy. In IS-LM model at any point of these curves the equilibrium condition in the corresponding market is true, but only at the point where the two curves intersect, both equilibrium conditions are satisfied.

The model is graphically illustrative and mathematically simple to demonstrate the possibilities of Excel and VBA language, however, is sufficient. In the model we will work with real macroeconomic indicators for the Slovak Republic in 2013. Situation in Slovakia is shown in table 1.

**Tab. 1 Indicators of the Slovak Republic**

Symbol	Indicator	Value
Y	GDP	72134.10 mil €
C	Consumption	47400.93 mil €
T	Taxes	25925,80 mil €
I	Investment	12531.70 mil €
G	Government consumption	13526.40 mil €
M	M2 monetary aggregate	45916.00 mil €
P	Consumer Price Index	163,9
i	Interest rate	3,31

The first step to calculate is entering all parameters into excels worksheet. In terms of greater clarity, it is better to assign a single number numeric format. The next step is programming the functions of calculating the IS curve and the LM curve. Excel contains a lot of functions and also offers the possibility to program your own custom functions through VBA. VBA, which stands for Visual Basic for Applications, is a programming language developed by Microsoft. Imagine an intelligent robot that knows all about Excel. This robot can read instructions, and it can also operate Excel very fast and accurately. When you want the robot to do something in Excel, you write up a set of robot instructions by using special codes. Before you can start with the programming you need to display a new tab at the top of the screen called Developer. This tab is in the Customize Ribbon tab of Excel Options dialog box.



**Pic. 1 Developer tab in Excel 2010**

You can automate almost anything you do in Excel. Automating a task by using VBA offers several advantages:

- Excel always executes the task in exactly the same way.
- Excel performs the task much faster than you can do it manually.
- If user is a good macro programmer, Excel always performs the task without errors.
- If user set things up properly, someone who doesn't know anything about Excel can perform the task.

But VBA has some disadvantages too:

- User must know how to write programs in VBA.
- Other people who need to use your VBA programs must have their own copies of Excel.
- Sometimes, things go wrong. In other words, you can't blindly assume that your VBA program will always work correctly under all circumstances.
- VBA is a moving target. Microsoft is continually upgrading Excel. Even though Microsoft puts great effort into compatibility between versions, you may discover that the VBA code you've written doesn't work properly with older versions or with a future version of Excel.

Now, you must open the Visual Basic for Applications Editor (VBE) by clicking on Visual Basic icon or via shortcut ALT+F11. The VBE is a separate application where you write and edit your VBA macros. It is the environment you use to create, modify, and manage Office macros. A macro commonly consists of code starting with the keyword Sub and ending with the keywords End Sub. Firstly you must insert a new Module. A module contains one or more macros or subroutines. In the new module must be entered the following code for the first function called IScurve:

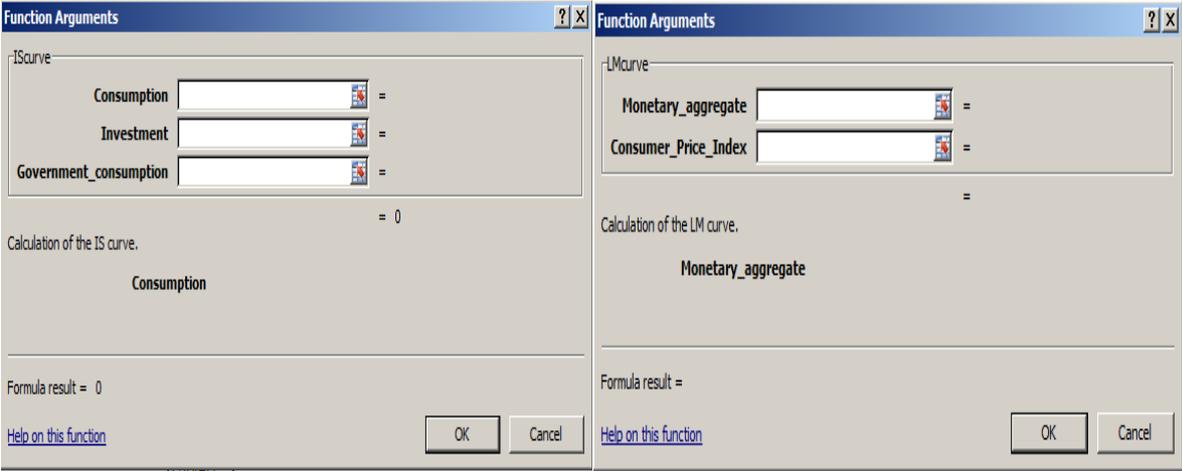
```
Function IScurve(Optional Consumption As Double, Optional Investment As Double,
Optional Government_consumption As Double)
    IScurve = Consumption + Investment + Government_consumption
End Function
```

Second function is called LMcurve, and the code is following:

```
Function LMcurve(Monetary_aggregate As Double, Consumer_Price_Index As Double)
As Variant
    If Consumer_Price_Index = 0 Then
        LMcurve = CVErr(xlErrDiv0)
    Else
        LMcurve = Monetary_aggregate / Consumer_Price_Index
    End If
End Function
```

This function includes the possibility that the Consumer Price Index is zero and thus function alerts the user with an error message.

Dialog boxes of both functions shown Pic. 2



**Pic. 2 Dialog boxes of IScurve and LMcurve functions**

If we denote planned expenditure in the economy  $E = C + I + G$ , and further let  $I, G, T$  are fixed. Then  $E = C + I + G = C(Y - T) + I + G$ . Because consumption  $C$  is an increasing function of disposable income  $Y - T$ , as well as the planned spending in the economy  $E$  is an increasing function of total income  $Y$ .  $Y$  represents a totally revenues, and hence the actual

expenditure of the economy, and therefore the economy is in equilibrium  $Y = E$ . Verification of balance can be done in Excel using the IF function in the form:

=IF(Y=E;"balance";"unbalance")

Also may be useful simple custom function that after entering the cell which is verified say user if model is in balance or not. Code of this function is as follows:

**Function** SayIt(txt)

Application.Speech.Speak txt, **True**

**End Function**

Values may change at any time and the whole model will be recalculated accordingly. It is important to save the file to have these functions for use in other files. If you stored one or more macros in a workbook, the file must be saved as a "macro-enabled" file type. In other words, the file must be saved with an XLSM extension rather than the normal XLSX extension. But firstly is important to understand macro security. The reason is that VBA is a powerful language – so powerful that it's possible to create a macro that can do serious damage to user's computer. A macro can delete files, send information to other computers, and even destroy Windows so that you can't even start your system.

## Conclusions

This paper offers no evidence that the use of spreadsheet software increases student learning in economics, the applications suggest to us that spreadsheets may be able to help instructors delve more deeply into traditional topics or tackle more advanced topics. Cause that we cannot yet judge whether this application and other planned applications result in improved learning outcomes is that research takes place at the moment. This is also the reason why the model is not yet fully complete. The model will be expanded to Mundell-Fleming model. Also everything will be in graphic design. Excel together with VBA is very powerful tool and its potential will continue to grow. The survey results will be published in other articles and other scientific publications.

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# Drinking Water in the Amathole District, Republic of South Africa

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Jiří SCHNEIDER<sup>1</sup>

## Abstract

The article presents the state of the water resources in the Republic of South Africa and the quality of drinking water in Amathole District. The writing deals with the contemporary state of South African water resources with regard to the aspects which potentially threaten the water resources and also explain the main challenges causing contamination. Important challenges of water quality in South Africa are Salinity, Water borne diseases, Low oxygen levels, Eutrophication, Suspended solids, Hydrocarbons, Acidification, Solid litter. Very comprehensive and useful data about water quality and management provides Blue Drop Certification Programme which has been prepared by the Department of Water Affairs since 2009. It is focused on tap water and provides integrated information about the quality of the tap water. There are huge differences among all the provinces and, moreover, there are also differences within the particular provinces. In spite of the fact, that the provincial Blue Drop Score is 82.1%, in case of Municipal Blue Drop Score it is only 74.62% and, furthermore, Performance Area Blue Drop Score (Alice) is just 68.45%. During years 2010, 2011 and 2012 there is the evident fluctuation which proves that the water quality is not stable. Large gaps are not only in the management but also in the microbiological compliance where the score is only 76.2%. That means that the water does not meet the standard and is potentially unsafe to drink.

## Keywords:

water-management, potable water, drinking water, regional development

## Introduction

The issue of water shortage is seen almost every day in news or other sources especially in developing countries. Water consumption together with growing population causes gradual decrease in finite water resources not only in developing countries but even in developed countries. The demand for water is rapidly increasing especially due to growing production in developed countries, industrialization in developing countries, trade, agriculture, energy etc. Due to such demand people must definitely face many challenges. For instance, sufficient amount of water must be ensured for living human population as well as future generations. The crucial point is that it must be done without any degradation of ecosystems. Moreover, the adequate quality of water is necessary especially because of health, production of food, economic development etc. (Collective 2001)

Another problem is the availability of water which is different in every country. If the developing countries are taken into account, people often have to get the water from remote areas and, furthermore, the water is usually of the poor quality. Obviously, that could cause serious health problems. In fact, as it is stated on [www.rozvojovka.cz](http://www.rozvojovka.cz), "there is 1 child dying every 20 seconds for problems connected with contaminated water and 800 million people do not have access to safe drinking water." And there are more alarming statistics. For example, "43% of people's deaths are caused by diarrhea after usage of contaminated water" (Collective 2008), which means that diarrhea is the most frequent cause of death. Diseases which are

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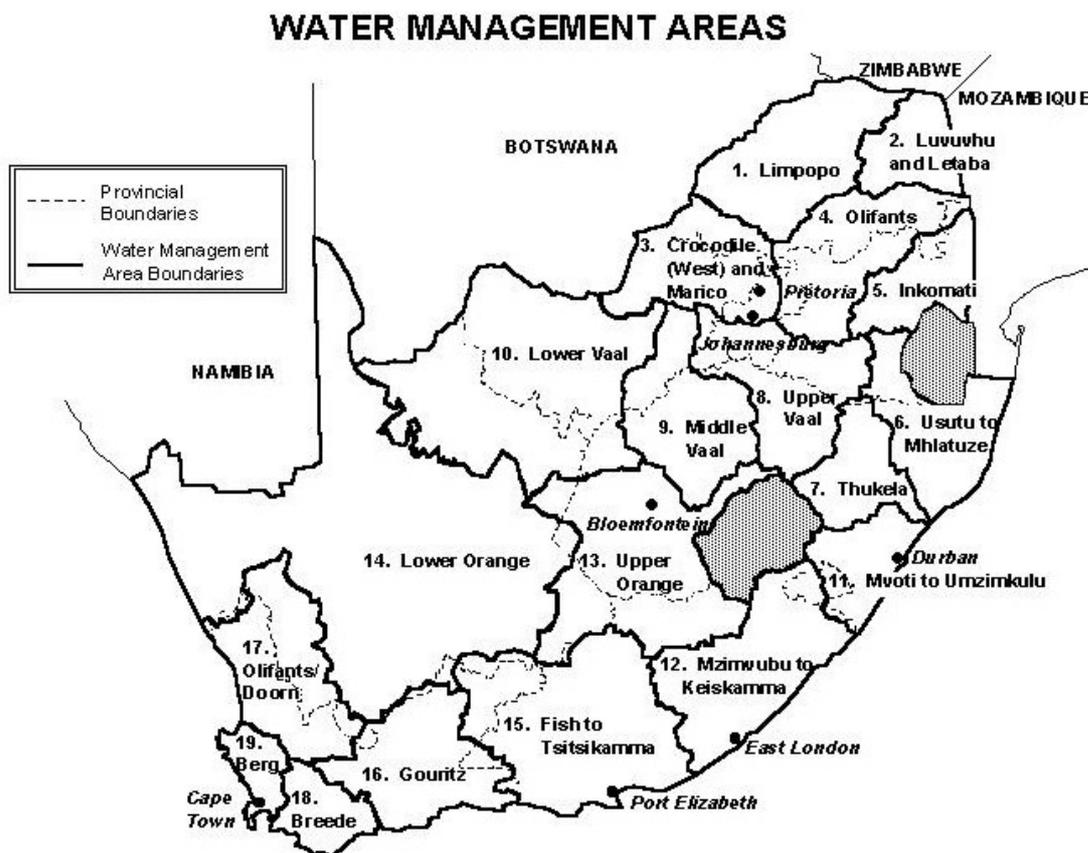
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connected with inadequate quality of water kill 5x more children than HIV/AIDS and 2x more than malaria. (Collective 2008)

## Water resources in the Republic of South Africa

In spite of the fact that the South African rainfall average is approximately 450 millimeters per year, which is half of the world average, the water supply is adequate in some location on the contrary to other ones. In fact, it is very variable. Comparing the eastern and southern part of the country, where the rainfall is cardinally higher, the situation in western and northern part is significantly worse.

The issue of water protection is very complicated and needs an integrated approach to water management. In terms of the Republic of South Africa, this role has The Department of Water Affairs and Forestry (DWA) which promote equity, sustainability and efficiency of managing these resources. For this reason, DWA prepared document called The National Water Resource Strategy (NWRS). This document sets all the plans of The Department of Water Affairs as a legal bind which can be altered according to changing situation and reviews at least every five years. Republic South Africa is divided into 19 Water Management Areas (WMAs). According to A report on the state of the environment, sizeable amount of water transfers take place from the Upper Orange to the Lower Orange, the Upper Vaal to the Middle Vaal. (Collective 2006)



Picture 1: Water Management Areas. Source: The Water Page, 2003

In terms of the type of water resources which provide water supplies, majority of water requirements are ensured by rivers or dams. To be concrete, there are about 320 dams which have the capacity of more than 32 400 million m<sup>3</sup>. In fact "it is 66% of the total mean annual runoff of about 49 000 m<sup>3</sup>". Usually 20% of the runoff has to stay in rivers in order to support the ecological needs. Just a little part of the remainder can be used as a yield which may be

polluted by, for example irrigation return flow, urban drainage, industrial activities or mining activities. (Collective 2006)

### **Water quality in South Africa**

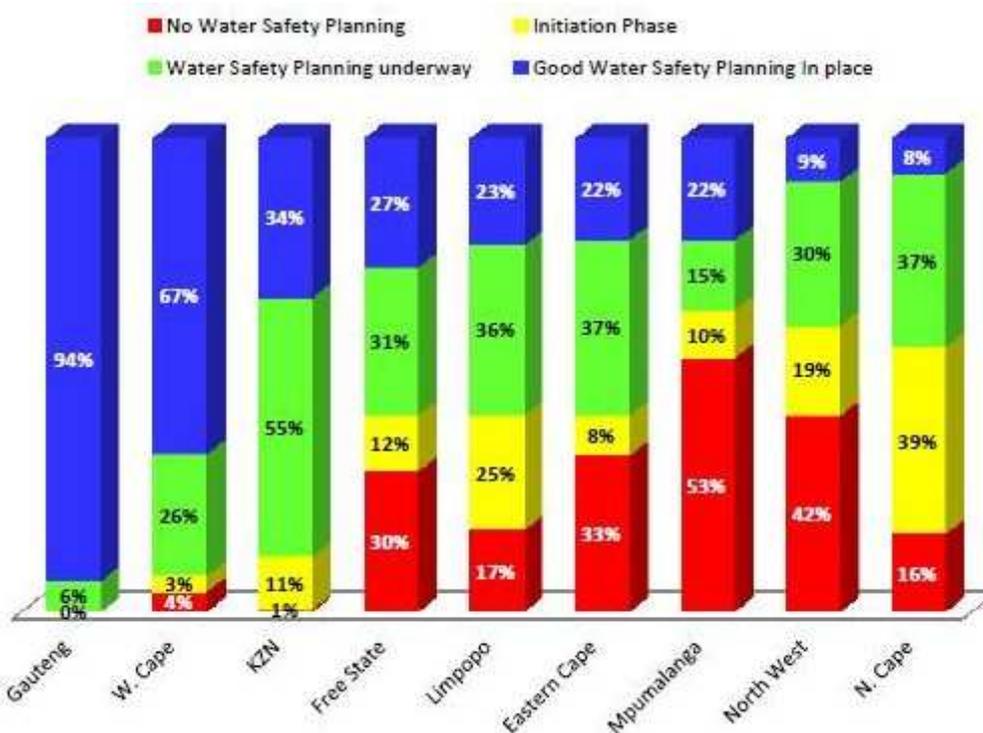
The availability of water is not always the main aspect which must be taken into account. Very important factor is physical and chemical nature of the water. In addition, there are water quality requirements which differ according to particular users. For instance, it can be influenced by natural processes, storage, transfer of water and so on. In terms of irrigation, livestock watering, recreation or domestic use and others, such water requirements have been defined in the Water Quality Guidelines at DWAF. In the document there is specification of water quality which is used by distinct domestic water users. To be concrete, it is created in order to publish information which is needed to make judgements about water fitness which is intended to use especially for human consumption as well as for bathing and other domestic uses regardless the water source.

Very comprehensive and useful data provides Blue Drop Certification Programme which has been prepared by the Department of Water Affairs since 2009. It is focused on tap water and provides an integrated information about the quality of the tap water. An important fact is participation of people in the programme. They participate as process controllers, laboratory staff, samplers, engineering staff, scientists, environmental health practitioners, maintenance staff, management workers and general workers. Thus the programme is more transparent and the awareness of water quality as well as the necessity of its improvement rises.

Since the research has been conducted, there have been remarkable improvements which mean that there is a positive impact due to this approach. In 2009, when the first Blue Drop Report was created, the national microbiological compliance for tap water in South Africa was at 93.3% against SANS 241 (South African National Standard). After three years this number increased to 97% (Blue Drop Score). According to Blue Drop Report 2012 “the national drinking water compliance is recorded at 98.3% based upon microbiological, chemical, physical and organoleptic data. (Collective 2012)

The percentage, Blue Drop Score, is a performance indicator of the drinking water quality management business. The officials from the DWAF evaluate the performance of the WSA which ensures the access to water has the function of Water Service Provider that provides water services in compliance with the constitution.

The Graph 1 depicts the state of water safety planning which is a key component of Blue Drop Certification programme. In order to achieve improvement of water quality, it is necessary, that water supply systems must have good risk management processes, water safety planning principles etc. Otherwise they will not be qualified for the incentive based regulation initiative.



**Graph 1: Provincial Status of Water Safety Planning Source: Blue Drop Report, 2012**

There is an indication of drinking water quality based on the percentage from blue drop scoring criteria. The focus is on chemical and microbiological compliance.

Water safe to drink and Blue Drop Certified: in accordance with national standards. The score must be 95% according to Blue Drop Requirements. It must comply with SANS 241.

Water safe to drink, comply with the SANS 241.

- o Microbiological compliance > 97%
- o Chemical compliance > 95%

Water safe to drink, however, chemical compliance must be improved.

- o Microbiological compliance > 97%
- o Chemical compliance < 95%

Water generally safe to drink but with some microbiological failures.

- o Microbiological compliance < 97%
- o Chemical compliance > 95%

Water is not up to standard targets

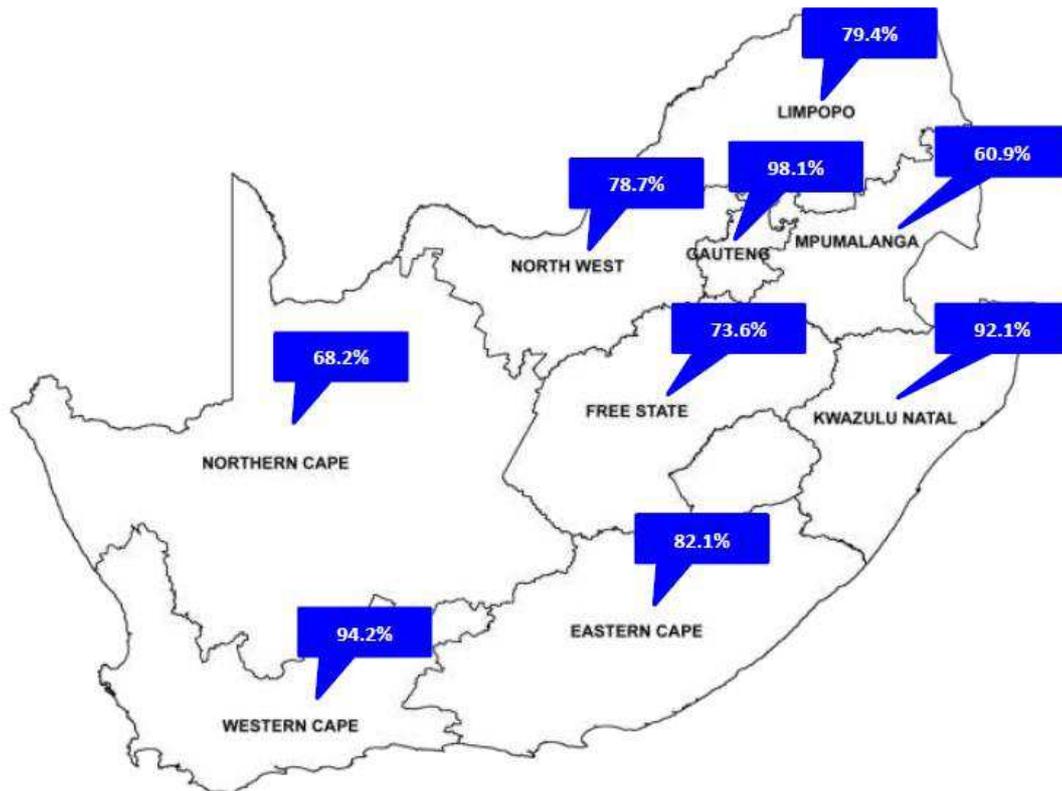
- o Microbiological compliance > 90% < 95%
- o Chemical compliance > 90% < 95%

Water does not meet the standard or there is no monitoring of water quality

- o Microbiological compliance < 90%
- o Chemical compliance < 90%

Source: Blue Drop Report 2012

On the Picture 2, there is an overview of Blue Drop Scores throughout the country. Apparently, there are huge differences among all the provinces and, moreover, there are also differences within the particular provinces as it will be shown afterward.



**Picture 2: Blue Drop Scores. Source: Blue Drop Report, 2012**

## Management of South African Water Resources

As all the spheres and resources, which are used by public, must have their own management, the water resources are not an exception. Let's look at the management structure of South African water resources.

### Minister

Full responsibility for the water resources and its management has the Minister of Water Affairs and Forestry. Furthermore, several of his/her duties are deputed to other departmental officials, water management institutions, advisory committees and water boards. In fact, "powers and duties of the Minister and national government (Department of Water Affairs and Forestry) are addressed throughout the National Water Act".

The main role of the minister lies in the power to delegate, purchase property, make regulations, fulfill the functions of a CMA (Catchment Management Agencies), where no CMA has been established and assign powers and duties to CMA.

### The Department of Water Affairs (DWA)

As for the Department of Water Affairs and Forestry, this entity has responsibility for administration of all issues of the National Water Act. Another task for DWA is delegation of water management responsibilities to CMAs and other regional and local institutions. With regard to other duties, the department develops national policy and regulatory framework in

order to govern the water resource management of other institutions. Controlling and monitoring of the institution's performance is the task of the department as well. (Anonym 1998)

### **Catchment Management Agencies (CMA)**

This institution was established by a government and has a governing board which is designated by the minister. It must be represented by all the stakeholders. It is already mentioned above that there are 19 water management areas in South Africa for better control and effective management. These areas are operated by the particular CMA and managed in accordance with catchment management strategy. Since it is necessary to include local communities in water resource management, it is the main objective of CMA. In fact, public participation is considered as a key principle of the catchment management because all the stakeholders such as also poor and disadvantaged communities have the possibility to consult the processes and decisions of CMA. Thus, the water resource management is more effective and better results can be achieved. Promotion of community participation is often ensured by forums and formation of catchment management committees.

The main functions of this institution is investigation and consultancy on the protection, development, conservation, management, control of the water resources in its water management area, develop a catchment management strategy, coordination of the activities of water users and water management institutions, promotion of coordination between implementation of its catchment management strategy with implementation of water services development plans by water service authorities – municipalities, promotion of community participation in the protection, use, development, conservation, management and control of the water resources.

There are also supplementary functions which can be added after CMA proves that it is able to fulfill the assigned functions. Afterward, the other function can be transferred to CMA. Such functions are, for example, general management of water resources, acting as a responsible authority relating to water use and allocation of water etc.

### **Water-User Associations (WUA)**

The last institution established by the Minister is called Water-User Associations which associates people who are interested in collective work. These people, water users, operate together in water related activities at the local level. The example of water user association is water irrigation boards or water board for stock watering purpose. In fact, it can work as a single sector association which is basically group of alike users (e.g. farmers), or multi-sector association which is formed by group of distinct users (e.g. farming, mining, industry). (Anonym 1998)

Enabling cooperation, gathering the financial and human resources and expertise are the most essential intentions of WUA which helps water users to perform water related activities. Beyond it plays a big role in poverty eradication and food security.

Functioning of WUA depend on the approval of constitution and the purpose of its establishment. The main functions are prevention of water from any water resource being wasted, prevention of unlawful water use or act, protection of water resources, supervision of water resources, regulation of the flow of any watercourse, investigation of water quality and water use, construction, operation and maintenance of waterworks for draining land or supplying water.

### **Water monitoring programs**

In South Africa, there have already been several water monitoring programs conducted. In fact, these programs have been conducted by various spheres of government; however, the main focus is on the examples of DWAF's national water quality and microbial monitoring programs, the River Health Programme, and monitoring by local authorities and service providers. Since there is need to have all the results from research integrated, the Water

Research Commission has funded many of these initiatives in order to collect the results from different sources into the Department of Water Affairs's (DWA's) Water Management System (WMS) database. In this database are continuously collected and analyzed water samples from approximately 1600 surface water sites and 450 groundwater sites across the country. According to the results from the research the DWA publishes a National Water Resource Quality Status Report. (Collective 2006)

Based on the findings, it is certainly necessary to put the efforts to activities which help to improve the quality of drinking water. As it is mentioned above, the main focus is on Amathole District Municipality, concretely Alice, where the data shows that the water management processes, monitoring and the quality of water, especially microbiological compliance is on low level. Hence, there is a project proposal in the next chapters which will support the local inhabitants who strive for "cleaner" water.

### Situation in Eastern Cape province

As the second part of the thesis will be focused on Amathole District Municipality located in Eastern Cape, the situation of this province must be explained. The water quality is very diverse in South Africa and even within provinces as well as municipalities. Table 1 shows the Blue Drop provincial performance in years 2010, 2011 and 2012.

**Table 1: Municipal Performance based on Blue Drop scores. Source: Blue Drop Report, 2012**

Water Services Authority	Provincial Blue Drop Log Position	Blue Drop Score 2012	Blue Drop Score 2011	Blue Drop Score 2010
Buffalo City (+ Amatola Water)	1	92.55	91.28	95.2
Nelson Mandela	2	90.04	90.11	95.1
Joe Gqabi (+ Amatola Water + WSSA)	3	85.18	83.49	55
Chris Hani	4	75.23	73.47	53.1
Amatole (+ Amatola Water)	5	74.62	65.21	68.2
Makana	6	71.9	55.07	28.4
Alfred Nzo	7	64.37	52.54	26.2
Kouga	8	60.69	74.93	60.5
Blue Crane Route	9	59.05	39.51	30
Camdeboo	10	51.65	32.95	37.4
Ndlambe	11	42.37	20.93	37.8
Baviaans	12	35.09	24.18	52.6
Sundays River Valley	13	25.37	35.55	46.9
OR Tambo	14	22.7	43.69	22.2
Ikwezi	15	7.91	26.55	6.5
Koukamma	16	5.6	14.36	15.8

The Table 2 shows the progression of Blue Drop scores since 2009. Except of the years 2010 and 2011, there is fortunately an increasing tendency which is good achievement considering the fact that the score in 2009 was only 54.3%.

**Table 2: Blue Drop scores progression. Source: Blue Drop Report, 2012**

	2009	2010	2011	2012
<b>Provincial Blue Drop Score</b>	54.3%	79.4%	77.3%	82.1%

As the main focus of this article is on Amathole District Municipality, there will not be the description of other municipalities except of certain comparisons. Thus, the overall Blue Drop Score of Amathole District Municipality for the year 2012 is 74.62%. The number is counted from 30 performance areas. The Table 3 describes particular indicators and Blue Drop Score in previous years for example of Alice Performance Area.

**Table 3: Performance Area Blue Drop Score and indicators – Alice Source: Blue Drop Report, 2012**

<b>Water Safety Planning</b>	76
<b>Process Management &amp; Control</b>	90
<b>DWQ Compliance</b>	41
<b>Management, Accountability</b>	82
<b>Asset Management</b>	0
<b>Bonus Scores</b>	3.7
<b>Penalties</b>	0
<b>Blue Drop Score 2012</b>	68.45%
<b>Blue Drop Score 2011</b>	75.79%
<b>Blue Drop Score 2010</b>	72.81%
<b>Average daily Consumption (l/p/d)</b>	231.67
<b>Microbiological Compliance (%)</b>	76.2
<b>Chemical Compliance (%)</b>	>99.9%

In spite of the fact, that the provincial Blue Drop Score is 82.1%, in case of Municipal Blue Drop Score it is only 74.62% and, furthermore, Performance Area Blue Drop Score (Alice) is just 68.45%. During years 2010, 2011 and 2012 there is evident fluctuation which prove that the water quality is not stable. Large gaps are not only in management but also in microbiological compliance where the score is only 76.2%. That means that the water does not meet the standard and is potentially unsafe to drink.

### **Challenges of water quality in South Africa**

**Salinity** - It is basically the amount of inorganic solids or salts in the water. Salinity occurs either naturally or after industrial activities, mining or agriculture. In case of domestic use, higher salinity causes corrosion in water pipes and consequently changes the biotic communities. Higher salinity which exceeds 3000 mg/l causes intestinal and renal damage. 1000 mg/l is still tolerable for human health and do not causes health hazard but the taste may be salty. (Collective 2006)

**Water borne diseases** - For example diarrhea, dysentery, skin infections, intestinal worms, cholera, trachoma, schistosomiasis (bilharzia). These diseases occur as a consequence of poor sanitation and arise from bacteria and parasites. (Collective 2006)

**Low oxygen levels** - As far as there is an increased concentration of organic matter in the water, it is probably caused by inappropriate waste management or it can also be brought by animals, human or plants. The result is low oxygen level which decreases when bacteria in the water decompose organic matter. (Collective 2006)

**Eutrophication** - Such situation occurs when water contains high quantity of nutrients, usually nitrogen and phosphorus compounds. In that case, higher proportions of phosphorus cause increase of potentially toxic cyanobacteria. Again, there are many ways of increasing quantity of nutrients, for instance, domestic waste, over application of fertilizers, mining etc.

**Suspended solids** - Erosion, destruction of offshore vegetation, construction activities, domestic and industrial discharges or over-grazing are the main causes of insoluble sediments in the water. Suspended solids or deposited sediments can change the habitat of aquatic organisms and influence the quality of water.

**Hydrocarbons** - It encompasses lubricating oil, petrol, paraffin, diesel, greases and tar. Together with synthetic organic solvents as well as oils and fats of biological origin, which are not classified as hydrocarbons, are toxic and seriously affect respiratory organs. (Collective 2006)

**Acidification** is mainly caused by acid rains, waste disposal or mining industry. It results in lower pH of the water. The consequence of lower pH can be an occurrence of metals such as cadmium or lead which deteriorate aquatic ecosystems and has a negative impact on water and its users. (Collective 2006)

**Solid litter** - As an example of solid litter we can be mentioned plastics or cans which represent non-biogenic form. In terms of biogenic form, there is vegetation or cellulose-based paper. The litter can release toxic substances, drain oxygen, bar the watercourses resulting in floods. (Collective 2006)

With regard to other aspects causing quality problems such as endocrine disruptors, herbicides, pesticides, trace elements or radioactive contamination which are being considered as a serious threat to water quality, however it still must be recognized and investigated.

Human activities affecting water quality are mentioned in the National Water Resource Strategy. Among the biggest factor influencing the quality is industry and mining. The consequence of that activity is considerable change of acidity of the water (pH), higher salinity and metal content, sediment load. Moreover, there is a danger of chemical release etc. Other significant aspect is increased urbanization which results in deteriorating standards in waste water management. Especially in informal settlements is little or no waste water management and if there is some, there is often inadequate or insufficiently maintained sewer reticulation. Then the leakage to natural environment can occur. Looking at urban runoff which usually contain high organic and nutrient load, it brings, for instance, microbial contamination. (Collective 2013)

Irrigation return flows, seepage, application of fertilizers and agro-chemicals such as herbicides and pesticides, runoff or effluent from feedlots, piggeries, chicken farms etc. are the typical examples of agriculture activities which have a negative impact on water quality. Regarding waste disposal, it is triggered off mainly by industry, mining and urban development. It increases production of waste and creates a need for appropriate waste management facilities.

In connection with urban development, there is necessity to lay down the impervious surfaces in certain areas. Obviously, it decreases the rainwater recharge to groundwater. The dilution effect is insufficient so it tends to increase in solute concentrations of the existing aquifers. There is also a danger of erosion and the occurrence of sediment in surface water. (Collective 2013)

It has already been talking about the need of sufficient water management and it is closely connected with well-timed classification of water resources. Lack of reliable data and statistics ends up with delayed processes and, after all, creates problems with issuing of water-use licenses, granting etc.

## **Conclusions:**

Republic of South Africa is divided into 19 Water Management Areas (WMAs). The Department of Water Affairs and Forestry (DWAF) promotes equity, sustainability and efficiency of managing water resources in RSA.

In terms of the type of water resources which provide water supplies, majority of water requirements are ensured by rivers or dams. There are about 320 dams which have the capacity of more than 32 400 million m<sup>3</sup>.

Very comprehensive and useful data of water quality provides Blue Drop Certification Programme which has been prepared by the Department of Water Affairs since 2009. There is an indication of drinking water quality based on the percentage from blue drop scoring criteria. The focus is on chemical and microbiological compliance. Water safe to drink and Blue Drop Certified: in accordance with national standards. The score must be 95% according to Blue Drop Requirements. It must comply with SANS 241. There are huge differences among all the provinces and, moreover, there are also differences within the particular provinces as it will be shown afterward

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# Multicriterial macroeconomic evaluation of Chinese and Japanese economic levels in connection to resolving their territorial dispute

Markéta HECZKOVÁ<sup>1</sup>

## Abstract

Japan and China are great powers of the region of East Asia and their territorial disputes and its development is highly important for international relations. The instability in their relationship resulting from the animosity in their territorial dispute resolving process could affect the regional relations and potentially the environment of global international relations beyond the region, as well. Therefore it is important to be aware of the dispute resolving process and all the factors which influence it. This study examines the macroeconomic situations in China and Japan and evaluates their current state of development.

The aim of the paper to answer a research question was to conduct a multicriterial analysis of the chosen macroeconomic magnitudes and on the basis of the analysis evaluate the economic situation of the countries. Both countries have exceptionally high GDP (gross domestic product) at current prices which indicates production of goods and services as well as the change of price level. The unemployment rate was feasible in both cases, around 4 %, while Chinese development of the discussed indicator can be evaluated as more stable. Both countries experienced deflation during 2008 – 2012, but in the case of China the prevailing phenomenon was inflation, unlike in Japan. Deflation rates in Japan were more apparent.

Multicriterial macroeconomic evaluation of these countries' economic levels is applied to conduct the study while the chosen macroeconomic magnitudes in particular country are examined and compared. The results of research are further used to evaluate interconnections of the economic situation in East Asian countries and their attitudes to the territory dispute-resolving process. Moreover, the study will explain the main interests of countries in the disputing territory.

Despite some of the difficulties in both economies, they were evaluated as strong and it was presumed that both Japan and China will try to fortify their position in international relations and presumably will try to negotiate while discussing territory disputes without any compromises that would reduce their economic gains. This presumption was affirmed in the third chapter where it seemed that economic reasons for owning the territory were prevailing (especially when there are mineral reserves found in the vicinity of disputed territory) whereas the strategic position of the territory is an important aspect of resolving disputes, as well.

## Keywords

Japan, China, Territorial disputes, Senkaku/Diaoyu islands, macroeconomic evaluation

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## Introduction

Japan and China (People's Republic of China, PRC), both great powers of the East Asia region (Yahuda, 2004), are significant countries that serve as economic centres there. Japan and China differ from each other culturally, economically, and politically even though they are neighbouring countries. Their economic and political development throughout history is also unlike; therefore, the region is diverse and these countries cannot be evaluated according to the same scale. China's economy, as a non-democratic country, is to some extent influenced by its political decisions. Its development in history was affected by major reforms in 1978 concerning agriculture and local governments. In 1992, there were new reforms introduced (Song, Storesletten & Zilibotti, 2011) which led China to become a market economy, a now increasingly important player not only in the region but also in the international relations environment. It can be said that China has global influence (Yahuda, 2004). On the other hand, the Japanese "golden age" occurred in the 1990s with its fast growth and technological development. Nowadays Japan is unlike China. Japan is affected by the worldwide economic crisis and its development is similar to western countries, whose economic growth was significantly slowed-down as a result from the crisis. Both countries have their own cultural identities and institutional heritages, which also influence the way of economic development (Chung, 2004). China and Japan both developed differently and this paper will evaluate their current economic situation.

China and Japan experienced difficulties in development throughout history when some of their territorial disputes emerged. Certain disputes are still unsolved and therefore affect the international relations of all countries in the region. One of the most significant territorial disputes between Japan and China concern the Senkaku or Diaoyu islands in the East China Sea. These islands are known mainly for mineral reserve deposits in their vicinity, thus the economic reason for their ownership plays a significant role. Even though these islands are uninhabited, both countries show high interest in their ownership. In this paper the economic situations of the two countries are analysed and the findings are interlinked with their territorial dispute resolutions.

The first chapter briefly characterises the economic development of Japan and China, and shows the value of chosen economic indicators in the last couple of years since 2008. GDP at current prices, inflation, and unemployment rate are the indicators that will be examined. Multicriterial macroeconomic analysis will be conducted in order to evaluate the economic situations of these countries. Finally, the third chapter describes the Senkaku territorial dispute existing between China and Japan. According to the main characteristics of the dispute analysed in line with outcomes from multicriterial analysis, the paper shows the main reasons that the two countries have for owning the territory.

## **OBJECTIVES AND METHODOLOGY**

China and Japan are neighbouring countries and important business partners. Koo (2009) claims that the economic interdependence between Japan and China and their increasing economies could influence the resolution of the territorial dispute concerning the Senkaku islands. He designed the liberal peace perspective where these countries avoid costly military conflicts that could damage their economic relationship. Chiozza and Choi (2003) claim, that the territorial disputes' resolution process is influenced by economic, political or strategic factors. These factors show the benefits of owning the territory and also the effect of the development and strategies on the territory disputation. Therefore the hypothesis was established as follows: Economic situations can influence the decision making process while resolving territorial disputes. It can be assumed that both countries would like to fortify their position in international relations and presumptively will try to negotiate while discussing territory disputes without any compromises which would reduce their economic gains and moreover could weaken their negotiation position in other territorial disputes that they have with other countries in the region. The research question is further defined as follows: Have the economic situations of China and Japan impacted the Chinese and Japanese attitudes towards resolving their territorial dispute and if so, is the impact preponderant among others? To answer the research question above, the economic situations of these countries is further evaluated according to the multicriterial analysis of chosen macroeconomic indicators and their impact on the dispute about Senkaku islands.

A single criterion is not sufficient to evaluate the economic situations in these countries. The most important attribute will be the multicriterial analysis used (IMF, 1993). Multicriterial analysis of chosen macroeconomic indicators helps to evaluate the economic situations in these countries. The economic situation will be hereafter linked with territorial dispute resolution. Multicriterial analysis will be conducted in several steps (Babić, Pervan and Pervan, 2001; Lohrerová, Labounková, 2007). Firstly, the criteria will be defined and then the value of each of the criterion determined. The neoclassical approach will be used to describe the macroeconomic indicators. The neoclassical growth theory is well-suitable for modern economics because it explains technology and emphasises the physical capital (especially knowledge). It predicts that the selection among new technologies is constant and costless (Phelps, 2007). The value of each criterion will be compared to the average of the European Union and according to the scale, the analysis of the results of the multicriterial analysis will be conducted. Finally an evaluation of the economic situation in both countries is needed, according to the results from the analysis. After the determination of the economic situations in these countries, the Senkaku territorial dispute will be described and analysed based on the results from the multicriterial analysis.

## **MAIN MACROECONOMIC CHARACTERISTICS OF CHINA AND JAPAN**

China and Japan experienced different economic development. Even though they both built strong global economies and have stable positions in international relations, their economies have a specific development, especially in regards to the world economic crisis and its consequences.

While evaluating the macroeconomic situation (especially during a crisis or in short term), the emphasis should be put not only on price-stability, so called inflation, but as well as on the stability of output, and unemployment (Nayyar, 2011). All of the indicators above have a significant impact on the economy of a country and all of them should be examined and analysed. The analysis of all the macroeconomic indicators mentioned above provide data for the economic comparison of the countries.

GDP indicates the total products and services produced in an economy during the year. GDP at current prices reflects not only changes in the production of goods, but also the price

(Froyen, 1995). This indicator is complex and unlike real GDP which indicates only changes in production in a specific country or territory and also includes the inflation factor (Soukup, 2011). Inflation is defined as an increase of price level and hereby the decrease of purchasing power in the economy. Inflation is a prevailing phenomenon in economies nowadays and generally is considered to positively affect an economy. Deflation, on the other hand, is the decrease of price level (Kadeřábková, 2003). To calculate the inflation rate, a price index is used. A price index measures the general price level to a base year (Froyen, 1995b). Unemployment rate indicates the quotient of unemployed people to the overall number of people in the work force available in a country (ČSÚ, 2014). In other words, it is the percent of the total labor force not employed (Froyen, 2013c). According to neoclassical theory, if there is an excess in the supply of potential workers, wages should be lowered. If this does not occur, unemployment is created (Hall & Ludwig, 2008).

### 1.1. Japan

Japan is often said to have experienced an economic miracle after World War II. (WW II.), when the pace of its economic growth was significantly high. Japan also quite quickly became a developed country even though it was considered a less developed country previously. Its economic growth was even more noticeable given the fact that approximately 80% of the Japanese production capacity was lost during WW II. Japan is known worldwide for its high-technology production where it began to concentrate during the 1980s (Zang & Baimbridge, 2012). Its development accelerated in the 1990s when Japan became known worldwide as a producer of high quality technological goods.

Nowadays, Japan is considered one of the most developed economies in the world. It has a democratic government and exports high quality products all over the world. Hence, its economy was affected by the world economic crisis with the decrease of demand across the economies of the world. It was also affected previously by several crises such as the global IT bubble in 2000 and the Asian Financial Crisis in 1997 (Schulz, 2013). Today, Japan is recovering from the global economic crises.

Table 1 below shows the development of Japan's macroeconomic indicators during the years of 2008 – 2012. After the economic decrease during the crisis, GDP at current prices increased from 4 847 billion USD in 2008 to 5 051 billion USD in 2012. In Japan, inflation occurs as well as deflation. Japan experienced deflation between 2009 and 2011. The deflation rate of 1, 4 % was significant in 2009 but gradually became weaker, firstly 0, 7 % in 2010 and finally dropped to 0, 3 % in 2011. The increase of price level vanished in 2012 with the inflation rate 0 %. This inflation trend can be evaluated as positive because the higher inflation rate positively affects the Japanese economy and its competitiveness. Unemployment rate rose from 4 % to 5 % from 2008 to 2009 which is still considerably low compared to European countries where unemployment rate reaches values above 10 % (Eurostat, 2014). This low unemployment rate can be evaluated as positive in the Japanese economy.

**Tab. 1 - Development of chosen macroeconomic magnitudes, Japan 2008 - 2012**

	<b>GDP at current prices</b>	<b>Inflation rate</b>	<b>Unemployment rate</b>
	(bill. USD)	(%)	(%)
<b>2008</b>	4 847	1,4	4,0
<b>2009</b>	5 035	-1,4	5,1
<b>2010</b>	5 491	-0,7	5,1
<b>2011</b>	5 864	-0,3	4,5
<b>2012</b>	5 051	0	4,4*

Sources:

Personal compilation according to

RateInflation. (2014). *Japanese Inflation Rate*. RateInflation. Web address:

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## 1.2. China

The Chinese economy is increasing rapidly. In 2010, China became the world's largest exporter with its GDP reaching 5 926 billion USD. Since the implementation of economic reforms at the end of the 1970s, China has experienced rapid changes. Its economy changed from centrally-planned to a more market-oriented economy (CIA, The world factbook, 2014) which is interlinked with the global economy. China has become an increasingly influential player in the global economy and international relations. China has experienced many changes, among them also institutional from centrally-planned to market economy (Li, 2005). In the last three decades, not only has the economy grown, but there have also been changes in economic sectors including their interconnection with GDP and the increasing importance of world markets for the Chinese economy. China also experienced a growing net foreign surplus (Song, Storesletten & Zilibotti, 2011). President of PRC Xi Jinping is in favour of further reforms which would help the Chinese economy to overcome its current problems such as its aging population and insufficient domestic demands.

Table 2 shows chosen macroeconomic indicators which characterize the development of the Chinese economy in 2008 - 2012. The GDP at current prices is constantly increasing and it nearly doubled in only four years. In 2008 the GDP was 4 532 billion USD, and in 2009 it reached a higher value than the Japanese economy when it was 5 051 billion USD. Finally in 2012 the GDP was 8 262 billion USD. Chinese GDP growth remains high despite the worldwide economic crises. The inflation rate changed rapidly from 2008 to 2012. In 2008 it achieved nearly 6 % while the rate next year significantly dropped to a deflation of 0,7 %. The inflation rate increased to positive numbers in the years since then. The slight fluctuation in inflation during the discussed years is apparent in the Chinese case when it moves from deflation to inflation. The unemployment rate in cities is very similar to the Japanese figures where it has a stable development and the rate oscillates above the 4 % limit. Despite its fast economic growth, development, and increase in globalization, China remains a lower-cost location for the manufacturing of goods. Therefore the manufacturing is often outsourced to China from

abroad. This phenomenon has a positive impact on the Chinese low-wage workers but has a negative impact on less-skilled workers in developed countries (Hsieh, & Woo, 2005). However, this trend is changing and manufacturing companies are targeting lower-cost countries than China.

Even though China is one of the main world economic players with trade connections all over the world and according to the macroeconomic values is its development noticeably positive, there are still problems which should be eliminated. China has prevailing difficulties with damaging the environment and relative small domestic income. It is vital to encourage the domestic demand which is interconnected with the domestic income. The higher domestic consumption the less there exists a risk of foreign influence on its domestic economy. Higher domestic consumption leads to an increase in domestic income and hereby also a positive influence on product (GDP) (Atesoglu, 2013). The Chinese one child policy also implicates many problems due to the aging population in the society. China is claimed to influence the development of its exchange rate and thereby constrains Chinese yuan from appreciation to support Chinese export (Rodrik, 2010). The surplus in national balance leads to appreciation of exchange rate and an increase in wages, however in China's case the interference to exchange rate natural development can lead to deflation and problems interrelated with this phenomenon (Mckinnon, 2006). Overall the economic point of view is the current situation rather positive.

**Tab. 2 - Development of chosen macroeconomic magnitudes, China 2008 - 2012**

	<b>GDP at current prices</b>	<b>Inflation rate</b>	<b>Unemployment rate</b>
	(bill. USD)	(%)	(%)
<b>2008</b>	4 532	5,9	4,2
<b>2009</b>	5 051	-0,7	4,3
<b>2010</b>	5 926	3,2	4,1
<b>2011</b>	7 035	5,5	4,1
<b>2012</b>	8 262	2,6	4,1

Sources:

Personal compilation according to:

Businessinfo. (2014). *Souhrnná teritoriální informace Čína*. Businessinfo, MPO. Web address: <http://www.businessinfo.cz/cs/zahranicni-obchod-eu/teritorialni-informace-zeme/cina.html>.

## **2. RESULTS AND DISCUSSION**

### **2.1. Multicriterial Analysis To Evaluate The Economic Situation Of China And Japan**

Basic multicriterial analysis of chosen macroeconomic indicators will help to indicate economic situation of Japan and China. Afterwards, the findings will be used to indicate the economic reason for owning the territory. The table consists of three magnitudes evaluated in comparison with the development in the EU area (Source: Eurostat statistics on inflation and unemployment), GDP at current prices, inflation rate, and unemployment rate. To be evaluated positively, the GDP should be at a high level, above the average. On the other hand, when evaluating unemployment rate it is vital to maintain lower levels of unemployment. Therefore, its rate under 5 % can be evaluated as positive phenomenon, a significantly high rating.

Inflation rate is very complex and vital to maintain a stable development of inflation rate without distinctive fluctuations.

The weight of unemployment rate was established according to the study by Babić, Grčić and Tomić-Plazibat (2001b) in table 3.

**Tab. 3 - Rating grades for chosen criteria**

	HIGH	MEDIUM	LOW
Unemployment rate	≤ 5%	8 % < X ≤ 12%	15% <

Sources:

Personal compilation according to:

Babić, Z., Grčić, B. and Tomić-Plazibat, N. (2001). Achievements of Transition Process in the Central and Eastern European Countries - Multicriterial Analysis. *Enterprise in Transition: International Conference*, 2350 – 2367.

Table 4 shows the evaluation of the main macroeconomic indicators. Japan's GDP is one of the highest (The World Bank, 2014) in the world even though its increase is considerably slower than China's. On the other hand, the unemployment rate in Japan is remarkably low, the average in Europe stands around 10 % (Eurostat, 2014), while the unemployment rate in Japan hovers around 4 % as shown in Table 1 above. It is a positive phenomenon and according to Table 3 above and after comparison with the EU is evaluated positively. Inflation rate, in Japan's case merely deflation, is a complicated phenomenon to evaluate. It is considerably low, which can be correlated with the GDP development and its slower increase. Too low inflation and deflation respectively, therefore, is not in Japan's case evaluated positively. Deflation can lead to stagnancy in wage growth rate and domestic demand is therefore negatively influenced (Simms, J., 2011). However, there still exist many opposite attitudes to inflation and deflation evaluation (O'Hanlon, S, 2009; Authers, 2011).

**Tab. 4 - Basic evaluation of Japanese macroeconomic indicators**

	High	Medium	Low
GDP at current prices	X		
Price stability (inflation rate)		X	
Unemployment rate	X		

Source: Personal compilation.

The Chinese economy is rapidly growing even though its growth was slowed by the world economic crisis. Its GDP reached 8262 billion USD representing the second highest GDP in the world (The World Bank, 2014), with the USA remaining in first place. Therefore the GDP in Table 5 must be evaluated highly. Price stability is also above average compared to Europe. The inflation rate seems to be stable (Kamal, 2013), except the crisis year 2009 when it dropped to the deflation rate 0,7 %. Consequently it is evaluated as high. Inflation is not always tightly interconnected with money stock in the economy (He & Liu, 2011) and in the case of China can be also imported inflation and deflation respectively as the reason for the current situation. Finally, the unemployment rate in cities is similar to Japan and at a lower level than in Europe, around 4 %, undoubtedly a positive phenomenon.

**Tab. 5 - Basic evaluation of Chinese macroeconomic indicators**

	High	Medium	Low
GDP at current prices	X		
Price stability (inflation rate)	X		
Unemployment rate	X		

Source: Personal compilation.

Both countries show considerably higher GDP at current prices and their unemployment rate lies around 4% in the period 2008 – 2012, which had a positive effect on the economy. Inflation rate is not very stable in Japan's case and it changed to deflation between the period of years given, similar to development of the Chinese indicator that experienced deflation only in 2009. Therefore, development of Chinese inflation can be evaluated as slightly more positive than Japanese which also reflects its higher growth in GDP. Both economies are very strong with high GDPs, feasible unemployment rates, and relatively steady inflation rates. Japan experienced some difficulties in the development of inflation. It can be said that both countries need to keep their economies strong to further development and to strengthen their positions in international relations and in the region. Therefore, it can be assumed that both countries would like to gain as many benefits to fortify their position as possible and presumably will try to negotiate without compromises while discussing territory disputes and will try to gain as much territory and power as possible. Their mutual trade interdependence can also play an important role in resolving their disputes and be influenced by the developments in their discussions.

## **2.2. Senkaku Islands Territorial Dispute**

The dispute about the Senkaku (Diaoyu) Islands is the most discussed territorial dispute between Japan and China. The Senkaku Islands are a group of islands in the East China Sea controlled by Japan. The Islands consist of eight smaller islands without inhabitants. Some of them are built only from rocks without recorded economic activity or inhabitants. In 1895 Japan annexed the Senkaku Islands, but the dispute was not the priority for either Japan or China until the late 1960s when there hydrocarbon was found in the seabed around the islands (Pan, 2007). At the beginning of 1970s, petroleum deposits around the islands were also found (Chung, 2007) and afterwards the dispute became more important to both players. Since then nothing indicates a near end to the dispute. The deposits of petroleum and hydrocarbon in the sea bed in waters around the Islands made China gradually more interested in its claims (Donaldson & Williams, 2005). Senkaku is important territory with mineral reserves in its vicinity and therefore the position of the islands also presents a security advantage.

The sovereignty over the Islands would enable the country to dispose of 40 000 km<sup>2</sup> of shelf around the Islands, which could be used not only for establishing a fishery but also for control of gas and oil reserves in the area. Therefore, China and Japan are highly concerned with the Exclusive Economic Zone (EEZ) that extends around these small islands (Chung, 1998). The EEZ gives the countries rights to the continental shelf as well as the water outside their territorial sea. The EEZ can cover up to approximately 370 km from the territory. Countries can thereby manage resources contained in the discussed water area in EEZ (Donaldson & Williams, 2005). In spite of the fact that Article 121(3) of the Law of the Sea has determined that "rocks, which cannot sustain human inhabitation or economic life of their own, shall have no EEZ," both countries claim the EEZ around the Islands even though they are inhabited (Chung, 2007b). The reasons for owning the territory are not only economic, even though these may seem to be prevailing. The security interest also plays a role because while disputing the territory, each country would gain the maritime defence space. Moreover, the ownership of such territory could contribute to increasing domestic political stability or instability. There also exist historical circumstances of owning the territory (Drifte).

Even with the facts given above, China is strict in this dispute and therefore there exists no compromises from the Chinese (Taylor, 2005). Not only is the territory for both countries very important because of the reasons mentioned, but both Japan and China have several territorial disputes with numerous countries and if they were too benevolent in resolving them, precedent would be set for other territorial dispute issues. The tightening of the situation in the Senkaku Islands dispute with China targeted attention also to other Japanese territorial disputes; namely to the Takeshima Islands (Bukh, 2013) in dispute between Japan and South Korea. Making compromises could be a pricey decision for leaders in the country, because the territorial disputes are very important for domestic inhabitants of the country (Huth, Croco & Appel, 2011). This conflict is quite complicated and moreover there is a threat of possible military conflict (Pan, 2007b). There was a real intimidation of military conflict in the last few years when both China and Japan commenced armed action. Fortunately, it ended only at a threatening level rather than fighting, but both countries showed that the conflict could possibly escalate into an international conflict with involvement of more international actors such as other countries as well as international organizations.

Last time the dispute escalated was in 2012 when the Japanese government bought some of the Senkaku Islands from their private owner (Drifte). This animosity which originated from dispute also affected other countries' territorial disputes and stability. Then the dispute became acute and both Japan and China threatened the usage of violence. Indeed, there was increasing military activity around the islands, but fortunately the dispute did not escalate to the open military offense. China's military spending has increased whereas Japan constantly invests in the military, spending approximately 50 billion USD annually. Chinese military spending at the beginning of 1990s was approximately 20 billion USD, but by 2010 has the sum rapidly increased and reached approximately 130 billion USD. The studies have also shown that China should by the year 2061 become the dominant power of the region when considering military spending (Atesoglu, 2013b). Thus, the Chinese economy must henceforth be well-performing to support military spending.

However, their bilateral economic relations were influenced by the escalation of the dispute. The traditional *seikei bunri* relationship where economic and political relations were strictly separated was no longer actual as there was a decrease in bilateral trade between these two countries. Both Japanese exports to China and imports from China decreased at the end of 2012. The economic situation is therefore strictly interconnected with the development of territorial dispute (Nagy, 2013).

Given the fact that the dispute became more important for countries after further mineral reserves in the vicinity of Senkaku Islands were found, it is still a very important character for both countries even nowadays. Additionally, both countries have become very dependent on their mutual trade and the dispute-resolving process can have direct impact on their exports and imports. Therefore it can be assumed that the economic reasons for owning the territory are very strong as there are oil and mineral reserves as well as seabed hydrocarbon deposits. Fishing around the disputed islands is also very important for both countries. The hypothesis was affirmed. As a result from the chapter above, both countries have strong economic events though they must confront particular problems connected with their economies. To sustain their important position in international relations they need the support of strong economies and relatively stable relations with other countries, particularly those in the region. Even though there exist many other reasons for owning the territory—China for example has historical claims in the South China Sea (Malek, 2013)—the economic reasons seems to be the strongest, above all of the others such as strategic or security reasons. Therefore the answer on the research question is positive. The economic situation has an impact on attitude of countries to resolving their territorial disputes, and moreover this factor is preponderant among others.

## CONCLUSION

Japan and China have experienced different development through history and as a result of their relations in the past few years, they still have some unsolved territorial disputes that affect their relations. The dispute about the Senkaku Islands is one of the most significant because of its importance for both countries.

To answer the research question (Has the economic situation of China and Japan impacted Chinese and Japanese attitudes to resolving their territorial dispute and if so, is the impact preponderant among others?), a multicriterial analysis of chosen macroeconomic magnitudes was conducted and on the basis of the analysis the economic situation of countries was then analysed along with the territorial disputes-resolving process. Both countries have exceptionally high GDPs at current prices which indicates production of goods and services as well as the change of price level. The unemployment rate was feasible in both cases with its rate around 4 % which could be evaluated as very positive. Nevertheless, Chinese development of the discussed indicator can be evaluated as more stable. Both countries experienced deflation during 2008 – 2012, but in case of China inflation was prevailing unlike in Japan. Deflation rates in Japan were more apparent. Despite some of the difficulties in both economies they were evaluated as strong and it was presumed that both Japan and China will try to fortify their position in international relations and presumably will try to negotiate while discussing territory disputes without any compromises that would reduce their economic gains. This presumption was affirmed in the third chapter where it was shown that the economic reasons for owning the territory were prevailing.

For the future research of the topic I am preparing the addition of more macroeconomic indicators to the multicriterial analysis. These include current account of balance of payment in its relation to GDP or national budget deficit. Its relationship to countries' GDP is essential to research while evaluating the macroeconomic stability and overall economic situation of the country. Current account and its analysis is very important, because it provides information about international trade of the country especially trade in goods, services, and income and current transfers. These show international exposition of the country. Moreover, the future research will deeply analyse economic situations as well as the complexity of the Senkaku territorial dispute. This analysis will be conducted in connection with the history of states' relations and also with their position in international relations. Their economic situation will be analysed according to neoclassical economics. Even though there are many opportunities to deepen the research, this paper established a basis to achieve first goals and lay the foundations of future research.

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# Production, quality and cost ratio of meadow's hay production

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Roman SERENČEŠ<sup>2</sup>

## Abstract

Ecological management of semi natural grassland was evaluated in three-year long vegetative cycle in locality Chvojnica (Strážovská vrchovina). Experimental treatments were studied in variant 1- unfertilized, variant 2 – 30 kg/ha of P and 60 kg/ha of K, treatment 3-PK + 90kg/ha of N. Vegetation in all treatments of fertilization was 3 times cutted in haymaking time of ripening. The aim of research was to found changes in phytocenology, production, nutrition and economy under different treatments of fertilization, cutting and experimental years. In structure of semi natural grass vegetation in the first cuttings are grasses, in the second clovers and in the third other meadow herbs dominating. Application of fertilizers increases production of dry mass. According applied nutrition is increased quality of dry matter presented by organic nutrients, minerals and secondary metabolites. The evaluation of costs and revenues of grasslands in low inputs revealed that amount of costs were influenced by working operations that are related to management, application of fertilizers and hay production.

## Keywords:

grassland, fertilization, economy, production

## Introduction

During the latest twenty years the world scientific and political communities have been dealing with the series of global warming, reduction of biodiversity of terrestrial systems and related restriction of costs and regulation of farming methods and agricultural land utilisation. The resources within the semi natural grass vegetation - grassland were mainly the systems of low inputs (KRAJČOVIČ, et al. 2004), ecologically and environmentally friendly programmes (HOLÚBEK, I.), agro-environmental programmes (KRAJČOVIČ, et al.2004) as well as the suggestions for their integration (HOLÚBEK, R. et al 2007). All of these systems respected eco-physiological features and protective functions of grass ecosystems including the multi functionality.

Permanent grass vegetation - grassland provides the versatile benefits for the society. It is the part of agricultural system and countryside and it has got the economic value in production and it contributes to the group (Set) of country interests (amenities). The most important are the values that express the benefits of potential future utilisation as well as the existential and trusteeship values that emerge from the knowledge of continued existence. These values include non-market benefits that may be evaluated by the means of methods based on the preferential economic evaluation or integrated optimizing models.

Extensive coverage of meadows is well-founded mainly in the production areas where there is a need to invest lot energy in order to gain higher production of phyto mass. The production on these meadows is usually lower by 30-35 % in comparison with those that are intensively fertilized, but the inputs are 2.7 times lower. Extensive production of hay is more energetic and in addition it preserves the biodiversity of meadows (Ružičková, H. Kalivoda, H. 2007). The aim of the article is to evaluate the nutrition and fertilization impact on the meadow phytocoenosis that is based on the multi annual research of their floristic, productive and nutritious

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changes with the accent on the content of secondary metabolites and their influence on the fodder value. To gain the overview about the costs and gains of hay production when accepting the low inputs.

## Material and methods

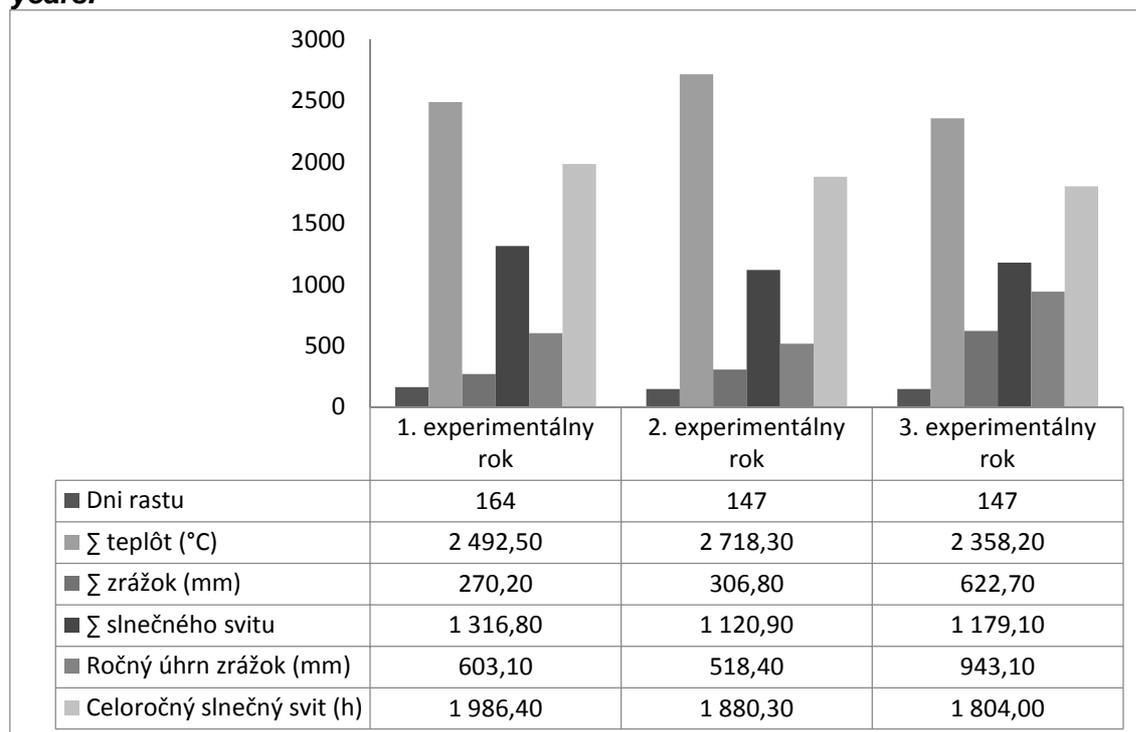
We observed the production, quality and economy of hay production of semi natural grass vegetation in the chosen variants of field experiments in Strážovská hornatina in locality Chvojnica within the research project "Agricultural systems on the basis of grass vegetation in foothill and mountain areas" T-95 (No 5-529-921).

The subject of the research was the semi natural grass vegetation (SGV) (*Lolio-cynosuretum* typicum association). Mineral nutrition  $P_{30} + K_{60}$  kg. p.n. (pure nutrients) /ha (var. 2), 90 N + PK kg. p.n./ ha (variant 2) was applied in the spring of the experimental years 2010, 2011, 2012. The control sample was the unfertilized semi natural grass vegetation (variant 1). Potassium - phosphate fertilizers (superpotassium and 40 % -salt) were applied in the spring, N in ammonium nitrate together with the limestone in the spring and after the cuttings in the dose of 30 kg p.n. / ha<sup>-1</sup>. The vegetation in the monitored variants was used in three cuttings of hay-mowing maturity.

Soil - climate and phytocenologic characteristics of experiment standpoint is cited in the work (HOLÚBEK I., KUZMA, F.2009).

The area is from the point of view of climate classified as agro-climate of hot macro area (1.2), a relatively warm area (1.2.1), a mild-dry area (1.2.1.2) and a district with predominantly cold winter (d).

**Picture no.1: Climate characteristic of experiments' standpoint in the experimental years.**



1<sup>st</sup> experimental year/2<sup>nd</sup> experimental year/ 3<sup>rd</sup> experimental year

Day of growth

of temperature

of precipitation

of sunlight

total precipitation per year (mm)

annual sunlight (h)

The calculation of the primary production of grass vegetation was based on the determination of green mass weight from the harvested plot of ground during four repetitions with the

dimensions 1.2x10 m by weighting and consequent calculation of dry mass concentration in the grass vegetation. It enabled us to calculate the dry matter production in t.ha<sup>-1</sup>. A green mass sample with the weight of 0.5 kg was taken after cutting of individual variants and four repetitions. The samples from four repetitions were dried at the temperature of 60°C. Then they were grinded and sifted through a sieve with 1mm openings. The samples of individual repetitions were mixed and homogenized. A sample was taken from the homogenized mass for the purpose of dry matter calculation (at 105 ° C up to constant weight) and chemical analysis. The indicators of the dry matter quality of hay were calculated from the taken samples in the laboratories of KTE a KP SPU in Nitra and Agricultural research institute in Nyon (Switzerland) - chart 2, 3 and 4.

Direct costs (DC) and working costs (WC) per 1 ha and the hay production unit SGV (Ø for 6 years) per two or three cuttings were monitored according to VUEPP in Bratislava by used, partially adapted costing model (BURIANOVÁ et al.):

- grass vegetation type,
- costs of machinery operation
- purchased and produced seeds,
- purchased and produced fertilizers,
- total direct costs,
- manufacturing and administrative overheads,
- total working costs,
- hay harvest, production of N-substances and net-energy of lactation NEL,
- working costs per 1ha and 1ton and other economic indicators.

An individual item consists of costs of industrial fertilizers. We used the average prices of 2012 in the interest of objectivity. We used the prices of p.n. as the basis: 1 kg N-0.73 €, 1 kg P – 2.70 €, 1 kg K – 1.02 €. Used doses of nutrients in the variant 2 and 3 were multiplied by the price per 1kg p.n. This way, we gained the costs of the purchased industrial fertilizers in €.ha<sup>-1</sup>. Costs of machinery technology within the hay production were calculated by the computer programme "TEKONS" (Nozdrovický et al 1998). The results are shown in the chart 5.

The results obtained within the production of dry matter and its quality were statistically evaluated by multi factor analysis of variance (chart 1).

**Chart 1.**

Indicator	Year	Cutting	Variant
dry matter (t/ha)	0,285 <sup>-</sup>	0,00 <sup>++</sup>	0,001 <sup>++</sup>
N-substances (g/kg)	0,320 <sup>-</sup>	0,00 <sup>++</sup>	0,00 <sup>++</sup>
PDI (g/kg)	0,478 <sup>-</sup>	0,07 <sup>-</sup>	0,00 <sup>++</sup>
NEL (MJ/kg dry matter)	0,004 <sup>++</sup>	0,009 <sup>++</sup>	0,19 <sup>-</sup>
DMOL (in %)	0,065 <sup>-</sup>	0,063 <sup>-</sup>	0,00 <sup>++</sup>
Fibre (g/kg)	0,176 <sup>-</sup>	0,586 <sup>-</sup>	0,00 <sup>++</sup>
Lignin (g/kg)	0,016 <sup>+</sup>	0,091 <sup>-</sup>	0,00 <sup>++</sup>
RF (CPFS)	0,001 <sup>++</sup>	0,056 <sup>-</sup>	00,005 <sup>++</sup>
NF (CPFI)	0,379 <sup>-</sup>	0,288 <sup>-</sup>	0,059 <sup>-</sup>
IPNA	0,836 <sup>-</sup>	0,000 <sup>++</sup>	0,000 <sup>++</sup>

The work was prepared as a part of the solution of the project VEGA no.1/0291/11 "Ecological and economic- friendly coverage of GV in the disadvantaged and mountain areas of Slovakia."

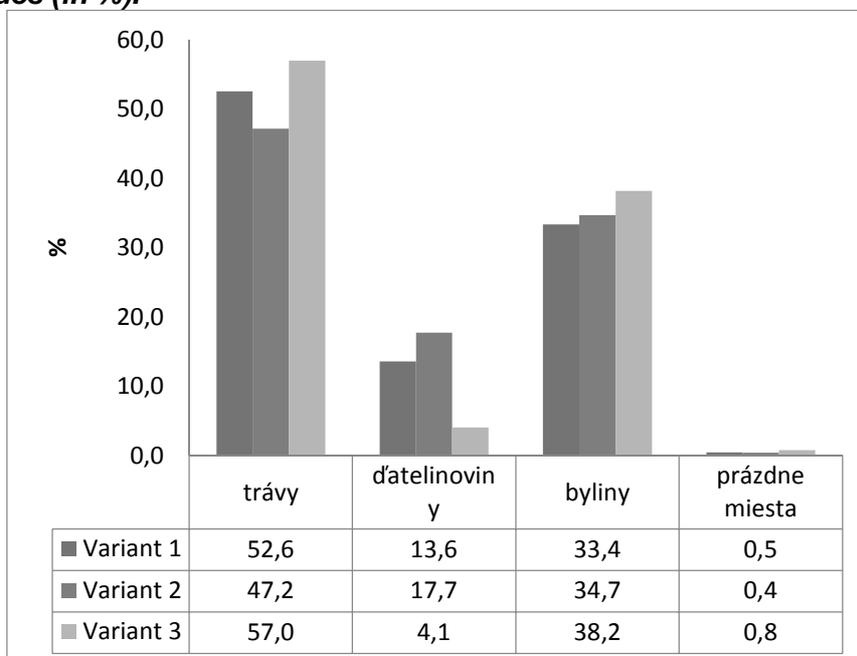
## Results and discussion

### Alterations within the floristic groups of meadow plants.

The alterations of floristic groups were monitored using the method of reduced projective dominance. The results of representation of floristic groups in the experimental years of the variants and cuttings are shown in the picture 2. On the controlled unfertilized grass vegetation the average values of grass coverage reached 44.9 % in the first cutting and 59.7% in the second cutting. The grass coverage on the variant fertilized by PK fertilizers fell in comparison with the variant 1, respectively grew evidently within the variant 3. The reached maximums were 58.9% at the second cutting and 60.4% at the third cutting. The coverage of floristic group of clover was very same within the first and second cuttings of variants 1 and 2. It grew during the second and third cutting of the variant 2 with the maximum from 16.1% to 24.8%. Within the variant fertilized by NPK fertilizers, the coverage of clover in the cuttings did not go over 6%. Other meadow herbs present an important part of the coverage. On the unfertilized control sample the coverage gained in average numbers 42.4% at the first cutting, 27.3% at the second cutting and 30.4% at the third cutting. Very precious balance of floristic groups' coverage was gained on the variant fertilized by PK fertilizers. The highest coverage of other meadow herbs was registered by the grass type fertilized by NPK fertilizers with the maximum values of 42.7% at the first cutting. We can generally state that during the first cuttings on the control sample and PK variant the predominant was grass, during the second cuttings it was clovers and during the third ones it was meadow herbs. Dicotyledonous species are registered in average by 53% up to 65%.

From the important and differential species of association Lolio – Cynosuretum typicum were these species Lolium –perenne, Poa trivialis, Plantago major, Trifolium repens, Trifolium pratense, Cynosurus cristatus, Festuca pratensis, Carex hirta, Ranunculus repens, Brisa media, Singlingia desumbes, Daucus carota on the standpoint of Chvojnica.

**Picture 2 Floristic groups representation within the chosen years and variants in the average values (in %).**



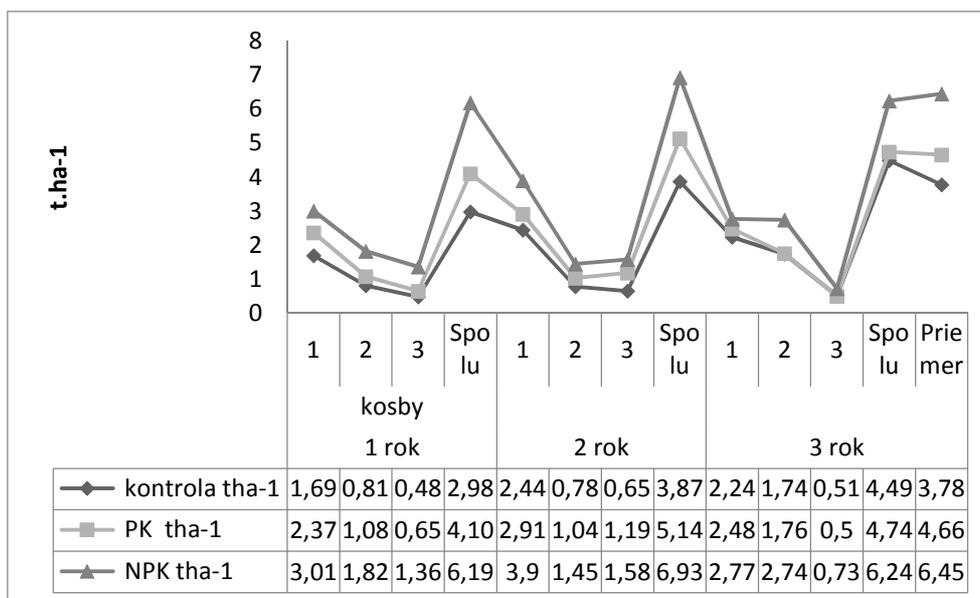
#### Variant 1/2/3

Grasses/ clovers/ herbs/ empty places

## Alterations within production of grass dry matter

We show the obtained values of dry matter harvest in the picture no. 3. The harvest of dry matter within variants of fertilizing has the growing trend. Unfertilized grass vegetation produces from 2.98 t/ha to 4.49 t/ha of dry matter. The vegetation fertilized by PH fertilizers produces from 4.10 to 5.14 t/ha and the vegetation fertilized by NPK fertilizers produces from 6.19 to 6.93 t/ha of dry matter. The high evidence between the cuttings and the variants of fertilisation was registered by the statistics evaluation. We have to say in this context that the amount of dry matter production is limited by the atmospheric precipitation (picture 1). The highest amount of dry matter harvest per ha was reached at the maximum precipitation level in the third experimental year. In average of three years the unfertilized grass vegetation produces 3.78 t/ha, the variant fertilized by PK fertilizers 4.66 t/ha, i.e. increase by 0.88 t/ha. The variant fertilized by NPK fertilizers produces 6.45 t/ha of dry matter that means the increase by 2.67 t/ha, i.e. 70.6 %. PK fertilisation in our conditions ensures the medium intensity of harvest; the growth in comparison with the control sample is 37% in the first year 32% in the second year. When comparing the PK harvest results of fertilized grass vegetation (Lichner 1973) (4.3 t/ha) and our results (4.6 t/ha), we can observe the accordance. The result is approximately the same as the results in the middle Europe (Klapp 1971). However, the dry matter increment in our experiments is lower than in the controlled variant. It is possible that it influences also the economic effectiveness of fertilisation of grass vegetation by PK fertilizers. A notable indicator in the systems of grass fertilisation effectiveness is the production effectiveness. On the variant fertilized by PK fertilizers the production effectiveness reached 9.77 kg of dry matter. On the variant 3 it reached 14.83 kg of dry matter. Higher production effectiveness on the variant 3 was conditioned by the higher grass coverage, which can effectively use a supply of nitrogen fertilizers. In the work (Lichner 1973) 1 kg of PK fertilizers produced in average 7.4 kg of dry matter. The coverage of clovers in the vegetation has the optimal levels for the PK fertilisation effect. The highest increment was reached at the coverage from 10% to 40%. Very low and very high coverage reduced the increments. It is necessary to consider also the clover species composition at fertilisation.

**Picture 3 Dry matter harvest of semi natural grass in the variants and experimental years.**



Cuttings /total/ average  
 Control sample  
 PK  
 NPK

## Evaluation of quality of hay dry matter

The volume of N-substances and other nutrients in the grass societies is related to the representation of floristic groups, species composition, nutrition and fertilisation, climatic conditions, a phase of grow and usage frequency. The volume of N-substances can change from 300 to 350 g/kg of dry matter of young vegetation with the prevalence of leaves up to the level of 50 to 100 g/kg of over seasoned grass vegetation with the high volume of stems (Holúbek et al. 2007). From our results (chart 2, 3, 4) it arises that the volume of N-substances in the dry matter grows after the fertilisation by PK and NPK fertilizers with the maximum of 18.83 % on the variant 3 within the first cutting.

Determined values of N-substances volume reached desired optimum, i.e. 50 g/kg of dry matter with some exceptions of second cuttings in the first experimental year. Except of P, K, Ca and Mg, the nitrogen nutrition of grass vegetation is also important. Nitrogen fertilisation is consequently shown by optimal usage of related humidity and temperature conditions. That leads to the increment of phytomass harvest and improvement of its quality. From the applied industrial fertilizers the harvest uses nitrogen only partially in the interval of 40-60%. It is necessary to emphasize that within the grass vegetation it is possible to use more per cent of nitrogen from the applied industrial fertilizers according to the conditions that determine mainly phytocenologic, ecologic, pratotechnic and other factors (Holúbek et al. 2007). It is indisputable that without the nitrogen fertilisation would not be possible to reach the dry matter harvest over 6.0 t/ha and its quality. This emerges from the physiological and biochemical function of nitrogen during the organic mass production. We found out in the works (Holúbek, Jančovič 1999) that semi natural grass vegetation in whose phytomass there are quality meadow herbs and grass that offer to ruminants not only proteins, minerals and vitamins but also energetic component. In our work there was no evident difference in the values of net energy of lactation (NEL) among the variants of grass vegetation. Highly evident differences in the content of NEL were registered within years and cuttings. We found out that the highest average values of NEL are presented within unfertilized semi natural grass vegetation (chart 2). The system of three cuttings of utilisation of grass vegetation enables to produce the fodder with the desired high evident amount of fibre. In all monitored variants of cuttings and years within the average values, the amount of fibre did not go over 250 g/kg of dry matter.

The exception is only the grass vegetation fertilized by 90 kg p.n. N+PK in the first cutting and first experimental year 266 g/kg of dry matter, 26.6 % respectively. The low amount of fibre is shown by good up to very good digestibility of organic mass. The factor of fertilisation has got an important impact on the digestibility of organic mass. In connection with previously mentioned, it is necessary to say that within the average values the variant fertilized by PK fertilizers has got lower digestibility than the vegetation of unfertilized control sample, fertilized vegetation 90 kg p.n. respectively. N + PK. Lower digestibility of organic mass correlates in the first and second cutting by the amount of lignin. It can be said that the higher frequency of cuttings allows obtaining the fodder with the higher quality from grass vegetation.

The biggest significance from the cytoplasmic components that are represented by secondary metabolites has phenols (chart 2, 3, 4). The most famous representative of phenol compounds is lignin. The values higher than 70 g/kg in the grass (limit of digestibility) are registered in our experiments by grass vegetation at the third cuttings. Modern conception of problematic of lignification is continuously replacing quantitative aspect of lignin (that means its concentration in the vegetable phytomass) by qualitative aspect. Therefore the primary components (vanillin, vanillin acid etc.) have the higher importance in the area of its impact on the quality that is given by its anti-nutritious activities (Sčehovič 2001):

A very important fraction from the point of view of the impact on the quality of hay dry matter from the grass vegetation is considered to be soluble phenol polymers - tannins (CPFS). Unfertilized grass vegetation is presented by higher values of soluble phenols than grass vegetation fertilized by PK fertilizers. The results are statistically demonstrable. The carriers of soluble phenols are mainly meadows herbs. It was confirmed by the works (Sčehovič 1999). Another important fraction is presented by esterified phenol acids (CPF1) that are similarly to lignin insoluble in the common types of organic dissolvent. Their primary effect is the negative

impact on the penetration of cellulosic enzymes into the protein structure and therefore the impact on the digestibility of nutrients. The reached values of esterified phenol acids' amount in the vegetation within the years and cuttings are very balanced, statistically non demonstrable. The carrier of their higher concentration is hay dry matter in the summer-autumn cuttings.

As we have already said the dicotyledonous meadow plants species dominated within the monitored grass vegetation. In this context the quality of grass vegetation confront with the amount of secondary metabolites have recently been expressed by the index of potential negative activity (IPNA) (Ščehovič 1994). This index enables to quantify in a quick and undemanding way the potential negative reaction of inhibitors that are present in the plant organism, plant society respectively. It accumulates the negative synthesis of all components that are present in the precisely defined extraction environment on the enzymatic degradation of specific fibre substrate. From our results (chart 2-4) it is clear that required criteria of values of IPNA to 120 full fill the evaluated grass vegetation only at the first cuttings. In the second and the third cuttings the values of IPNA go over the required optimal level in a highly demonstrable way. The carriers of high values are mainly *Hypericum perforatum* 285, *Alchemilla vulgaris* 224, *Salvia pratensis* 193, *Leontodon hispidus* 184, *Centaurea jacea* 136 (Ščehovič 2001), from the societies they are mainly *Triseteta* and ruderal societies. From the clover types the carriers of high values of IPNA are presented mostly by meadow vetchling - 202, clover medium -192, alpine clover - 168, golden clover – 142 (Holúbek et al. 2007).

It was also demonstrated that the herbs with the high values of IPNA sometimes show the high digestibility as the consequence of low amount of fibre and its dilution in fermentative environment in vitro in comparison with the amount of fibre in the digestive tract of ruminants and therefore as the result of impact of potentially active principles. On the contrary, the standard addition of the extract of these herbs to the tested samples with the high digestibility evoked an important decrease of proteases and celuases in the digestive tract.

Because of the qualification of these effects the index of active fermentation potential (IAFP) was created on the basis of the amount of released gases in the process of fermentation and decrease of pH (from the extract of sample with the artificial saliva, rumen juice and addition of glucose, incubated at the optimal conditions create the gas production. Its effect in the environment creates the decrease of initial value of pH). The extent of this process, that is linear function of microbial activity, is measured and expressed by the relation to the control sample without extract of vegetable part.

At IAPF with the values < 100 the species have inhibitive effects. Meanwhile the values > 100 are classified within the group with the stimulating effects (Ščehovič 2001): Grass and leguminoses belong to the group with the stimulating effects. Their ageing is however related to the tendency of stimulation decrease.

The families with the highest concentration of phenol substances (phenol acids, polymers of phenols), e.g. Rosaceae and Geraniaceae families produce more noticeable inhibitive activities. The plants with the toxic organic acids show decrease in fermentation activity (Ščehovič 2001).

This problematic related predominantly to grassland management is aimed at the potential determination of quality and digestibility of permanent grass vegetation. It contributed to the knowledge about the peculiarities that distinguish natural and semi natural GV from the intensive and permanent. Sooner or later it will be necessary to respect it.

Beside the mentioned things, the solution brought many new findings of detailed parameters of quality (lignocelluloses, real celluloses, corrected digestibility - IPNA, soluble phenols in the artificial saliva and in the cellulolytic enzyme, phenol acids, involatile terpenoids etc.) whose broader functions would be needed to examine not only from the nutritious but also from the ecosystems' point of view.

**Chart 2. Indicators of dry matter quality of association *Lolio-Cynosuretum typicum* within the reported period - unfertilized control (in g/kg of dry matter)**

Indicator	Years											
	1 year			2 years			3 years			average		
	Cuttings											
	1	2	3	1	2	3	1	2	3	1	2	3
Dry matter (t/ha)	1.69	0.81	0.48	2.44	0.78	0.65	2.24	1.74	0.51	2.12	1.11	0.55
N-substances (g/kg)	158.0	124.0	151.0	166.0	145.0	177.0	181.0	141.0	146.0	168.3	136.7	158.0
PDI (g/kg)	101.0	79.3	96.6	106.1	92.7	113.2	102.0	80.7	78.6	103.0	84.2	96.1
NEL MJ/kg dry matter	6.19	6.02	6.11	5.73	5.70	5.32	5.85	4.61	3.99	5.92	5.44	5.14
DMOL	74.94	73.10	74.78	70.51	70.92	68.23	72.95	66.02	60.17	72.80	70.01	67.73
Fibre (g/kg)	210.0	197.0	197.0	225.0	197.0	208.0	195.0	213.0	239.0	210.0	202.3	214.7
Lignin (g/kg)	46.80	52.50	44.10	61.60	59.50	67.70	55.10	77.20	92.70	54.50	63.10	68.20
RF (CPFS)	3.75	4.69	4.61	3.04	3.43	3.42	3.07	3.14	2.29	3.29	3.75	3.44
NF (CPFI)	1.11	1.18	1.15	1.21	1.30	1.39	1.21	1.27	1.59	1.18	1.25	1.38
IPNA	116.5	165.0	159.0	100.0	165.0	143.0	133.0	165.1	176.4	116.5	165.1	159.7

**Chart 3. Indicators of dry matter quality of association *Lolio-Cynosuretum typicum* within the reported period after the fertilisation by PK-fertilizers (in g/kg of dry matter)**

Indicator	Years											
	1 years			2 years			3 years			average		
	Cuttings											
	1	2	3	1	2	3	1	2	3	1	2	3
Dry matter (t/ha)	2.37	1.08	0.65	2.91	1.04	1.19	2.48	1.76	0.50	2.59	1.29	0.78
N-substances (g/kg)	171.0	144.0	181.0	173.0	139.0	152.0	201.0	158.0	181.0	181.7	147.0	171.3
PDI (g/kg)	110.0	100.8	110.3	97.0	84.5	82.9	103.5	92.6	96.6	103.5	92.6	96.6
NEL MJ/kg dry matter	5.6	5.6	5.2	5.4	4.7	4.3	5.5	5.5	4.8	5.5	5.3	4.8
DMOL	63.1	64.1	58.6	69.1	66.1	62.9	66.8	65.1	60.7	66.3	65.1	60.7
Fibre (g/kg)	248.0	211.0	226.0	223.0	237.0	247.0	170.0	174.0	190.0	213.7	207.3	221.0
Lignin (g/kg)	51.2	50.8	58.3	60.6	75.7	82.4	54.8	56.2	72.2	55.5	60.9	71.0
RF (CPFS)	2.98	3.24	2.96	2.65	2.88	2.68	2.76	3.38	2.88	2.80	3.17	2.84
NF (CPFI)	1.34	1.31	1.47	1.47	1.28	1.50	1.07	1.06	1.12	1.29	1.22	1.36
IPNA	101.40	128.40	137.80	118.60	155.20	177.80	110.00	121.00	112.00	110.00	134.87	142.53

**Chart 4. Indicators of dry matter quality of association *Lolio-Cynosuretum typicum* within the reported period after the fertilisation by NPK-fertilizers (in % of dry matter)**

Indicator	Years											
	1 years			2 years			3 years			average		
	Cuttings											
	1	2	3	1	2	3	1	2	3	1	2	3
Dry matter (t/ha)	3.01	1.82	1.36	3.9	1.45	1.58	2.77	2.74	0.73	3.23	2.00	1.22
N-substances (%)	16.20	15.20	14.90	19.30	20.80	16.50	21.00	15.60	13.10	18.83	17.20	14.83
PDI (%)	10.36	9.72	9.53	12.28	13.30	10.55	10.84	9.29	8.91	11.16	10.77	9.66
NEL (MJ/kg dry matter)	5.85	6.01	6.06	5.62	5.59	5.39	6.04	5.25	4.09	5.84	5.62	5.18
DMOL	69.54	73.13	73.84	70.75	72.39	73.18	71.92	67.94	61.35	70.74	71.15	69.46
Dry matter (%)	26.60	21.10	21.70	24.90	21.90	24.70	22.40	24.40	27.00	24.63	22.47	24.47
Lignin (%)	4.64	5.95	4.34	5.59	5.75	6.01	4.89	5.85	7.49	5.04	5.85	5.95
CPFS (%)	2.33	3.86	3.68	2.20	2.43	3.00	2.39	2.74	2.42	2.31	3.01	3.03
CPFI (%)	1.55	1.22	1.21	1.43	1.48	1.45	1.42	1.49	1.76	1.47	1.40	1.47
IPNA	-	-	-	69.20	102.7	112.8	94.00	114.00	116.40	54.40	72.23	76.40

### Evaluation of costs and profits of grass vegetation

The results of costs and profits are shown in the chart 5. The amount of costs has been influenced by working operations related to the treatment, fertilisation and hay production. The hay production is presented by the lowest direct costs (66.98 €/ha) at the unfertilized control sample. By fertilizing PK (variant 2) the costs went up to 269.87 €/ha, i.e. by 202.89 €, by NPK fertilizing (variant 3) in two cuttings by 268.96 €/ha, in three cuttings by 312.52 €/ha.

Analogue situation is repeated with the working costs per 1ha. In comparison with the unfertilized control sample the direct costs (DC) went up by 31.66 €/ha as the consequence of PK fertilizers usage (variant 2). On the variant 3 that was fertilized by NPK fertilizers the DC grew by 32.71 €/ha and on the variant 3 used in three cuttings by 38.46 €/ha. Higher DC per 1ha from variant 3/3 cuttings in comparison with variant 3/2 cuttings increased by one cutting. The harvest of N-substances and NEL production per 1ha has the increasing trend when compared with the control sample of the variant 1 up to fertilisation of NPK fertilizers on the variant 3.

The sales per ha have the increasing trend within the variants of fertilisation. They grew by 113.6 € on the variant fertilized by PK fertilizers in comparison with the unfertilized control sample and by 224 €/ha on the variant 3 fertilized by NPK fertilizers.

We gained the profit after deduction of costs from the reached sales. The vegetation of unfertilized control sample is presented by its highest values of 291.19 €/ha. The inputs in the form of the industrial fertilizers and the number of cuttings bring the growth of the profits on the variant 2 in comparison with the control sample by 109.99 €/ha, variant 3/2 by 77.39 €/ha and variant 3/3k by 12.95 €/ha.

In the agrochemical literature there have recently been many reviews of the industrial fertilizers utilisation prepared on the basis of economy evaluation expressed by the fertilisation effectiveness (FECENKO-LOŽEK 2000, SLAMKA-HANÁČKOVÁ 2012). In this context we evaluate the results reached by us, we detect that the fertilisation increment in variant 2 reaches 113.60 €/ha and does not cover the costs of industrial fertilizers and their application

(150.21 €/ha). The costs of grass vegetation fertilisation are in comparison with the profit higher by 36.61 €/ha, i.e. fertilisation by PK fertilizers is loss-making.

**Chart 5. Costs and profits per 1ha and 1ton of hay production on SGV grass vegetation.**

Indicators	SGV - meadows				
	Costs of working operations and main parameters				
	units	V1	V2	V3/2k	V3/3k
Vegetation treatment and NDV+	EURO/ha	14.32 €	14.32 €	14.32 €	14.32 €
Uploading of mineral fertilizers by a tractor set	EURO/ t	-	0.06 €	0.21 €	0.21 €
Transport of mineral fertilizers by tractor transport set	EURO/ tkm	-	0.34 €	0.56 €	0.56 €
Fertilisation by mineral fertilizers	EURO/ha	-	7.61 €	7.61 €	7.61 €
Cutting of grass vegetation in the 1st and 2nd cutting	EURO/ha	17.65 €	35.31 €	35.31 €	52.96 €
Turning of hay in the 1st and 2nd cutting	EURO/ha	8.30 €	16.60 €	16.60 €	24.90 €
Raking of hay in the 1st and 2nd cutting	EURO/ha	10.40 €	20.80 €	20.80 €	31.20 €
Gathering of hay in the 1st and 2nd cutting	EURO/ha	9.10 €	18.20 €	18.20 €	18.20 €
Transport of hay in bulk by transport set in the 1st and 2nd cutting	EURO/ t km	4.89 €	9.78 €	9.78 €	14.67 €
Uploading of hay in hay-loft 1st and 2nd cutting	EURO/ t	2.32 €	4.65 €	4.65 €	6.97 €
Purchased fertilizers	EURO	-	142.20 €	207.90 €	207.90 €
Total direct costs	EURO/ha	66.98 €	269.87 €	335.94 €	379.50 €
Manufacturing and administrative overheads	EURO/ha	24.23 €	44.71 €	56.66 €	56.66 €
Total working costs	EURO/ha	91.21 €	314.58 €	392.60 €	436.16 €
Hay harvest	t/ha	4.78	6.2	7.58	7.58
Direct costs on 1t of hay	EURO/ t	14.01 €	43.53 €	44.32 €	50.07 €
Working costs on 1t of hay	EURO/ t	19.08 €	50.74 €	51.79 €	57.54 €
Harvest of N-substances	t/ha	0.649	0.832	1.079	1.079
NEL production	GJ/ha	22843	28403	37107	37107
Revenue	EURO/ha	382.4	496	606.4	606.4
Profit	revenue - working costs	291.19 €	181.42 €	213.80 €	170.24 €
Reduction profits of losses at the harvest (20%)		242.66 €	151.18 €	178.17 €	141.87 €

## Conclusion

Production, nutritious and economic potential of meadow vegetation of association *Cynosuretum typicum* on the standpoint of Chvojnica was followed in the three-vegetative-year period. The variants of experiment with the low inputs were these: variant 1 unfertilized control sample, var. 2 – 30 P in kg p.n. / ha + 60 K in kg p.n. / ha and var. 3 PK + 90 N in kg p.n. / ha. A floristic group of dicotyledonous is dominant in the structure of semi natural grass vegetation variants. Graminoids dominated in the phyto mass harvest in the first cuttings on the variant 1 and 2. They were the clovers at the second cuttings and other meadow herbs at the third cuttings.

The harvest of hay dry matter within the variants of fertilisation with the repeated doses of industrial fertilizers has the increasing trend. Unfertilized grass vegetation produces from 2.98 t/ha to 4.49 t /ha of dry matter. The vegetation fertilized by PH fertilizers produces from 4.10 to 5.14 t/ha and the vegetation fertilized by NPK fertilizers produces from 6.19 to 6.93 t/ha of dry matter.

The content of N-substances in the dry matter after the fertilisation by PK and NPK fertilizers increases (to the maximum of 18.83% on variant 3) and meets the requirements of young cattle with the average yield. The system of triple-cutting-utilisation of semi natural grass vegetation that is harvested in the phenol-phase at the beginning of grass blossoming produces the hay dry matter of the very balanced average values of net energy of lactation: at the first cuttings 5.5 – 5.9 MJ/kg, at the second cuttings 5.3-5.4 MJ/kg and a the third ones 4.8-5.1 MJ/ kg. This vegetation is also presented by low content of fibre within the average values under 22% and relatively low content of lignin under 70 g/kg. The content of lignin demonstrably grows from the first to the third cutting.

In the system of fertilisation and utilisation, semi natural grass vegetation with the high level of coverage of dicotyledonous plants is the carrier of high content of phenols. Only grass vegetation at the first cutting full fills the required criteria of values of Index of potential negative activity (IPNA) up to 120 in the variant 1 and 2. The values of IPNA far exceed the required optimal level at the second and third cutting. Vegetation fertilized by NPK fertilizers produces dry matter with the required, respectively optimal values of IPNA.

From the evaluation of costs and profits of grass vegetation at low inputs is clear that the amount of costs was influenced by working operations related to the treatment, fertilisation and hay harvest. The hay production is presented by the lowest direct costs (66.98 €/ha ) on the unfertilized control. The costs grew within the fertilisation by PK fertilizers (variant 2) when compared with the control sample to 269.87 €/ha, i.e. by 202.89 € , by NPK fertilisation (variant 3) by 268.96 €/ha at two cuttings, by 312.52 €/ha at three cuttings. The sales per 1ha within variants of fertilizing have the growing trend. From the economic point of view the fertilisation by phosphoric and potassium fertilizers is problematic. Dry matter increment € ha<sup>-1</sup> does not cover the expenses of fertilizers and their application. From the practical point of view we recommend to use the evaluated meadow phyto - coenosis at two cuttings. The third harvest (after grass) can be used by livestock and sheep grazing.

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# Review of Classical and Neuroscience Insights on Visual Merchandising Elements and Store Atmosphere

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## Abstract

Visual merchandising plays the crucial role in buying behavior of customers at the point of purchase. Store environment, store atmosphere and shopping comfort are elements evocating positive or negative emotions during the process of purchase. Due to increasing competition at the retail sector in generally, higher demands of customers for the sales culture and convenience the marketers and business practitioners are forced to implement any possible progressive features able to increase the attractiveness and efficiency of the retail store.

Main aim of the paper is to explain the impact of different visual merchandising elements and store atmosphere on consumer behavior and shopping comfort. As the numbers of similar studies have been done in this area worldwide, added value of our study lies in the combination of classical merchandising approaches with nowadays rapidly developing neuro-science approach, supported with economic or environmental aspects, if appropriate.

Object of the study is food merchandising. To explain the importance of individual visual merchandising elements we use traditional classification of 5 senses: sight, smell, taste, touch and hearing. Besides 5 senses there are also some demographic and psychographic segmentation criteria to be considered, especially in two extreme situations: economic buyer versus hedonistic buyer. In the paper we devote attention to visual merchandising factors as light, music, smell, visual, touch and taste experience, space comfort and weight-price-labelling systems are. While the factors as light, music, etc. are highly connected with consumer psychology, weight-price-labelling systems provide relevant and exact information to customers, e.g. weight of the product, price, date of packaging and expiration, ingredients, bar code for better product identification, country of origin, producer or trader identification or article number as well. Research is a part of the research project supported by the Ministry of Education, Science, Research and Sport of the Slovak Republic VEGA 1/0874/14 "The use of neuromarketing in visual food merchandising."

Paper results with identifying possible areas for further studies, fundamental and applied neuroscience research and practical implication in food retailing as well. Partial results of neuroscience research related to accent lighting and its impact on consumer hidden reaction in the section of fresh fruits are already mentioned in the paper.

## Keywords:

Visual merchandising, customer behavior, shopping comfort

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## **Introduction**

Visual merchandising plays the crucial role in buying behavior of customers at the point of purchase. Store environment, store atmosphere and shopping comfort are elements evoking positive or negative emotions during the process of purchase. Due to increasing competition at the retail sector and higher demands of customers for the sales culture and convenience, the marketers and business practitioners are forced to implement any possible progressive features able to increase the attractiveness and efficiency of the retail store. The main aim of the paper is to explain the impact of selected visual merchandising elements and store atmosphere on consumer behavior and shopping comfort. Despite many similar studies done in this area worldwide, the added value of our study lies in the combination of classical merchandising approaches with nowadays rapidly developing neuroscience approach, supported with economic or environmental aspects, if appropriate.

## **Material and Methods**

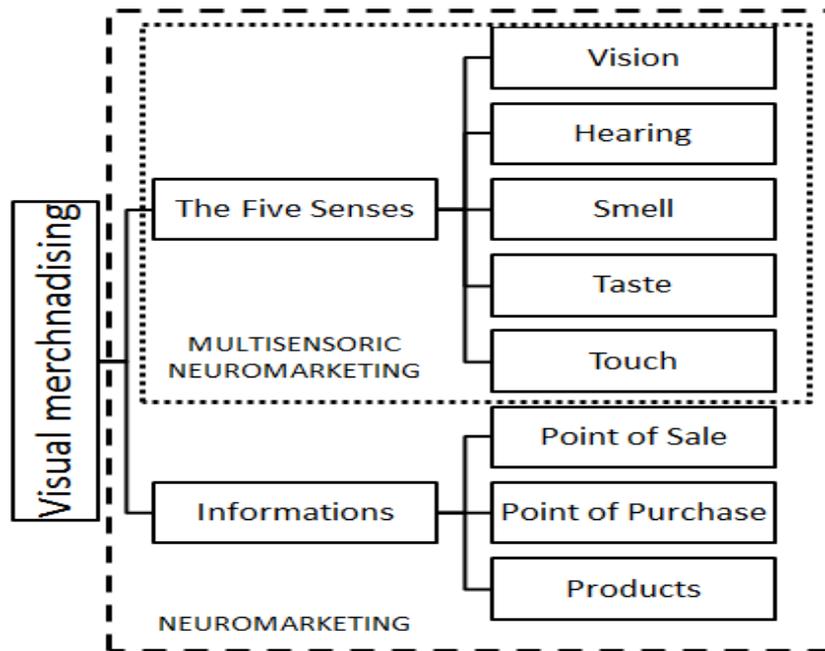
The study focuses on food merchandising. To explain the importance of individual visual merchandising elements we use traditional classification of five senses: sight, smell, taste, touch and hearing. Besides these five senses there are also some demographic and psychographic segmentation criteria to be considered, especially in two extreme situations: economic buyer versus hedonistic buyer. In the paper, we devote attention to visual merchandising factors such as light, music, smell, sight, touch and taste experience, space comfort and weight-price-labelling systems. While the previously mentioned factors as light, music, etc. are highly connected with consumer psychology, weight-price-labelling systems provide relevant and exact information to customers, e.g. weight of the product, price, date of packaging and expiration, ingredients, bar code for better product identification, country of origin, producer or trader identification or article number as well.

The study is part of the research project supported by the Ministry of Education, Science, Research and Sport of the Slovak Republic VEGA 1/0874/14 "The use of neuromarketing in visual food merchandising."

In the paper, we devote special attention to providing relevant and exact information to customers at the point of sale through the precociously identified product origin and its features using modern labelling system. Based on rapidly increasing consumer awareness in Europe related to food safety, hygiene, animal welfare and environmental issues such detailed system of providing information for customers is becoming of operational necessity in modern retail store.

## **Research Results**

Hand in hand with development of marketing research techniques and sensory studies there have been brain research techniques developed using functional magnetic resonance imaging (fMRI) in which the activities of different areas of the brain are recorded and displayed (brain scans). Such advanced studies and experimental studies of psychology show that 95 % of our (purchase) decisions are influenced by unconscious emotional processes. For retailers, there is a great importance to understand why buyers in certain situations do not react economically, following the logical thinking of the cerebrum, but respond by learnt behavior differently than expected, or even contrary to their in surveys collected intentions, i.e. when the reason for shopping is often unknown. (Loewestein, 2008).



**Figure 1 Using Neuromarketing in Visual Merchandising**

Source: Own processing, 2014.

Total enormous efforts in the food trade are made to survive in the market. It is more and more necessary to employ the findings of neuroscience, sensory marketing and visual merchandising Figure 1. Neuromarketing research has begun to focus on the sensory aspects of shopping and combines the findings of brain research with approaches of classical marketing. The neuromarketing tools allow market researchers to control the buying behavior of people. One such tool which influences the buying behavior is the production of emotions. Emotions are expressed in mental and physiological states, triggered by perceptions, thoughts and memories (Dalglish, 2004) and so are closely associated with incentives perceived through the brain – senses (sight, smell, taste, touch and hearing). According to Plutchik (2002), we distinguish eight primary emotions: anger, fear, sadness, disgust, surprise, anticipation, trust, and joy.

**Table 1 Relative importance of the five main senses**

Sense	Relative importance in %
Eyes (visual)	83,0 %
Ears (acoustic)	11,0 %
Nose (olfactory)	3,5 %
Skin (movement – tactile, kinesthetic)	1,5 %
Tongue (gustatory)	1,0 %

Source: Bronner and Hirt (2009) In Gains (2014).

At the point of purchase there are many external impulses affecting customers during the process of purchase. Besides basic marketing approaches and tools there are also the multi-sensory experiences that create stronger engagement and more powerful memories (Hill, 2008). We can mention here some classical studies focusing on the classical five senses of smell, taste, touch, hearing and vision (Lindstrom, 2010). Based on studies of Professor Zimmerman (1989) we know that the maximal conscious information from sensory perception is around 40 bit per second. This is in contrast to the millions of pieces of information that flood into the brain from customer's senses. Our eyes send at least 10 million bit of information to the brain every second, the skin around 1 million, the ears 100 000 and the taste buds a much

more limited 1000 (Gains, 2013). Table 1 shows the importance of the eyes and ears relative to other senses and reinforcing the view of the conscious bandwidth of the senses.

Emotions are generated by cognitive perceptions and positive or negative memories. They are saved in limbic system in hypothalamus, which is also responsible for the release of endorphins (luck producers) in the framework of a reward system. Neuroscience describes the limbic system as an emotional power center in the brain (Häusel, 2008). The generation of a reward in the limbic system leads to the activation of the Have-Want – System (Nudens accumbens). If a threshold value is exceeded, the urge for a thing is so strong that we necessarily have/want to buy it (Sheperd, 2010). The decision to purchase is made in the brain stem (reptile brain), the evolutionarily oldest part of our brain that owns each vertebrate. Here are the instincts that are most important for survival. Products that trigger any emotions are worthless for this part of brain (Neuromarketing Kongress, 2014).

Often, there are only small, short-term signals that have a great emotional impact. There are specific ways of making a contagious message memorable, and there are relatively simple changes in the presentation and structuring of information that can make a big difference in how much of an impact it makes (Gladwell, 2007).

Purchasing has to be an event for the customer, which transports joy and luck and therefore hedonistic feelings. Those feelings are only possible with trust in the brand. An emotionally strong brand is able not only to turn off the mind but displaces also another brand (Lindstrom, 2010; Plassmann et al., 2012; Kenning et al., 2007).

Because the possibility of influencing positive purchase decision about the food label is to be determined in this paper as there are highly related to food retailing and providing comprehensive information for customers, factors as joy (conveyed through visual elements, such as photos on the label) and confidence (conveyed as brand, also in connection with visuals), are in focus of the considerations provided in the following study.

Prerequisite that arises when the customer joy and confidence can grow up is of course good or best quality of the product being sold. If the quality is poor, the perfectly crafted label can make, only in the short term, if at all, the sales successful. The best label is nothing worth for successful purchasing if quality of product is bad. The price is important, but not crucial, if best quality is offered. A higher price can produce even better quality feeling and perception, as investigations by Plassmann (2008) have shown.

Trust grows out of positive experiences, it arises when it exceeds a critical threshold value to these. Below this positive experience amount, the customer is still uncertain. Above this value, he trusts in the future.

### **Study on color concept**

In the 21<sup>st</sup> century, sight is the most used sense in marketing and sense most stimulated by the environment. Arguably other senses could and should be better utilized by brands, in retailing or merchandising practice in food retailing or any other retail format. The choice of colors and forms in the design of a store interior are the most critical, along with the use of sounds, and smell in specific store sectors. According to Gains (2013), most of the senses comprise multiple feedback systems and are ultimately integrated in the brain, which checks for patterns that have been experienced before. Vision includes perception of motion, color and luminance, while touch includes pressure, temperature, pain, vibration and movement. Our ears help us keep a sense of balance as well as a sense of the rhythms of life.

A study of southwestern German television shows how much consumers trust a brand defined by colors, in the "Market check" show, which was broadcasted on 14.08.2014. Here, the

marketing expert Professor Markus Voeth from the Department of Marketing of the University of Hohenheim expressed: "I think that colors are a tool to transport brand and the Gardena brand (gardening company) is certainly stronger than the brand of great other competitors. And of course it enables Gardena, at the point of sale, to implement advantage (trust) it has built up over decades, by providing sometimes the same or sometimes maybe slightly worse products to the customer, but the customers have learned that Gardena stands for high quality and therefore still buy Gardena, because they have the confidence that these products are good". Further, the spokesman of Gardena, Heribert Weffels explains: "For a brand it is vital to be recognized. The color concept of Gardena, with turquoise and orange, was formative for the brand from the beginning and continues to this day. And what many do not know is that color also has a function. So in Gardena products are today moving parts, switches and buttons in orange, so that you can see immediately where the product function is" (SWR Fernsehen, 2014).

As known from studies, the emotional confidence is stimulated by cognitive stimuli, the limbic system communicates with the Codex. It is therefore useful to assign the label a color that is associated with a brand, or better, the colored trademark on all products marketed by that producer. Thus, color and brand in the brain of the customer with the emotion confidence is burned. It is important, even crucial, in choosing the colors that an emotional color is selected. A "warm" red (REWE) conveys emotionally pleasure, heat (security, trust) and stimulates the metabolic activities, so stimulates for purchase. At the same time, it is the second most popular color of the people, with equal proportions among men and women. Blue (ALDI) is the most popular color for people, it radiates contentment, harmony and tranquility, inspires trust and confidence. Yellow (EDEKA), as the color of the sun and sunflower, stands for light, floral fragrance, bloom, ripe fruit, creativity, fun, vitality and kindness, thus also for confidence. Examples given by the marks of ALDI, EDEKA, REWE and LIDL.

If a manufacturer succeeded to establish his product by means of a mark in connection with the emotion trust, then he can further strengthen the manufacturer-customer relationship with measures that offer the customer an added value when purchasing the product. These benefits may be in the form of joy or even happiness for the customer. Both feelings deepen confidence in the complex and diverse network system of the brain (Plasmann et al. 1999).

## **Unique retail store experience through scent and sound**

Stimulating the sense of smell to buy products is not a new concept for those in the food industry. Bakers and patisseries have been using these techniques for many years. They understand that smell amplifies taste and the use of these smells can attract an otherwise reluctant customer. Studies show the sense of smell is the most powerful stimulus known and often provokes a strong emotional response meaning customers are more likely to spend on impulse (Air-aroma, 2014).

Human olfactory bulbs are, in fact, part of limbic system, the deepest, most primitive part of our brain. They are separated by only two synapses from the amygdala, the seat of memory and emotion, and six synapses form the hippocampus, the brain organ responsible for storing memories. Every other sensory system must follow a long and winding path to the brain, full of transfers and hand-offs. But smells are mainlined directly into our centers for emotion and memory (Pradeep, 2010). For that reason, whether an aroma is pleasant or not depends on the memory with which each person associates it (Zurawicki, 2010).

Every retail leader understands the importance of good customer service and realizes that a large portion of this is achieved through the in-store experience. Store layout optimizes product presentation, the color and style of décor compliments brand and works in combination with

in-store lighting, audio and smell. For example, we know that the soft scent of lemon increases sales in seafood restaurants. The subtle smell of grass near the dairy aisle could take consumers back to a simpler, more carefree time, and subconsciously remind them of the fields the products come from. In high-end car or luggage stores, the rich fields deep scent of polished leather calls to mind luxury, relaxation and reward. In clothing stores, the invigorating scent of the sea or the romantic mix of roses and violets suffuses the experience and makes purchasing a product associated with these memories powerful. Raudenbush (2009) suggests that the peppermint scent can increase the athletic performance, and helps people work out longer and harder, including doing the office work. In the same spirit, peppermint and cinnamon scents make more alert, less frustrated drivers. This is reflected in the evident stimulation of the reticular activating system – the part of the brain stem responsible for arousal and sleep – as noticeable in the functional magnetic resonance scans even when the scent concentration falls below of conscious perception (Grayem, 2002)

Another experiment with brain scans showed that drinking sugar water (taste) may temporarily increase in volunteers the readiness to pay a certain price for food. In particular, the smell stimulates buying behavior positively. So in all branches of ALDI bread makers usually right at the entrance in the supermarkets is the baked goods department, as the smell of fresh bread makes you hungry and so encourages the purchase of food. Another example is to use the smell of coffee or bread to stimulate buying behavior. Kenning said that "Coca-Cola owns a good part of our head". Kenning is doing research about what happens in the brain when we repeatedly access the same brand in the supermarket. The manufacturer of the brown effervescent drink is already long time in front - he yet charged his brand with emotions (Kenning, 2003).

The importance of the auditory perception lies in the fact that it enables the basic function of the interpersonal communication, hearing sounds and interpreting the speech. In a similar manner as the visual system makes it possible to distinguish between colors, forms and depths, the auditory system identifies different qualities of the sounds within the complex signal it receives (such as tones, color and flexions of the voice, volume rhythm).

The sounds that accompany peak experience are critical to its enjoyment, and to its retention in memory. When casinos removed the tinkling of coins from one-armed bandits, they did a lot of damage to the fun of winning and being around winners in the coin machines (Pradeep, 2010).

Recently some interesting experiments on the concealment of the voice (Zaltman, 2003) demonstrated that even when the real words spoken were unclear, the tone of the voice continued to be discernible for the participants. The results suggest that our judgment of the words we listen to is based more on the tone of the voice than on what is actually being said (Zurawicki, 2010).

If it is still possible to link the brand with an emotional spell, then that is excellent, such as at EDEKA: "We love food". "Love" conveys confidence here. Love is an emotional link of trust (in the quality of the food) and joy (here enjoyment of the food for the buyer). This creates a further stimulus for a positive buying decision. As studies have shown, the buying behavior is also stimulated by vision through the emotional link with the senses of hearing, taste and smell. Thus by hearing, an experiment in the wine department of a shopping center showed that by 77 % more French wine was sold when French accordion music, and more German wine was sold when German brass music sounded over the speakers (Die-webseitenverbesserer, 2014).

## Conclusion

Favorable store atmosphere is a result of a synchronic effect of visual merchandising elements. Within the internal buying environment we differentiate five fundamental sense elements (vision, smell, taste, touch and hearing), which are completed by additional sales factors (personnel, presentation of products and layout plan of a store). The relevant and correct information stated on products as well as on the location of sales (POP – Point of Purchase, POS - Point of Sale) contribute to the overall final atmosphere which is a result of everything what the customer perceives and sees and it leaves a positive feeling in him, which motivates him to buy a product or service. In this context, the customer's emotions and motivations can be influenced by the information obtained about things being sold (origin, content, quality, expiry date). To create the pleasant and cultured store environment with an adequate information level requires deep research activities. Within researching the factors of visual merchandising and information (about products and purchase location) it is necessary to implement the traditional forms of research as well as the new tools which offer more precise and detailed information about consumer perception. One of the options is relatively new modern neuromarketing tool and its newest mutation the multisensoric neuromarketing. The core benefit of the brain imaging techniques in the research lies in a whole range of testing possibilities in the area of visual merchandising. It means that it offers an option to test the influence of not only five sense elements, but also the influence of various information stated on products and on the sales location. Its implementation in practical management is possible to achieve an attractive sales environment in which the customers feel better, more satisfied and spend a lot more time what is in the scope of every retailer.

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# Serious infectious diseases of humans and animals in Nicaragua

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## Abstract:

Nicaragua, the largest country in Central America with 6.1 mil inhabitants is surrounded by Honduras and Costa Rica. More than 40 per cent of the population currently lives in poverty and more than 43 per cent of the population lives in isolated, rural areas of the country. Despite the progress in many fields, the health risks still remain high. In this article we will try to analyse the main zoonoses in the country plus also describe main features of institutional setting of health policy.

Key words: zoonoses, epidemiology, ecology, reservoir animals, food safety

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## Introduction

Nicaragua is currently the poorest land based country in the western hemisphere, with the World Bank listing its GDP per capita in purchasing power parity for only 4.600 dollars. In 2009, when the last government data about poverty were released, 42.5 per cent of the population lived in poverty (World Bank 2014), mainly in rural areas. Despite the fact that the number is decreasing under the current socialist Sandinista government, it still remains very high. The levels of development affect the situation of health and healthcare in the country, posing a certain limit to government efforts in this area. The access to healthcare generally remains limited, mainly in distant and less populated areas. In this article, we will examine the basic health risks in the country, both for its inhabitants and animals. The main reason for doing so is that systematic analysis of the occurrence of important zoonoses both in animals and humans in Nicaragua is missing in available literature. The aim of this work is thus to provide this analysis with respect to the last decade.

## History matters – Historical affect the current situation

In a still recent history, Nicaragua went through a civil war during the period since 1979 to 1990 which claimed 30,000 human lives. The economic system was disrupted. The GDP in 1989 reached only 20% of its value in the time before the revolution (civil war) broke out in 1979. More than 30% of Nicaragua inhabitants able to work were unemployed and social support was minimal.

Understandably, this severe economic situation had a strong impact on health of inhabitants. Mainly human tuberculosis, as well as malaria, diarrheal diseases, measles, leishmaniasis and meningitis were not under the control (Garfield, 1989). A therapy of human tuberculosis was insufficient and unsystematic and led to occurrence of multiresistant strains of *Mycobacterium tuberculosis* (Brudney and Dobkin, 1991). Infectious diseases rapidly spread among emigrants from Nicaragua, as well; e.g. in refugee camp in Costa Rica (Diaz and Achi, 1989).

After democratic elections won by Violetta Chamorro in 1990 this situation began to be stabilized and strengthening of politics aimed at public health was an important goal of practically every government in the country. Gradually, an access of inhabitants to drinking water got better in cities, but mainly in rural areas. Quality of sanitation facilities improved and maternal mortality decreased (Table 1). As well, demographic situation got better, as seen in Table 2.

Table 1 Proportion of the population using drinking water and improved sanitation facilities and maternal mortality ratio per 100,000 live births

Year	Drinking water sources (%)			Improved sanitation facilities (%)			Maternal mortality per 100 000 live births	
	Rural	Total	Urban	Rural	Total	Urban	Value	Footnotes
1990	54	74	92	26	43	59	190	*, **
1995	58	77	94	29	46	60	170	*, **
2000	62	80	95	32	48	61	140	*, **
2005	66	83	97	35	50	62	110	*, **
2008	68	85	98	37	52	63	100	*, **

Source: United Nations Statistics Division

\*Countries lacking complete registration but where registration and/or other types of data available

\*\*Trends in Maternal Mortality: 1990-2008. WHO/UNICEF/UNFPA/WB

Table 2 Demographic situation in Nicaragua

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total population (1000)	5 318	5 386	5 455	5 525	5 596	5 668	5 743	5 822	5 905	5 992
Population proportion under 15 (%)	39.05	38.42	37.78	37.11	36.44	35.77	35.13	34.51	33.92	33.37
Population proportion over 60 (%)	5.76	5.86	5.94	6.00	6.04	6.07	6.14	6.24	6.4	6.59
Life expectancy at birth, total (years)	71	71	72	72	73	73	73	74	74	74

Source: <http://apps.who.int/gho/data/node.country.country-MNG?lang=en>

As example could be shown the dengue fever transmitted by mosquitoes and belonging among severe human diseases. In the period since 2004 to 2010, it was diagnosed in 5,545 children aged 2-14 years in Managua, capital of Nicaragua (Gordon et al., 2013). An occurrence of dengue fever is associated with communal hygiene, because the disease vectors (mosquitoes) can easily reproduce in bad hygiene conditions (Grange et al., 2014). Rapid and accurate diagnostic procedures including effective treatment are important in travellers, who can be infected (Wiwanitkit, 2014). Preventive measures including improvement of communal hygiene are crucial.

## Organization of Public Health in Nicaragua

Health services in Nicaragua are mainly provided by the state and financed by general taxes. The primary health provider in the country is the Ministry of Health (MINSAs), officially covering about 70% of the population. The Nicaraguan Social Security Institute (INSS), which covers formal sector workers, finances health care for about 10% of the population. Only a small percentage of the population receives private health care services (PATH 2011: 11).

Apart from its role of a healthcare provider, MINSAs has a planning role in the Nicaraguan healthcare system. Its main aim is to implement reforms and changes that are being made in the Nicaraguan system of healthcare. According to most of the sources MINSAs lags behind this stewardship role and the Nicaraguan healthcare system generally suffers by ineffective use of resources, segmentation and still unequal access to healthcare (Mathauer et al. 2010: 5). Nicaraguan healthcare system have undergone series of reforms since 1990s and most recently, the Sandinista government have strengthened the role of MINSAs with ultimate goal of universal coverage of healthcare in Nicaragua. Despite the efforts, there still continue to be relatively large groups of persons without access to medical services (Muiser 2011: 234). This problem seems to be from a large part spatial with the more remote and less populated areas having significantly less coverage than the urban ones or most densely populated ones.

## Material and methods

**A source of statistic data.** Data on the occurrence of zoonoses in human and animals beings were obtained from published OIE (Office International des Epizooties, French name used universally since its foundation in 1924; its name change to English in 2003: The World Organisation for Animal Health) reports from the last decade (OIE, 2004, 2005, 2007, 2008a,b, 2009-2013, 2014).

## Results

According to the OIE databases, information was available on 15 important zoonoses which were diagnosed in Nicaragua inhabitants during the period since 2005 to 2012. Bovine tuberculosis, leishmaniasis, leptospirosis and toxoplasmosis are to be considered as the most important. Only few deaths due to listeriosis and leptospirosis were noted in 2008 (Table 3).

Table 3 Human cases of zoonoses according to OIE data during the years 2005-2012

Disease	2005	2006	2007	2008	2009	2010	2011	2012	Total
Anthrax	NA	+ (NA)	+.. (NA)	NA	NA	NA	+.. (NA)	NA	+.. (NA)
Botulism	NA	NA	+.. (NA)	NA	NA	NA	NA	NA	+.. (NA)
Bovine cysticercosis	NA	NA	20 (NA)	NA	NA	NA	+.. (NA)	NA	20 (NA)
Bovine tuberculosis	1,931 (0)	3,156 (0)	3,831 (NA)	3,733 (0)	3,114 (0)	3,338 (0)	2,273 (0)	1,668 (NA)	23,044 (0)
Brucellosis	7 (0)	NA	2 (NA)	1 (0)	2 (0)	1 (0)	+.. (NA)	NA	13 (0)
Campylobacteriosis	NA	NA	+.. (NA)	NA	NA	NA	+.. (NA)	NA	+.. (NA)
Echinococcosis*	NA	NA	+.. (NA)	NA	NA	NA	NA	NA	+.. (NA)
<i>Escherichia coli</i> O 157	NA	NA	NA	+.. (NA)	NA	NA	NA	NA	+.. (NA)
Leishmaniasis	NA	NA	5,342 (NA)	NA	5,838 (0)	5,235 (0)	3,188 (0)	36,485 (NA)	56,088 (0)
Leptospirosis	48 (0)	74 (1)	361 (11)	305 (0)	391 (0)	698 (20)	98 (2)	98 (2)	2,073 (0)
Listeriosis	NA	NA	+.. (NA)	1 (1)	2 (0)	1 (0)	+.. (NA)	NA	4 (1)
Porcine cysticercosis	11 (0)	+ (NA)	3 (NA)	4 (0)	6 (0)	7 (0)	11 (0)	7 (0)	49 (0)
Salmonellosis	NA	NA	+.. (NA)	21 (0)	38 (0)	26 (0)	15 (0)	7 (NA)	107 (0)
Swine erysipelas	NA	NA	+.. (NA)	NA	NA	NA	NA	NA	+.. (NA)
Toxoplasmosis	359 (0)	NA	+.. (NA)	NA	NA	NA	+.. (NA)	NA	359 (0)

Source: OIE reports (OIE, 2004, 2005, 2007, 2008a,b, 2009-2014)

NA = not available

\*hydatidosis

+zoonosis was present, but exact data were not available

(0) No. of deaths

Table 4 Cases of notifiable animal diseases in Nicaragua during the years 2005-2014

Year	Anthrax	Bovine Cysticercosis	Bovine tuberculosis	Brucellosis ( <i>Brucella bovis</i> )	BSE	Rabies
2005	2	6	3	NA	0	1
2006	4	0	2	34	0	4
2007	5	0	2	22	0	1
2008	0	0	1	20	0	0
2009	0	0	18	41	0	1
2010	0	0	4	10	0	0
2011	0	0	5	26	0	0
2012	1	0	13	22	0	3
2013	0	0	14	31	0	1
2014	0	0	4	7	0	0
Total	12	6	66	213	0	11

Source: OIE reports (OIE, 2004, 2005, 2007, 2008a,b, 2009-2014)

NA: not available

BSE Bovine spongiform encephalitis

Information was only available for six infectious diseases with zoonotic potential in animals: anthrax, bovine cysticercosis and tuberculosis, brucellosis caused by *Brucella bovis*, BSE (bovine spongiform encephalitis) and rabies in dogs. All these diseases except of BSE were diagnosed in animals in Nicaragua during the period since 2005 to 2014 (Table 4).

## Discussion

**Anthrax.** The disease causative agent of anthrax (*Bacillus anthracis*) is transmitted through a dead animal's body, contaminated soil or water. Spores of the causative agent are highly resistant to influences of external environment. Anthrax was registered in animals in Nicaragua in the period of 2005 to 2007 and in 2012 (Table 4). Human infections can be prevented by disposal of infected animal bodies in sanitation facilities (waste processing plants or rendering plants). These facilities are only two in Nicaragua, which is insufficient (Anon., 2001).

**Botulism.** The disease is caused by toxins produced by bacteria *Clostridium botulinum*. Reservoirs are especially soil, bone meal, fish meal, and contaminated fish products and waters (Ward et al., 1967). Human botulism was diagnosed in 2007 (Table 3) without details about the cases (patients, course of the disease, sources of intoxication etc.). But the risk exists in this country as in other Central American countries (Ward et al., 1967).

**Bovine and porcine cysticercosis.** Bovine and porcine cysticercosis was diagnosed in 20 patients in 2007 and in 49 patients during the whole period, respectively (Table 3). Bovine cysticercosis was documented in cattle in 2005 (Table 4). Bovine and porcine cysticercosis is

caused by beef tapeworm (*Taenia saginata*, 1782) also called unarmed tapeworm; and pork tapeworm (*Taenia solium*, 1758) also known as armed tapeworm; respectively. In the small intestine of a human, the adults attach to the intestinal mucosa and they can grow up to 3–10 m. The source of infection for human beings is not properly cooked (uncooked or undercooked) beef or pork meat; especially tongue or chewing muscles of the head or other muscles. The humans' exposition is rather high based on serological tests (Bucardo et al., 2005). Especially tourists could be infected consuming highly risky street food prepared from beef and pork meat (Doherty and Wright, 2010; Salazar-Anton and Lindh, 2011).

**Bovine tuberculosis.** The disease was diagnosed in both humans and cattle (Tables 3 and 4). The risks for spread of the causal agent are represented by purchase or smuggle of infected animals. The most common way of humans' exposition is represented by airborne or foodborne infection (de Kantor and Ritacco, 2006).

**Brucellosis.** The disease caused by *Brucella bovis* was diagnosed in humans and cattle during the whole period between the years 2005 and 2012 (Tables 3 and 4). Clinical disease is manifested by fluctuating fever, affection of liver, joints and other organs, and can cause abortions in pregnant mothers. The causal agent is spread through raw milk and products produced from raw milk, which is common in Nicaragua (Pavlik and Hrabalek, unpublished observations).

**Campylobacteriosis.** Food borne bacterial infection was documented in Nicaragua in the years 2007 and 2011 (Table 3). USA travellers visiting Latin American countries including Caribbean region are very often infected with Campylobacteriosis and clinically ill after their return (Kendall et al., 2012).

**Echinococcosis.** This serious and often fatal disease in patients with affected brain tissue is most often caused by fox tapeworm (*Echinococcus multilocularis*). In Nicaragua, *Echinococcus vogeli* and *Echinococcus oligarthrus* were diagnosed as well (D'Alessandro, 1997). In the OIE reports Echinococcosis was diagnosed in humans in 2007 (Table 3) but more cases could be expected due to the poor food hygiene in the villages (Pavlik and Hrabalek, unpublished observations).

**Escherichia coli O 157.** Bacteria of this serotype causes deadly infections in patients consuming not properly done minced beef meat, i.e. hamburgers and other street food offered not only in the cities and towns, but also in the small villages. This situation was observed in different parts of Nicaragua (Pavlik and Hrabalek, unpublished observations). The diagnosis of this disease in humans in 2007 (Table 3) documents this risks for Nicaragua citizens and for the visitors.

**Leishmaniasis.** The causative agents (*Leishmania tropica*, *L. major*, *L. braziliensis*, *L. donovani* and *L. infantii*) are transmitted by blood sucking flies known as sand-flies (*Phlebotomus*) described also in Nicaragua (Raymond et al., 2010). Reservoir animals are dogs, horses and pigs in a so called "rural" cycle; and birds, ground mammals and monkeys in a so called "sylvatic" cycle. The third urban cycle is formed only by humans and mosquitoes which transmit the protozoa between the infected and healthy individuals. In Nicaragua the disease represented big problem during the last years as it was documented by OIE reports and other published data (Table 3; Duarte et al., 1994; Palacios et al., 2000).

**Leptospirosis.** In developing countries including Nicaragua (Table 3), surface water is above all the source of viral infections and bacterial leptospirosis. Infection is frequently diagnosed in humans drinking from surface waters contaminated by urine and droppings of infected reservoir and small ground mammals. The limited access to drinking water especially in rural areas represents high risk for humans' infection (Mahy and Brown, 2000). During the last two

decades more epidemics were diagnosed in Nicaragua (Schneider et al., 2013). The risk of tourists' infections is currently rather high due to contaminated surface water during the rain-season (Bacallao et al., 2014).

**Listeriosis.** The bacterial causal agent *Listeria monocytogenes* is a typical example of sapronosis (soil represents the main source of infection). Contaminated food is the main source of infection for animals (especially dogs) and humans. In Latin America this disease causes fatal meningitis, similarly as in other countries (Blum-Menezes et al., 2013). In Nicaragua listeriosis was documented during the whole period except the years 2005, 2006 and 2012 (Table 3). The risk of infection represents milk products from raw milk (especially soft cheeses).

**Salmonellosis.** Alimentary infections caused by different serovars of *Salmonella enterica* are known in Nicaragua for a long time (Scardino, 1971). During the last years the infection was often documented (Table 3). The disease causative agent is widely spread through the animal population including contaminated environment (especially surface water contaminated by animals' and humans' excrements). The drinking from the river water was more times observed in Nicaragua (Pavlik and Hrabalek, unpublished observations).

**Swine erysipelas.** The disease is caused by zoonotic bacterium *Erysipelothrix rhusiopathiae*, which is often found in most if not all pig farms (pigs and pork meat is the original source of this infection). In Nicaragua, the human infection was documented in 2007 (Table 3). In other Latin American countries the infection was described in a lot of patients with dermatitis and endocarditis (Rocha et al., 1989). Due to the simple conditions of pig breeding in rural areas and narrow contact with humans (Pavlik and Hrabalek, unpublished observations) the disease incidence could be underdiagnosed.

**Toxoplasmosis.** The disease caused by *Toxoplasma gondii* is endemic in the country. The reservoir animal – cat, is the most common domestic and/or pet animal in rural areas. The extremely close contact of children with faecal contaminated environment in villages is visible at first sight (Pavlik and Hrabalek, unpublished observations). From this point of view, the number of documented cases (only 359 patients) during the analysed period is surprisingly low (Table 3). The improvement of living conditions for children is crucial to reduce the incidence of toxoplasmosis.

## Conclusions

Based on information describing the presence of different serious zoonoses the consumption of raw milk and milk products, meat and meat products could be risky. The contaminated surface water could be a source of infection not only in rural areas, but also in cities. For further steps forward it is crucial that the resources for the area of healthcare are larger and at the same time more effectively used. Also, further institutional changes will have to be made that will lead to organizationally more developed system of managing public healthcare. This would be a task both for the government and MINSAs, with the ultimate goal of universal coverage of healthcare for all the Nicaraguan citizens.

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# European Union and Latin America: A European Perspective

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## Abstract

The article deals with the topic of current relations between Latin American states and the European Union. It focuses mainly on the theme of possible mutual cooperation between these two regions, be it any form of economic integration through large mutual FTA or cooperation inside of international institutions. The author also tries to identify the main brakes for successful development of mutual relations and tries to assume if previous experience from European integration may serve as a guidance for integration within the Latin/South American region.

## Keywords:

European Union, Mercosur, Unasur, cooperation, external relations

## Introduction

Latin America and Europe should constitute what we might call “natural partners” (Maihold 2007: 1) or “most natural allies on the planet” (Roy 2012:6) in the international system. They share many common historical, political, economic and cultural ties and for long Europe has been perceived as a counter-balance to U.S. influence in the region. Yet despite these ties the actual cooperation between these two regions somehow have somehow lacked behind the expectations in the past.

In last few years, both regions have undergone very different path as regards the development of their economies, with Latin American countries having not been hit very hard by the crisis and growing fast afterward and large part of the EU states falling into a long-lasting crisis from which they have not recovered so far. Between the years 2010-2012 Latin American region grew by more than 4 per cent annually in average (Montoya 2013: 4), while European states still struggled overcoming the crisis with negative or zero growth. This fact also has affected mutual relations, as the EU tended to rather solve its internal economic problems than to play an important role abroad.

In this article the authors will try to analyze current relations between the European Union and Latin American States. The authors will focus both at the political and economical levels and will try to identify main backlashes of mutual relations. Apart from the only bi-regional approach, the authors will also try to take a look at how the EU is currently perceived vis-a-vis other important actors in Latin America, be it ever present United States or dynamic China that have entered the region only recently and but now plays an increasingly more important role.

Last part of the article is dedicated to regional integration. The main reason for doing so is the fact that Europe has always played a role of a “model example” for Latin American states in this area. Yet current problems of integration in Europe and so far unsuccessful attempts to

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establish really functioning platform in Latin America seem to undermine the attractiveness of European way of integration within the Latin American region.

### **Development of mutual relations between Latin America and European Union**

Up until the accession of Spain and Portugal to the European integration project in mid-80s the significance of Latin America in external relations of the European Community was rather low compared with other regions. The entrance of former colonial powers into the club meant significant strengthening of mutual relations and at the end of 90s bi-regional platform of EU-LAC summit was created, with the first summit being held in Rio de Janeiro, Brazil, in 1999. The first summit brought a lot of enthusiasm about the possible cooperation of the two regions.

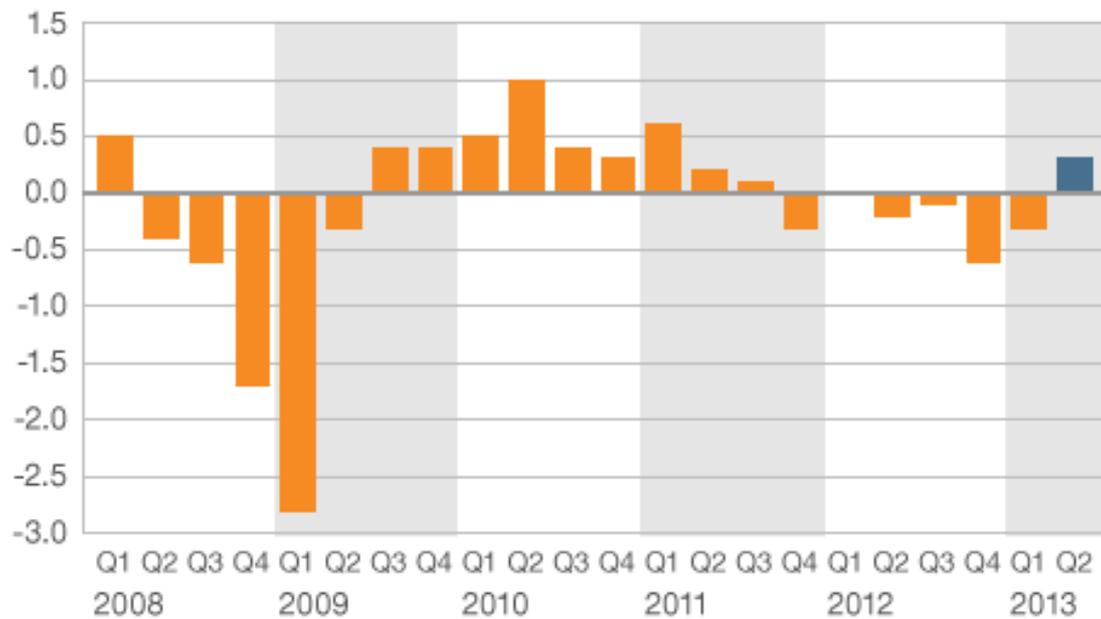
These summits have been held biannually since and most recently, in 2013, they have been transformed into meetings of two large regional integration projects – the European Union covering currently 28 states with more than 500 million inhabitants on one side and the Community of Latin American and Caribbean States (CELAC) representing 33 states and 600 million people on the other. The first EU-CELAC meeting was held in Santiago de Chile in January 2013, although it should have taken place in 2012 and the summit was postponed due to more important meetings in European agenda – meeting of G20 that currently governs the economic problems of the world and Rio+20 Conference on Sustainable Development, a topic very important to European states. This postponement shows signs of relative unimportance given to Latin America from the side of the EU, but there is currently not much enthusiasm on the Latin American side either, so the mood at the summit could most precisely be described as “indifferent” (Sberro 2013: 2). This “asymmetric importance” (Elspach – Tulchin 2001) has always been part of the mutual relations with Europe being much more important partner to Latin America than vice versa.

Currently there seem to be lack of common topics between the regions and on topics that are common, the two regions would usually disagree. Typical example would be migration where the EU would prioritize fight against illegal migration, while the Latin American states would prefer opening new channels of legal migration. Topic where we would find most agreement, would be drugs or sustainable development.

### **Economic Relations: European Decline?**

Europe as a region has been hit most severely by the financial crisis and still struggles to overcome it. Although the Eurozone came out of the crisis in late 2009, the economy went into decline in late 2011 and up until late 2013 this decline continued. This evolution means that for the last few years, Europe was the slowest growing region in the world. At the same time, the prospects of European growth are rather shallow, with the countries at the South encountering deep structural problems that will take quite some time to solve.

### 1. Economic growth in Eurozone by quarters since the start of crisis (2008-2013)



Source: Eurostat

On contrary, for Latin America the previous decade was economically one of the most successful in its history, with significant economic growth in practically all the countries in the region.

Based on this economic performance, we could witness growing self-confidence of Latin American countries. Luis Alberto Moreno, the president of Inter-American Development Bank, for example spoke about “Latin American decade” with Latin America being one of the fastest growing regions in the world in the decade between 2010-2020 (Moreno 2011).

Although the latest data and progress of Latin American growth show significant signs of slowdown and Latin America will probably grow much slower than expected, as Table 1 shows, many Latin American countries made huge steps in their economic development in last few years.

**Table 1. Economic growth in Latin America and its Prospects According to IMF as for September 2013**

(real GDP growth, annual percent change)				
	2012	2013	Projections	
			2014	2015
<b>North America</b>				
Canada	1.7	2.0	2.3	2.4
Mexico	4.0	1.1	2.4	3.5
United States	2.3	2.2	2.2	3.1
<b>South America</b>				
Argentina	0.9	2.9	-1.7	-1.5
Bolivia	5.2	6.8	5.2	5.0
Brazil	1.0	2.5	0.3	1.4
Chile	5.5	4.2	2.0	3.3
Colombia	4.0	4.7	4.8	4.5
Ecuador	5.1	4.5	4.0	4.0
Guyana	4.8	5.2	3.3	3.8
Paraguay	-1.2	13.6	4.0	4.5
Peru	6.0	5.8	3.6	5.1
Suriname	4.8	4.1	3.3	3.8
Uruguay	3.7	4.4	2.8	2.8
Venezuela	5.6	1.3	-3.0	-1.0
<b>Central America</b>				
Belize	4.0	0.7	2.0	2.5
Costa Rica	5.1	3.5	3.6	3.6
El Salvador	1.9	1.7	1.7	1.8
Guatemala	3.0	3.7	3.4	3.7
Honduras	3.9	2.6	3.0	3.1
Nicaragua	5.0	4.6	4.0	4.0
Panama	10.8	8.4	6.6	6.4
<b>The Caribbean</b>				
Antigua and Barbuda	3.6	1.8	1.9	1.7
The Bahamas	1.0	0.7	1.2	2.1
Barbados	0.0	-0.3	-0.6	0.5
Dominica	-1.1	0.8	1.4	1.2
Dominican Republic	2.7	4.6	5.3	4.2
Grenada	-1.8	1.5	1.1	1.2
Haiti	2.9	4.3	3.8	3.7
Jamaica	-0.5	0.2	1.1	1.8
St. Kitts and Nevis	-0.9	3.8	3.5	3.2
St. Lucia	-1.3	-2.3	-1.1	1.4
St. Vincent and the Grenadines	1.5	2.3	1.7	2.6
Trinidad and Tobago	1.2	1.6	2.3	2.1
<b>Latin America and the Caribbean</b>	<b>2.9</b>	<b>2.7</b>	<b>1.3</b>	<b>2.2</b>

Source: IMF

The important question is how the European economic problems have affected mutual economic relations and financial flows between the regions. More particularly, what impact the problems had in three main areas of economic cooperation – trade, investment and foreign aid.

As for trade, in 1995, the EU accounted for 25 per cent of Latin American commercial flows, being region's second largest trading partners after the United States (Gratius 2013: 96). In 2013, this number was only 14 per cent already, partly caused by dynamic entrance of other players, with China being the most active (Barcena et al. 2012: 29) and partly by European stagnation and declining demand. This declining trend is most likely to continue in the years to come.

In the area of foreign direct investment, there was a significant decline of European FDIs in the region between the years 2008 and 2009. The EU as a bloc still remains the largest investor in the region, but the largest European investor, Spain, has rather withdrawn from Latin America, due its own economic problems. It is unlikely that Spain will return to a high level of investment in Latin America and the rise of investment from other European countries, such as United Kingdom or Netherlands, was rather modest.

When we concentrate on foreign aid, the European Union is still the most important player in Latin America in this area, although from the overall aid Latin America presents a tiny fraction due the fact that some of the states in the region are already well developed. The economic problems in Europe caused several states to make significant cuts in their foreign aid budgets. One of these states is again Spain, traditionally the largest donor in Latin America (Roy 2012: 8-9). Further deepening of economic problems might lead to more austerity measures and more cuts for foreign aid budgets.

### **The rise of China**

China has entered the Latin American region only recently, but with strong vigour. Its political and even more economic presence can be currently felt in practically every Latin American country. In some of the countries, China is currently the most important trade partner or largest investor. This would be the case of Brazil that in 2013 sent 40% of its export to China and at the same time Chinese imports represented largest part of Brazilian imports.

What kind of a partner is China in Latin America? China is heavily interested in Latin America's vast riches in resources (Hilton 2013: 2) that its need as a fuel for its own rapid economic development. The economic relation can be understood as uneven. While China imports a lot of resources from Latin America, it exports vast amounts of manufactured goods. And although the free trade areas that China has signed with some of the countries in the region, such as Chile and Peru, are classified as South-South treaties, they do not differ much in nature from classic North-South treaties of uneven partners (Klinger 2013: 45).

China is not only ever stronger trading partner in the region, but its investments into Latin America are also rising. Since 2010 China has invested in the region more than 10 billion dollars annually and Latin America currently represents 13 per cent of outward Chinese investment, making it second most important region after Asia (Chen – Pérez 2013: 5-6). Chinese investments in the region are likely to grow in the years to come.

All in all, both from the economic and political point of view China presents another "option". Latin American states have been long dependent on the United States or Europe for their foreign partners. It is quite probable that for the years to come, the "Atlantic" dimension of Latin American foreign policy will tend to diminish, while the newly emerged "Pacific" one will tend to grow stronger.

### **Integration Processes in Latin America and their Impact on Mutual Relations**

Latin America presents the most ambitious region in the world after Europe as regards regional integration and the EU was often presented as a "model example" that should be followed. Although the integration processes in the region has long tradition, but have always struggled somehow to be successful. This is also the case of the two most important processes in the region – UNASUR covering all South American countries and MERCOSUR as the most advanced integration project in the region. And most probably it will be true for CELAC, the all-

embracing project covering all states in a heterogeneous region of Latin America and Caribbean.

José Sanahuja (2012) identifies number of factors that are responsible for slow progress of regional integration in Latin American territory. The most important would be strong nationalism inside most of Latin American countries and the traditional view of the national sovereignty. This forms a base for rather intergovernmental form of cooperation with limited competences of the institutions in the integration. Put together with the reluctance of some states to accept Brazil's leading role in the process, the prospects for a fast movement forward have to be modest.

The European Union (and prior to its existence the European Communities) has always served as a model example for Latin American countries. The current economic and political problems with evident lack of vision how to get out of the crisis might cast different light on the European project. But even admitting it is has never been perfect, the European experience is a guidance for Latin America in one aspect. In its more than 50-year history European integration have managed to move forward over the obstacles that emerged on the way (Guedes 2013: 66-67). From our point of view it thus does not matter if the Latin American states try to follow "European way" of integration. The message from Europe is that the obstacles, however they might seem unsurmountable, may be overcome.

## **Conclusions**

The relations between European Union and Latin America are currently undergoing most profound changes in last few decades. The decline of European presence can be perceived both in relative and absolute terms and we would not hesitate to predict further decline in future.

In absolute terms the decline is caused by the crisis in Europe. Europe has been hit strongest from the world regions by the 2008 economic crisis and still struggles to get out of it. Economic problems at home severely limit the possibility of European action abroad. From the economic point of view, European Union's role as both investor and trading partner in Latin American region is still less relevant, although its role as a trader is steadily decreasing.

In relative terms, the position that the European states once enjoyed in Latin America is vanishing due to the entry of other players. This would most notably be the case of China that has entered the Latin American region very dynamically. Europe, once "the automatic first pick" of most of the countries in the region is currently only one of the players and is losing its position to more active players.

European Union is also currently less seen as an example for regional integration in Latin America. One of the reasons lies in European integration itself, as the EU currently struggles for popular support and at the same time the European project at the moment lacks a clear leadership. The second reason would lie in the nature of Latin American integration that has so far been unsuccessful. Different worldviews, differing regimes and high level of nationalism seem to undermine regional integration in Latin America and the level of cooperation achieved in Europe seems so far very distant in the region.

From the European point of view the situation is unlikely to get much better in the years to come, as it is very dependent on the ability to deal with its internal crisis. So far, this ability was quite low and it is hard to predict which direction the EU will move. It is quite probable that the Southern countries, including Spain, once the largest European investor in Latin America, will continue to have economic problems. For the relation between the EU and Latin America this means that further decline of European presence is possible.

## Acknowledgement

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# Selected characteristics of personal capital as a determinant of human capital

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## Abstract

The personal capital is one of the components of human capital. Willingness to mobility is an essential characteristic of the personal capital, both geographic mobility, ie. the willingness to commute to work, to move, so vocational, ie. willingness to retrain, change profession. The research was conducted as a questionnaire survey, which was attended by 750 respondents. The aim of the analysis was to determine the willingness of respondents to the geographical and vocational mobility in selected regions of the Czech Republic in the context of potential human resources. It showed that passivity is more prevalent in the context of vocational and geographic mobility, in the willingness to change a job is the situation better. Respondents are not willing to move for work and employment.

## Keywords:

Human capital, personal capital, geographic mobility, professional mobility

## Introduction

Human capital is crucial for the creation and transfer of education and knowledge or is highlighted as the factor that determines the innovation potential and development of the society. The human capital model is derived from the standard economic logic of optimization and is supported by a large body of empirical evidence. It is not surprising; therefore, that the model is dominant in economic analysis of education throughout the world, and that it is taken as a background assumption in many other areas of economics, such as the theory of economic growth (Quigging, 1999).

The personal capital is one of the components of human capital. Willingness to mobility is an essential characteristic of the personal capital, both geographic mobility, ie. the willingness to commute to work, to move, so vocational, ie. willingness to retrain, change profession. In the Czech Republic after 1989 the social and political transformation was accompanied with the change in the demographic behaviour of population. New regional imbalances have arisen as a result of the transition from a planned economy to a market economy. These are then reverberated in the disparities of quality of human resources (Pomazalová, Drahořová, 2012). Human resources can be defined as the knowledge and skills possessed by an individual. It probably belongs to the most important developing factors in the emerging post-industrial period.

Working mobility represents one of the components of the developing theory. The high degree of working mobility is required, because the labor market adapt better to change. The population structure affects reproduction of the population - population change by changing generations and spatial movement - spatial mobility (Koubek, Koschin, Soucek, 1990).

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Personal capital is represented, for example, customs and habits of the individual. The essential feature is the willingness to mobility. Mobility divided into:

- professional - the willingness to retrain, change profession,
- working - geographical - the willingness to commute to work, move house.

Mobile people allow efficient use of human resources and promote labor market flexibility. In the model, human capital is the preferred maximum willingness to geographical and professional mobility. Total change in population caused by migration reflects the attractiveness of the location.

## Theoretical bases

Human capital is becoming part of the strategy management and development companies and enterprises and their adaptation to market changes and evaluation of the business environment (Atkinson, Meager, 1986, Marvel, 2013). Human resources are also an important element in labor market indicators (Daly, 2004) and flexibility of employees. Human capital components are knowledge, experience and individual capital. According to OECD (2010), several studies have attempted to identify the intergenerational effects of education. The findings suggest that the more educated parents are, the greater the likelihood that their children will become healthy adults. Other researches have studied the parental education-child health. Winters (2011) suggested that the local level of human capital and higher education institutions create valuable consumption amenities that increase an area's quality of life. The human capital level and the presence of higher education institutions have a shared effect and also separate effects on quality of life. Lanzi (2007) highlighted directly increase human qualities and skills for economic production (and reproduction) and market exchange. It indirectly enlarges individual opportunity sets by giving people new possibilities to enrich their lives.

Working mobility of labor can be divided in two different ways. The first is called professional mobility. This type of mobility implies a set of factors such as flexibility legislation, the existence of retraining programs or distribution of functional knowledge in the population. On the contrary, there is relatively a lot of problems that make it difficult for professional mobility. It is very difficult to change from unskilled work to skilled work or skilled work from one to another (e.g. teacher can not want to become a nuclear engineer). It is not also possible to perform some unskilled work later in life given to their high physical demands (eg. secretary probably will not work in storage in 60 years). Other barriers can include the development of modern economies and the growth of professionalism of the work. A typical example is the development of medical fields. Today it is hard to imagine that the dentist became a surgeon, although it is still a doctor.

In terms of interdisciplinary mobility, the Czech Republic has relatively good position compared with the European Union. Only the United Kingdom, Ireland, Denmark and Hungary are before the Czech Republic according to the EPI index. Employment Protection Index was published by the OECD (2013) and includes many relevant components, which assesses the flexibility of the labour market is.

The second basic type of the population mobility is working mobility (geographical). In this case the situation of the Czech Republic is significantly worse in comparison with the European Union. And it has its reasons. These include social reasons (culturally conditioned). It is, for example, the problem of "separation" from family and from friends (loss of social affiliation) or unwillingness to work outside the place of residence or place of birth. Next up are your objective reasons - the absence of quality infrastructure, high cost of land, population density, location of manufacture (e.g. small number of technology centres) and so on. Space for migration is significantly limited in the Czech Republic, thereby also greatly limited geographical mobility. In this respect, the Czech Republic is not very good in compared with the European Union, let alone the USA (in the USA are fulfilled almost all conditions for high working - geographical mobility together).

In the Czech Republic many people prefer to work in the vicinity of his residence and not they don't think about traveling for work outside of their region. At the present time it can be seen a greater willingness to travel for work of younger people. Generations of young people are ambitious and flexible. Trip takes approximately one hour to almost two-thirds of Czechs, who are daily commuting to work, (tab. 1). The time spent on the way to work relatively increased in the last decade.

**Tab. 1 Time spent on the way to work**

year	travel time	under 30 minutes	under 60 minut	more than 60 minutes
2001		53 %	38 %	9 %
2011		36 %	33%	31 %

*Czech statistical office (2014)*

### **Aims and methods of research**

The main object of the analysis is to specify the personal capital in the Czech Republic. The main object is implemented by using two sub-objectives:

- briefly describe the evolution of internal migration in geopolitical and economic contexts,
  - determine the willingness of the population to geographical and occupational mobility through empirical research – questionnaire survey.

The research was conducted in selected regions of the Czech Republic as a questionnaire, which was attended by 750 respondents.

### **The research results - migration and personal capital in the Czech Republic**

#### **The period to 1989**

The development of migration in the Czech Republic was affected by specific political and economic situation after the Second World War. In view of geographical organization of migration processes post war development was in the long term affected by the expulsion of German nationality and subsequent colonization of the borderlands (Kühnl, Pavlik, 1981). The tendency of socialist central planning is another important factor, which resulted to a decline in migration mobility. An important role was played by the so-called health settlement system. This concept has become since the 70s of last century, an important planned development of selected small and medium towns. Now small and medium-sized cities showed the highest intensity of migration growth in the period 1960-1989 (Cermak, 2001). Only some larger cities with important economic functions was preferred (especially in the coal basins).

#### **The period after 1989**

The decline migration continued in the early stages of transformation after 1989. Due to the improvement in the housing market, has been the mobility increase, since the end of 90s of the 20th century. This period is associated with the great development of suburbanization processes. After 2000 the suburbanization processes are the decisive factor which influences the migration relations in the Czech Republic. The highest annual net migration is in districts of the capital city of Prague and other big cities. They are territorial units, located in the hinterland of the largest urban centres. The most important area with high migration profits are created around the capital city of Prague. An attractive area to migration formed also in the area around the second largest city - Brno agglomeration. There is polarity between migration loss-making core agglomerations and their profit hinterland at micro- regional level.

This process is gradually spreading to smaller metropolitan areas in the Czech Republic and has all aspects of residential suburbanization.

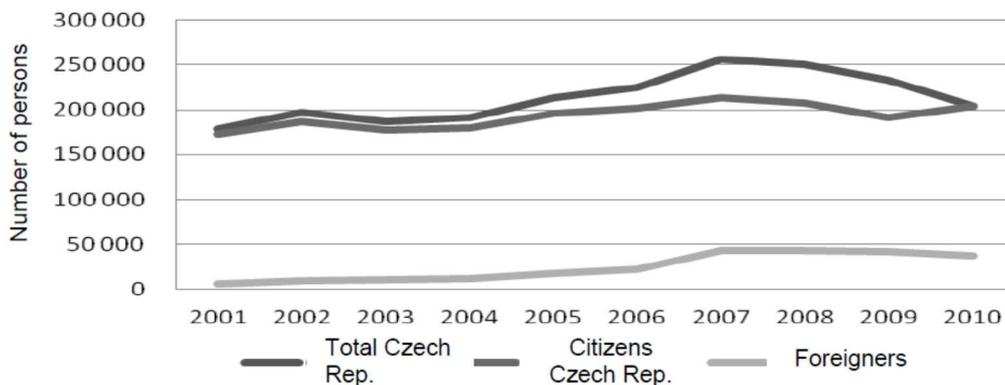
By contrast cities with more than 10 thousand inhabitants and rural villages in peripheral regions migration loss are. This is especially the frontier area. Another region is called internal peripherals. These regions are characterized by insufficient level of technical and social infrastructure and poor economic potential with inadequate offer of jobs.

It is interesting to compare the migration of profitable and unprofitable regions and educational levels of migrant populations. Generally, the higher migration activity (even at a distance) exhibit university educated people in younger age to 35 years. Migration of population with higher education causes an increase in the social and spatial differentiation in the Czech Republic, it form regions with the higher social status and the weakening regions of the lower social status.

The migration development in the Czech Republic has a clear trend.

- There was a significant decline in internal migration mobility (especially in 1990-1996).
- Changes to the migration balance of municipalities by size (the traditional model of concentration currents from smaller communities to larger deconcentration is altered migration processes).
- The most important factors of migration and mobility are mainly economic conditions (the main migration flow from the core to the rear is profiled as the migration of married couples aged 30 to 45 years with higher levels of education and low number of children).

As you can see in pic. 1, top migration was recorded in 2007 in the Czech Republic, while the lowest values are at the beginning of the period under review, i.e. the 2001 foreigners do not play important role in the context of internal migration.

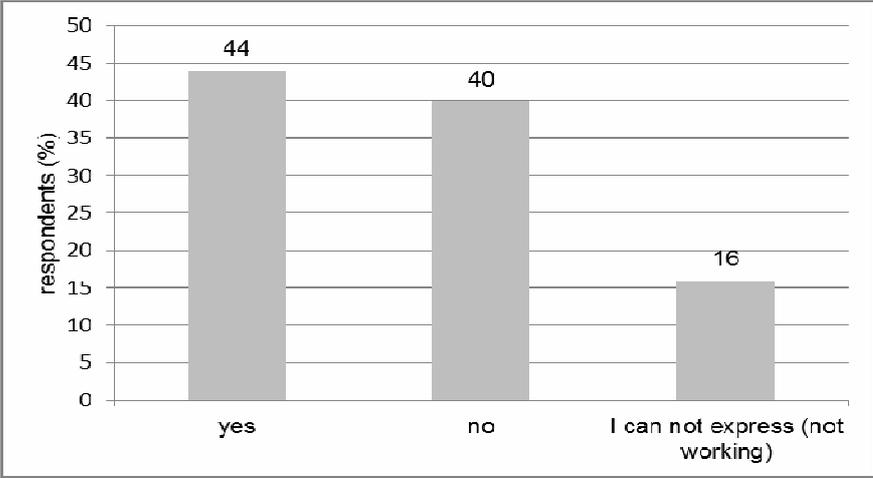


**Pic. 1: Internal migration in the Czech Republic**  
(Czech statistical office, 2012)

Regions that are disadvantageous geographical location, availability of transport and basic services have the lowest educational level. Lower education is closely related to the structure of the demand for staffs. Young people with higher education aged 20-34 prefer to migrate the economic level of the region and the competitiveness. Highly educated population is an important part of human capital, but its migratory movement is dependent on the life cycle. Young university graduates go mainly to large cities and developed regions with job opportunities and career growth. Older college-educated people seek a better life and move to the wider hinterland cities and large towns (Structural Funds, 2009).

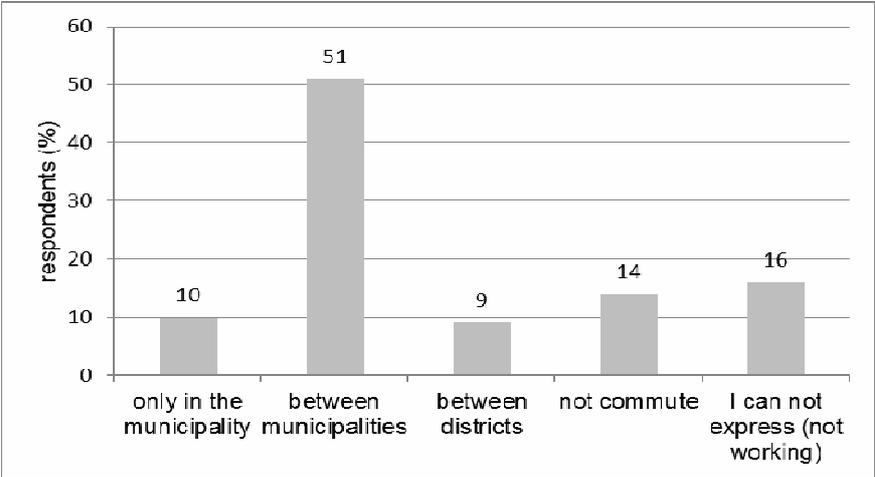
The questions in the questionnaire survey, which is interested in the personal capital, focused on occupational mobility and working mobility – geographic mobility. The results of the survey show that respondents are willing to partially change profession (pic 2). Of

the 750 respondents, 44% said they are willing to change careers, on the other hand 40%, is not willing to change careers and 16% could not evaluate the question, they don't work (they study).

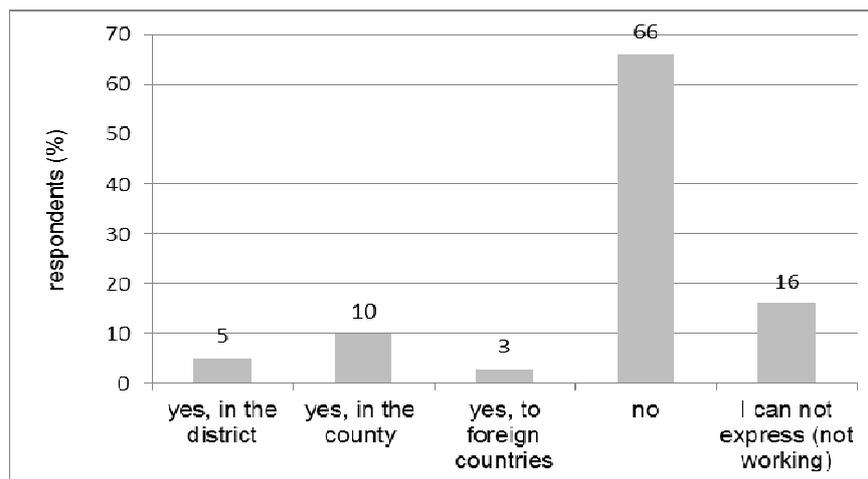


**Pic. 2: The willingness of respondents to change profession (in %)**  
(own processing, data from the questionnaire survey)

Willingness to working - geographical mobility was specified in questions of daily commuting to work and willingness to move for work. The answers to individual questions are diametrically different. Daily commuting to work is quite high, because 70% of those surveyed daily commute to work (pic 3) on the contrary willingness to move for work is quite low. Only 18% answer positive of respondents, 66% of respondents never migrated (pic 4). On both questions could not express 16% as not working (studying).



**Pic. 3: The willingness of respondents commute to work daily (in %)**  
(own processing, data from the questionnaire survey)



**Pic. 4: Overview of respondents migrating during his life work (in %)**  
(own processing, data from the questionnaire survey)

### Conclusions:

The personal capital is one of the components of human capital. Willingness to mobility is an essential characteristic of the personal capital, both geographic mobility, i.e. the willingness to commute to work, to move, so vocational, i.e. willingness to retrain, change profession. The research was conducted as a questionnaire survey, which was attended by 750 respondents. Empirical research suggests that the individual parts of a personal capital differ. Respondents are almost of half willing to change profession and about two-thirds of daily commutes, but the geographical mobility is very low (only 18%). The results of the questionnaire survey correspond to the publication OECD (2013). Migration mobility has been steadily decreasing in the Czech Republic. The main reason for internal migration is primarily suburbanization and economic conditions of the regions and migrants. Foreigners play an important role in the context of internal migration.

Migration is an important part of regional processes. The impact of migration on the level of the whole Czech Republic is not important, but it is a crucial factor in the level of districts and municipalities. Migration significantly affects regional differentiation of the population. Its complex is an important indicator of regional development. At the same time acts on the other, mainly socioeconomic indicators. Moving affects the absolute number the population, but applies also in the formation of demographic, social and socio-cultural structure of the population of districts. Migration is an increasingly serious impact on the labor market and social stability in the local and regional level.

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# Investment Support and Farm Performance in the Slovak Republic

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## Abstract

We investigated total effects of the CAP investment support on efficiency and productivity changes in farms of Slovak Republic over the period 2004-2008. Farm efficiency was assessed by non-parametric method DEA by output-oriented models under assumption of constant return to scale and variable return to scale. Total factor productivity change was measured by Malmquist indices and decomposed to technical efficiency and technological changes. Technical efficiency change was further decomposed to pure and scale efficiency changes. We found fall of TFP and technological regress. The farms were catching up the competitors. The most productive were the large farm operated on DRS. There was no significant effect of the investment support on farm productivity.

## Keywords:

Efficiency, farm investment support, Malmquist productivity index, productivity, Slovakia

## Introduction

Farm investment support is a policy measure oriented on support of growth of agricultural production efficiency and enhancement of agricultural farm competitiveness. Thus investment to new technologies could lead to efficiency growth and improvement of farm position on the market. The accession of the Slovak Republic (SR) to the EU opened to the agricultural farms new market opportunities and at the same time exposed them to strong competition. The Slovak Republic is characterized by dual farm structure. In 2003 the Slovak agriculture dominated corporate farms with average size of 1185 ha and operated on approximately 88% of total agricultural area, while family farms average size was 42 ha and they operated on remaining 12% of total agricultural area (SO SR).

Before the SR accession to the EU, most agricultural farms were insufficiently equipped by production, harvesting, storage and processing technologies or they possessed the obsolete ones. The Slovak farms than could benefit from the investment support under the CAP. In the post accession period we expected productivity and efficiency growth especially of farm investment support beneficiaries, mainly due to investment in new technologies. In addition, productivity and efficiency of large specialized farms on crop production, beneficiaries of investment support, are expected to growth faster than productivity and efficiency of beneficiary farms specialized on animal production, where the effects of new technology investment are usually postponed.

Based on the FADN (Farm Accountancy Data Network) sample data, we investigated CAP 2nd pillar investment support policy provided through the Rural Development Program (RDP) over two programming periods 2004-2006 and 2007-2013. The paper is organized as follows. The next section provides a brief overview of empirical studies and their findings. Applied

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methodology, data and procedures used are presented in section Methodology. In the subsequent section we present our results and the last section provides some concluding remarks

### **Effect of the farm investment support in empirical studies**

There are growing number of empirical studies on farm investment support impact and farm productivity and efficiency. Gorton and Davidova (2004) provide an overview of studies and their findings on farm efficiency in the Central and Eastern European countries. Many studies investigated efficiency differences between small family farms and corporate farms and they found dissimilar results. Ciaian et al. (2009) found that corporate farms specialize in capital-intensive products and in products with low labor monitoring requirements. Kimura and Le Thi (2013) analyzed cross country farm economic performance and found, that large farm size is a factor of high economic performance for most types of farms across countries and overall, high performers tend to invest more. The size of investment tends to be correlated with economic size of farms, especially those specialized to fruit and vegetable and non-ruminants.

The studies analyzing the investment support policy impact are based on application of quantitative methods or mixed quantitative and qualitative approaches. The most methods used for impact assessment, including DEA methodology, are based on comparison of before- and post treatment effects, on comparison of with and without treatment (beneficiaries, non-beneficiaries of the support). The shortcoming of such an approach is in the assessment of the total instead of net effect of the treatment. In case of the investment support efficiency change due to effects of new investments is therefore not explained.

Problems in assessment of farm investment support impact in EU Member States under the CAP 2nd pillar summarized Bergschmidt et al. (2006). The main problems are caused by inconsistent intervention policies, lack of data, difficult communication with decision makers and administrators. The basic problem arises also from the nature of the investment support measures which often cause real effects and impacts only with a considerable time lag. Evaluations, however, are widely based on short- and medium-term effects analysis.

Another deficiency of commonly used methods is identification of adequate control group and sample selection bias, due to voluntary participation in the investment support programme. This can be avoided by using parametric and non-parametric methods and econometric approaches, e.g. propensity score matching, preferred in latest studies.

Farm investment behavior in selected EU Member States was analyzed by e.g. Gallerani et al. (2008), Viaggi et al. (2011). They applied mixed methods, case studies of selected countries which were complemented by the positive programming model. Beck and Dogot (2006) assessed investment support impact on farm income of dairy farms in Valonia and proposed the investment support impact indicators. They found that in the short run there were no connection between investment and farm income growth. Investments however, have positive long run effect on the farm competitiveness and sustainability. Qualitative aspects, socio-economic factors and incentives of investment behavior were examined by Olsen and Lund (2011).

Pufahl - Weiss (2009) applied non-parametric propensity score matching (PSM) to estimate effects of agro-environmental measures and LFA (Less Favored Area) measures on farm in Germany. Kirchweiger et al. (2012) analyzed the investment support effects in Austria using the direct matching, PSM and difference in difference (DID). Michalek et al. (2013) assessed the deadweight losses of dairy farm investment support in Schlezwig and Holstein with PSM and found significant deadweight losses due to the fact that farms would invest even without the investment support. Farm investment support impact in the Czech Republic evaluated Ratering et al. (2013) by using the counterfactual approach, PSM and qualitative data. They found significant positive effects of the investment support in the CR on gross value added and improvement of labor productivity. Henning and Michalek (2008) applied econometric approach and PSM approach for assessment of the SAPARD (Special Accession Programme for Agriculture and Rural Development) impact in the Slovak

Republic. Factors of the farm investment support in Slovakia using PSM and DID methods were analyzed by Božik et al. (2013). They concluded that investment in farms with strong capital endowment would be realized even without investment support. They found negative effect of investment support policy on employment. They suggested to support investments of smaller farms rather than a few large projects of farms with strong capital endowment.

With regard to existing studies, deficiencies of existing approaches and availability of data, we assess investment support policy impact in Slovakia on farm total factor productivity and efficiency changes using DEA approach. Despite of relatively short time span analyzed, we expect positive impact of investment support on productivity and efficiency of all types of farms by specialization. The Slovak agriculture is characterized by dual farm structure with domination of large farms on utilized agricultural area (UAA). In the paper we investigate whether there are differences in investment support impact by farm size.

The objective of this paper is an assessment of the Slovak farm investment support impact on efficiency and productivity of beneficiary farms by their specialization and size over the period 2004-2008, after the Slovak Republic accession to the EU. We investigated the investment support available under the RDP measure 1.1 Modernization of Agricultural Holdings.

## Methodology

Performance of the farms we expressed by total factor productivity (TFP) approach, a suitable methodology for multi-input and multi-output technologies. As an estimator for the TFP change we applied output oriented Malmquist index, which employs Shephard's (1970) output oriented distance functions. We follow Färe et al. (1989, 1994) procedure, where Malmquist TFP index is defined as the geometric mean of two Malmquist indexes for two adjacent periods  $t$  and  $t+1$ , using reference technology  $S_t$ , as well as technology  $S_{t+1}$  (Eq. 1).

$$M_o(x^t, y^t, x^{t+1}, y^{t+1}) = \left[ \frac{D_o^t(x^{t+1}, y^{t+1}) \cdot D_o^{t+1}(x^{t+1}, y^{t+1})}{D_o^t(x^t, y^t) \cdot D_o^{t+1}(x^t, y^t)} \right]^{\frac{1}{2}} \quad (1)$$

Depends on employed distance functions type, Malmquist index can be expressed  $M_o(x^t, y^t, x^{t+1}, y^{t+1}) \geq \leq 1$  and can be positive zero or negative, depending on productivity change between period  $t$  and  $t+1$ .

Malmquist index (Eq. 1) can be decomposed (Färe et al., 1989, 1994) to technical efficiency change (TECH) and technical (technological) change (TCH). Following Fare et al. (1989, 1992) an equivalent way rewriting this index is:

$$M_o(x^t, y^t, x^{t+1}, y^{t+1}) = \frac{D_o^{t+1}(x^{t+1}, y^{t+1})}{D_o^t(x^t, y^t)} \left[ \frac{D_o^t(x^{t+1}, y^{t+1})}{D_o^{t+1}(x^{t+1}, y^{t+1})} \cdot \frac{D_o^t(x^t, y^t)}{D_o^{t+1}(x^t, y^t)} \right]^{\frac{1}{2}} \\ = TECH(x^t, y^t, x^{t+1}, y^{t+1}) \cdot TCH(x^t, y^t, x^{t+1}, y^{t+1}) \quad (2)$$

where:  $TECH > 1$  indicates improvement in technical efficiency and  $TECH < 1$  deterioration in technical efficiency.  $TCH > 1$  indicates technical progress (evidence of innovation) and  $TCH < 1$  technical regress. Both components equal unity are associated with no change. Likewise Malmquist index of total factor productivity change equal unity means stagnation, index greater than unity indicates growth and index less than unity means deterioration of productivity.

Malmquist index (Eq. 1), (Eq. 2) assumes that technology exhibits constant returns to scale (CRS). If the assumption on returns to scale is relaxed, to allow variable returns to scale (VRS), then component of TECH in (Eq. 2) (Färe et al., 1994), can be further decomposed to scale efficiency change (SECH) and pure efficiency change (PECH) (Eq.3).

$$TECH(x^t, y^t, x^{t+1}, y^{t+1}) = \left[ \frac{D_o^t(x^t, y^t | VRS)}{D_o^t(x^t, y^t | CRS)} \cdot \frac{D_o^{t+1}(x^{t+1}, y^{t+1} | CRS)}{D_o^{t+1}(x^{t+1}, y^{t+1} | VRS)} \right] \cdot \left[ \frac{D_o^{t+1}(x^{t+1}, y^{t+1} | VRS)}{D_o^t(x^t, y^t | VRS)} \right]$$

$$= SECH(x^t, y^t, x^{t+1}, y^{t+1}) \cdot PECH(x^t, y^t, x^{t+1}, y^{t+1}) \quad (3)$$

Distance Functions  $D_o^t(x^t, y^t)$  and  $D_o^{t+1}(x^{t+1}, y^{t+1})$  are reciprocal to Farrell (1957) technical efficiency measures and can be estimated by output oriented models of Data Envelopment Analysis. An output oriented DEA model under constant and variable returns to scale applied to estimate technical efficiency (TE) scores of farms is expressed by Eq. 4.

Max  $\varphi$

$$\text{s.t.} \quad -\varphi y_{ro} + \sum_j^n y_{rj} \lambda_j \geq 0 \quad r = 1, 2, \dots, s$$

$$\sum_j^n x_{ij} \lambda_j \leq x_{io} \quad i = 1, 2, \dots, m$$

$$\lambda_j \geq 0 \quad \text{CRS constraints}$$

$$\sum_j^n \lambda_j = 1 \quad \text{VRS constraint;}$$

(4)

Where:  $x_{ij}$  – i-th input of DMUj;  $y_{rj}$  – r-th output of DMUj;  $x_{io}$  – i-th input of DMU under evaluation;  $y_{ro}$  – r-th output of DMU under evaluation;  $\lambda_j$  – intensity (or weight) variable of j-th DMU;  $\varphi$  – technical efficiency score in the range  $[1; \infty]$ ; DMU decision making unit (farm). If technical efficiency score  $\varphi = 1$ , then a farm is technically efficient. If  $\varphi > 1$ , then the farm is inefficient and in comparison with efficient units it could produce higher output given the level of inputs. We apply and interpret  $1/\varphi$ , reaching values from zero to one. Further we can calculate scale efficiency measure (SE) as a ratio of TECRS and TEVRS (Eq. 5)

$$SE = \frac{TE_{CRS}}{TE_{VRS}} \geq 1$$

(5)

SE = 1 indicates scale efficiency or constant return to scale (CRS) and  $SE < 1$  indicates scale inefficiency. Scale inefficiencies arise due to the presence of either increasing returns to scale or decreasing return to scale. The measured level of scale efficiency does not, by itself, indicate whether a farm is operating under increasing or decreasing returns to scale. The following conditions (Banker and Thrall, 1992) identify returns to scale (RTS) for the CRS model given in (4):

Constant returns to scale (CRS) prevail if  $\sum_j^n \lambda_j^* = 1$  in any alternate optimum.

Decreasing returns to scale (DRS) prevail if for all alternate optima.  $\sum_j^n \lambda_j^* > 1$

Increasing returns to scale (IRS) prevail if for all alternate optima.  $\sum_j^n \lambda_j^* < 1$

Occurrence of a farm in region of decreasing returns to scale indicates that downscaling of farm inputs may improve its efficiency and occurrence in region of increasing returns to scale

indicates that upscaling of farm inputs may improve farm efficiency. Distance function values were estimated by six DEA models for each farm.

Three output variables were used in our study: total output crops and crop production in EUR; total output livestock and livestock products in EUR; and other output. Four input variables were selected: total specific costs; total farming overheads; depreciation; and total external factors. Selection of input variables was based on available data and FADN input data classification.

Effect of farm investment support was assessed based on panel data of 130 Slovak agricultural farms. Panel was constructed from the FADN from years 2004-2008. Out of 130 farms there were 56 (43%) beneficiaries of farm investment support, out of which 12 farms were specialised on plant production, 13 on livestock production and 31 had mixed production. There were 74 farms non-beneficiaries in the panel, of which 16 were specialized on plant, 14 on livestock production and 44 had mixed production (Table 1).

**Tab. 1 Average Slovak farm indicators in the panel 2004-2008**

Investment Support	Type	ESU	AWU	UAA
Beneficiaries(56)	CP	408	54	1664
	LP	316	66	1683
	MP	365	59	1605
Non-Beneficiaries (74)	CP	248	34	1431
	LP	198	39	1167
	MP	350	55	1663
Average farm (246)		326	53	1569

Notes: CP - crop production; LP- livestock production; MP - mixed production; ESU - Economic size unit (1ESU=1200 Euros); AWU - annual work units, corresponds to the work performed by one person who is occupied on an agricultural holding on a full-time basis; UAA – utilized agricultural area. Source: own estimation

The average size of ESU, AWU and UAA of the farms in the panel was higher than there was the average value of indicators of the farms provided data to the FADN SK permanently (246 farms) over the period 2004-2008. The average characteristics of the panel farms according the specialization show that mostly large farms according to their ESU, AWU and UAA gained the investment support in all analyzed specialized groups of farms over the period of 2004-2008. In comparison, the EU-27 average farm size in 2007 was 13 hectares of utilized agricultural area (UAA) or about 11 ESU (EC, 2012).

## Results and discussion

Average technical efficiency (TE) under constant return to scale (CRS) of the farms in panel was 0.78 with standard deviation 0.18, minimum 0.08 and maximum 1. The average TE over 5 year implies that only 78% of the possible outputs have been produced by the farms using the current level of inputs. Number of farms producing on the production possibility frontier increased from 17 (13%) in 2004 to 27 (21%) in 2008 (Table 2).

**Tab. 2 Frequency distribution of technical efficiency (TE CRS) of farms**

Year	TE score, No. of farms (Percent)							
	< 0,4	0,40-0,50	0,50-0,60	0,60-0,70	0,70-0,80	0,80-0,90	0,90-1,00	1
2004	3 (2%)	11 (8%)	20 (15%)	23 (18%)	25 (19%)	19 (15%)	12 (9%)	17 (13%)
2005	1 (1%)	5 (4%)	12 (9%)	18 (14%)	18 (14%)	21 (16%)	27 (21%)	28 (22%)
2006	3 (2%)	4 (3%)	18 (16%)	27 (21%)	30 (23%)	11 (8%)	20 (15%)	17 (13%)
2007	3 (2%)	3 (2%)	17 (13%)	22 (17%)	26 (20%)	18 (14%)	18 (14%)	23 (18%)
2008	3 (2%)	4 (3%)	7 (5%)	21 (16%)	23 (18%)	22 (17%)	23 (18%)	27 (21%)

Source: own estimation

The average yearly technical efficiency (TE) of the Slovak farms in the panel increased from 73% to 83% over 5 years period (Table 3). Beneficiary farms average technical efficiency exceeded those of non-beneficiaries. Farms specialized on livestock production were the most inefficient in 2004, when the SR became the EU member. These farms gained the highest improvement of technical efficiency and catch up in the 5 year span. While unsupported farms efficiency increased by 13.3%, efficiency gain of beneficiaries of farm investment support, reached 21.6% and can demonstrate a positive effect of investment support policy and growth of livestock farm competitiveness.

The annual average value of total factor productivity change measured by Malmquist indices ranged from 0.716 to 1.357. Total factor productivity increased in all groups of the farms only in 2007, regardless of whether they were or not beneficiaries of the investment support. The average TFP growth over 2004-2008 was -1.9% per annum and TFP has declined by 11.7%, compared to average productivity level in 2004. We also note the highest TFP decline of the mixed farms, beneficiaries of investment support (-23.7%), and the farms specialized on animal production, non-beneficiaries (-22.6%) (Table 4).

**Tab. 3 The average technical efficiency (TE CRS) of farms, 2004-2008**

Farm investment support	Specialisation	Number of farms	2004	2005	2006	2007	2008
Beneficiaries	CP	12	0.813	0.847	0.860	0.803	0.880
	LP	13	0.660	0.791	0.688	0.762	0.876
	MP	31	0.727	0.811	0.757	0.815	0.781
Average beneficiary			0.733	0.816	0.768	0.793	0.846
Non-beneficiaries	CP	16	0.713	0.825	0.791	0.781	0.739
	LP	14	0.739	0.854	0.765	0.801	0.872
	MP	44	0.753	0.817	0.749	0.732	0.808
Average non-beneficiary			0.735	0.832	0.768	0.771	0.806
Average in panel			0.734	0.824	0.768	0.782	0.826

Notes: CP - crop production; LP- livestock production; MP - mixed production; CRS - constant returns to scale  
Source: own estimations

Further we decomposed total factor productivity growth expressed by Malmquist indices to technical efficiency change over time (catching up) and a change due to shift in technology over time (technological change; production frontier shift).

Technical efficiency change (TECH) relates to how the farms have performed relative to the best farms on the frontier. It represents movement of the farms towards the frontier over time, capturing the catch-up phenomena. A value of efficiency change greater than one means that the farm is closer to the frontier in 2008 than it was in 2004 (Table 3). Technical efficiency changes of all group of farms exceeded 1 and mean that farms falling behind in 2004, were catching up the best farms (move up to the frontier) over 5 years period after the EU accession. The highest improvement of efficiency (TECH) reached livestock farms – beneficiaries of the investment support (1.81), followed by livestock farms non-beneficiaries of investment support (1.051). It seems that the farm investment support thus was mainly used to cope with strong competition in short time.

Technological change (TCH) refers to shift of the best practice frontier capturing innovations. This shift is affected by new agricultural technologies or innovations, like high yielding varieties, change in the economic policies or environmental regulations. Livestock farm adjustment to the EU common market conditions required increased investments, restructuring and introduction of new production technologies related to adjustment to the EU production standards and hygiene conditions and thus higher support.

We expected positive impact of the investment support on TCH in beneficiary groups of farms. All groups in our panel however, reached TCH value less than 1, disregard of farm specialization (Table 5, Table 6). This finding means that all farms, including beneficiaries

of investment support did not adopt in sufficient extent the innovative technologies. The highest deterioration of TCH was found in beneficiary livestock farms (by 44%) and mixed farms (by 41 %). Possible explanation of livestock farms lag can be in requirements of more complex and costly technologies used in livestock production compared to those in plant production. In addition, transfer and introduction of new technologies in livestock production could take longer time and observation of their impact could be possible in medium and long run.

**Tab. 4 Yearly and cumulative change of TFP (2004-2008)**

Farm investment support	Specialization	2005/2004	2006/2005	2007/2006	2008/2006	Cumulative change 2008
Beneficiaries	CP	0.814	1.028	1.247	0.89	0.929
	LP	0.929	0.829	1.271	0.887	0.868
	MP	0.899	0.894	1.209	0.785	0.763
Non-beneficiaries	CP	0.824	0.988	1.357	0.859	0.949
	LP	1.072	0.716	1.248	0.808	0.774
	MP	0.884	0.864	1.181	1.05	0.947
<b>Average</b>		<b>0.904</b>	<b>0.886</b>	<b>1.252</b>	<b>0.88</b>	<b>0.883</b>

Notes: TFP - total factor productivity change (Malmquist index), CP - crop production, LP - livestock production, MP - mixed production Source: own estimation

The technological progress was observed in panel farms only in 2007, which could be attributable to beginning of the new RDP programming period. The subsequent negative technological change in 2008 could be a consequence of the global financial crisis which affected the farm performance and hence their investment decisions.

The technical efficiency change (TECH) under the constant returns to scale (CRS) was decomposed into the pure (VRS) technical efficiency change (PECH) and the scale efficiency change (SECH) (Fare et al., 1994). Pure technical efficiency is also known as the managerial efficiency. A farm exhibits managerial inefficiency when the inputs used to produce a given level of output is more than the required amount. Scale efficiency is defined as the potential productivity gain from achieving the most productive scale size of a farm. A scale efficient farm produces where there are constant returns to scale.

The yearly values of the PECH over the 2004-2008 (Table 5) show managerial inefficiency of the farms in the panel in 2006 and 2007. Farm technical efficiency growth (TECH) was driven by scale efficiency growth (SECH), since SECH in 2007 prevailed managerial efficiency decline (PECH). Cumulative values of indices over the period 2004-2008 show that farms improved their performance compared to the best farms by 35%, mainly due to improvement of the managerial efficiency by 30% and improvement of scale efficiency by 3%.

**Tab. 5 Decomposition of average yearly Malmquist TFP indices for the panel farms**

year	TFP	TECH	TCH	PECH	SECH
2005/2004	0.855	1.123	0.762	1.109	1.012
2006/2005	0.836	0.924	0.905	0.975	0.947
2007/2006	1.148	1.007	1.14	0.971	1.036
2008/2007	0.821	1.062	0.773	1.045	1.016
Mean	0.906	1.026	0.883	1.023	1.002
Cumulative change 2008	0.883	1.35	0.663	1.301	1.032

Notes: TFP - total factor productivity change (Malmquist index), TECH - technical efficiency change, TCH-technological change, PECH - pure technical efficiency change, SECH - scale efficiency change, mean-geometric mean Source: own estimation

**Tab. 6 Total factor productivity components (average values), 2004-2008**

Farm investment support	Specialisation	TFP	TECH	TCH	PECH	SECH
Beneficiaries	CP	0.957	1.02	0.938	1.019	1.002
	LP	0.929	1.081	0.86	1.067	1.013
	MP	0.886	1.023	0.864	1.019	1.004
<b>Average</b>		<b>0.924</b>	<b>1.041</b>	<b>0.887</b>	<b>1.035</b>	<b>1.006</b>
Non-beneficiaries	CP	0.939	1.012	0.929	1.027	0.985
	LP	0.909	1.051	0.866	1.044	1.007
	MP	0.901	1.022	0.883	1.017	1.004
<b>Average</b>		<b>0.916</b>	<b>1.028</b>	<b>0.893</b>	<b>1.029</b>	<b>0.999</b>
<b>Geom. Mean</b>		<b>0.920</b>	<b>1.035</b>	<b>0.889</b>	<b>1.032</b>	<b>1.002</b>

Notes: TFP - total factor productivity change (Malmquist index), TECH - technical efficiency change, TCH - technological change, PECH - pure technical efficiency change, SECH - scale efficiency change; CP - crop production, LP - livestock production, MP - mixed production. Source: own estimation

The growth of beneficiary farm TE generally can be attributed to the investment support. According to Ferto et al. (2012) subsidized producers can invest in farm development and achieve higher technical progress since they are less credit constrained. The results and conclusions of empirical studies estimating the effects of the investment support on farm productivity and efficiency differ. Capital investment did not have effect on the productivity growth of Dutch arable farms (Zhengfei and Oude Lansink, 2006). The investment support did not show any significant influence on the TE for example of the Swedish farms (Manevska-Tasevska et al., 2013), due to its poor targeting. Another their explanation is that support paid for investments aimed at improving the environment says that the effect of positive externalities can be at least partially underestimated, as it does not have direct influence on the farm output. This can be one of the relevant reasons why TFP change and TCH of the Slovak farms were not positive, when the farms invest mostly in technologies to cope with all the EU environmental and hygienic requirements after the EU accession.

All groups of the Slovak farms in the panel, disregard of their specialization and farm investment support, improved their average technical efficiency after the EU accession. This was due to improvement of both, managerial and scale efficiencies but the crop production farms non-beneficiaries of the investment support (Table 6).

**Tab. 7 TFP and its components of the efficient farms (geomean), 2004-2008**

Type	Farm Share	Beneficiaries					Farm Share	Non-Beneficiaries				
	B	TFP	B	TCH	PECH	SECH	NB	TFP	TECH	TCH	PECH	SECH
CP	17%	1.014	1.052	0.964	1.055	0.998	26%	1.036	1.108	0.937	1.112	0.997
LP	9%	1.034	1.17	0.884	1.167	1.003	13%	1.031	1.064	0.977	1.06	1.003
MP	22%	1.043	1.153	0.905	1.143	1.009	13%	1.055	1.206	0.874	1.169	1.033

Notes: TFP - total factor productivity; TECH - technical efficiency change; TCH - technological change; PECH - pure technical efficiency change; SECH - scale efficiency change; CP - crop production; LP - livestock production; MP - mixed production, B – beneficiaries; NB non-beneficiaries. Source: own estimation

At the same time, average technological regress occurred in all groups of farms by specialization in both beneficiary and non-beneficiary groups. The technological progress was observed in all groups of farms disregard specialization only in 2007.

48% of the farms investment support beneficiaries were efficient over 2004-2008 (23 farms). Among them, the highest number was specialized on mixed production, followed by the efficient farms specialized on crop production (Table 7). Beneficiary efficient farms regardless of the specialization increased their technical efficiency mainly due to increase of managerial efficiency and scale efficiency in livestock and mixed production.

The positive change of technical efficiency of the efficient farms beneficiaries, prevailed technological regress occurred in these farms over 2004-2008.

The share of efficient farms out of non-beneficiaries, reached 52% and half of them were specialized on crop production. We observed the same pattern of development of TFP change and its component of efficient farms non-beneficiaries by specialization, as for the efficient farms beneficiaries of the investment support.

The results of the returns to scale (RTS) estimation indicate that decreasing returns to scale was predominant form of scale inefficiency of the efficient farms in years after the EU accession of both beneficiaries and non-beneficiaries of the investment support (Table 7). Diseconomy of scale implies that farms are too large to take full advantage of scale and has supra-optimum scale size. In order to reduce unit costs, downsizing seems to be an appropriate strategic option for these farms.

**Tab. 9 Mann-Whitney (M-W U test) test for differences in productivity change**

Farm Type	M-W U test	Z	Asymptotic significance (two tailed)	M-W U test	Z	Asymptotic significance (two tailed)	M-W U test	Z	Asymptotic significance (two tailed)
	TFP			TECH			TCH		
CP	22	-0.09	0.926	96	0.00	1.000	97	0.05	0.963
LP	104	0.63	0.528	116	1.21	0.225	94	0.15	0.884
MP	666	0.63	0.528	689	0.08	0.940	662	-0.22	0.830
Total	2138	0.31	0.756	2249	0.83	0.405	1971	-0.47	0.635
	PECH			SECH					
CP	92	-0.19	0.853	130	1.58	0.114			
LP	112	1.02	0.308	111	0.97	0.332			
MP	701	0.20	0.838	618	-0.69	0.491			
Total	1937	-0.63	0.526	1933	-0.65	0.513			

Notes: \* indicates significance in 0.10 level; \*\* indicates significance in 0.05 level;

TFP - total factor productivity, TECH - technical efficiency change, TCH - technological change, PECH - pure technical efficiency change, SECH - scale efficiency change, CP - crop production, LP - livestock production, MP - mixed production

Source: own estimation

The efficient farms among beneficiaries of the investment support were larger than the efficient farms non-beneficiaries (Table 8). This was true especially for farms with mixed production specialization. The average ESU of the efficient beneficiaries was higher by 60%, AWU by 58% and UAA by 35% than was the corresponding level of indicator of non-beneficiary efficient farms. The average indicators of the beneficiary efficient farms by specialization were also higher than was the respective level of non-beneficiary efficient farms. The only exception was the lower average level of the UAA by 13% of the beneficiary effective farms specialized to crop production, compared to the average size of the crop production farms non-beneficiaries.

To examine differences between average productivity change of the beneficiaries and non-beneficiary farms in 2004-2008, we employ Mann-Whitney U-Test with the null hypotheses that the performances of beneficiaries and non-beneficiaries are the same. Table 9 shows no evidences that the performances of beneficiaries and non-beneficiaries of the investment support are different because the results are not significant. This implies that the investment support did not contribute to the significant improvement of the investment support beneficiary farms productivity.

## Conclusions

In the paper we investigated total effects of the CAP 2<sup>nd</sup> pillar farm investment support, provided under the Rural Development Program (RDP), on efficiency and productivity changes of the Slovak agricultural farms over period 2004 - 2008. Data of 130 farms from the FADN SK were analyzed. Agricultural farm efficiency was assessed by output-oriented models of data envelopment analysis (DEA) under assumption of CRS and VRS. Total factor productivity (TFP) change was measured by Malmquist indices and decomposed to technical efficiency change and technological change. Further we identify sources of efficiency changes by decomposition of technical efficiency change to pure efficiency and scale efficiency changes. We found, that farm productivity of both beneficiaries and non-beneficiaries of the investment support declined over time. Technical efficiency of all farms was growing, while technological change was negative over time. Technological progress in 2007 was replaced by technological regress in 2008 which could be attributed to impact of the crises. The farms were focused on catching up the competitors. To positive development of technical efficiency contributed mainly managerial efficiency growth. The most efficient farms were those specialized on crop production, regardless of the investment support. The most productive were the large agricultural farms with the ESU, AWU and UAA above the FADN SK average, operated mostly on DRS with approaching the most productive scale size. We found no significant effect of the farm investment support on farm productivity in the first years of the Slovak EU membership. In order to improve efficiency and enhance the competitiveness of the Slovak farms, the product and technology innovation should be encourage and promote and the investment support should be more targeted.

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# “Regional Labels In Vysocina Region – Do Consumers See Differences?”

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## Abstract

The paper presents results of research on recognition of regional food products labels in Vysočina Region in the Czech Republic and the ability of consumers to differentiate them. Presented results are part of longitudinal research that aims to analyse evolution of Czech regional labels and their impact on regional development. The questionnaire survey was conducted in May 2012 on sample of 404 respondents from the Vysočina Region. Respondents were asked to connect several characteristics with brands VYSOČINA Regional Product®, Regional Food Vysočina Region and also nonexistent brand From Our Region Vysočin (11 % of respondents claimed that they know it). Data have been processed with correspondence analysis and proved that consumers see more the similarities between the regional labels – they symbolise above all quality, only few people consider that food with regional label must be a symbol of higher price. To analyse the media presence of the regional brands in Vysočina, the company Newton Media, provided the texts that included both existing regional labels. Further analysis showed, that media present both labels as the signs of a quality production above all.

## Keywords

Consumer research, correspondence analysis, media monitoring, Vysocina Regional Product, Vysocina Region Regional Food.

## Introduction

Regional label is one of several ways how to promote rural regions, also it supports regional development of socially, culturally and environmentally oriented economies (Čadilová, 2011). An increasing demand for regional food have been observed both in the Czech Republic in the last few years (Turčínková, Kalábová, 2011) and other European countries (e.g. Loureiro, Umberger, 2005, McEntee, 2010). Van Ittersum, Candel and Meulenberg (2003) provide a definition for a regional food product as one whose quality and (or) fame can be attributed to its region of origin, important attribute is that the product is marketed using the name of the region of origin. Regional certification labels signal authenticity and genuineness, it is a signal that the product is authentic, actually produced in the region denoted by the name of the product (Van der Lans, Van Ittersum, De Cicco and Loseby, 2001, Bingen, 2012).

The European Union has built three systems for promoting and protecting the names of quality agricultural products and foods: known as PDO (protected designation of origin), PGI (protected geographical indication) and TSG (traditional speciality guaranteed) (European Commission, 2014). Successful examples of products being marketed based on regional characteristics in the Czech Republic are Horice Filled Wafers, South Bohemian Golden Niva

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Cheese (PGI), Pohořelice Carp (PDO) and Liptov Salami (TGS – together with Slovak Republic). The names of these products include the name of their region of origin to communicate regional characteristics to consumers. By using this indication, marketers may exploit existing associations consumers have with the region and provide their product with an image (Steiner, 2004). Combined with their specific qualities, this regional image can create a unique identity for these products and add them value in this way (Ilbery and Kneafsey, 2000) and help reconnect with consumers (Marsden, Sonino, 2008).

Apart from the authenticity and quality, regional certification labels may trigger associations that could influence product evaluations. During a series of focus group interviews conducted by Van Ittersum, Meulenberg, Van Trijp and Candel (2007), quality-related associations as well as the economic consequences of PDO labels were reoccurring themes.<sup>3</sup> Similarly, Teuber (2011) questioned German consumers' (particularly Hessian) awareness and knowledge about geographical indications and the results showed that it was very limited. Moreover, it was found that the quality warranty dimension was not as important as the economic support dimension and perceived authenticity of the product. A hypothetical willingness to pay for protection was mainly driven by consumer perceptions and expectations towards the positive impacts of geographical indications on the local economy. Giovannucci et al. (2010) stressed that *“for regional product to thrive, it must be properly identified and credibly conveyed to consumers”*.

Consumers' appreciation of regional certification labels should be studied with consideration for the image of and the associations with these labels. The main aim of this paper is to show whether the customers in Vysočina Region see differences between labels that aim to symbolize quality and origin of the food, as their number rose dramatically over past ten years. The next chapter first presents the situation in food labeling in the Czech Republic, then Regional labels in Vysočina Region. The chapter Results and Discussion summarizes results of the data analysis – both from the questionnaire research and texts from the media monitoring delivered Newton Media. In Conclusion authors express the need for more research on the topic, especially content analysis of the media coverage.

## **Food Labels in the Czech Republic**

One of the researches made in the Czech Republic (Horska, Ůrgeova, Prokejnova, 2011) showed that despite the positive attitude of Czechs towards foreign food products, most consumers perceive Czech products as the ones of a high quality and competitive in comparison with the foreign production. Also, results of the research showed that quality symbol plays a very important role in the Czech consumer behavior. Particularly, label Klasa, that symbolizes high quality food products on the Czech market, has a very dominant position in the food marketing strategy (research made by Skořepa and Hes in 2005 and Skořepa and Dušek in 2006 – 2007 showed that the recognition of the label by the Czech consumers rose slowly and required significant investment in promotion)<sup>4</sup>.

Apart from Klasa, food products sold in the Czech Republic carry a wide range of quality marks, awards and origin labels such as Czech Made, Česká kvalita (Czech Quality) and

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<sup>3</sup> To gain insights into consumers' image of regional certification labels, authors conducted 18 focus group interviews, involving approximately 150 consumers, from Greece, Italy and Netherlands. In each country, two PDO-protected regional products were selected.

<sup>4</sup> Brand Klasa was presented to the Czech consumers in 2003. According to Skořepa and Hes only 29% of the respondents recognised brand Klasa in 2004, Skořepa and Dusek (2005) proved in the follow-up reserch in 2005 that only 33 % of selected respondents recognised the brand, after 238 mil. CZK promotion campaign in 2006 the number rose to 68 % and in 2007 its recognition elevated to 87 % (Skořepa, Dušek, 2007).

Česká chuťovka (Czech Delicacy), alongside annual awards such as best bread, best dairy product among the many others. The last one that has been presented to the Czech customers in 2011, is quality label Český výrobek – garantováno Potravinářskou komorou ČR (Czech Product – guaranteed by the Federation of the Food and Drink Industries of the Czech Republic). It is the first quality guarantee initiative organized, implemented and financially supported solely by Czech food producers. All previous quality label marketing projects have a state institution or non-food or agriculture related institutions, such as regional administrations. For example Klasa is supported by the Ministry of Agriculture, and therefore due to EU regulations cannot be reserved purely for Czech products. Label Czech Product – guaranteed by the Federation of the Food and Drink Industries of the Czech Republic is financed only by private capital, therefore it can emphasize “Czech-made” and proclaim Czech origin of all ingredients or unique Czech methods and recipes. Products that could qualify for this label represent a very significant percentage of all produce available on the Czech food market. In the first phase of this new labeling initiative, the full range of products produced by the biggest food companies in the Czech Republic Madeta and Kostelecké uzeniny were attributed with the new mark. It can be said that this label is the industrial scale equivalent of produce sold by local producers.

### **Regional Labeling Schemes in Vysočina Region**

First regional labeling schemes were established in the Czech Republic in 2005, their creators got the inspiration from projects implemented in Great Britain, Spain, Ireland and other European countries where similar initiatives already existed for more than ten years at the time (Čadilová, 2011). The first labels, which became the basis for the future Association of Regional Brands (ARB), originated from the project supported by the European Commission “People for Nature, Nature for People”. Recently, ARB associates 24 regions with their regional labels, including Vysocina Region (<http://www.regionalni-znacky.cz> ©2014).<sup>5</sup> All of them have unified graphic design as well as common granting principles. Their basic characteristics include the guaranteed origin and environmentally friendly production and sale, production must include proportion of manual work and local raw materials.

Vysocina Region joined ARB and created its first regional label (see Figure 1), VYSOČINA Regional Product®, in 2007. First local producers of agricultural products, food and handicraft products applied and those who succeeded in evaluation, received their certificates from the certification commission in 2008. Beginnings of labeling were rather complicated, the local co-ordinator Zera Agency had to contact the producers actively before every meeting of the certification commission, in order to persuade the producers to get involved in the system.



**Figure 1 VYSOČINA Regional Product® logo**

*Source: [www.regionalni-znacky.cz](http://www.regionalni-znacky.cz)©2012*

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<sup>5</sup> Outside ARB there are also other regional labels, e.g. Regional Product of Czech Paradise, West-Bohemian Local Product, Traditional Product of Slovácko or the trademark Tradition of the White Carpathians® that are considered to be established. These labels are also based on similar criteria as ones associated in ARB, but they do not apply them fully and their co-ordinators are not members of ARB.

In 2010, the Ministry of Agriculture of the Czech Republic in cooperation with the Agrarian Chamber and the Federation of the Food and Drink Industries started the project Regional Food, the labeling scheme for regional food. Part of this project was also creation of the label “Regional Food” successful local small and medium producers and agriculturists may place on their products. This project strives to improve the consumers’ awareness of the regional food, referring to its tradition and quality, communicate the benefits brought by the regional food, strengthen its relations to the given region, and emphasize the advantages of consuming local food in relation to the development of a region and, thus, to the support of employment, tourism, etc. A competition for this label is yearly held in all 13 regions of the Czech Republic (including Vysocina Region), with exception of the capital city Prague. For a product to be able to enter the regional competition, it must be produced in one of the 13 Czech regions and from traditional raw materials. In addition, the share of domestic raw materials must total at least 70% and the main ingredient must be 100 percent domestic in origin (Annual report of the Federation of the Food and Drink Industries, 2011). In January 2013, 20 food products from Vysočina Region are certified with the logo (see Figure 2)



**Figure 2 Regional Food Vysočina Region**

Source: [http://eagri.cz/public/web/regionalni\\_potraviny](http://eagri.cz/public/web/regionalni_potraviny)©2014

To test the main aim of the research (finding out whether consumers see the differences between regional brands), respondents were asked to connect characteristics with nonexistent brand (see Fig. 3) Z našeho kraje Vysočina (From Our Region Vysočina). Word “vysočina” means highlands, therefore the motive of the hill had been used as well as green and blue colours that are traditionally associated with Vysočina Region (and are also present on the other two regional brands).



**Figure 3 Nonexistent Regional Food Brand**

Source: Authors

## Materials and Methods

The primary research followed a quantitative design. It was conducted via personal interviews, questionnaires were completed with the help of interviewers, in all the districts of Vysočina Region in May 2012. 432 respondents filled in questionnaires, 404 of them were processed. The questionnaire consisted of 11 questions. Apart from demographic questions, consumers were asked to answer what attribute they connect the most with a particular regional brand (actual logo was presented in the questionnaire).

Attributes that have been selected:

- Quality,
- Premium price,
- Specialty,

- Vysočina Region origin,
- Eco product,
- Environmentally friendly product.

Data have been processed with correspondence analysis. Correspondence analysis (CA) is a multivariate statistical technique. It is conceptually similar to principal component analysis, but applies to categorical rather than continuous data. In a similar manner to principal component analysis, it provides a means of displaying or summarising a set of data in two-dimensional graphical form (Nenadič and Greenacre, 2007). All data should be nonnegative and on the same scale for CA to be applicable, and the method treats rows and columns equivalently. It is traditionally applied to contingency tables— CA decomposes the chi-squared statistic associated with this table into orthogonal factors. Because CA is a descriptive technique, it can be applied to tables whether or not the chi-square statistic is appropriate (Greenacre, 1984).

According to Nenadič and Greenacre (2007), as in principal component analysis, the idea in CA is to reduce the dimensionality of a data matrix and visualize it in a subspace of low-dimensionality, commonly two- or threedimensional. The data of interest in simple CA are usually a two-way contingency table or any other table of nonnegative ratio-scale data for which relative values are of primary interest. The CA solution was shown by Greenacre (1984) to be neatly encapsulated in the singular-value decomposition (SVD) of a suitably transformed matrix. To summarize the theory, first divide the  $I \times J$  data matrix, denoted by  $N$ , by its grand total  $n$  to obtain the so-called correspondence matrix  $P = N/n$ . Let the row and column marginal totals of  $P$  be the vectors  $r$  and  $c$  respectively, that is the vectors of row and column masses, and  $D_r$  and  $D_c$  be the diagonal matrices of these matrices. The computational algorithm to obtain coordinates of the row and column profiles with respect to principal axes, using the SVD, is as follows:

1. Calculate the matrix of standardized residuals:  $S = D_r^{-\frac{1}{2}}(P - rc^T)D_c^{-\frac{1}{2}}$
2. Calculate the SVD:  $S = UD_\alpha V^T$  where  $U^T U = V^T V = I$
3. Principal coordinates of rows:  $F = D_r^{-\frac{1}{2}}UD_\alpha$
4. Principal coordinates of columns:  $G = D_c^{-\frac{1}{2}}VD_\alpha$
5. Standard coordinates of rows:  $X = D_r^{-\frac{1}{2}}U$
6. Standard coordinates of columns:  $Y = D_c^{-\frac{1}{2}}V$

The total variance of the data matrix is measured by the inertia (see, e.g., Greenacre 2007, Chapter 4), which resembles a chi-square statistic but is calculated on relative observed and expected frequencies:

$$7. \text{ Inertia} = \phi^2 = \sum_{i=1}^I \sum_{j=1}^J \frac{(p_{ij} - r_i c_j)^2}{r_i c_j}$$

The rows of the coordinate matrices in (3)-(6) above refer to the rows or columns, as the case may be, of the original table, while the columns of these matrices refer to the principal axes, or dimensions, of the solution. Notice that the row and column principal coordinates are scaled in such a way that  $FD_r F^T = GD_c G^T = D_\alpha^2$ , i.e. the weighted sum-of-squares of the coordinates on the  $k$ -th dimension (i.e., their inertia in the direction of this dimension) is equal

to the principal inertia (or eigenvalue)  $\alpha_k^2$ , the square of the k-th singular value, whereas the standard coordinates have weighted sum-of-squares equal to 1:  $XD_r X^T = YD_c Y^T = I$ . The implementation of the algorithm follows Blasius and Greenacre (1994).

The graphical representation of results from CA is commonly done with so-called symmetric maps. In that case, the row and column coordinates on each axis are scaled to have inertias equal to the principal inertia along that axis: these are the principal row and column coordinates. Depending on the situation, other types of display are appropriate. This can be set with the scaling option map in the plotting functions for CA.

To analyse the media presence of the regional brands in Vysočina, the company Newton Media (NM), provided the texts that included both existing regional brands. Media monitoring included texts from newspapers, journals, electronic media (internet, radio, TV) which were published between January 2006 and December 2013. This analysis was done because of the role that mass media play as a source of information for the consumers.

## Results and Discussion

The questionnaire was filled-in by 404 respondents, 137 men and 267 women. Majority of them were 20 – 39 years old (233), and 40 – 59 years old (120). Among them, 137 were male and 267 female. Less than 19 years had 22 respondents and more then 60 years had 29 of them. Only 186 of respondents didn't have children. 22 of them had children that attended kindergarten, 20 respondents claimed that their children are in the age that allow them to go the elementary school and 23 claimed that their children study at the high school, 37 of them were parents of the university students. 39 respondents said that their children already live in separate households.

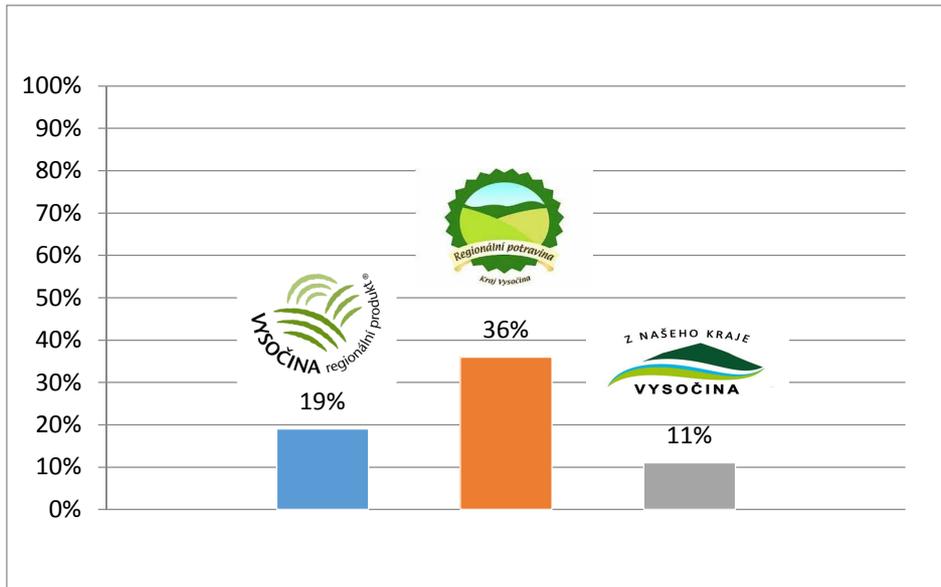
Results of the research showed that respondents in Vysočina Region tend to read the information about the food origin displayed on the packaging. Only 10 % of respondents never read these information (see Table 1).

**Table 1 Interest in food origin displayed on the food packaging in Vysočina Region**

Answer	Frequency	Relative frequency (%)
Always	30	7.4
Very often	91	22.5
Often	146	36.1
Very seldom	96	23.8
Never	40	9.9
Did not answer	1	0.3
Total	404	100

Source: Chalupova, Prokop, Rojik (2012)

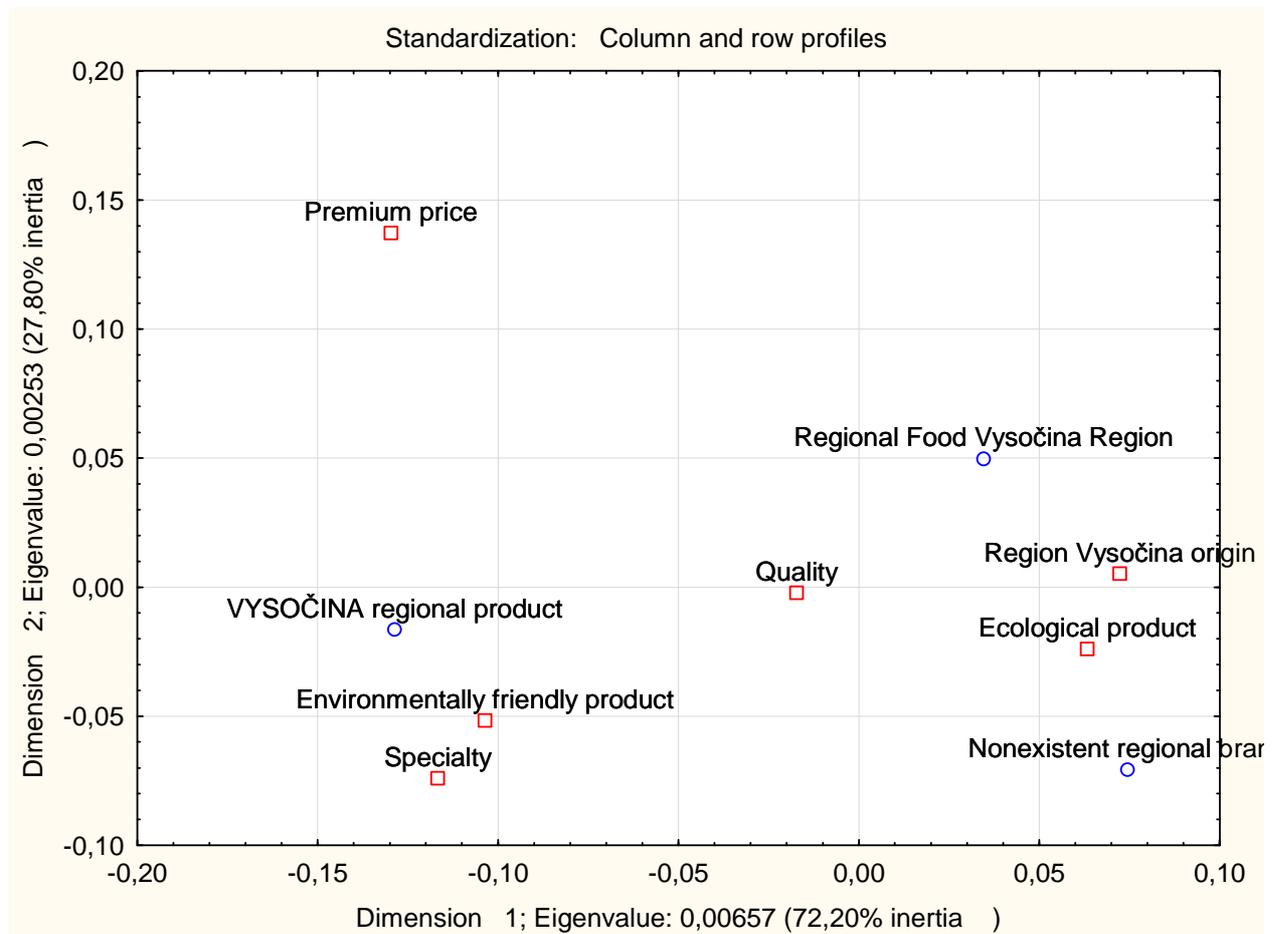
Recognition of existing regional labels logo in Vysočina Region in May 2012 was rather poor (see Figure 4). Most consumers did not recognise VYSOČINA Regional Product® (81% of them), Regional Food Vysočina Region label had better recognition (36% of respondents were able to identify it). Respondents also claimed that they know non-existent brand From Our Region Vysočina (11%).



**Figure 4 Recognition of regional labels in Vysočina Region**

Source: Authors' research

Results of the correspondence analysis (see Figure 5) show, that regardless label only few people consider that food with regional label must symbolise higher price. On the other hand quality is the characteristic that is close to all three brands.

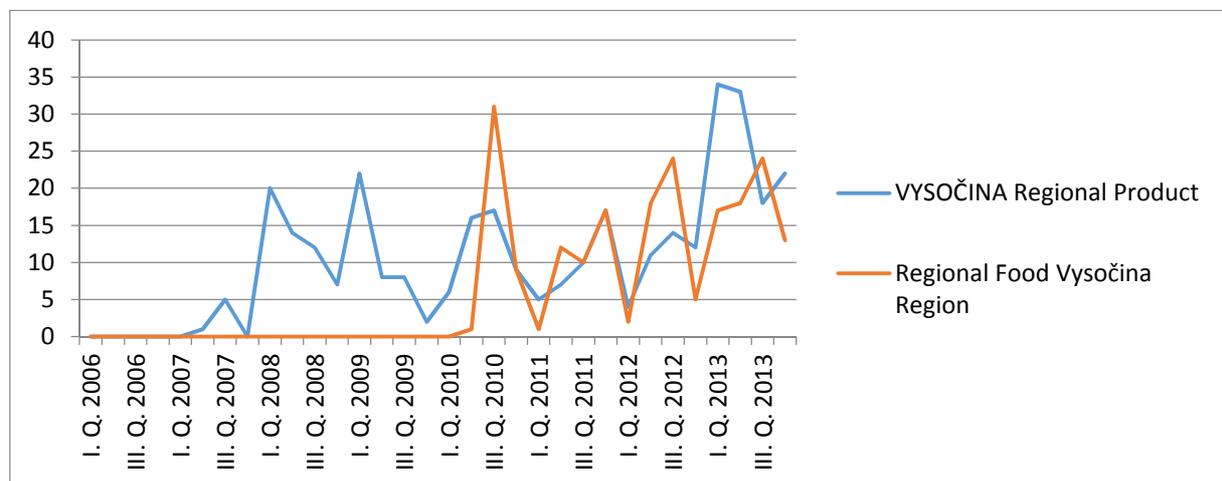


**Figure 5 Vysočina Region regional brands - attributes**

Source: Authors' research

Figure 5 also shows that respondents associate label VYSOČINA Regional Product the most with environmental friendliness and also they recognise it symbolises to them a specialty. Brand Regional Food Vysočina Region and nonexistent brand symbolise to the respondents Vysočina Region origin and ecological characteristics. These two brands are perceived similarly. Brand Vysočina Regional Product is particularly distinctive by two characteristics: specialty and environmentally friendly product.

Media monitoring showed, that brand VYSOČINA Regional Product appeared more in media (334 texts) than Regional Food Vysočina Region (202 texts) in 2006 - 2013. If we exclude media presence before label Regional Food Vysočina Region appeared on the market, i.e. since 2010, the media presence is almost the same (235:202). Publicity of the label Regional Food Vysočina Region culminated in the third quarter of 2010, but again has its peaks also in the same quarters of the following years (see Fig. 5). The reason for that may be the fact, that the winners of the regional competition for the label Regional Food are being introduced during the agricultural fair Bread Basket (Země Živitelka) in České Budějovice in August/September.



**Figure 6 The frequency of the texts about VYSOČINA Regional Product and Regional Food Vysočina Region in January 2006 – December 2013**

Source: Authors' research

Figure 6 also shows, that the media coverage in May 2012 could not have a major influence on results of research of the recognition of regional brands in Vysočina Region, as both brands gained almost the same publicity at this period of time. Almost double recognition (36%) of the brand Regional Food Vysočina Region (as shown in Fig. 4) may have caused other promotion (such as billboards, leaflets and other marketing communication). The media coverage in 2013 shows stronger presence of the label VYSOČINA Regional Product.

Further analysis of all 536 texts from 2006 till 2013 that Newton Media delivered, focused on the characteristics connected with both labels. Table

**Table 2 Characteristics connected with regional labels in Vysočina Region mentioned in the media monitoring from 2006 till 2013**

Characteristic	VYSOČINA Regional Product	Regional Food Vysočina Region
Higher price	7	10
Eco friendliness	60	9
Specialty	44	15
Quality	116	97

Source: Authors' research

Table 2 shows that possible higher price of the labelled products was mentioned only in 17 of the texts from media monitoring (in 6 texts only before the research in May 2012, 4 texts of them were about VYSOČINA Regional Product). Ecological characteristics were mentioned in 69 of them, (in 62 before the research in May 2012, 54 of them were informing about VYSOČINA Regional Product). Specialty, as the characteristic of the products with regional label was described in 59 texts (in 45 before the research in May 2012, 37 were about VYSOČINA Regional Product). The most frequent characteristic that was mentioned with the both labels was quality (in 213 texts), 77 texts were about VYSOČINA Regional Product and 48 texts about Regional Food Vysočina Region before the research in May 2012.

## Conclusion

Research showed that respondents in Vysočina Region tend to read the information about the food origin displayed on the packaging. On the other hand, majority of them have not recognised logos of existing regional brands Vysočina Region. Only 19% of them recognised VYSOČINA Regional Product®, 36% of them were able to recognize brand Regional Food Vysočina Region. Respondents also claimed that they know non-existent brand From Our Region Vysočina (11%). This may be also a signal that respondents do not really pay attention to the design of regional labels (further research must test this hypothesis). Media monitoring analysis showed that weaker recognition of VYSOČINA Regional Product® might not be caused by difference in media coverage. Characteristics that the respondents connected with the labels were present in media. For deeper analysis a content analysis is necessary. It is important to analyse what, how and in which contexts the regional labelling is presented in media, as they significantly influence the society (McLuhan, 1991). This analysis might help understand why respondents see differences in existing regional brands, that showed correspondence analysis. VYSOČINA Regional Product is particularly distinctive as brand that symbolises environmental friendliness and a specialty. Regional Food Vysočina Region and nonexistent brand are connected the most with Vysočina Region origin and ecological characteristics. Other characteristics that might be tested include Experiment also showed, that any other regional label in Vysočina may easily profit from the brand building effort of the networks built to support the existing regional brands.

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# The effect of learning organization on organizational performance: a case study of Toyota Motor Thailand Co., Ltd.

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## Abstract

The main objective of this study is to investigate the effect of learning organization on organizational performance in Toyota Motor Thailand Co., Ltd. The sample size of quantitative technique in this research was 400 employees who are knowledgeable and working in Toyota Motor Thailand Co., Ltd. The theoretical framework of this study took learning organization as independent variable which used Peter Senge's concept with five dimensions, i.e. personal mastery, shared vision, mental model, team learning and systems thinking. Moreover, organizational performance was also used as dependent variable, which consists of financial perspective (operational income grow, return on investment, sale growth, and market share), customer perspective (on time delivery, quality of delivery, delivery reliability, and customer satisfaction), internal process perspective (efficiency of internal process, cost reduction, process cycle time, and waste rate), and learning and growth perspective (number of new product launches, training, employees satisfaction, and turnover rate). A balanced scorecard was used to measure four perspectives. In the data collection, 41 questions were used in a questionnaire-based survey which was proved by experts. This survey used a five-level rating scale, which is considered as the most appropriate research approach to gather information. Chronbach's alpha was used to test the reliability of questionnaire which can acceptable result was 0.915. For data analysis, a regression analysis was applied to find independent variable on the dependent variable to test hypotheses.

The findings indicated that the current level of dimensions of learning organization that characterize Toyota Company has a moderately positive association with organizational effectiveness and has a strongly positive relation with organizational performance with statistical significance at 0.05 level. In conclusion, the results obtained from this study could be used as a strategy of characteristics of the learning organization applied for the Toyota Company to enhance performance and to be used as a guideline for improvement and planning in order to gain competitive advantage. The recommendation of this study includes a model for integrating HR activities of the organization with the career development process.

## Keywords:

Learning organization, organizational performance, balanced scorecard

## 1. Introduction

Currently, business organizations are facing, and will also continue to face in the future, a number of unprecedented challenges and demands. These challenges are, but are not limited to, rapidly changing environment, fierce competition, globalization, information technology,

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rising expectations and demands of various stakeholders, corporate social responsibility, ethical dilemmas, and the emergence of knowledge economy / society / organization. In an ever-changing business world, the need to gain a competitive advantage is extremely important for companies to survive in the age of globalization. The businesses, such as banks, insurance, oil and car companies, face more challenges, including economic uncertainty, because the prices of products in the markets have been increasing gradually which can lead to the inflation situation as well as the increase of interest rate. Furthermore, there are some issues regarding the political problems in the country, which can result in the lack of confidence and pressure for investment. In this case, most of firms have to adapt and be ready to change in each situation by doing their business carefully. Therefore, in order to sustain, organizations need to adapt themselves to the new change and developments. A learning organization is considered as a major privilege in this competitive world (Zare, Jajarmizadeh, & Abbasi, 2010) because organizations need to learn in order to strive hard to overcome the chaotic and changing conditions. In addition, learning organizations promote innovation and employee creativity which in turn help to improve organizational performance. It can also facilitate knowledge sharing and transfer within the organization which is very important in the process of organizational performance. This supports Peter Senge (1990) who stated that the rate to which an organization learns may become the only sustainable source of competitive advantage for such organization. Many discussions on learning organization have focused on private corporations. The general story is simple enough. In the era of globalization, companies that learn and use this learning to shape new structures, processes and systems are better able to thrive and prosper.

Building a learning organization is an important challenge in the workplace. It needs to create an organizational climate that values experimentation, risk taking, toleration, mistakes, reward system, non-traditional thinking, and knowledge sharing (Daft 2008; Ivancevich et al., 2008). For example, learning is as mere as "problem solving" with a focus on identifying and correcting errors, rather than reflecting inwards to identify own behavior towards solving problems. Also, motivation people always have the right attitude and commitment, in which learning automatically follows.

Based on the concepts introduced in previous literature, many organizations eagerly aim to implement learning organizations' practices. There have been several workshops listed by the Thailand Business Council for Sustainable Development taken place in Thailand's winning companies like Advance Agro Company Limited, Amway Thailand, Bangchak Petroleum Public Company Limited, Electricity Generating Authority of Thailand, PTT Public Company Limited, Saha Union group and Toyota. Jeffrey Liker (2004) in "Toyota way" shares the 14 management principles that have helped Toyota become the largest and most profitable car company in the world. Principle number 14 is "Become a learning organization through relentless reflection and continuous improvement".

A good case study as Toyota Company, which has been steadily growing and expanding, in the market, and playing an important role in car economy. But, in order to keep growing and expanding, and even maintain the current position, Toyota Company has only one choice: to reinforce and expand their capabilities to learn, adapt, innovate and transform themselves, i.e. to build and maintain learning organizations. The significance of this study stems from several reasons. First, human resources are considered the most valuable assets for any organization, particularly automobile organization where financial and material resources are scarce. Second, knowledge has become the main, if not the only, source of sustainable competitive advantage. Third, the learning organization has been widely and strongly advocated as a critical and crucial factor for organizational performance. Fourth, most of the management of Toyota Company is not fully aware of the critical role of a learning organization.

Summarily, a learning organization is one that continually expands its ability to shape its future. A modern knowledge-based service organization always focuses its business to serve and be successful. Learning must be linked to the strategic goals of the organization. The organization's goal is to make continual learning a way of improving the performance of the organization as a total system.

## **2. Objective**

To examine the effect of learning organization on organizational performance

## **3. Literature Review**

In this research has investigated elements namely, definition of learning organization, characteristic of learning organization and also organizational performance.

### **Definition of learning organization**

In the first place, the literature survey focused on the concept of a learning organization (LO). The foundations of learning organizations have been introduced in several ways, but the most widely used definition of a learning organization is Senge's (1990:3) definition that defines learning organization as one where: "people continually expand their capacity to create results they truly desire; new and expansive patterns of thinking are nurtured; collective aspirations are set free; and people are continually learning to learn together".

Farago and Skyrme (1995) define LO as "those that have in place systems, mechanisms and processes, which are used to continually enhance their capabilities and those who work with it or for it, to achieve sustainable objectives for themselves and communities in which they participate. Learning organization is defined by Garvin (1993) as an organization not only skilled at creating, acquiring, and transferring knowledge, but also at modifying its behavior to reflect new knowledge and insights. The heart and soul of learning organization lies in the creation of new results and new knowledge or insights by continuous learning. Though the debate over the nature and importance of learning organization has grown and become more diverse over the years, the basic underlying concept has remained the same: organizations sustain them through their learning capability.

In summary, learning organization is an adequate organizational structure for a fast changing environment, which is especially due to its capability to anticipate change. It provides new ways to manage in the circumstances of almost permanent economic uncertainty and turbulence that dictate need for rapid adjustments to a market environment. A starting point in creating a learning organization seems to be when an organization starts to recognize the need for change.

### **Characteristics of Learning Organization**

The idea of a learning organization is more or less as an ideal and desirable goal that is rather difficult to articulate in practice. Thus, theorists have been trying to emulate those elements that are deemed characteristics of a learning organization. So far, there has no generally admitted understanding which elements are essential for a learning organization. However, there is unanimity between the scholars that a learning organization is a complex association and that interdependencies between characteristics exist.

Therefore, there are some researchers who determine the characteristics of a learning organization as follows:

Watkins and Marsick, (1991) identify six features that characterize a learning organization: creating continuous learning opportunities, promoting inquiry and dialogue, encouraging collaboration and team learning, establishing systems to capture and share learning, empowering people to a collective vision, and connecting the organization to the environment.

Senge, in his landmark book "The Fifth Discipline" (1990), identifies five disciplines that are critical to organizations today if they are to cope with the rapid changes taking place in the world. These five disciplines are: systems thinking, personal mastery, mental model, shared vision and team learning. There have been several different multidimensional models proposed to describe the characteristics of a learning organization. One of leading models

used within the academic literature, which actually originates from the practitioner literature, and used in this thesis is the model proposed by Peter Senge which includes five disciplines as described in *Tab. 1 below*:

**Tab. 1 Senge's dimensions of a learning organization**

Shared Vision	The discipline of creating a shared picture of the future that fosters genuine commitment and engagement. In an organization, a shared vision binds people together around a common identity and a sense of destiny, giving a sense of purpose and coherence to all activities undertaken.
Team Learning	The discipline of raising the collective IQ of a group and capitalizing on the greater knowledge and insights of the collectivity. This implies dialogue and overcoming patterns of defensiveness that undermine group learning.
Personal Mastery	The discipline of continually clarifying and deepening employees' personal visions, and focusing their energies. This includes awareness of personal weaknesses and growth areas as well as humility, objectivity and persistent willingness to pursue self-development.
Mental Model	The discipline of clarifying deeply ingrained assumptions, pictures/images that influence employees' understanding of the world and the actions they take. Change in organizations rarely takes place in the absence of systematic attempts at unearthing these internal pictures, bringing them to surface and holding them rigorously to scrutiny.
System Thinking	A framework for identifying patterns and inter-relationships, seeing the big picture, avoiding over-simplification, overcoming linear thinking and dealing with issues holistically and comprehensively.

Note: This table synthesizes the work from Senge  
 Source : Jamali Khoury and Sahyoun (10, p. 343).

## Organizational Performance

Literature on organizational performance clearly shows that there is no single universal measure that can be used to assess overall organizational performance. Traditional financial measures are not accepted as the sole indicators for organizational performance. Moreover, we can hardly find an organization that is very successful or fails in every aspect.

Many performance measures and models have been developed and advocated by various writers, such as profitability, productivity, efficiency, effectiveness, adaptability, growth, and innovation, etc.

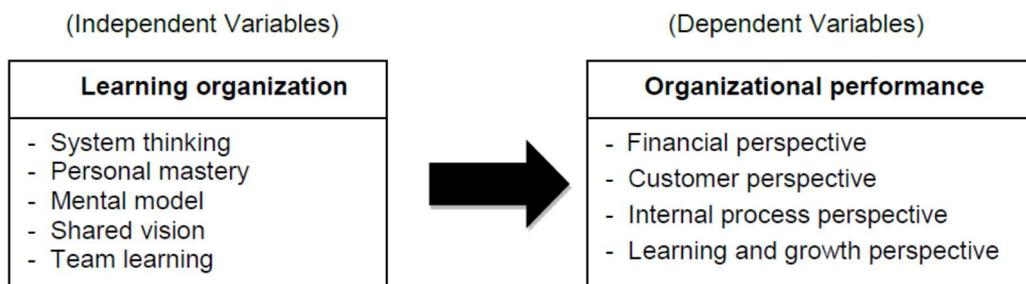
Hodge and Anthony (1994:268-274) classify performance criteria into three groups: efficiency, effectiveness, and humanism. Effectiveness measures include four models/ approaches: goal/output achievement, resource acquisition, internal process, and satisfaction of main constituencies. These models/ approaches complement each other.

Robbins (1998: 483) suggested four performance indicators to assess organizational effectiveness: profit maximization, organizational ability to acquire inputs and transform them

successfully into outputs, maintenance of stability and balance, and identification and satisfaction of customers' needs.

According to Bourguignon (1995), performance refers simultaneously to the action, the result of the action, and the success of the result compared to some benchmarks. All performances being done today will lead to measure values and outcomes tomorrow. Thereby, for better outcomes for tomorrow, throughout the last two decades a number of industries, primarily manufacturing sector, have introduced new methods and techniques to shift traditional paradigms. This has led to the creation of new philosophies, such as concurrent engineering/construction, lean production/construction, and many others like Just- In-Time (JIT), TQM, etc. One of the approaches/models of assessing organizational performance, which have become popular and been widely applied, is the "balanced scorecard". It is a comprehensive management control system that makes a balance between traditional financial and operational measures related to factors that are critical to the organizational success and high concern with markets, customers and employees (Kaplan and Norton, 1992; Chow and Haddad, 1997). The balanced scorecard is a performance measurement tool that focuses on four areas: financial performance, customer service, internal process, and people/innovation/growth. These four measures are interdependent indicators/measures. Daft (2004:293) comments that "this model has attracted much attention and become the main management system in many giant firms, and managers can use it for setting goals, resource allocation, budget planning and rewards."

### Conceptual Framework Model



**Fig. 1 Conceptual Framework Model**

### Study of Hypotheses

The hypotheses of this study were derived from the conceptual framework above based on the effect of characteristics of a learning organization on organizational performance. The hypotheses are listed as follows:

*H1:* Personal mastery, shared vision, mental model, team learning, and system thinking have an effect on organizational performance.

*H2:* Personal mastery, shared vision, mental model, team learning, and system thinking have an effect on organizational performance in terms of financial perspective.

*H3:* Personal mastery, shared vision, mental model, team learning, and system thinking have an effect on organizational performance in terms of customer perspective.

*H4:* Personal mastery, shared vision, mental model, team learning and system thinking have an effect on organizational performance in terms of Internal process perspective

*H5:* Personal mastery, shared vision, mental model, team learning and systems thinking have an effect on organizational performance in terms of learning and growth perspective.

## **4. Research methodology**

### **Population and sampling**

Approximately 5000 total employees has been working in Toyota Motor Co. Ltd., Samutprakarn, Thailand (Based on human resource data in 2014). In addition, a convenience sample was used for this study due to the complexity and difficulty of data collection. Hence, 400 participants have been surveyed by the Researcher that is using the questionnaire that being as a tool to analysis the data.

### **Research Intrument**

The questionnaire consisted of close-ended questions that were translated from English to Thai, native language. Moreover, this questionnaire was developed for the purpose of collecting field data and consisted of three parts.

The first part was about the demography of employees, which included six questions with multiple choices, i.e. gender, age, education, position, time working in the organization, and knowledge about learning organization.

The second part dealt with the learning organization and included twenty-five statements. This part was drawn based on Senge's model (1990) as well as on Chien-Chi Tseng (2010) and Jamali et al., (2008). Rating scale was applied to this technique which has five levels (1= very low to 5 = very high).

1. Personal mastery: Statements 1-5
2. Shared vision : Statements 6-10
3. Mental model : Statements 11-15
4. Team learning : Statements 16-20
5. Systems thinking : Statements 21-25

The third part focused on the organizational performance and included sixteen statements that cover four performance measures based on the balanced scorecard.

Moreover, it was a modified version of the one used in a previous study by Mafini and Giannopoulos et al., (2013). Rating scale was applied to this technique which has five levels (1= very low to 5 = very high).

1. Financial performance : Statements 1-4
2. Internal process : Statements 5-8
3. Customer service : Statements 9-12
4. Learning / growth / innovation : Statements 13-16

The reliability test of the questionnaire was conducted with thirty employees of Toyota Motor Thailand Co.,Ltd. It indicated the reliability value of the scale at 0.915. The result suggested that most of the items contributed to internal consistency.

### **Data collection**

The letter sent by the Researcher to the HR manager to take an appointment for distributing questionnaires among the employees or upper level workers. 400 sets of questionnaires sent to the HR representatives via post office and 375 sets of questionnaires was collected out of 400 questionnaires distributed, the response rate was 93.75%.

### **Data analysis**

In this study, the following relevant statistical methods and tools were used:

1. The first part of the questionnaire was the demographic data. Descriptive analysis was used, i.e. analysis of frequency, percentage, mean, and standard deviation.
2. The second part was used descriptive analysis to describe the learning of the organization. Moreover, third part was also used descriptive analysis to describe organizational

performance, which used the balanced scorecard as an indicator. Multiple regression analysis was used to test hypotheses both of this part.

## 5. Results and Discussions

### Charateristics

The study shown that most of 221 respondents (58.90%) were male, 172 respondents (45.90%) were 30-39 years old, 168 respondents (44.80%) obtained a bachelor's degree, 274 respondents (73.10%) were employees, 217 respondents (57.90%) were 5-0 years of working time, 230 respondents (61.30%) were knowledgeable of learning organization.

### Learning organization level

The result on disciplines for learning organization reveal that the overall attitude of respondents was at a high level ( $X = 3.58$ , S.D. = 0.47). As a result, it was found that personal mastery was ranked as the high level and followed by mental model, team learning, and systems thinking, respectively. In addition, the last item, shared vision, was ranked as the moderate level. This is shown in the following *Tab.2*:

**Tab. 2: Mean ( $\bar{X}$ ) and Standard Deviation (S.D.) of learning organization**

learning organization	$\bar{X}$	S.D.	Interpretation
Personal mastery	3.74	0.57	High
Mental model	3.71	0.55	High
Shared vision	3.39	0.61	Moderate
Team learning	3.56	0.63	High
System thinking	3.50	0.59	High
<b>Overall</b>	<b>3.58</b>	<b>0.47</b>	<b>High</b>

### Organizational performance level

The result on organizational performance reveal the overall attitude of respondents was at a high level ( $X = 3.58$ , S.D. = 0.43). As a result, it was found that internal process was ranked as the high level, followed by learning/growth/ innovation, financial performance was ranked as the high level, and the last item, customer service, was also ranked as the high level. This is shown in the following *Tab.3*.

**Tab. 3 Mean ( $\bar{X}$ ) and Standard Deviation (S.D.) of organizational performance**

Organizational Performance	$\bar{X}$	S.D.	Interpretation
Financial performance	3.55	0.58	High
Customer service	3.53	0.63	High
Internal process	3.68	0.66	High
Learning/growth/innovation	3.56	0.48	High
<b>Overall</b>	<b>3.58</b>	<b>0.43</b>	<b>High</b>

### The effect of learning organization on organizational performance

Multiple regression analysis was used to test hypotheses of the study. The decision is based on the probability ( $p$ -value) of obtaining a sample mean, given that the value stated in the null hypothesis is true. If the probability of obtaining a sample mean is less than 5%

when the null hypothesis is true, then the decision is to reject the null hypothesis. If the probability of obtaining a sample mean is greater than 5% when the null hypothesis is true, then the decision is to retain the null hypothesis.

*H1*: Personal mastery, shared vision, mental model, team learning, and system thinking have an effect on organizational performance.

Based on the regression analysis to find five independent variables that have an effect on organizational performance as shown in *Tab 4*:

The result of initial model shown that there are four independent variables, i.e. personal mastery, mental model, team learning, and system thinking, which have an effect on organizational performance. The remaining independent variable (shared vision) plays no role increasing on organizational performance at 0.05 significance level. Therefore, we run a new regression model that choose only four independent variables have an effect on the dependent variable.

After running a new regression model, the result indicated that final model has a rather moderate prediction power 50.60% (adjust  $R^2 = 0.506$ ,  $p < 0.05$ ) of total organizational performance variance. The most important predictor variable is team learning ( $\beta = 0.209$ ,  $p = 0$ ) which is positively related to organizational performance, followed by systems thinking ( $\beta = 0.196$ ,  $p = 0$ ), mental model ( $\beta = 0.311$ ,  $p = 0$ ), and personal mastery ( $\beta = 0.083$ ,  $p = 0.28$ ). Based on the statistical results of final regression model, we found that this model includes four independent variables, i.e. personal mastery, mental model, team learning, and system thinking, which have an effect on organizational performance at 0.05 significance level. The estimated organizational performance ( $y$ ) are based on team learning, system thinking, mental model, and personal mastery.

According to *H1*, the final equation model can be written as:

$$y = 1.355 + .209 (\text{team learning}) + .396 (\text{system thinking}) + .111 (\text{mental model}) + .081 (\text{personal mastery}).$$

**Tab. 4 Personal mastery, shared vision, mental model, team learning, systems thinking and organizational performance.**

Independent Variables	organizational performance (Initial model)			organizational performance (Final model)		
	Beta	t	p-value	Beta	t	p-value
Personal mastery	.080	2.176	.030*	.081	2.206	.028*
Shared vision	.055	1.687	.093			
Mental model	.116	3.017	.003*	.133	3.601	.000*
Team learning	.209	5.521	.000*	.209	5.524	.000*
System thinking	.175	4.407	.000*	.196	5.200	.000*
*Significance at .05 level	<b>Dependent variable:</b> Organizational performance			<b>Dependent variable:</b> Organizational performance		
	Adjust $R^2$ : .509 df: 5, 369 F: 78.485 $p = .000$			Adjust $R^2$ : .506 df: 4, 170 F: 96.912 $p = .000$		

*H2*: Personal mastery, shared vision, mental model, team learning, and system thinking have an effect on organizational performance in terms of financial perspective.

Based on the regression analysis to find five independent variables that have an effect on organizational performance in terms of the financial perspective as shown in *Tab 5*:

The result of initial model shown that there are three independent variables, i.e. shared vision, team learning, and system thinking, which have an effect on organizational performance in terms of financial perspective. Personal mastery and mental model play no role increasing on the financial perspective at 0.05 significance level. Therefore, we run a new regression model that choose only three independent variables have an effect on the dependent variable.

After running a new regression model, the result indicated that final model has a rather moderate prediction power 49.30% (adjust  $R^2 = 0.493$ ,  $p < 0.05$ ) of total organizational performance in terms of financial perspective. The most important predictor variable is team learning ( $\beta = 0.375$ ,  $p = 0$ ) which is positively related to organizational performance in terms of financial perspective, followed by system thinking ( $\beta = 0.286$ ,  $p = 0$ ), and shared vision ( $\beta = 0.107$ ,  $p = 0.12$ ). Based on the statistical results of final regression model, we found that this model includes three independent variables, i.e. shared vision, team learning, and system thinking which have an effect on organizational performance in terms of the financial perspective at 0.05 significance level. The estimated organizational performances of the financial perspective (y) are based on team learning, system thinking, and shared vision.

According to *H2*, the final equation model can be written as:

$$y = 0.853 + .375 (\text{team learning}) + .286 (\text{system thinking}) + .107 (\text{shared vision}).$$

**Tab. 5 Characteristics of learning organization have an effect on organizational performance in terms of financial perspective**

Independent Variables	Financial Performance (Initial model)			Financial Performance (Final model)		
	Beta	t	p-value	Beta	t	p-value
Personal mastery	.091	1.871	.062			
Shared vision	.170	3.311	.001*	.107	3.311	.012*
Mental model	.053	1.231	.219			
Team learning	.287	5.692	.000*	.375	5.692	.000*
System thinking	.252	4.760	.000*	.286	4.760	.000*
*Significance at .05 level	Dependent variable: F			Dependent variable: F		
	Adjust R <sup>2</sup> : .517 df: 5, 369 F: 91.151 p = .000			Adjust R <sup>2</sup> : .491 df: 1, 173 F: 122.408 p = .000		

*H3*: Personal mastery, shared vision, mental model, team learning, and systems thinking have an effect on organizational performance in terms of customer perspective.

Based on the regression analysis to find five independent variables that have an effect on organizational performance in terms of customer perspective as shown in *Tab 6*:

The result of initial model shown that there are three independent variables, i.e. Personal mastery, team learning, and system thinking, which have an effect on organizational performance in terms of customer perspective. Shared vision and mental model play no role increasing on customer perspective at 0.05 significance. Therefore, we run a new regression model that choose only three independent variables have an effect on the dependent variable. After running a new regression model, the result indicated that final model has a rather

moderate prediction power 41.10 % (adjust  $R^2 = 0.411$ ,  $p < 0.05$ ). Most important predictor variable is system thinking ( $\beta = 0.308$ ,  $p = 0$ ), followed by team learning ( $\beta = 0.280$ ,  $p = 0$ ), and personal mastery ( $\beta = 0.197$ ,  $p = 0$ ), which are positively related to organizational performance in terms of customer service. Based on the statistical results of final regression model, we found that this model includes three independent variables, i.e. system thinking, team learning, and personal mastery which have an effect on organizational performance in terms of customer perspective at 0.05 significance level. The estimated organizational performance of customer perspective (y) is based on team learning, system thinking, and personal mastery.

According to *H3*, the final equation model can be written as:

$$y = 0.721 + .308 (\text{system thinking}) + .280 (\text{team learning}) + .197 (\text{personal mastery})$$

**Tab. 6 Characteristics of learning organization have an effect on organizational performance in terms of customer perspective**

Independent Variables	Customer Service (Initial model)			Customer Service (Final model)		
	Beta	t	p-value	Beta	t	p-value
Personal mastery	.147	2.545	.011*	.197	3.582	.000*
Shared vision	.116	1.905	.058			
Mental model	.094	1.830	.068			
Team learning	.254	4.250	.000*	.280	4.706	.000*
Systems thinking	.241	3.850	.000*	.308	5.242	.000*
*Significance at .05 level	<b>Dependent variable: C</b>			<b>Dependent variable: C</b>		
	Adjust R <sup>2</sup> : .423 df: 5, 369 F: 55.884 p = .000			Adjust R <sup>2</sup> : .411 df: 3, 371 F: 88.148 p = .000		

*H4*: Personal mastery, shared vision, mental model, team learning, and system thinking have an effect on organizational performance in terms of internal process perspective.

Based on the regression analysis to find five independent variables that have an effect on organizational performance in terms of internal process perspective as shown in *Tab 7*:

The result of initial model shown that there is no effect of independent variables on organizational performance in terms of internal process perspective at 0.05 significance level. Therefore, we run a new regression model and change the method from entering to stepwise in order to find the significance of this model. It was found that there is only one independent variable which is system thinking has an effect on the dependent variable. The result of final model indicated that the model has a rather low prediction power 2.7 % (adjust  $R^2 = 0.027$ ,  $p < 0.05$ ) of total organizational performance in terms of internal process perspective. System thinking was the single best predictor for the final model ( $\beta=0.192$ ,  $p=0.001$ ), which is positively related to organizational performance in terms of internal perspective. Therefore, the estimated organizational performances of internal process perspective (y) are based on system thinking.

According to *H4*, the final equation model can be written as:

$$y = 3.010 + .192 (\text{system thinking}).$$

**Tab. 7 Characteristics of learning organization have an effect on organizational performance in terms of internal process perspective**

Independent Variables	Internal Process (Initial model)			Internal Process (Final model)		
	Beta	t	p-value	Beta	t	p-value
Personal mastery	-.066	-.841	.401			
Shared vision	.096	1.168	.244			
Mental model	.053	.760	.448			
Team learning	.085	1.050	.294			
System thinking	.085	.996	.320	.192	3.365	.001*
*Significance at .05 level	Dependent variable: I			Dependent variable: I		
	F: 3.143 $p = .009$			F: 11.312 $p = .001$		

*H5*: Personal mastery, shared vision, mental model, team learning and system thinking have an effect on organizational performance in terms of learning and growth perspective. Based on the regression analysis to find five independent variables that have an effect on organizational performance in terms of learning and growth perspective as shown in *Tab.8*:

The result of initial model shown that there are three independent variables, i.e. personal, team learning, and systems thinking that have an effect on organizational performance in terms of learning and growth perspective. Shared vision and Mental model play no role increasing on learning and growth perspective at the 0.05 significance level. Therefore, we run a new regression model that choose only three independent variables have an effect on dependent variable.

After running a new regression model, the result indicated that final model has a rather moderate prediction power 33.40% (adjust  $R^2 = 0.334$ ,  $p < 0.05$ ). Most important predictor variable is team learning ( $\beta = 0.223$ ,  $p = 0$ ), followed by personal mastery ( $\beta = 0.175$ ,  $p = 0$ ), and systems thinking ( $\beta = 0.146$ ,  $p = 0.003$ ), which are positively related to organizational performance in terms of learning and growth perspective. Based on the statistical results of final regression model, we found that this model includes three independent variables, i.e. team learning, personal mastery, and system thinking which have an effect on organizational performance in terms of learning and growth perspective at 0.05 significance level. The estimated organizational performance of learning and growth perspective (y) are based on team learning, personal mastery, and system thinking.

According to *H5*, the final equation model can be written as:

$$y = 1.602 + .223 (\text{team learning}) + .175 (\text{personal mastery}) + .146 (\text{system thinking}).$$

**Tab. 8 Characteristics of learning organization have an effect on organizational performance in terms of learning and growth perspective**

Independent Variables	Learning and Growth (Initial model)			Learning and Growth (Final model)		
	Beta	t	p-value	Beta	t	p-value
Personal mastery	.146	3.056	.002*	.175	3.883	.000*
Shared vision	.082	1.630	.104			
Mental model	.019	.443	.658			
Team learning	.208	4.220	.000*	.223	4.585	.000*
System thinking	.121	2.337	.020*	.146	3.044	.003*
*Significance at .05 level	Dependent variable: L			Dependent variable: L		
	Adjust R <sup>2</sup> : .336 df: 5, 369			Adjust R <sup>2</sup> : .334 df: 3, 371		
	F: 63.417			p = .000		

According to the hypotheses, the characteristics of learning organization that have an effect on each dimension of organizational performance can be summarized as shown in Tab.7 below:

**Tab. 7 Summary of characteristics of learning organization that have an effect on organizational performance**

Organizational Performance	Financial Performance	Customer Service	Internal Process	Learning/growth/innovation	Overall of Organizational Performance
<b>learning organization</b>					
Personal mastery	-	√	-	√	√
Mental model	-	-	-	-	√
Shared vision	√	-	-	-	-
Team learning	√	√	-	√	√
Systems thinking	√	√	√	√	√

There is a positive influence found in personal mastery, which is positively related to organizational performance in terms of customer service, learning/growth/innovation, and overall organizational performance, that was significant with  $p$ -value < 0.05. This supports Robbins (1998: 483) who suggests four performance indicators to assess organizational effectiveness: profit maximization, organizational ability to acquire inputs and transform them successfully into outputs, maintenance of stability and balance, and identification and satisfaction of customer needs. Kotler (2000: 40-42) identifies four key dimensions to achieve competitive performance: stakeholders, internal process, resources and organizational management.

There is a positive influence found in shared vision, which is positively related to organizational performance in terms of financial performance, that was significant with  $p$ -value < 0.05. It supports Metin Kaplan (2014) who studies about the relationship between organizational learning and financial performance: A study of small-sized businesses in Turkey founded shared vision which refers to an organization-wide focus on learning (Calantone et al., 2002: 516). Shared vision influences the direction of learning and leads to increase in the quality of learning. In fact, without shared vision, learning of individuals in organization will be extremely meaningless. In other words, even though individuals are stimulated for learning, their problem is that they don't know what to learn unless they have a shared vision (Eshlaghy and Maatofi, 2011: 116).

There is a positive influence found in team learning, which is positively related to organizational performance in terms of financial performance, customer service, learning/

growth/innovation, and overall of organizational performance, that was significant with  $p$ -value  $< 0.05$ . It supports Farhad Alipour (2014) who studies about learning organization and organizational performance: Mediation role of entrepreneurship. To improve their performance, organizations need to focus on continuous learning and use of knowledge, which can serve as a critical key to success for facilitating individual, team, and organizational learning that can in turn lead to continuous improvement and innovation in business operations (Harrim, 2008; Watkins & Marsick, 1996; Weldy, 2009). In order for organizations to achieve these ends, they need to have the qualities of learning organization.

According to Watkins and Marsick (1993, p.8), learning organization is “ an organization that learns continuously and transforms itself. Learning takes place in individuals, teams, the organization and even communities that the organization interacts. Learning is a continuous, strategically used process – integrated with, and running parallel to work”.

There is a positive influence found in systems thinking, which is positively related to organizational performance in terms of financial performance, customer service, internal process, learning/growth/innovation, and overall of organizational performance, that was significant with  $p$ -value  $< 0.05$ . It supports Li Ming-fei. et al., (2007) who examine the construct validity of the learning organization concept and its influence upon firm performance in mainland China. Based on the theoretical framework proposed by Watkins and Marsick, the results showed that the learning organization in the Chinese context consisted of four dimensions as follows: support individual learning for achieving collective vision, build communication and innovation mechanism, encourage team learning and collaboration, and advocate systems thinking and strategic leadership. A balanced scorecard-based performance evaluation questionnaire was developed. Regression analyses were used to examine the relationship between learning organization and firm performance. The results indicate that learning organization has a positive influence on firm performance. The study proves the necessity to construct learning organization for the purpose of improving the enterprise performance.

## 6. Conclusion

This research studied the effect of learning organization (personal mastery, mental model, shared vision, team learning, and systems thinking) on organization performance of Toyota Motor Thailand Co., Ltd. The results of this study can be used in two aspects, i.e. organizational and academic aspects. In organizational aspect, executives, heads, managers and staff can use the results of this study as a standard for acceptable organizational performance or for creating a new dimension in organizational performance that can raise more advantages over their competitors and differentiate their organization apart from others. Based on the hypothesis, we found that this model includes four independent variables, i.e. personal mastery, mental model, team learning, and systems thinking, which have an effect on organizational performance. The remaining independent variable (shared vision) plays no role in increasing the organizational performance at the 0.05 significance level. In this study, the author examined the effect of learning organization and identified contributing elements between personal mastery, mental model, shared vision, team learning, and systems thinking towards organization performance of Toyota Motor Thailand Co., Ltd. Data in the study were collected by questionnaire with 375 staffs from Toyota Motor Thailand Co., Ltd., which are located in Samutprakarn, and came from non-probability method called a convenience sampling.

## **7. Recommendations for research**

1. Management of Toyota Company should maintain and reinforce the current levels of learning organization their firms have developed. In fact, they should keep moving steadily towards reaching a higher level of continual learning.

2. In order that organizations develop higher levels of continual learning, and consequently attain a higher performance level, management should give prompt special attention to the following areas:

- In terms of shared vision, HR also needs to concentrate employees' efforts are needed to enhance and reinforce their acceptance and commitment to the company's mission, vision and goals.
- Managers need to discuss constructively with employees about their mistakes in order to avoid these mistakes in the future.
- Managers should develop employees to have knowledge and also support their idea for new innovation.
- Team learning and system thinking should encourage, support, and even reward experimentation in every level.
- The automotive organizations should take benefit from this research result by providing a meaning job to them can learn in order to develop their knowledge.

## **8. Recommendations for further studies**

The researcher recommends the following points for further studies:

1. A comparative study on the relationship and identification of contributing elements in a learning organization (personal mastery, mental model, shared vision, team learning, and systems thinking) on organization performance from Toyota Motor Thailand Co., Ltd. In different branches, such as Chachoengsao or Samutsakorn, etc., should be conducted. The study will be one effective way of indicating the effectiveness of the relationship and identification of contributing elements in a learning organization on organizational performance at different locations. The result can help executives, heads and managers realize both strong and weak points of others and can adapt these points to improve their relationship and identify contributing elements in a learning organization on organization performance from Toyota Motor Thailand Co., Ltd. in different branches.

2. The study of relationship and identification of contributing elements in a learning organization on organization performance from Toyota Motor Thailand Co., Ltd. to compete the rivals and fulfill the needs of its staff.

3. A similar study should be conducted in other organizations, such as government or private organizations, to gain better understanding of organizational learning in different cultures and levels of learning.

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# Analysis of Tourism in Selected Latin America Countries

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## Abstract

Given the continued growth in tourism over the long run, this paper intends to explore this topic within the Latin America region. In doing so, the tourism will be assessed over 4 indicators, namely: average expenditures on tourism per one tourist, revenues per one inhabitant from incoming tourism, number of tourists per 1000 inhabitants, and most importantly, Travel and Tourism Competitiveness Index (TTCI). As the level of tourism is expected to vary among the Latin America countries, groupings of similar tourism profiles will be constructed. To do so, hierarchical clustering using the Ward's criterion will be employed. Finally, cluster description along with projection of cluster results into a cartogram will be presented.

## Keywords

Latin America, tourism, cluster analysis, TTCI, indicators

## Introduction and Objectives

Before being more concerned with tourism in Latin America, let's first define what geographically Latin America indeed means. Latin America is a name for region that spreads from the river Rio Grande in Mexico to Cape Horn in the South America. It covers 4 sub-regions, namely: the North America, the Central America, Caribbean and the South America. The North America covers only Mexico while the Central America comprises 7 countries (Guatemala, Belize, Salvador, Honduras, Nicaragua, Costa Rica and Panama). Caribbean is the most indented area, it spreads over 3 sub-regions: the Bahamas, the Lesser Antilles and the Greater Antilles. The Caribbean islands are organized into 30 territories of which only 13 are sovereign states. The South America consists of 13 states (Columbia, Ecuador, Venezuela, Guyana, Suriname, Peru, Brazil, Bolivia, Chile, Paraguay, Uruguay, Argentina and French Guiana) and altogether there are 33 sovereign states that make up the Latin America.

Latin America's tourism and travel industry is facing a continuous growth over the long term. Revenues from incoming tourism have dramatically risen since 2000 and amounted to 33.5 billion USD as compared to 57.8 billion USD in 2010 in 33 Latin America countries. In doing so, it was the South America region that encountered the fastest grow (10.6 billion USD in 2000 compared to 23.5 billion USD in 2010) while Caribbean, North and Central America have been growing at slower rate.<sup>3</sup> In addition, number of arrivals due to tourism has been on average rising over the same period as well. Specifically, North, Central and South America faced grow (besides Brazil). In some countries such as Guatemala, Costa Rica, Panama, Bolivia, Columbia and Peru the jump was even more than double then back in 2000. Situation in Caribbean varied – a decline in Bahamas, Barbados, Grenada, Saint Vincent, Grenadines and Trinidad and Tobago was outperformed by a rapid rise in Dominican Republic, Jamaica and Cuba.

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<sup>3</sup> The World Bank - Indicators. [Online]. [Cited: 2013-10-27]. Available at: <<http://data.worldbank.org/indicator>>.

The impact of tourism on the development of these countries is undisputable – it generates incomes into the state and local budget, it promotes employment by creating new job positions and business opportunities, it encourages domestic and foreign spending and finally, it stimulates demand. At the same time though, one shall bear in mind environmental impacts of tourism and related sustainability.

So that tourism can freely develop, however, following assumptions need to be satisfied first (Drobná and Morávková, 2007) Safety, political stability, level of economy, standards of living environmental situation, level of transport and tourism infrastructure collectively constitute the objective assumptions. In this sense, economic situation differs a lot in these countries. In terms of GDP per capita there are poor regions such as Haiti, Nicaragua, Honduras on one hand and rather rich ones such as Bahamas, Barbados and Trinidad and Tobago on the other hand. From the standpoint of safety, Barbados, Chile and Uruguay manifest the highest level of safety whereas Columbia and Venezuela show the lowest level (World Economic Forum, 2013). Transportation infrastructure very loosely approaches the western standards. The air transportation best works in Barbados and Costa Rica while Paraguay and Haiti dispose of very low level. However, every sovereign state has own airport.<sup>4</sup> Barbados and Trinidad and Tobago performs best in terms of land transportation while the worst railways and highways are prevalent in Venezuela and Haiti. Furthermore, one can encounter the highest level of density of railway network in Trinidad and Tobago, Jamaica or Barbados whereas the lowest density level falls upon Guyana, Suriname and Bolivia. When comes to tourism infrastructure, Barbados and Costa Rica are best equipped with recreational facilities while the equipment in Guyana and Haiti is rather very low. Cultural attractiveness forms another set of assumptions. In this regard, historical heritage from Mayan, Inca or Aztec civilization plays a major role here.

As demonstrated above, the individual country performance varies. Thus, bearing this in mind the, the objective of this paper is to describe international long term (for stays longer than 24 hours) incoming tourism in the Latin America (regardless from which foreign country tourists come) by means of cluster analysis. In this regard, cluster analysis is expected to form groupings of similar profiles (i.e. homogeneity) on tourism within clusters and at the same time pinpoint differences (i.e. heterogeneity) when compared across clusters.

## Data and Methodology

In order to assess the quality of tourism 4 indicators were deemed important: Travel and Tourism Competitiveness Index (1), average expenditures on tourism per one tourist (2), average revenues per one inhabitant from incoming tourism (3) and number of tourists per 1000 inhabitants (4). In doing so, last three indicators were calculated as fractions as follows:

- Indicator *average expenditures on tourism per one tourist* (expressed in USD) was calculated as a ratio of total revenues form incoming tourism and number of arrivals due to tourism. Both indicators were published within the framework of the “Yearbook of Tourism Statistics” brochure to be accessible from the World Bank database.
- Indicator *average revenues per one inhabitant from incoming tourism* (expressed in USD) was then computed as a ratio of total revenues form incoming tourism and population of visited country. The latter was, again, obtained from the World Bank database.
- Finally, indicator *number of tourists per 1000 inhabitants* was calculated as a ratio of number of arrivals due to tourism (multiplied by 1000) and population of visited country.

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<sup>4</sup> Skyscanner. [online]. [Cited: 2014-01-30]. Available at: <<http://www.skyscanner.cz/letistni/c/letiste-v-stredni-amerika-a-karibik.html>>.

The indicator Travel and Tourism Competitiveness Index (TTCI) remained unchanged (released within the Travel and Tourism Competitiveness Report 2009 by the World Economic Forum) (Blanke and Chiesa, 2009). TTCI reflects level of tourism attractiveness in a given country and is measured on a 7-point scale where 1 indicates very low level of attractiveness and 7 very high level of attractiveness. The index is calculated from the following three basic sub-indices (altogether though it includes more than 70 indicators)<sup>5</sup>:

- Regulatory framework of tourism – politics and legislation, environment sustainability, safety, health and hygiene and state support of tourism
- Business environment and tourism infrastructure – airport infrastructure, land transport, tourist infrastructure, information technology infrastructure and price competitiveness in tourism
- Human, cultural and natural sources

For the analysis the 2009 data will be used. There are several reasons for that. First, data to be available are commonly with missing values and second, reported with substantial time delay. The UNWTO organization published last brochure in year 2013, however, last year recorded was 2011. In addition, the 2011 year is incomplete to a great extent. Simultaneously, the data collection happens once in couple of years (e.g. the TTCI is collected every two years, that is, in 2013, 2011 and 2009). Therefore, to avoid above mentioned problems year 2009 will be assessed.

Furthermore, due to data unavailability (for small islands in Caribbean, for instance), only 23 out of 33 sovereign states will be subjected to the cluster analysis. Based on that, only states that are included in the TTCI amongst 125 best were selected. Thus, the analysis will be performed on the following states:

- North America – Mexico
- Central America – Guatemala, Honduras, Costa Rica, Nicaragua, Panama and Salvador
- Caribbean – Barbados, Dominic Republic, Jamaica, Trinidad and Tobago
- South America – Columbia, Ecuador, Venezuela, Guyana, Suriname, Peru, Brazil, Bolivia, Chile, Paraguay, Uruguay and Argentina

As mentioned elsewhere groupings of objects (here states) will be formed using cluster analysis, more specifically, by means of *hierarchical agglomerative clustering*. In doing so, groupings of objects will be created so as to yield *squared Euclidean distance*. Similarity of clusters will be then assessed using the *Ward's method* which joins those clusters together that minimize the within-cluster variability and simultaneously maximize the between-cluster variability.

## Results

As indicators were expressed in different units and have markedly differing mean and variability (see tab. 1), the data matrix (prior to cluster analysis) needs to be standardized first. In addition, high correlations between indicators shall be treated with great caution since these may bias the results of cluster analysis significantly (high correlations act as weighting). Therefore, it is customary to re-weight variables if high correlations are present and none of them may be excluded from analysis. Based on that, correlation matrix (see tab. 2) was inspected. By doing so, high correlations between indicator *number of tourists per 1000 inhabitants* and indicator *average revenues per one inhabitant from incoming tourism* were found (marked in red,  $r=0.96$ ). Owing to this, z-scores of uncorrelated variables (*average expenditures on tourism per one tourist* and *TTCI*) were weighted by assigning weight of 2 to them.

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<sup>5</sup> Česká republika – bezpečná destinace. [Online]. [Cited 2013-10-31]. Available at: <<http://vyzkumy.czechtourism.cz/download.php?type=analyzy&file=0604.pdf>>.

**Tab. 1 Descriptive statistics of 4 indicators**

Variables	N	Mean	Min	Max	St.dev.
Avg. expenditures on tourism per one tourist	23	936.7	248.2	2161.9	495
Number of tourists per 1000 inhabitants	23	282.8	21.5	1860.2	387.6
Avg. revenues per inhabitant from incoming tourism	23	360.1	29.1	4021.4	825.7
TTCI	23	3.9	3.2	4.8	0.4

Source: authors

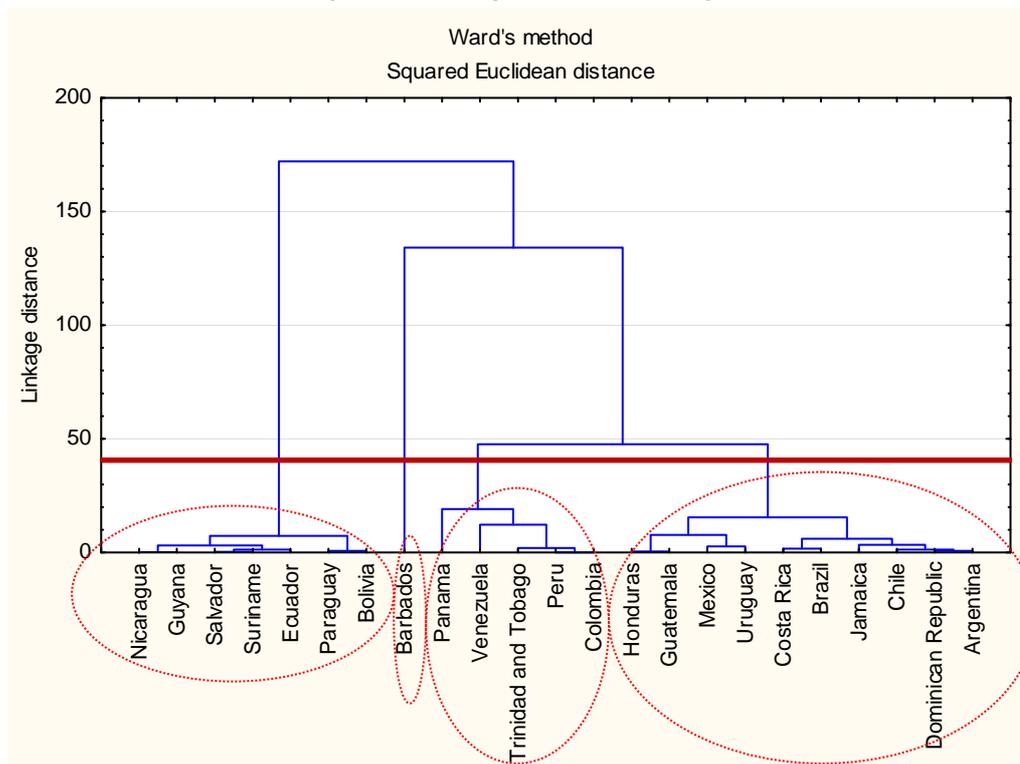
**Tab. 2 Correlation matrix of 4 indicators**

Variables	Avg. expenditures on tourism per one tourist	Number of tourists per 1000 inhabitants	Avg. revenues per inhabitant from incoming tourism	TTCI
Avg. expenditures on tourism per one tourist	1.00	0.52	0.62	0.58
Number of tourists per 1000 inhabitants	0.52	1.00	0.96	0.60
Avg. revenues per inhabitant from incoming tourism	0.62	0.96	1.00	0.58
TTCI	0.58	0.60	0.58	1.00

Source: authors

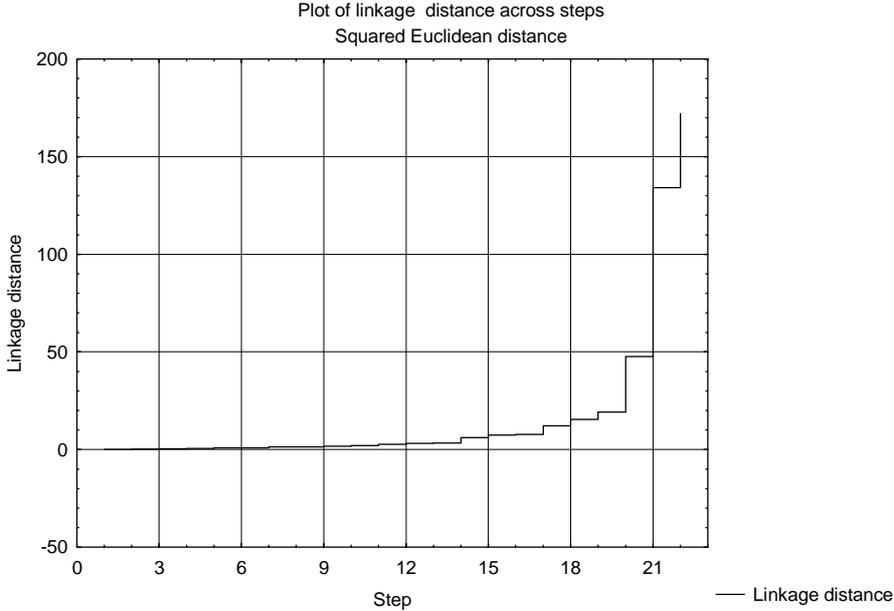
Having prepared data matrix into a necessary form, cluster analysis was conducted. In doing so, 4 clusters were created (see groupings of states in dendrogram, fig.1) based on the amalgamation schedule (fig. 2). As amalgamation schedule manifests, significant change in heterogeneity takes place in the 21. step. Therefore, to avoid this, cluster solution in the 20. step ought to represent the final cluster solution.

**Fig. 1 Dendrogram (clustering cases)**



When clustering, two most similar objects were Guatemala and Honduras which collectively contributed to cluster 3. This cluster emerged as a result of joining two clusters comprising Argentina, Dominican Republic, Chile, Jamaica, Brazil, Costa Rica together with Honduras, Guatemala, Mexico and Uruguay. Bolivia and Paraguay were then objects which as first grouped together and along with Ecuador, Suriname, Nicaragua, Guyana and Salvador formed cluster 2. Colombia, Peru and Trinidad and Tobago resembled at most and together with Venezuela and Panama created cluster 4. Due to specificity across all indicators, Barbados formed one-cluster membership within cluster 1.

**Fig. 2 Plot of linkage distance across steps (graph of amalgamation schedule)**



Description along with cluster membership is presented in tab. 3 (where high values of indicators are associated with good performance and low values with bad performance), cartogram portraying a 4-cluster solution is shown in fig. 3 and mean values of indicators within clusters are in fig. 4.

**Tab. 3 Description of formed clusters**

Clusters	No. of states	Cluster membership	Description
1.cluster	1	Barbados	Very high values on all indicators.
2.cluster	7	Bolivia, Ecuador, Nicaragua, Paraguay, Salvador, Suriname	Very low values of <i>TTCI</i> and <i>average expenditures on tourism per one tourist</i> ; low values of <i>average revenues per one inhabitant from incoming tourism</i> and <i>number of tourists per 1000 inhabitants</i> .
3.cluster	10	Argentina, Brazil, Dominic Republic, Guatemala, Honduras, Chile, Jamaica, Costa Rica, Mexico, Uruguay	High values of <i>TTCI</i> ; average values on <i>average expenditures on tourism per one tourist</i> , <i>average revenues per one inhabitant from incoming tourism</i> and <i>number of tourists per 1000 inhabitants</i> .
4.cluster	5	Columbia, Panama, Peru, Trinidad and Tobago, Venezuela	Average values of <i>TTCI</i> and <i>average revenues per one inhabitant from incoming tourism</i> ; high values on <i>average expenditures on tourism per one tourist</i> and low values on <i>number of tourists per 1000 inhabitants</i> .

Source: authors

**Fig. 3 Cartogram depicting results of cluster analysis**



One-member-cluster comprising only Barbados tends to be very much different to any other Latin American country as measured by tourism indicators. Despite the fact it spreads over small area (only 430 km<sup>2</sup>) it performs best with respect to tourism. Barbados contributes more than 30% to the overall GDP and majority of the workforce works in the service sector (official language is English).

Cluster 2, on the contrary, includes states with the highest level of poverty in the Latin America as measured by GDP per capita. In addition, these states were largely affected by authoritarian system in the past. Furthermore, more than one half of states suffer heavily under drug business, tourism contribution to overall GDP is very low (besides Nicaragua) and, most importantly, these states are still dominated by agriculture.

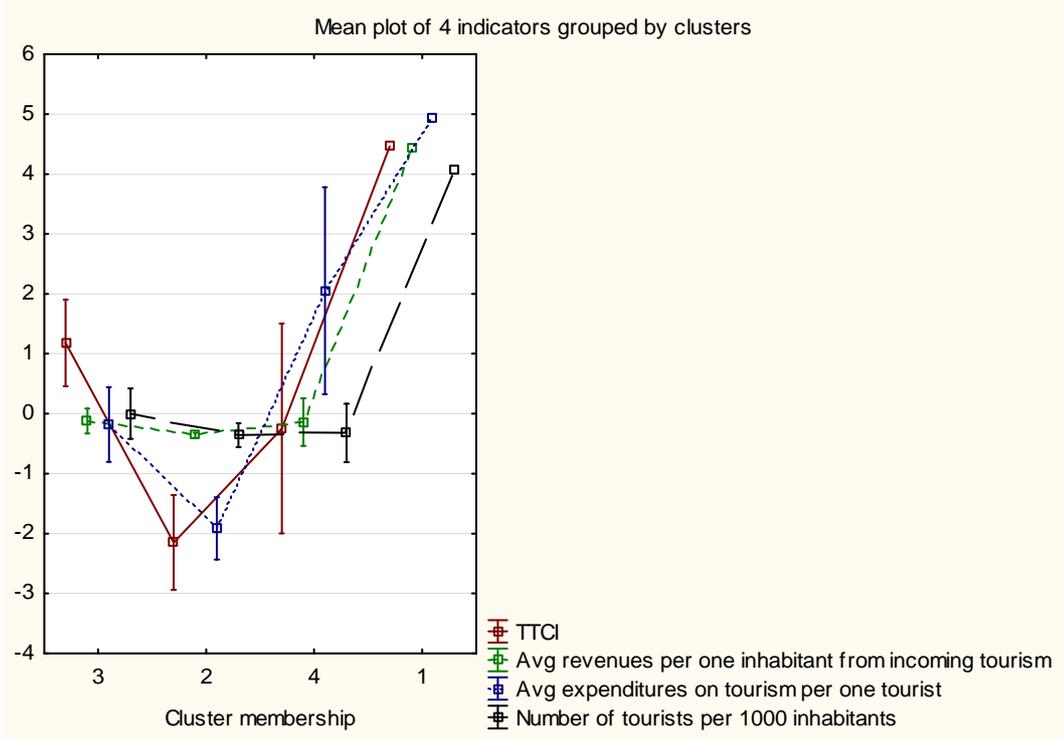
Cluster 3 grouped states with different economic level, for instance, rich Argentina and Chile compared to poor Guatemala and Honduras. Apart from the obvious exceptions, these systems are ruled by democratic systems. Drug related problems are present only in Mexico and Brazil. This cluster involves states in which economic activity is evenly distributed into all spheres, that is, an equal number of states that are dominated by agriculture and states dominated by services. More than half of states have twice as much tourism to GDP contribution as states in cluster 2 and cluster 3.

States in the cluster 4 may be regarded as states with above average GDP per capita. These states are characterized by non-authoritarian systems, however, more than half suffer from illegal drug trade, that is, activities related to manufacture, distribution and sale of drugs. Apart from Panama, the tourism to GDP ratio is very low. Mining is activity prevalent in most of countries.

According to the World Economic Forum (points assigned in the framework of TTCI), states within cluster 4 (besides Panama) show the lowest level of safety to travel while one-member-cluster with Barbados was considered as the safest travel destination as compared to the 22 analysed Latin America countries.

Profile diagram (fig. 4) demonstrates mean values of standardized variables (y-axis) for respective clusters (x-axis). Therefore, mean values around zero indicate average performance on given indicator, positive mean values indicate above average performance and negative values then low performance. The whiskers (i.e. vertical lines extending from the boxes) represent standard deviations of a given variable and indicate the level of cluster homogeneity with respect to a measured indicator. In this regard, the least homogenous cluster seems to be cluster 4. If we were to measure how much given variable contributed to a cluster formation then we would have to refer to a variable whose mean values differ at most among clusters. In this sense, variable *TTCI* tends to have the largest discriminative power. On the contrary, variable whose mean values tend to be similar across clusters should be considered for deletion.

**Fig. 4 Profile diagram**



## Conclusion

The objective of this paper was to analyse tourism based on 4 indicators (of which the most important one was the TTCI indicator) in the Latin America. To do so, 23 states were subjected to hierarchical cluster analysis using the Ward's algorithm to form clusters. Similarity between objects was then assessed by means of squared Euclidean distance. As a result, 4 clusters emerged of which the worst performer was cluster 2 with Bolivia, Ecuador, Nicaragua, Paraguay, Salvador and Suriname while best performing cluster over all four indicators was undoubtedly cluster 1 with Barbados. The latter may be described as cluster with high level of tourism-oriented services, low poverty and high travel and tourism's total contribution to GDP. Generally speaking, countries with high rate of tourism are regarded as the wealthier ones.

Still, while the international long term tourism has been booming nowadays in Latin America, barriers to overcome remain (safety, poverty, level of service, infrastructure) and the question to be addressed is: How sustainable the current tourism development is? Unless government undertakes necessary steps to make tourism in this region of priority, the impressive boom will be difficult to maintain.

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# Economic, Social and Ecological Strengthening of the District of Ccapi, Cusco Region, Peru

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Jiří SCHNEIDER<sup>1</sup>

Willem H. M. IMMERZEEL

## Abstract:

The article presents support possibility of regional development of poor Andean district Ccapi in Cusco region (Peru). This support is processed into proposal of developmental project. The project would generate the adoption of a set of innovations by the vast majority of the population in each Ccapi community. The adoption of a coherent set of innovations is achieved, including, "healthy homes", improved preventive healthcare, increased productivity in agriculture and animal husbandry, forestry and environmental recovery. The local government becomes motivated and acquires the necessary know-how to orient a greater percentage of investments in projects that increase incomes, fixed capital, and improve health of the population. The Project would be carried out by the Peruvian Non-Governmental Organization Pachamama Raymi.

## Key words:

regional development, rural community, landscape potential, sustainable agriculture, mountain agriculture, spatial planning

## Introduction

Outlying communities in the Ccapi District create a part of the Andean Region. In these higher altitudes, people have less variability in the food production that they consume because of the limited amount of crops and commodities that they produce. As a result, these parts have the highest rates of chronic infant and child malnutrition and maternal-child mortality. These problems are caused by acute respiratory infections, diarrheal diseases and malnutrition. Especially, the malnutrition is a very serious problem in Ccapi as 73% of children under age of five have nutritional difficulties. At the same time, high rate of children under age of three suffer from serious nutritional problems. According to the "Map of chronic child malnutrition in Peru" 2007 FAO presents Cusco Region as one of the areas with the greatest vulnerability in terms of child malnutrition reaching 36.9%. It is well known that people need to have an adequate and diversified diet in order to build a stronger immune system and avoid morbidity and mortality. The communities in Ccapi district are difficult to reach and usually it takes several hours to get from the community to the city. Farmers often do not have effective irrigation systems and sufficient water availability on agricultural parcels. This lack of technology goes along with the cultivation of monocultures with a low nutritional value. Therefore, the ecosystem is very difficult and vulnerable, but with positive potential.

The district of Ccapi is among the 3% poorest districts of Peru. According to INEI's (National Institute of Statistics and Informatics) map of poverty from 2009, percentage of poverty in the district is 87.7 % from which 54.3 % of population is extremely poor.

The main causes of health and income problems in the Ccapi District are:

Lack of food

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Lack of access to basic services  
Lack of preventive health care (hygiene)  
Illiteracy  
Alcoholism, which also generates family violence, poor job performance or job losses  
Lack of accessible roads to communities  
Lack of health personnel  
Extensive barren areas in need of reforestation  
Lack of livestock and crop production  
Lack of irrigation management

In order to prevent and to deal with these problems, the development project will be introduced. It is also crucial in order to achieve the Millennium Development Goals - namely number 1) eradicate extreme poverty and hunger, number 4) reduce child mortality, number 5) improve maternal health, and number 7) ensuring environmental sustainability.

The project would generate the adoption of a set of innovations by the vast majority of the population in each community. The adoption of innovations will improve the economy, preventive healthcare, self-esteem and ensure environmental recovery. Very significant progress would be made during the first 12 months of the project through peer learning and enhancing motivation. The Project would be carried out by the Peruvian Non-Governmental Organization Pachamama Raymi.

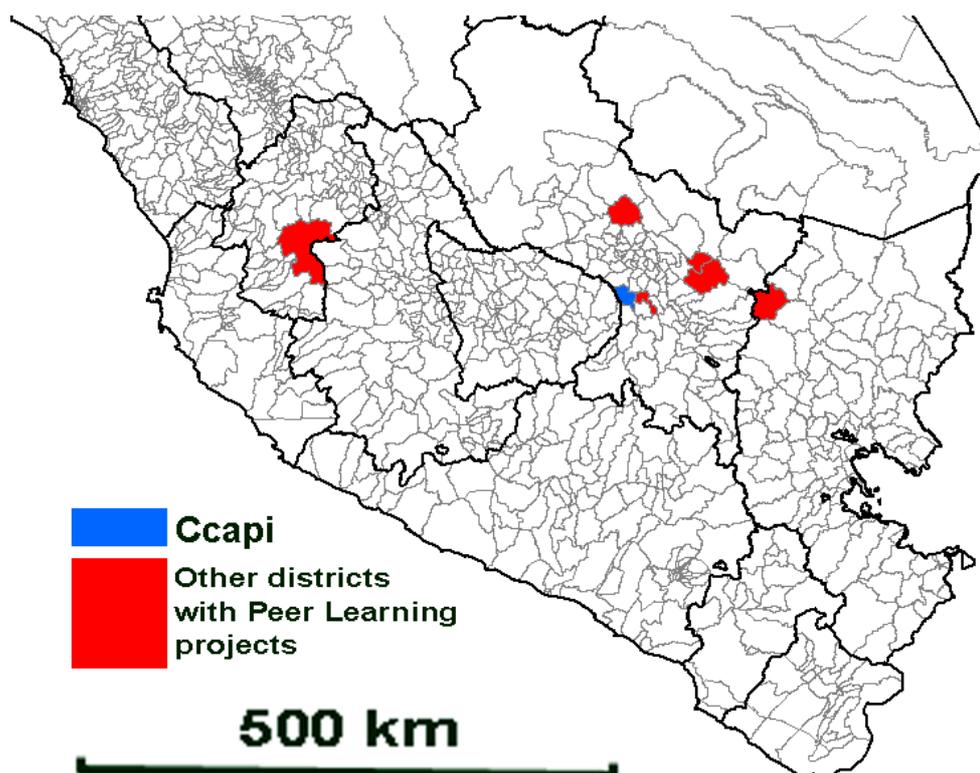
#### **Specific Objectives of the Project**

Achieve at least the level of the legal minimum income for over 50% of the population  
Increase the value of people's fixed capital by at least US\$ 20,000 through forestation  
Improve people's health by changing preventive health habits of the population and facilitate their relation with the national health services  
Significant reduction in incidence of serious health problems such as bronco-pulmonary and intestinal infections, anemia, and malnutrition  
Significant reduction in child mortality  
Support farmers' education in agricultural and preventive healthcare practices together with greater cohesion among community members  
Strengthen the capacity of the local authorities to promote economic development of their population  
Increase the sustainable farm production and farmers' abilities  
Achieve considerable economic, social and environmental development of the district  
Eliminate undesirable migration of inhabitants

#### **Project Location**

Ccapi district is located in the western part of the Paruro province in the department of Cusco. Paruro is geographically located at 13 ° 50 '58" south latitude and 72 ° 04 '53" west longitude. The district has an area of 334.85 km<sup>2</sup>, which is the third largest in the Paruro province. The whole province has an extent of 1984.42 km<sup>2</sup> and is divided into nine districts.

The altitude of the territory is between 2550 meters in the lower areas, and up to 5438 meters in the high altitudes.



**Pic. 1 Ccapi district location in Southern Peru. Source: NGO Pachamama Raymi**

#### **Climate, water and soil resources**

In the lower altitudes, the district has a typical behavior of an Andean valley defined by precipitation and relative humidity, which refers to its high potential to grow vast variety of crops including fruit. In higher altitudes it is a good environment for planting trees such as pine or eucalyptus.

**Tab. 1 Water Resources of Ccapi district. Source: Municipality of Ccapi, 2010**

Lagunas	12
Rivers	5
Springs	43

**Tab. 2 Land Use in Ccapi District in 2007. Source: Peruvian National Institute of Statistics and Informatics**

	Hectares	%
Agriculture	1 422.15	8.71
Irrigation	613.10	
Dry land	809.05	
Nonfarm	14 901.71	91.29
Natural grassland	13 472.34	
Mountains and forests	269.84	
Other types of land	1 159.53	
TOTAL	16 323.86	100.00



**Pic. 2 Community Uyllullo. Photo by Schneider, 2013**

### **Economic Aspects**

The most important economic activity in the district is the agriculture and livestock. This activity is a source of subsistence farming as well as source of income for local farmers.

**Tab. 3 Economic Activities per Sector in 2007. Source: Peruvian National Institute of Statistics and Informatics**

Agriculture and Livestock	85.5%
Commerce	2.3%
Clerk	1.8%
Construction	2.3%
Education	2.8%

### **Production in the Ccapi District**

The villagers' main activity is production of corn and potatoes for their own consumption. The agricultural conditions in the area are convenient for agricultural production, breeding of animals and forestation, however, so far this potential hasn't been realized adequately.

Livestock production in the area of the project is a complementary activity to the agriculture. Its development is quite limited and subsistence and the main breeds are small animals such as chickens and guinea pigs. The large animal breeding is minimal however there is the presence mainly of cattle. Animals that stand out are the guinea pigs as on average each family has 15 units. They are kept mostly in a kitchen or unsuitable conditions outside in a cold weather.

**Tab. 4 Production in the Ccapi District. Source: Municipality of Ccapi, 2010**

COMMUNITY	Communal Total							Total per community	
	Potato	Corn	Barley	Wheat	Bean	Cultivated pastures	Vegetable	Hectares	%
Huatta	4.56	9.60	4.80	4.80	0.05	1.92	4.80	30.53	4.0
Tucuyachi	6.40	12.80	12.80	9.60	0.32	0.29	4.80	47.01	6.2
Percca	6.70	33.50	6.70	20.10	0.34	2.68	5.36	75.38	10.0
Chocho	3.24	7.20	2.16	7.20	0.16	0.90	0.90	21.76	2.9
Uyllullo	4.76	20.72	2.52	6.72	1.68	0.08	0.28	36.76	4.9
Ccoyabamba	55.10	19.00	38.00	19.00	7.60	2.85	0.48	143.93	19.1
Cajapucara	25.90	35.52	18.50	24.42	7.40	6.66	1.48	119.88	15.9
Quehuayllo	10.88	17.00	15.13	6.80	4.76	0.68	0.34	55.59	7.4
Incakona	3.50	42.00	3.50	28.00	14.00	7.00	7.00	105.00	13.9
Callancha	44.84	38.00	3.80	15.20	11.40	4.56	0.76	118.56	15.7
Total per product	Has	165.9	253.3	107.9	141.8	47.7	27.6	754.39	
	%	22	31	14	19	6	4		3

### Development Indicators

The Ccapi District has a human development index of 0.5, which is significantly below the rate of Cusco Region. This is caused by the literacy rate, which is 72.41% compared to 86.07% representing Cusco Region. The same states for the schooling and educational attainment, and finally household income per capita which is only S/.104.30 compared to average income in Cusco Region of S/.262.50. The Ccapi District's number of inhabitants ranked 991 at the national level. Human Development Index of Ccapi ranks 1776 from all the 1882 districts in Peru.

### Project Description

The project would generate the adoption of a set of innovations by the vast majority of the population in each community. The adoption of innovations would improve the economy, preventive healthcare, self-esteem and ensure environmental recovery. Very significant progress would be made during the first 12 months of the project through peer learning and enhancing motivation.

### Improving People's Health

The project to improve people's health introduces a number of preventive healthcare measures, to overcome the most prevalent diseases (bronco-pulmonary and intestinal), to improve people's diet and to facilitate access to governmental healthcare services. The project also includes strengthening the local government to ensure that it can and would continue improving people's health and the financial and fixed capital of the inhabitants of its district.

Innovations are clearly defined and are introduced to the population by a team of expert farmers, through peer learning. The expert farmers come from communities where

Pachamama Raymi already generated the necessary changes. These farmers assist the families to remodel their homes into "healthy homes", with separate bedrooms for their children, improve order and hygiene, upgrade the kitchen, build furniture, etc. These expert farmers also assist the farmers to implement the required changes in rangeland management, animal husbandry, crop management, etc.

The families would have improved their diet, changing their eating habits. Most of their food will come from what they produce themselves in their own bio-garden. In coordination with the health centers from the Ministry of Health, the volunteer health promoter of each community will check the size and weight of the children, detecting problems.

One of the factors contributing to malnutrition is the presence of intestinal parasites. The reduction of this problem is achieved by a set of measures, from water chlorination by the community organization, to more order in the house, avoiding bringing pets and pigs into the house, keeping utensils, dishes, etc. in closets, changing personal hygiene, among others. Another health problem in the communities is iron-deficiency, so called anemia, which affects many, especially young women and children. Not just the diet needs to improve to reduce anemia in the population. To reduce anemia, it is also necessary to reduce the incidence of intestinal parasites and to remove smoke from the kitchen.

### **Irrigation, Crops and Pastures**

Communities and the vast majority of families in each community would improve the management of their pastures and their cattle herd. This will result already within the first year, in higher productivity, more meat and more milk. The same will happen in other subjects, through better management of crops (better management of guano and soil fertility, production of biol, which is a foliar fertilizer, better management of seeds, along with a reduction in crop losses to rodents.

The focus is on management changes: achieve more and have better results, with less effort, thus improving health and finances of the families.

### **Forestation**

As for forestation, the standard goal is planting an average of one thousand trees per family per year. A long term strategy through forestation complements the economic recovery: on average, every family planted 1000 trees per year, which is one hectare, or 2.5 acre. Planting so many trees converts extensive areas of unproductive land into valuable timberland. Most of the forestation would be done with pine trees. These trees grow in symbiosis with a fungus which produces edible and valuable mushrooms. These mushrooms are sold to improve family incomes even further. (Pachamama Raymi, 2013).

Each participating family will choose at least one business from a wide range, of possible businesses according to their interest and possibilities. Examples are: raising guinea pigs, trout farming, and ham and jerky production, beekeeping, etc. Family associations are promoted with related businesses.

All improvements are implemented by the families themselves. They also make just about all necessary investments. All this is possible due to people's newly acquired knowledge and intense motivation.

### **Peer Learning and Motivation to Accelerate the Change**

Representatives of the communities of the district will travel to communities similar to their own, but which have already been "vitalized". For example, they will visit the districts of Ocongate, Ccarhuayo, and Urcos, in Cusco, where Pachamama Raymi has worked for 1 to 3 years, as well as other experiences, such as the Granja Porcón in Cajamarca, where massive forestry was implemented thirty years ago, which changed the landscape and profoundly impacted people's lives.

The mayor and other dignitaries of the Local Governments would participate in these internships. Experience in other districts has shown that their participation can profoundly

change their outlook on the possibilities of their district. Local governments of already “vitalized” districts will be visited; their mayors can become a role model for the visiting mayors.

Learning will be reinforced with training materials (videos and brochures), which will serve as “memory aids”.

The peer learning is accompanied by a set of motivators that would generate the necessary enthusiasm, and would achieve that over 60% of the families in every community would apply what they learned during the first year of the project. As for improving income, within three years the families acquire at least the equivalent of the legal minimum income, by starting viable businesses while moving away from marginal economic activities.

Since 1988 the methodology Pachamama Raymi has been developed, which from its early years proved to be very effective and very efficient, making these profound and rapid changes possible. The methodology is effective in the sense of achieving the above, and is very efficient because more than 80% of the communities and over 60% of the population would benefit from the project, adopting the necessary changes already within the first year of the project.

The main elements of this training system are (1) clear and unambiguous definition of the training contents, (2) high goals in terms of number of people that would adopt these contents within a very short time, (3) peer learning, a (4) coherent package of motivators, (5) coherent management of the different levels of the rural society, impacting simultaneously at its three levels: family, community and local government. It takes one to two years more to deepen and consolidate what has been achieved during the first year. Changing habits materializes only when adopted innovations have become new habits, which requires a total of three years.

The results generated are socially, economically and environmentally sustainable. The project would achieve generation of wealth, increasing fixed and financial capital of the families, attaining food security and surplus production.

The NGO Pachamama Raymi’s experience shows that the innovations adopted by most, continue to be practiced by the families, even many years after project closure. Many innovations even spread to those who did not adopt them during the project.

## Target Group

The target group includes all the residents of communities in the Ccapi District. The district of Ccapi has about 3861 inhabitants (669 families). The details of the population per community are indicated in the table below. In twelve months, about 60% of the families of every community of the proposed work area would adopt the required set of innovations. The same percentage of families would start at least one business within the same period. These expected results are based on the previous experiences during thirty years in many communities in Peru and other countries in Latin America.

**Tab. 5 Number of Participating Families. Source: Municipality of Ccapi, 2010**

Community	Number of families	Population	%
<b>Ccapi</b>	151	862	22
<b>Huatta</b>	24	137	4
<b>Tucuyachi</b>	32	182	5
<b>Percca</b>	67	389	10
<b>Chocho</b>	18	104	3
<b>Uyllullo</b>	28	162	4
<b>Ccoyabamba</b>	95	551	14
<b>Cajapucara</b>	74	429	11
<b>Quehuayllo</b>	34	197	5
<b>Incakona</b>	70	406	11
<b>Callancha</b>	76	441	11
<b>Total</b>	<b>669</b>	<b>3861</b>	<b>100</b>

## **Activities of Participating Families**

The project would be implemented using the peer learning methodology that proved to be capable to generate the results as indicated above. Expert farmers spread the awareness of local farmers who promote the responsible action in the entire community. Participating families, guided and supervised by expert farmers, will:

- Plant trees and reclaim degraded areas;
- Construct guinea pig sheds;
- Implement and improve vegetable gardens to improve their diet;
- Construct trout farms;
- Improve production of fodder by sowing grass and improve range land management;
- Improve housing, and take other relevant preventive health measures;
- Improve communal organization.

All these initiatives are aimed at enhancing local development opportunities in the Ccapi district.

## **Motivation – Contests**

A set of motivators would be employed to ensure that families apply what they learn, using their own means. The most visible of the motivators are contests between families in each community. At the same time, contests between communities are organized to achieve the application of innovations at the level of each community.

The contests are not only about getting points but it is a way how to motivate people. That is why it is relevant to come up with a reason for the contest. In Andean region indigenous people revere Mother Earth (Pachamama), a fertility goddess. She cares for us if we care for her. It is something like the “environment”, but with a strong religious and powerful dimension to it. The contest is about who cares best for Mother Earth, so for the people it is not just about points and winning a prize.

In addition to the competitions, there will be some materials for family businesses, which will be distributed according to the effort and progress made and not according to “need”. This distinction is made because if distribution is according to people’s “needs”, people tend to become needier. If distribution is according to progress and effort, people tend to optimize these issues.

## **Project Sustainability**

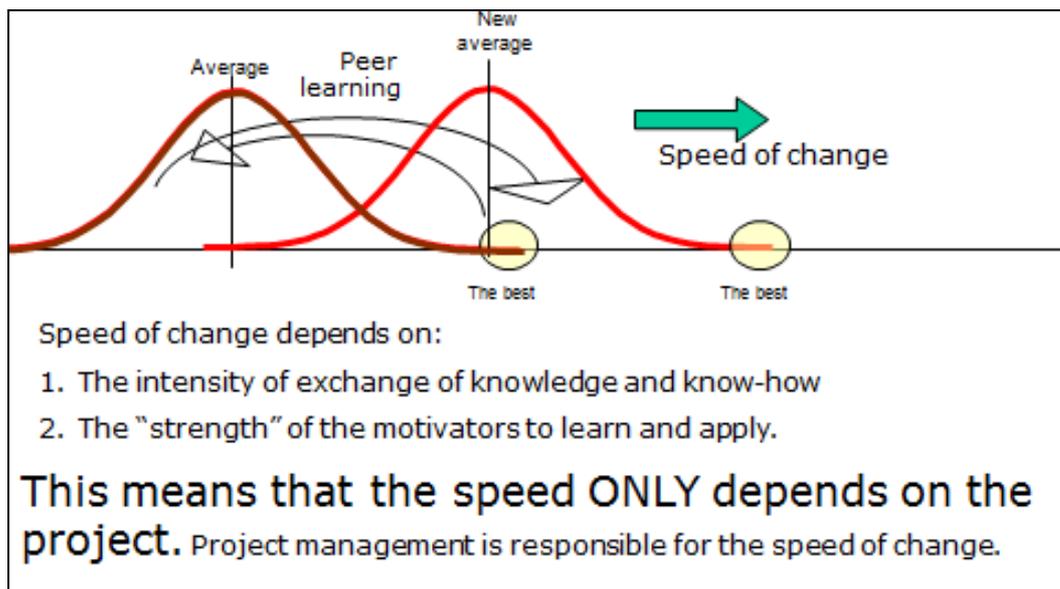
Experience with other projects using the proposed methodology has shown that innovations spread successfully among the target population. Already during the first year, over 60% of the total population adopts many of the required innovations. Changing habits is not easy, especially not in poor rural areas making it necessary to continue the project over a period of three years. However, these innovations are performed by the families many years after project completion, and they are even diffused to more families which did not adopt the project previously. As the project initiates a set of activities in the district, the families themselves become self-sufficient and financially independent based on their own businesses and know how.

The Local Government in Ccapi is expected to adopt some activities and methodology proposed for this project, particularly the production of saplings and the promotion of forestation, the attention to promoting family rural business and preventive healthcare measures. The NGO Pachamama Raymi’s projects in other districts show that these issues can be expected to be included by the local government.

## Risk Reduction

Pachamama Raymi achieves risk reduction by only promoting changes which have already generated great successes; by only promoting what was already validated under the same or very similar conditions and realities. Besides, the contents to be learned have to be as complete and coherent as possible. All this implies that the “teachers” should be those who achieved those great successes; they are the ones that know all details, the risks, etc.

Knowledge and know-how that determine profitability, productivity and environmental reclamation, can be learned. Consequently, people who are close to “normal” can move towards becoming a great exception. They can learn whatever is needed, from those who are great exceptions now. That is, they can “learn from the best”. If many do, it would be possible to move the whole curve towards the right. (See Graph 1).



**Graph 1 Impact of “Learning from the Best” principle. Source: Immerzeel, 2010**

A few families possess “know-how” (knowledge and skills) that enable valuable economic and environmental recovery. These families learn from “the best” (expert farmers, for example), identified and mobilized by Pachamama Raymi from other districts, but if available also from the population of the work area itself.

Consequently, the project controls, and is responsible for the speed of change. The experience of projects using Raymi is quite important, since it shows us a methodology capable of producing very quick and sustainable change, eradicating poverty while reclaiming natural resources.

As indicated in the Graph 1, the whole curve moves to the right as people acquire and apply the newly found knowledge and know-how about resource management. It means that a new curve is established, with new exceptions to be found on its extreme right. These people must be found, as they are essential to keep the whole curve moving. To accelerate these dynamics, Raymi proposes the use of motivators which should make it possible that a majority of families improve on today’s best. Prizes for competitions between families have shown to be excellent motivators.

Evidently, a participant in a contest must know how to outdo the others. This requires socializing information, making information accessible to all; information about winning innovations and about clarity of understanding reached by others, for example. Socializing information means frequent exchange between farmers, so they can see the best examples, talk and share their findings, right where it all happens, take some seed of a great species, see the right tools, learn how to handle them, and where they are sold, etc. It is also necessary to

use different media: written testimonies, pictures, radio. The farmers, who manage their resources best, should tell about their experience and about how they achieved their excellent results.

Consequently, Raymi is not just about contests, it is competing to share, going forward together.

The position and role of each person in society is the result of the capacities (s)he was able to develop or build. Each person, each organization constructs its own potential for action, by acquiring capacities, generating new ones based on the existing. This is how people will be able to adapt successfully and dynamically to rapidly changing realities (Imerzeel, 2010).

## **Budget**

The estimated total cost of the project is 1 331 656 US\$ and accounts for all 669 families and 3681 persons in the District. The total amount per supported person is 127 US\$.

## **Conclusions:**

One of support possibilities of regional development of poor Andean districts in Peru is method of NGO Pachamama Raymi. The method is based on adoption of a set of innovations by the vast majority of the population in communities. The most visible of the motivators are contests between families in each community. At the same time, contests between communities are organized to achieve the application of innovations at the level of each community. Experience with other projects using the proposed methodology has shown that innovations spread successfully among the target population. Already during the first year, over 60% of the total population adopts many of the required innovations.

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# Performance Analysis in SMEs through the Usage of Accounting Information Systems

Jana KAJANOVÁ<sup>1</sup>

## Abstract

The aim of the paper deals with research results oriented on the utilization of modern accounting information systems and their impact on the performance in small and medium sized enterprises. To achieve positive economic results from the long term period, to ensure the required profitability and financial stability putting pressure on implementation of information systems and especially accounting information systems, which are being used during the decision making processes in small and medium sized enterprises. Conclusions of research bring new knowledge and suggestions for small and medium sized enterprises, allowing them increase their performance, competitiveness and profitability.

## Keywords:

Accounting information system, performance, small and medium sized – enterprises, competitiveness

## Introduction

Company performance is becoming the key factor monitored and evaluated in managing business subjects. It is an inherent characteristic in assessing success, achieving the objectives, or performing on planned efficiency. The main task is particularly real and responsible reporting of facts which may be comparable (Kajanová, 2010, p.143).

Performance may be manifested in several intentions: performance of equipment, performance of human potential (labor productivity), the performance from the perspective of volume enterprise performance, efficiency according to market share, according to the amount of achieved profit etc. In entrepreneurial subjects, therefore, we monitor the performance in several ways. It deals with the performance of the production process, staff efficiency and overall business performance. The three key elements of performance evaluation are: performance indicators, achieved performance, and correcting actions to reach the goals.

Performance indicators are essential the following purposes:

- monitoring and controlling,
- innovation management,
- maximization the efficiency of innovation efforts,
- the achievement of harmonization needs and goals of the enterprise,
- the remuneration and discipline (Bartoš, 2007).

Specificity of individual characteristics, respectively criteria must be individually assessed and applied to a particular type of business. The exceptionality and uniqueness of businesses may critically affect the assessment and measurement of these parameters.

A necessary condition of enterprise performance assessment is the identification and measurement of factors which are its accelerators. Performance criteria, therefore, we derive from specific entrepreneurial objectives and are broken down into different levels of the management hierarchy, so that among them exist internal consistency (Lubelec, 2007, p. 405).

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In Slovakia, for the analysis and assessment of efficiency and effectiveness of corporate operations is being used many indicators, which allow the characterization by financial view on various aspects of enterprise management. Each enterprise has at its disposal a range of financial management tools. Important role in this respect plays "already classic" financial analysis, through which it is possible to find answers to many questions regarding the financial health of a company (Kicová and Paliderová, 2008, p. 177).

## **Goal**

The aim of the paper deals with research results oriented on the utilization of modern accounting information systems and their impact on the performance in small and medium sized enterprises. To achieve positive economic results from the long term period, to ensure the required profitability and financial stability putting pressure on implementation of information systems and especially accounting information systems, which are being used during the decision making processes in small and medium sized enterprises. Conclusions of research bring new knowledge and suggestions for small and medium sized enterprises, allowing them increase their performance, competitiveness and profitability.

## **Methodology**

During preparation of the submitted contribution were used basic qualitative and quantitative scientific methods, e.g. analysis, synthesis, deduction, comparison, questionnaire, statistic and mathematic methods. Based on the analysis of present state of the use of accounting information systems have been created special questionnaire, which was sent to 450 subjects (chosen small and medium size enterprises). Respondents replied on questions focused on usage of existing information systems, accounting information systems, costs related to accounting information systems, usage during planning, managing and decision processes, creation of specialised databases and repeated use of information from databases of accounting information systems. Responses were evaluated and analysed, based on results were created conclusions and recommendations, which are presented in this contribution.

## **1 Performance of small and medium enterprises**

Entrepreneurial entities, particularly micro, small and medium-sized enterprises are the key source of economic growth. These businesses are an important part of the Slovak economy, constitute more than 99% of all enterprises and participate on 72% the employment. Only 37% of European citizens want to establish own business. If we compare this with the situation 3 years ago, it is a decrease by 8% (from 45%). Namely in Slovakia it is about 33%. To compare, we can provide values in the USA (51%) and China (56%).

The European Union supports internationalization of small and medium enterprises, which increases possibilities also for business entities in Slovakia. Support of internalization is mainly based the following assumptions:

- until 2015 90% of global economic growth will be generated outside the European Union,
- until 2030 developing and emerging markets will represents 60% of world GDP,
- internationally active SMEs create higher turnover, create more jobs and support more innovations.

Internationalization is related to internationalization efforts of small and medium enterprises in Slovakia to increase their competitiveness, efficiency and profitability. Performance evaluation is closely linked to a data base of information used as a basis for the evaluation. Information, information system, quality of information and the possibilities of their exploitation generate space for issues relating to responsible corporate governance, financial stability of the enterprise, maintaining competitiveness, to ensure the required liquidity, risk control, the optimum inventory, correct and responsible accounting, selection - training and

staff education, quality systems, innovation potential as well as many others. The problems and specific situations of SMEs focused on economic crisis and their competitiveness in Czech republic and in Slovakia were discussed by the authors Šlahor and Majerčáková, Šúbertová or Hornungová and Klímková (Šlahor and Majerčáková, 2014; Šúbertová, 2011; Hornungová and Klímková, 2010).

Performance management company (Corporate Performance Management - CPM) is a framework that integrates strategy and business activities to its implementation. Business management allows the creation of a perspective and the real picture of the particular situation across the enterprise, with the intention of creating a robust platform to support future growth (Doležal, 2012). Corporate Performance Management includes: strategic planning, budgeting, and forecasting of the profitability analysis. It deals with the operational and financial performance and involves a process of data collection, analysis implementation, reporting to managers and employees at all levels of the enterprise. The essence of CPM is governance of corporate performance by a separate process.

Corporate performance improvement is in the current period one of the main tasks of small and medium-sized enterprises. The best known and most commonly used methods of determining enterprise performance include:

- Balanced Scorecard,
- European EFQM model and
- the economic value added EVA (Economic Value Added).

The current modern information system provides sufficient amount of relevant information for relevant decision-making processes is able to immediately provide a complete managerial overview in real time, focused on business growth, effectively changing processes in the company, depending on the needs and desires of consumers and increases employee productivity.

Dynamic and turbulent changes in the business environment lead to the fact that arise continuously new requirements on information systems. At relatively lower flexibility of the current software enterprise's information system must react and satisfy these continuously changing information needs (Kajanová, 2011).

The quality of enterprise information system belongs to the strategic factors of prosperity and competitiveness. Slovak enterprises significance of information and information system appreciate only gradually. It is caused mainly that a change in corporate governance in the transformation process occurs at a slower pace than what is developing Electronic data processing. It should be emphasized that no information system will solve its internal problems, nor weaknesses in management, or automatically will not increase its competitiveness. Managers must learn to work with information, not just to acquire, but also to share them, processing and evaluating them in a way to bring the company the corresponding effect.

The information and information system of the company are built to provide the suitable supporting system for decision-making processes of the company management. The role of the information system is to produce the inevitable information for the efficient management of the organization and for the association of its managing and managed system. The information system incorporates itself into both kinds of the system as their integral part and creates with them one whole (Sedlák, 2007, p. 141).

Sufficient amount of high quality information is needed especially for enterprises to have an option to take more qualified decisions on all levels of management. Information help to increase the value of enterprise outputs while also become a part of them. Correct information, combined with improved corporate processes and corporate culture are a suitable source of improvement and increased efficiency of corporate operations (Ólvecká, 2010). This underlines the need for a need to address the issue of management and use of information or by the corporate information system, which natural part is the accounting system.

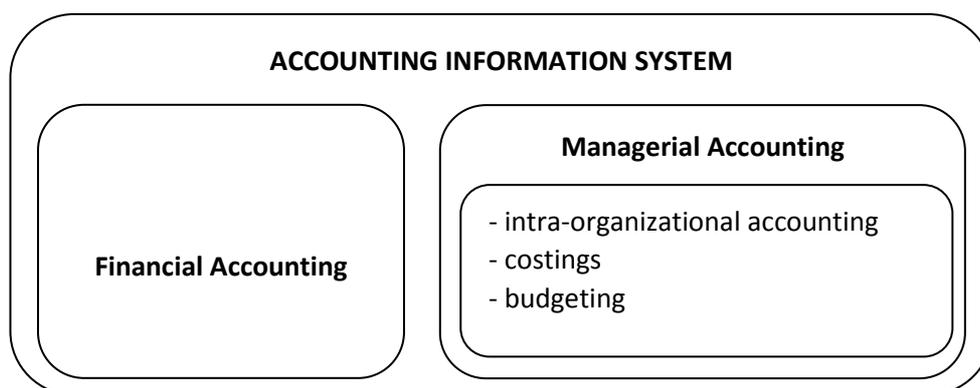
Properly processed and utilized information can have a positive impact on the number of company activities, such as the reduction or elimination of excess inventory, detection time

margins, speed of communication between enterprise and its clients, processing and distribution of actual offers, electronic exchange, the pricing of corporate outputs, reducing costs in various areas of corporate operations, the amount of realized corporate outputs, setting and control of working capital, the creation of competitive advantage, advertising and sales promotion corporate outputs, acquisition of new customers, etc.

## 2 Accounting Information Systems

Accounting information systems as part of enterprise information systems play an irreplaceable and important role in achieving positive corporate results in fulfilling the mission of business entities, or ensuring their competitiveness and success. Specifically use of accounting information systems in enterprises and their connection to competitiveness have become part of the research, which was conducted on a sample of 450 subjects (respondents) constituting representatives of small and medium enterprises in Slovakia.

In general the role of accounting information systems is understood by entrepreneurs as tools of collecting, sorting, arrangement and exploitation of the necessary information which managers utilise during decision process. They represent a relatively comprehensive set of data and data describing activities, processes and events in the enterprises. Their usefulness and importance is being evaluated and presented in different ways. Our aim was to confirm, respectively refute hypotheses based on knowledge related to the use of accounting information systems, impacts on the profitability of the company, the impacts on corporate costs, possibilities of databases utilisation for repeated decisions of managers and etc. (Kajanová, 2014). Classical model of accounting information system represents the figure 1.

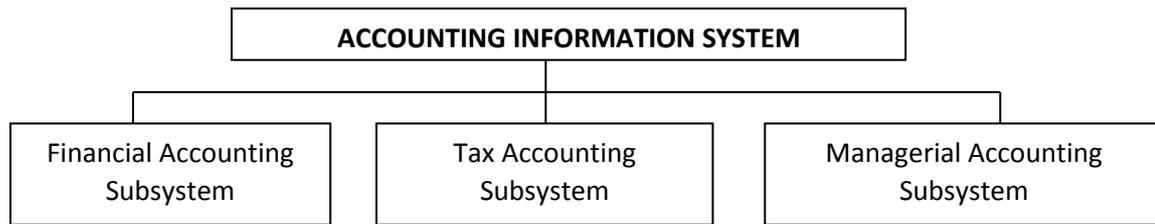


**Pic. 1 Classical model of accounting information system**

According to Šlosárová et al. accounting system includes financial accounting and management accounting, and management accounting includes cost accounting and costings as well as business planning and budgeting (Šlosárová et al., 2011, p. 18)

The accounting information system consists of three fundamental subsystems (Fig. 2):

- financial accounting subsystem,
- tax accounting subsystem,
- and managerial accounting subsystem (Poniščiaková, 2010, p. 11).



**Pic. 2 Accounting information system according to Poniščiaková**  
**Source: Poniščiaková, 2010, p. 12**

According to Látečková and Báležová "Managers require information provided by a subsystem of accounting to reach high quality management, efficient decision-making and control of the managed processes" (Látečková and Báležová, 2014, p.14).

The role of accounting is to accurately illustrate the economic reality of the accounting unit, which means to accomplish the accurate recording of its property, financial and income situation (Takács, 2010, p. 9).

Nowadays exists many software solutions which provides to corporates high quality records, storage, sorting and possibilities to ensure the information to meet its objectives Comparison of the benefits of individual programs, respectively systems contains several important factors: availability, reliability, level of costs, ensured service (maintenance), efficiency, complexity.

Utilization of enterprise information system, respectively accounting information system, the costs of its security and maintenance, assessment of the impact exploitation accounting information system on the overall results of business entities based on the evaluation of respondents' answers are described in the chapter "Results".

### 3 Results

Situation of small and medium sized enterprises depends not only on business and competitive environment, economic, political, legislative, cultural and social influences, but increasingly focuses on the use of human potential, knowledge and experience, information and communication technologies. Ensure sustainable growth, maintain competitiveness, innovation and modern management techniques usage become under the pressure of globalization an important tool of acquiring and retaining of the planned market position. Proper and systematic use of information systems namely accounting information systems contributes to a greater extent on the performance and profitability of small and medium sized enterprises. In the context of research, we sent out a questionnaire to 450 subjects (selected SMEs). The return the completed questionnaire to our requirements was 41,6% (187 questionnaires). Selected companies were:

- a) manufacturing (48%),
- b) business (37%),
- c) providing the services (15%).

We noted, the focus of the company, respectively. type of enterprise did not have a significant impact on research results. Respondents answered the questions focused on the use of the information system, Accounting Information System (hereinafter referred as "AIS"), costs accounting information system, its use in the management and decision-making, creating databases and reuse of information from the AIS.

In the context of question whether entrepreneurs perceived direct link between the use of accounting information system and the achievement of higher levels of profitability (return on assets, equity, costs), we achieved the following results: 44% strongly agreed, 27% agreed,

16% disagreed, 6% strongly disagreed , 7% did not know to answer. The results are illustrated in Table 1.

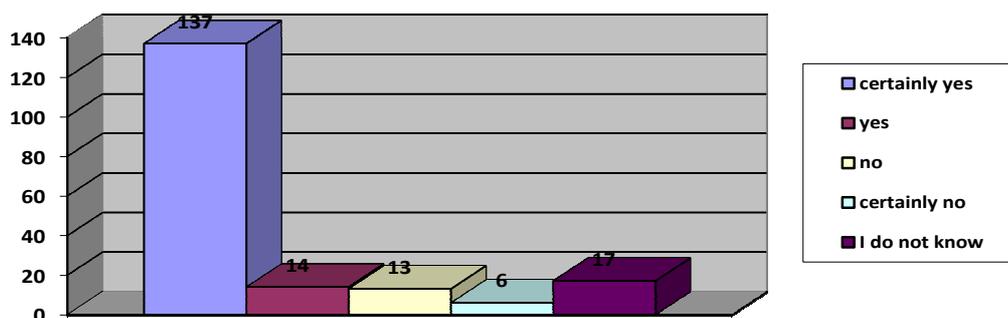
**Table 1 - Evaluation of the relation between the use of AIS and achieving higher profitability levels**

RESPONDENT'S ANSWER	NUMBER OF ANSWERS	PERCENTAGE SHARE
certainly yes	82	44 %
yes	50	27 %
no	30	16 %
certainly no	11	6 %
I do not know	13	7 %
	<b>187</b>	<b>100 %</b>

**Source: the own elaboration**

During hypothesis testing, which concerned specifically with relationship between information systems and results of operations of business entities, we noted that business entities confirmed the impact of introducing, respectively exploitation accounting information systems to realized result of operations.

Respondents in questionnaire also assessed benefits of the implementation of modern information systems to increase business performance. Based on the development of return on assets, return on costs and value of results of operations to 73% of those surveyed (137 respondents) indicated that the use of accounting information systems company strongly, ensured higher efficiency of the entrepreneurial entity. Entities rated last three consecutive financial years. Responses are recorded on Figure 3.



**Pic. 3 The impact of accounting information system on business performance**

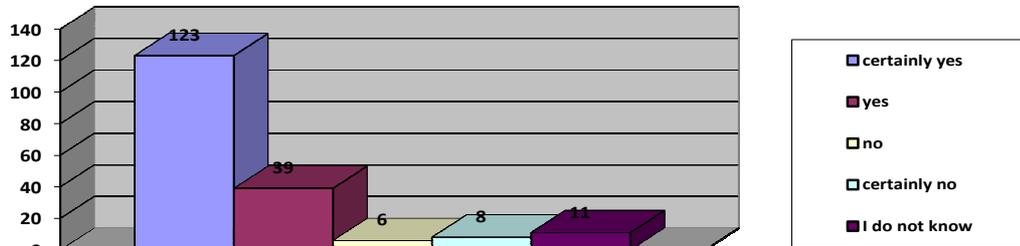
**Source: the own elaboration**

The question whether the use of accounting information systems reduced the riskiness of entrepreneurial activity, 66% of respondents answered the answer definitely yes. As other benefits of accounting information systems have been declared:

- availability of the necessary information,
- an easy way of reporting,
- the possibility of statistical assessments and predictions,

- easier management of assets and liabilities,
- increased working efficiency with supplies,
- possible utilisation in financial decision-making and others.

Responses are recorded on Figure 4.



**Pic. 4 The impact of accounting information system on the riskiness of entrepreneurial activity**

**Source: the own elaboration**

In the context of research the hypothesis has been confirmed more than 75% of business entities consider the accounting information system provides a higher quality and more responsible basis for deciding of management of small and medium-sized enterprises. Specifically, 81% of respondents indicated the answer definitely yes, 8% said answer yes, response not indicated 4%, 6% indicated definitely not, and the answer do not know indicated 1%. The results are illustrated in Table 2.

**Table 2 - Evaluation of the hypothesis "More than 75% of business entities considers the accounting information system provides a higher quality and more responsible basis for deciding more responsible of management of small and medium-sized enterprises".**

RESPONDENT'S ANSWER	NUMBER OF ANSWERS	PERCENTAGE SHARE
certainly yes	152	81 %
yes	15	8 %
no	7	4 %
certainly no	9	5 %
I do not know	4	2 %
	<b>187</b>	<b>100 %</b>

**Source: the own elaboration**

Based on questionnaires evaluation and conducted research we solved the issue of the use of accounting information systems and their contribution to ensuring the profitability and competitiveness of small and medium sized enterprises. The main recommendations for small and medium sized enterprises are:

- to support systematic usage of management and accounting information systems,

- to use innovations and modern trends in information and communication technologies,
- to analyse the opportunities and threats arising from global business a competitive environment,
- to focus investment decisions on low-risk projects at least during a period of stabilization of the economies after economic and financial crisis,
- to optimise the actions towards increased efficiency of small and medium sized enterprises based on management decisions in accordance with information from accounting information systems,
- to create a database in enterprise information systems, which contain information useful for management decision process in the future.

#### **4 Discussions**

Use of accounting information systems in business entities becomes common phenomenon. Many of entrepreneurs appreciate the speed, complexity and systematisms of information which this system offers to them. Use of accounting information systems is an appropriate instrument to ensure the high quality, economical and efficient management. Interact with information, and evaluate them appropriately, be used for management of stocks, of funds, of liabilities, optimize costs, evaluate investment opportunities of the enterprise, predict possible development, use existing databases to correct and responsible decisions of managers are just a selection areas which possibly through the accounting information system influence, manage, correct and improve effectivity.

In some extent it is simultaneously a matter of investing in this system, which can be costly, especially for micro and small enterprises which do not use to greater extent external resources and their own resources are usually limited. The research results confirm, however, that the benefit of the accounting information system is obvious for business, enables better, faster and more adequate responses to situations within the business activities arise allowing to consolidate market positions, meet corporate goals and strengthen competitiveness and to focus on sustainable development of their enterprises.

#### **5 Conclusions**

To the main tasks of accounting information systems belongs assurance, sorting and storing information which is necessary for decision making. This view, however, is mainly connected with the link to the information system and the company itself. If we perceive the use of accounting information systems and linking them to external environmental factors, we perceive the use of information in a direction expansion of the market position, market acceptance and competitors in a direction increasing competitiveness. Here arises the space for new positional interaction accounting information systems, in terms of a certain indicator that responds to the external environment and allows management of business entities in a direction of reducing risk, evaluation of potential opportunities and threats, cost optimization, storage methods or the obtaining of financial resources.

Main conclusions of the research are:

- presentation of the direct relation between the use of the accounting information system and the achievement of higher profitability levels (return on assets, equity, cost minimisation),
- confirmation of the hypothesis, that enterprise's information system has significant influence on economic results of small and medium sized enterprises,
- 73% of respondents indicates, the implementation of modern information systems directly participate on business performance,
- 66% of respondents indicates, the systematic usage of accounting information systems reduce risk level of commercial activities,

- 81% of respondents indicate, the modern accounting information system provides a high quality information base for decision process of management of the small and medium sized enterprises,
- identification for AIS space and possible relationships in relation to interconnection with the external environment.

Evaluation of the performance of small and medium-sized enterprises is depending on information, which are the part of the enterprise information systems. Accounting information as a part of these databases plays the key role in the management and decision management in small and medium-sized enterprises. Process and system approach to the information and their usage have the same use not only in Slovakia but also in other countries. The results of this research documenting the need for implementation of enterprise information systems as tools for enhancing the efficiency and effectiveness of business entities.

## Acknowledgement

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# The Enablers and Drivers for Sustainable Rural Development and Income Diversification in New European Union Countries

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Mária KADLEČÍKOVÁ<sup>1</sup>

## Abstract

The main objective of this paper is to analyse and introduce the tendencies in European Union (EU) countries for diversification of rural incomes. Furthermore, to outline the main elements of rural development such as improvements in rural infrastructure and the provision of local services with the objective of strengthening sustainability in rural areas. It is important to consider two factors in relation to dynamic rural development: a) agriculture alone will no longer guarantee the sustainability of rural areas, but it is essential to maintain it; and, b) significant diversity exists within rural areas. The rural areas of EU countries cover 91 percent of agricultural land, with 41.5 percent actively cultivated. However, in the rural areas of the EU-10 high unemployment persists, there is an outflow of inhabitants to cities or abroad and more of the rural population falls into poverty. Our results confirmed that rural areas are fragile when faced with socio-economic and environmental crises. Another important outcome is the fact that in economically stable EU countries, diversification represents a strong feature of rural economies, while in countries affected by the economic crisis; the number of farms with other income activities is significantly lower.

## Keywords:

EU tendencies, diversification, rural incomes, rural economy, rural infrastructure, sustainable development

## Introduction

Rural development is a vitally important policy for European Union States, since more than 38 percent of their populations live in rural areas which cover 91 percent of the European Union. Average income per capita in rural areas continues to be lower than in urban localities, the skills base is declining and the services sector is less developed. The GDP decline has been more dramatic in rural areas. Employment opportunities for women are fewer, remoteness and peripherality are major problems, although the general picture at EU level can vary substantially between the eastern and western regions of Europe and between Member States (Ludvig, Eberlin & Percze, 2010). With regard to the new EU countries, accession led to a number of changes with a significant impact on the performance and role of this sector (Csaki & Jambor, 2010). Important livelihood factors are exemplified by the human, natural, financial, social and physical assets (Ludvig, Eberlin & Percze, 2010). These assets lead to livelihood outcomes such as the achievement of higher incomes, increased well-being, reduction of vulnerability, improved food security and to ensuring a more sustainable use of natural resources. In connection to the volatility of agricultural commodities prices it was noted that while farmers benefited from higher commodity prices, at the same time, a reduction in real term wages, decreased employment and a decline in remittances have negatively affected the income of households in the region and increased poverty (Meyers, 2010).

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Diversification of income-generation activities under these economic market conditions is a key factor for the economic survival of farms. The important challenge is also to achieve balanced and sustainable growth of rural economies (Kadlečíková, Filo & Farkašová, 2011). The main objective of this paper is to:

- To introduce the recent development trends in rural areas of the new EU-10 countries following EU accession;
- To outline the main elements and opportunities that should be developed for restoration of economic vitality in rural areas and evaluate recent development trends in the field of income diversification.

## **1. Methodology**

In accordance with the objectives of this paper, research was based on scientific methods such as analysis, synthesis and comparison. The data was gathered from FAOSTAT and EUROSTAT.

In order to ascertain what are the business incentives for farmers in the Slovak Republic we also conducted a questionnaire research. We examined the opinion of 81 farmers on a selected list of opportunities (the opportunities of farmers were measured on a scale from 1) to 5) where 1) signified “no opportunity for our company” and 5) signified the opposite of 1). In our sample, farms were divided into groups according to the number of their employees, the area of agricultural land according to the LPIS and in line with the production area. The influence of these factors was evaluated using the Kruskal-Wallis test<sup>2</sup> and Jonckheere-Terpstra test. The Exact p-value in the case of these tests was estimated using the Monte Carlo simulation using IBM SPSS Version 21.

## **The Enablers of Rural Development**

At the very outset, it should be emphasized that ready framework solutions and guidelines do not exist for the successful development of rural areas. The downturn is affecting different areas in various ways and at diverse speeds. Therefore the approaches to how to resolve these rural development challenges have to be tailored to the conditions of each region and state. On the other hand, in many countries, especially in the new EU-10 States, there is an absence of rural development strategies (concepts), stimulus packages and business opportunities in the principal areas, as well as employment opportunities in the sustainable and diversified rural economy. In the case that a strategy for rural development has been formulated, this is usually part of a broader agricultural strategy in which the main focus is placed on primary and processed food production.

In most rural areas there are many individuals who can play a meaningful role in improving the economic and social well-being of their area or uplift rural livelihoods. There are technical specialists, agricultural extension agents, foresters, business people, representatives of non-governmental organizations (NGOs) or farmers’ associations and other stakeholders. All of them have a keen interest in bringing improvements to their respective rural area. However, sector experts have a tendency to resolve the challenges and problems of rural areas through their own narrow professional perspective. It should be highlighted that sectorial approaches have limited opportunities to resolve the multi-faced problems of the rural population in a complex and comprehensive way. Sectorial approaches perceive rural areas in a specific way, in other words, farmers see rural populations as food producers, foresters see them as working forces and wood processors, service providers see them as their potential clients, etc. From this viewpoint, the region presents complicated and complex problems that can only be solved through an integrated approach. This approach can be strengthened by using a combination of three sets of enablers which are defined as essential, important and useful enablers.

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<sup>2</sup> It was not necessary to carry out a post-hoc test in the case of our study because we could not reject the null hypothesis of the Kruskal-Wallis test in all cases.

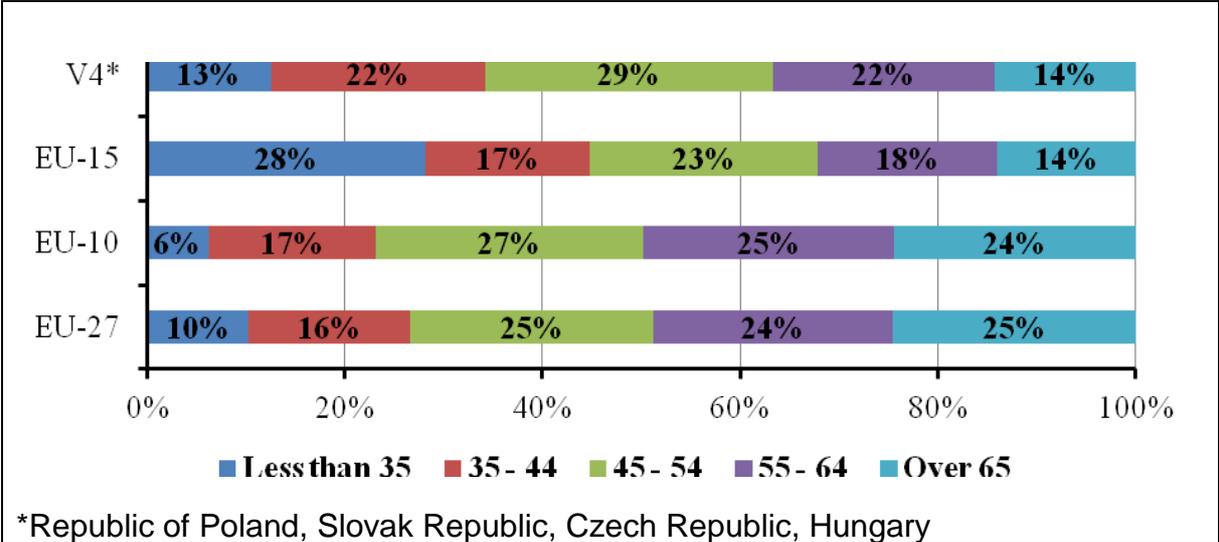
**In relation to what has been mentioned above, the following can be classified as essential enablers for rural development:**

- National rural development strategy/concept.
- Common Agricultural Policy (CAP)/European Agricultural Fund for Rural Development (EAFRD).
- Small and medium-sized businesses.
- Farms and farming-related non-farm activities.
- Government financial packages for economic development during recession.
- Human and institutional capacities.
- Comprehensive legislation linked to rural development.
- Functioning market institutions.
- Developed public services.

**The following supporting activities/tools can be identified as being some of the important enablers of rural development policies:**

- Support to maintenance and further development of rural infrastructure.
- Land tenure.
- Educational/training opportunities.
- Research and development.
- Agricultural and rural development extension service.
- Micro-regional planning.
- Vibrant inputs supply and market outlets.
- Financial services.

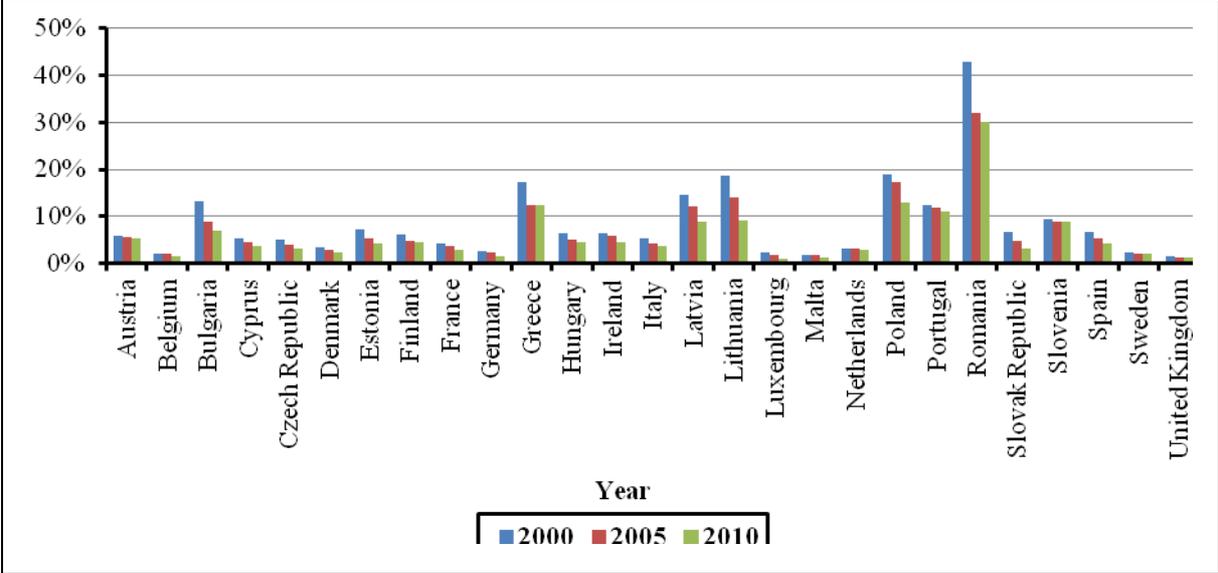
**Figure:1 Age Structure of Farm Managers in the European Union in the Year 2010**



Demographic shifts and economic restructuring are dramatically altering the lives of rural people and their communities. In the EU-10 countries, the rural population is ageing as the number of elderly people increases and the proportion of the younger generation declines and this is leading to economic and social problems (see Graph 1). In the EU-10 countries, very few young people under the age of 35 (6 percent) are involved in farm management, while in the EU-15 the figure is significantly higher (28 percent). The situation with regard to farm managers over 65 is alarming, in the EU-15 it is about 14 percent and in the EU-10 it is approximately 24 percent. In addition to other measures, the European Social Fund can be effectively used for this purpose, but the challenge is the design of flexible, adaptable delivery systems for rural communities under the conditions of the population mix. On the other hand,

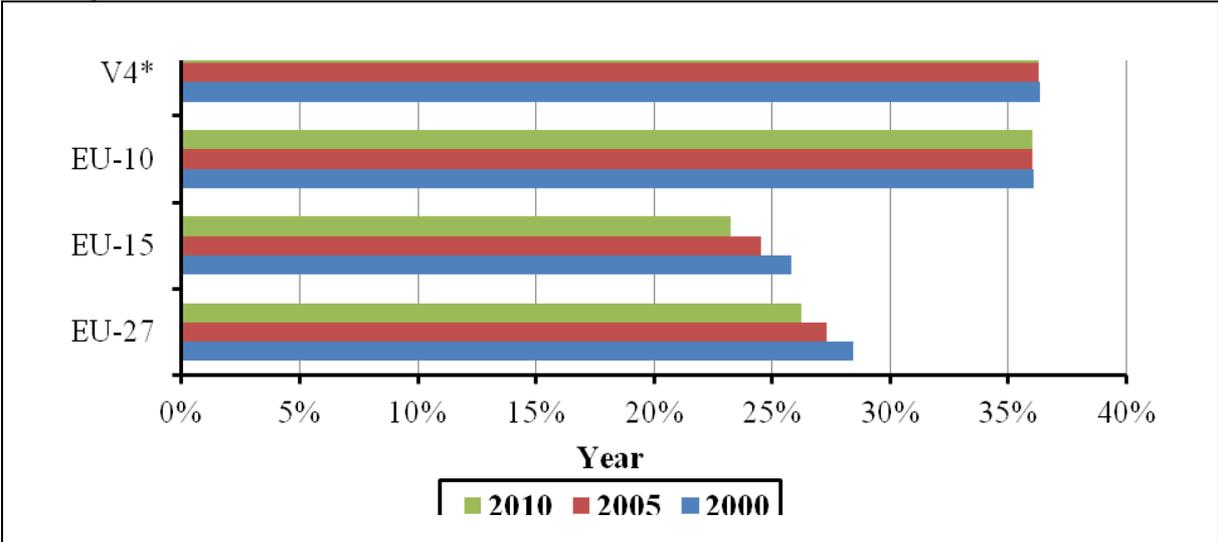
it is important to point out that the process of rural-urban migration in the EU-10 countries is not as dramatic as in the EU-15, or in other parts of the world. Between 1989 and 2011, in the EU-10 countries, the percentage of the rural population in comparison with total population has even slightly scaled-up from 36.40 percent to 38.12 percent (+1.72 percent), while in the EU-15 countries during the same period there was a decline of about 5.12 percent, in OECD countries about 9.32 percent and in the world about 12.67 percent. This development is partially influenced by the new lifestyle to live in family houses in the countryside near to agglomerations and by a reversal trend characteristic for the elderly population to move from cities to villages after their retirement. Figure 2 and Figure 3 provide information about employment in agriculture in the EU-27 countries and about the share of rural population in comparison to total population in the EU-27, EU-15, EU-10 and V4 countries.

**Figure 2: Employment in Agriculture as a Percentage of Total Employment**



(World Bank: World Development Indicators)

**Figure 3: Rural Population as a Percentage of Total Population in the European Union**



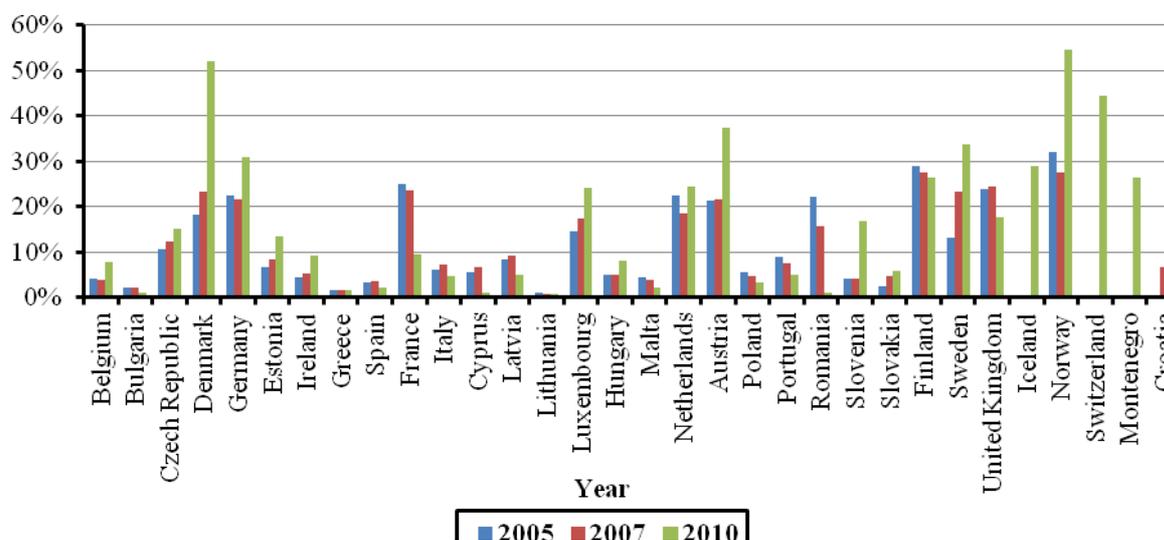
\*Republic of Poland, Slovak Republic, Czech Republic, Hungary

(World Bank: World Development Indicators)

## 2. Income Diversification and Farm Commercialization

The CAP places emphasis on the wider role of farmers in rural areas through its second pillar related to rural development. Due to the fact that outside the European Union this concept is frequently considered insufficient and limited in its effect on the well-being of agricultural holdings, internationally there are an increasing number of those who are calling for other more valid concepts. In point of fact, in many EU-15 countries, farmers have increased the diversification of their production through on-farming activities – energy crop production, organic farming production, processing of food crops or producing and processing regional products, through marketing and direct sales, agro tourism, catering, sport and recreational activities, loan of machinery, the harvesting of non-wood forest products, handicrafts, etc.), or by applying off-farming activities (establishment of small or medium-size enterprises).

**Figure 4: Agricultural holdings with other gainful activities directly related to the holding, percentage of the total number of holdings**



Source: Farm Structure Survey, Eurostat

While in the EU-15 the average number of agricultural holdings with other gainful activities besides agricultural production was 9.41 percent of all holdings, in the EU-10 this number accounted for just 4.75 percent. Diversification within the EU is increasing and the best results in 2010, with regard to this trend, were achieved in Denmark (52.02 percent), Germany (30.80 percent), the Netherlands (24.56 percent), Austria (37.34 percent), Finland (26.49 percent), Sweden (33.83 percent), Luxembourg (24.09 percent) and in the United Kingdom (17.54 percent). In 2010, the countries having the lowest percentage of farms with other gainful activities were: Greece (1.45 percent), Spain (2.10 percent), Italy (4.70 percent) and Portugal (4.98 percent). Within the EU-10, the best results have been noted in the Czech Republic (15.05 percent), Estonia (13.51 percent) and Slovenia (16.77 percent). It is worth noting that this indicator reveals the lowest results and downward tendencies in the countries most affected by the economic recession. In comparison to 2005, after five years the percentages had decreased in Spain by 1.15 percent, in Italy by 1.40 percent and in Portugal by 3.98 percent (see Graph 4). The results confirm that for diversification of farm activities, the financial health and economic viability of the respective state is important in order to be in position to support rural development activities, including diversification, rural employment and consequently the growth of commercialization of the farm and non-farm products and services. The new EU-10 States gained broad and positive experience from another profitable activity during the period of large-scale farming (so called additional production or non-agricultural production). Collective farms were engaged in various activities. Many of them diversified

through provision of services, agro-mechanical services and transport, others processed the food or provided construction work, or even assembled agricultural machines. They used to operate restaurants and tourist facilities with traditional backgrounds. Non-agricultural activities represented more than 20 percent of the company's market production and their share of the farm profit was about 50 percent (Doucha et al., 2003). In comparison, the recent status of diversification in the EU-15 States is at a lower level. There are four main reasons for this.

#### 4. Incentives for Slovak Farmers for Agricultural and Rural Development

In order to identify the incentives which are perceived by Slovak farmers to provide opportunities for their business activities in agricultural and rural development, research was undertaken on a sample of 81 farmers. The research results clearly demonstrated that farmers in the Slovak Republic consider subsidies to be the most important opportunity from the selected list of opportunities. The reason for this is that subsidies are one of the most important profit-creating factors in Slovak agriculture. Without subsidies, more than 90 percent of agricultural companies in our sample would not have been able to achieve a profit in the years spanning 2006 to 2010. Another important opportunity for farmers is the weather. This opportunity was perceived more acutely with the growing size of agricultural farm. This can be simply explained by the fact that favourable weather conditions can lead, in the case of larger agricultural companies (according to the area of agricultural land they own or rent), to significantly higher absolute values of profit than in the case of smaller agricultural enterprises. On the other hand, it is also important to point out that unfavourable weather conditions have the opposite effect on farm profits. Other important opportunities for Slovak farmers are modern technologies, the new Common Agricultural Policy (CAP) and the possibility to purchase the land which is currently rented by them (most of the cultivated land in Slovakia is not owned by the farmers).

**Table 1: The Perception of Selected Opportunities by Slovak Farmers**

Opportunities	Descriptive statistics				AL <sup>2</sup>		NE <sup>3</sup>		PA <sup>4</sup>
	N <sup>1</sup>	Average	Median	Mode	KW	JT	KW	JT	KW
Subsidies	81	4,543	5	5		⊕		⊕	*
Weather	81	4,506	5	5		⊕	*	⊕	
Modern Technologies	81	4,198	4	5		⊕		⊕	
The New CAP	81	3,951	4	5		⊕		⊕	
Purchase of Land	81	3,617	4	5		⊕		–	
Creating Producers' Associations	81	3,531	4	5		⊕		⊕	
Renewable Sources of Energy	81	2,753	3	1 <sup>a</sup>		⊕	**	⊕	

<sup>1</sup>sample size, <sup>2</sup>structure of farms according to the area of agricultural land in compliance with the land parcel identification system (LPIS), <sup>3</sup>structure of farms according to the number of employees, <sup>4</sup>structure of farms according to the production area, \*\* (\*) null hypothesis can be rejected at a significance level of 0.01 (0.05) – medians create a non-increasing sequence; ⊕ medians create a non-decreasing sequence; <sup>a</sup>mode no. 2 = 3, KW – Kruskal-Wallis test (Monte Carlo Sig.), JT – Jonckheere-Terpstra test (Monte Carlo Sig. 2-tailed)

(authors' research)

## Conclusions

Over the last two decades, the new EU-10 States have been facing many challenges in the countryside and most of them have experienced massive changes in the socio-economic, policy and institutional environment and tools. While following EU accession the importance of the agricultural sector in the national economy is further declining, the positive trend for rural development is that the importance of rural economies is gradually being recognized by EU policymakers and by some national governments as an important factor for vibrant rural areas. The lessons learned suggest making a distinction between rural development and agricultural development, since they are not the same. Rural development requires targeted attention, including the provision of rural development support systems and social infrastructure. A rural development support system provides rural residents and local governments with information, coordination, and technical assistance. Social infrastructure needs vary from place to place, but include such things as roads and highways, schools and childcare facilities, hospitals and clinics, community centres with libraries, internet connections, and adult learning facilities. These support measures are territorial not sectorial, and they improve the rural business environment as well as the capacity of rural residents to improve their own human capital, increase their economic opportunities and enhance the quality of life in rural areas. An active rural development policy has to cover farm investments, competitiveness of the agro-food industry, environmental management, bio-energy production, mitigation of and adaption to climate change, the benefits from local food brands, food of local origin, niche markets, direct sales from farms, animal welfare as well as the quality and safety of food products. In the most developed states of the EU-27 economic diversification is the dominant factor, with the tendency to introduce additional activities which stem out of agricultural production: handicrafts linked to rural life, rural tourism or the production of local food with protected geographical indication.

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# Private Universities and Education of Their Graduates for Companies in the CR

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Roman SVOBODA<sup>1</sup>

## Abstract

The aim of the study is to express the possibility of solving educational disparities between private and public universities in education system in CR. Politicians and pedagogues should break away from the prejudices of the previous period that education is the prerogative of the state and public institutions are the only right alternative for education. Studying at private universities is a good way for many people to supplement and enhance their qualifications or improve their position in the labour market. But the problem is that private universities are especially offering economic studies and humanities and Accreditation Commission revealed the cases of poor-quality studies there in the past. The period of acquisitions and mergers in the private higher education has already begun and there will be many major ownership changes in the next two years.

## Keywords:

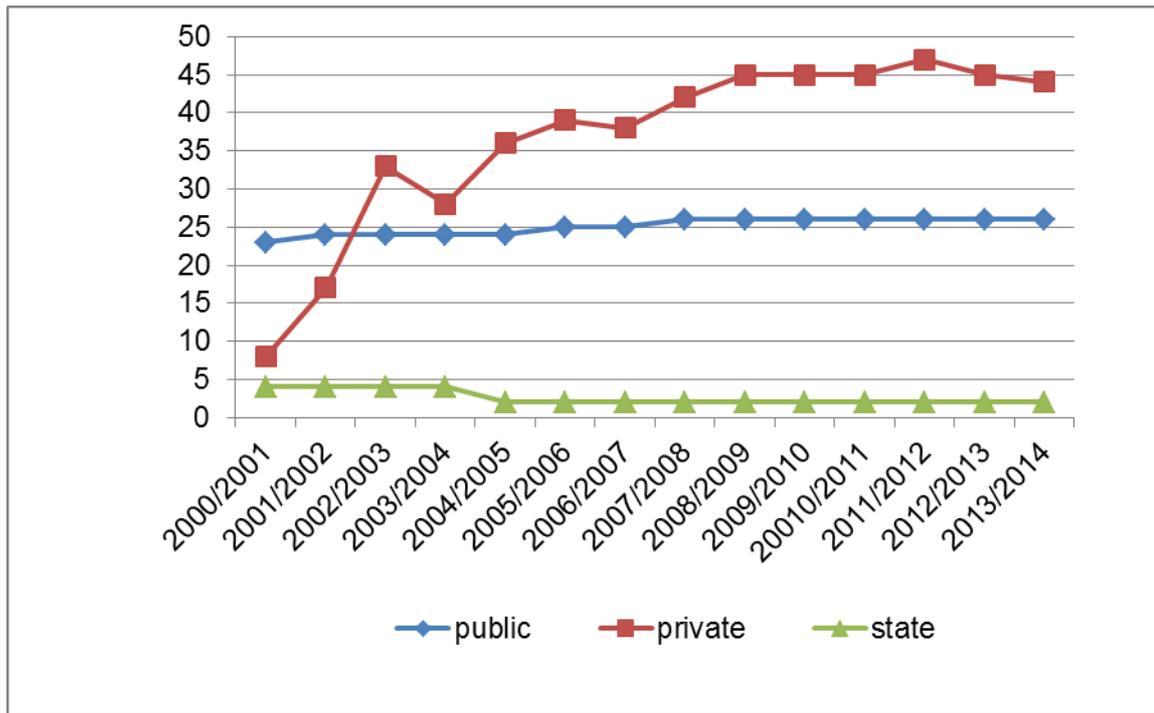
company, employability, graduate, private and public university, university studies

## Introduction

Private schools are the most common form of educational privatization, schools that are founded and sponsored by private entities, including religious group, independent organizations, and for-profit organizations (Belfield and Levin, 2010). Until recently it was profitable to have own "university", but now it is different. Students who paid school fees are disappearing. The number of private universities grew rapidly until 2007, but it began to stagnate later and now it is even decreasing. Yet there were 47 private universities in the Czech Republic in 2012. According to the estimates there should be left only a half of the 44 private "universities" within three years (see Pic. 1). It is expected that by the end of the next year there will remain around twenty such schools in the Czech Republic. There are currently seventy universities in the Czech Republic; two-thirds of them are private. Compared to the UK, where there live six times more people than in the Czech Republic with ten million people, there is around 130 such schools. This would mean that only 20 universities could be enough in the Czech conditions in the future.

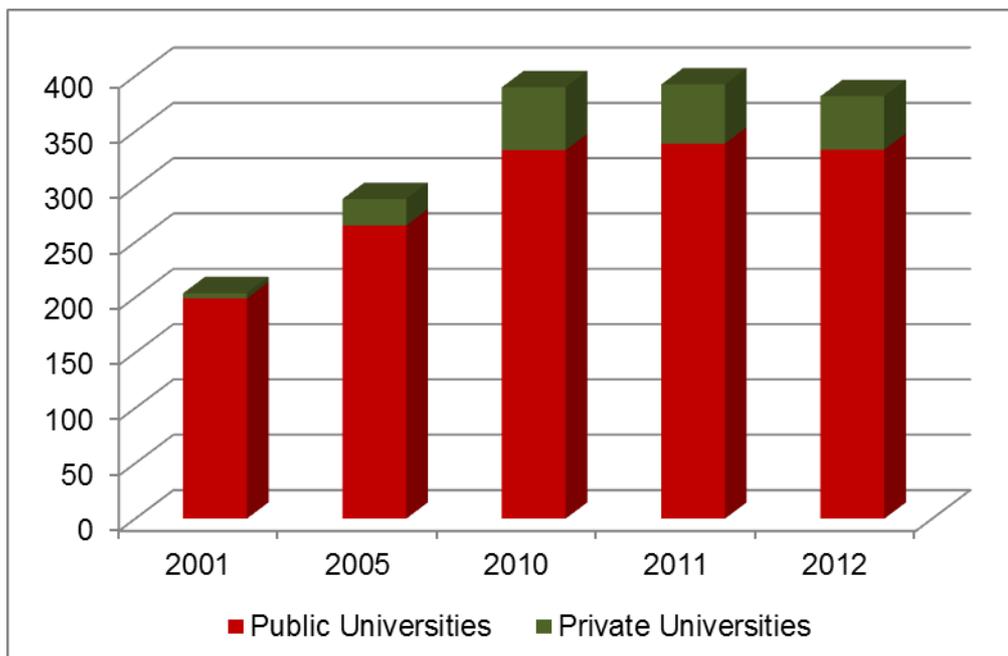
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**Pic. 1 : Number of Universities in the Czech Republic (ÚIV, 2014)**

However only 14% of the total number of students in the Czech Republic enrolls in private universities (see Pic. 2). According to the Ministry of Education there studied nearly 60,000 students at private universities four years ago. Currently there is studying a little over 48,000 students at private universities. Public universities take over students from private schools because due to lack of applicants they have begun to accept candidates without entrance exams for example. Another reason behind lesser number of students at private universities is often too high tuition fees.



**Pic. 2 : Number of students at Public and Private Universities in the CR (in thousands) (ÚIV, 2014)**

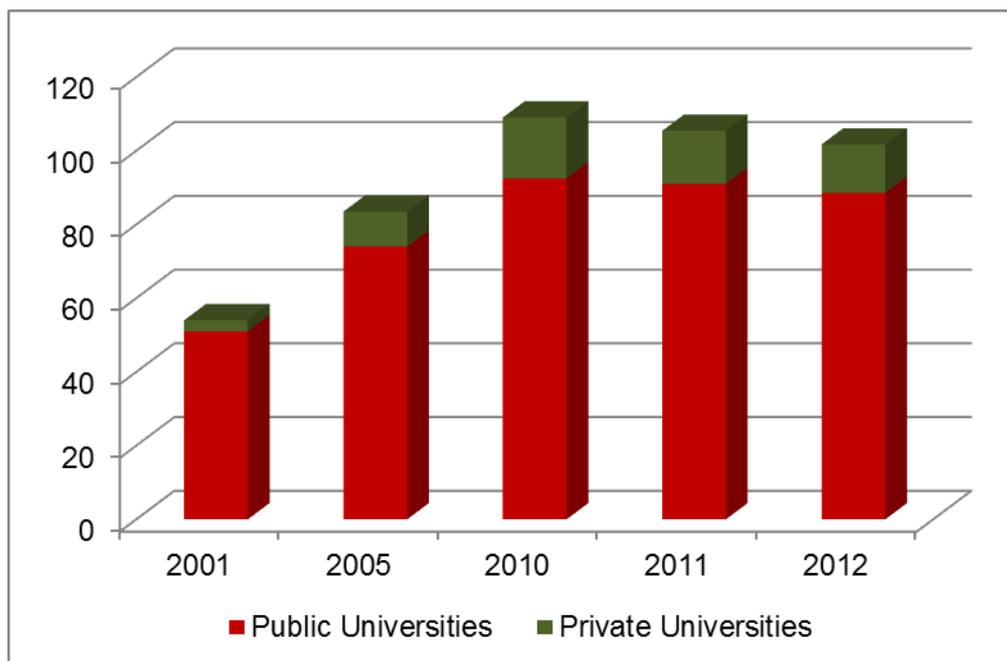
Not all private universities have good quality of education and thus the value of a university degree is constantly decreasing. Offer of schools in the Czech Republic is related to the local passion for the title before and after the name which is dating from the times of the Austria-Hungarian Empire. "Czech society is still dazzled by titles before and after the name. Czech desire for titles seems a bit archaic to me and in my opinion it had to be one of the reasons that drove people for accelerated degrees at the West Bohemia", says Professor Rudolf Haňka who works at the University of Economics in Prague and at the British University of Cambridge and also participates in the forthcoming changes in higher education (Adámková, 2012). On the other hand, Průcha states that "the greater the participation of the population in higher education, the better the qualification structure of the country's population and the higher the economic potential of the country" (Průcha, 1999).

## **Materials and Methods**

The methodology of the study is mainly based on the comparison of data in published papers about the issue of private education, as well as on our own knowledge from the teaching at universities. These include articles by renowned authors from the Czech Republic (Koutský, Průcha) and from abroad. Annual reports from Institute for Information in Education as well as internal materials of private universities were an important basis for obtaining statistical data on the status and development of the number of students in schools. When processing the paper a method of description (characterization of condition and development of private education) and a comparative analysis (comparison of selected indicators) as well as a graphical view of the development of indicators were used. The aim of the study is to express the possibility of solving educational disparities between private and public universities in education system in CR.

### **Deciding on the Selection and Admission to Private School**

The practice of graduates and their value in the labour market best reflect the quality of school; students accordingly decide to choose a public or private high school (see Pic. 3). The abilities of school lecturers can be seen as an added value. Teaching through quality teachers do not revolve only around bare theory and cramming, but students have the opportunity to meet with the recognized experts in their field and see how the study course works in practice. They can see what they have to expect from adult life, what are the requirements of employers when applying for a job and what how they should be prepared. When choosing a school it is appropriate to find out how many professors and associate professors is in teaching staff, publication activities, how is equipped a library and a computer lab and if the schools offers internships abroad (Kašparová, Svoboda, 2013).



**Fig. 3: Number of newly enrolled students at Public and Private Universities in the CR (in thousands) (ÚIV, 2014)**

A contract which a school conclude with each student and in which are specified relationships including tuition fees is a requirement for admission to a private university. The amount of tuition fees is estimated to be approximately in the range of 25-150 thousand CZK per semester and institutions usually require payment in two instalments. For example, students pay 50,000 CZK for one school year at the largest private school, the University of Jan Amos Comenius (UJAK, 2014) and 55,000 CZK at the Metropolitan University (MUP, 2014). Schools often offer preferential loans of banks, they cooperate with.

Easier acceptance at private university versus public university does not guarantee obtaining an academic degree. If someone enters the university with no interest in the study and do not fulfil his obligations, even private school will say goodbye to him. A school that wants to only make money on students does not usually have a long duration. Many private universities operate as non-profit company, so they invest their incomes into the development and quality of the school. In Europe, in general, it is also common to provide substantial government funding for private schools (McEwan and Carnoy, 2000). High competition motivates private schools to a higher quality of offered study programs, to an involvement of students in practice and to care about the professional level of teachers. Students at private universities will especially appreciate the involvement of experts from practise in teaching (Adámková, 2012).

### **Employability of Graduates of Private Universities in Tourism Sector**

The research of Centre of Education Policy at Charles University in Prague shows an interesting trend that there is better employability of graduates from private universities compared with graduates from public universities for the fourth consecutive year. For the first time in five years there was not an increase in the difference between them, rather the opposite. The unemployment rate of graduates from private universities was 3.3% in 2012, when talking about graduates from public universities it was 4.5%. There are mainly two reasons behind a better situation of graduates from private universities. Most private universities are located in Prague and their graduates find a job much easier due to the low unemployment rate of university graduates in Prague and due to the significantly wider range of relevant job opportunities than in other regions. The second reason behind this state is that private universities are more frequently visited by students who already have a job and are only complementing or increasing their qualifications (Koucký and Zelenka, 2013).

So studying at private universities is a good way to complement and increase the qualification or to improve position in the labour market for many people. The advantage is the combined or distance study based on self-study supports and variety of e-learning tools. This form of study allows a greater degree of autonomy and responsibility for learning (Pojsl, 2012). Private universities thus reflect the current trend that the most interested in the study are people who are already working; private universities are able to offer an individual approach to such students. However, "It is shown that needs of labour market are not in accordance with offer of the study fields, respectively study programmes at the universities" (Kubanová and Linda, 2013).

An example can be the study program Management of Tourism at University of Business in Prague where employees of our monopolistic firms engaged in tourism or foreign firms complement their higher education. The Institute of Hospitality Management in Prague focuses on education of workers in hotel and fast-food restaurant sector. Hospitality and Spa Management can be example of such a study programme at this institute. Employees of fast food chains of multinational companies (McDonald's, KFC, Subway et al) are often students at VŠO and especially at VŠH which focus on education of workers for managing positions at companies producing or distributing meals. Thanks to the practical approach at teaching at these private colleges, students obtain practical knowledge from the operation of international chains of fast food restaurants where they find, as it was verified, job. They have an advantage because of their practical knowledge in the field and managerial knowledge in leading team of people.

## **Results and Discussion**

### **The Quality of Private Universities**

People's opinions vary considerably when assessing the quality of private universities. It is reflecting the reality because there really are big differences between private universities. For example, private schools that focus generally on the same courses as their competitors (marketing, management, economics and human resource management) are the cause of criticized Czech higher education according to the experts as well as students. People study mainly economics, tourism and humanities at private universities and colleges. Private universities offer particularly a study of economic and humanities. These study programmes are demanded, for example, by the officials, who must finish their qualification. Private universities offer them a more individual approach and a wider range of distance study programmes as well as better equipment. Graduates generally receive a bachelor's degree, which is sufficient qualification for officials.

The Accreditation Commission revealed cases of poor-quality studies just at private universities in the past. According to the Chair of the Accreditation Commission Vladimíra Dvořáková poor universities must come to an end. "The situation in higher education has significantly deteriorated. In my opinion, there is a relatively high percentage of poor quality schools," says Vladimíra Dvořáková (Adámková, 2012). "The assessment of the quality of higher education institutions can stimulate positive changes in higher education" (Furková, 2013).

Representatives of private colleges and universities are aware of the end of the good old ages. It would certainly be difficult for many schools to survive; the period of acquisitions and mergers in the private higher education has already begun and there will be many major ownership changes in the next two years. According to the amendment of the Higher Education Act low-quality schools should be excluded in three ways:

- When establishing new private university, state approval will no longer arise automatically just by fulfilling conditions specified by the law as it has been till now. The Higher Education Act from 1998, which is still valid today, actually placed too

favourable conditions for the establishment of private schools. Applicants may seek approval from the state for how many times they want. The Accreditation Commission must clearly justify the decision in case of refusal. The applicant has the option to appeal to the Appellate Committee of Minister of Education, which can return the whole process back to the beginning

- The amendment of the Higher Education Act proposes to revise the system of accreditation granted to universities. There would be a central National Accreditation Agency which will grant accreditation to not only individual fields, but also to the entire higher schools. These institutional accreditations should provide a clearer, less bureaucratic management; of course it also requires greater responsibility of private higher schools for their results. As it seems study programmes in higher education in the CR will probably be divided into professional (more practical) and academic. The aim is to establish criteria for comparing universities and for the evaluation of their quality.
- The present draft of amendment to the Higher Education Act will introduce the differentiation of study programmes onto academic and practical and would lead to a higher quality of universities, such as improving the accreditation process and establishing of the system of internal evaluation of universities. A president of the republic will continue to appoint professors. Higher schools would also be capable to remove unfairly obtained degrees of their graduates, for example, in the case of copying the thesis.

### **The Evaluation of the Previous Analysis**

Contemporary higher education, as well as the entire education system yet lacks a vision of development and qualified concept of individual levels of education. Relatively high quality achieved throughout whole education sector in the past is quickly disappearing, which is evident from international comparisons. A number of successive interventions in the education system which were not based on research, evaluation studies, comparative analyses and other indicators required for decisions and setting concepts have been implemented. These were mostly political decisions that favoured the implementation of programs of political parties at the expense of the quality of the outputs. This was negatively reflected not only on the quality of the law, but consequently on the level or utility value of education (Král, 2012). Besides if we take into consideration almost universal availability of higher study, the direct dependence of the existence of all types of schools on the number of accepted students and gradual change in their behaviour, especially their significant trend of achieving results with minimum effort, then there is an unenviable situation and the threat of the loss of country's competitiveness which is proclaimed by the government. The direct employer involvement in the activities of universities is more and more considered as an effective way to improve the relationship between higher education and the labour market. Such cooperation ensures to employers that they get adequately prepared graduates and to higher schools that their graduates and their research will be well applied in economics, since they correspond to the needs of employers. The aim of future changes should be the general society's benefit rather than particular group benefit of subjects offering higher education.

### **Conclusion**

Politicians and pedagogues should break away from the prejudices of the previous period that education is the prerogative of the state and public institutions are the only right alternative for education. The question is whether the still promoted differentiation of universities on private and public universities brings something positive; developed world does not confirm this (Kašparová, Svoboda, 2013). Private universities have brought dynamics, rapid response to social needs of fields of education, contemporary knowledge and last but not least the competitive environment, which is the driving force behind any progress, into a static educational system. A partnership between the public and private sectors (PPP) and the foundation of for-profit higher education institutions is being developed in many countries. Higher education policy in some countries (especially in the United Kingdom and Australia) supports private universities to further meet the demand, which the public sector is not able to

ensure. In general, we can say that the Czech education system lacks better connection to the labour market. It is not possible that the Czech education would raise an army of unemployed. Therefore, let's deal particularly with the quality and competitiveness of education in the Czech Republic in terms of European and global space.

## Acknowledgements

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# On association of Internet usage in country and learning outcomes test scores

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Jindrich KLUFA<sup>2</sup>

## Abstract

Human capital development and knowledge-based economy are still frequently discussed topics not only in the developed countries these days. At the same time, thanks to the advances in information and communication technologies development, various tools based on computer and web technologies to be used in education have become available recently. There exist many studies addressing the evaluation of effects of an application of such tools, considering the situation at particular schools and study programs, which may provide an accurate view of the situation at local level.

Based on the data on learning outcomes from the Programme for the International Assessment of Adult Competencies survey and working with country level aggregations, we try to find factors of high performance, using characteristics of the education system and several general country characteristics as the explanatory variables. It is shown that higher percentage of Internet users is significantly associated with higher test scores.

## Key words:

Internet usage, ICT, literacy skills, numeracy skills, developing countries, education system.

## Introduction

The human capital and the knowledge-based economy development have been discussed by the policy makers for some time in the developed countries and more recently have become relevant for some of the developing countries too. The goals of the education activities today include providing the knowledge and skills needed in life, preparation for the job and providing the necessary background for a valuable life in the human society in general. For the proper education governance, it is important that some kind of measures which can be used for the assessment of the success ratio in such activities are available. In addition to subjective evaluations of the learning success, which are performed by the students, teachers and other stakeholders in the teaching process, the formal measurements of the learning outcomes provide the necessary feedback regarding how successful the education process actually is in achieving the goals. The results of such evaluations then may suggest what should be improved in the education process and what are the strengths of particular social groups with respect to education.

Thanks to the advances in information and communication technologies (ICT) development, various tools based on computer and web technologies which can be used in education have become available recently. The web-based e-learning environments, such as the Moodle learning management system, have been in operation for some time and are widely used by now to support teaching by schools in many countries. The newest ICT technologies applied in teaching include the Augmented Reality and the Radio Frequency Identification technologies, which may be integrated to support education in outdoor

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environments, creating the ubiquitous learning environment (the u-learning), as has been shown e.g. by Chen et al. (2013).

The question is, what is the extent of the benefits for the resulting quality of the education which can be expected to be obtained when using such technologies in practice. There exist many studies making an attempt to evaluate the effects of an application of such tools, using data at individual level and considering the situation at particular schools and particular study programmes. Such studies may provide a quite precise local view of the situation. Recent studies addressing the problem of evaluation of application of the information and communication technologies in teaching process include the study performed by López-Pérez et al. (2013), who report on running a research at University of Granada and report a statistically significant difference between the final marks obtained by students who participated in online activities and those who did not. They point out that using the technology in education allows students to learn at their own pace, among other benefits. Shapley et al. (2011) discuss the the evaluation of effects of the application of the Technology Immersion model performed in a sample of schools in Texas and conclude that the effects on achievements in reading and mathematics were positive, even though the statistical significance has not been reached in the study.

The present study aims at an assessment of the situation at a macro level, that is not just at a local level. The analysis is based on the data coming from a survey of a large-scale system of standardized learning outcomes measurements and the data are basically aggregations at a country level. The goal of the study is to identify if there is a sort of driver of high performance in the learning outcomes tests. The characteristics of the education system and several general background country characteristics, which include a measure of the usage of Internet in the country, are used as the explanatory variables in the analysis. This could help the educators and policy makers better understand how to increase the skills of the population in the future.

There exist several widely applied systems of standardized learning outcomes measurements. The results of the large-scale studies are then often discussed and analyzed in the particular countries and the measures for improvement of the situation are being developed by the policy makers and experts on teaching and finally the measures are applied in the teaching process. Thus the learning outcomes surveys often have significant impacts in the education policy and teaching practice and perhaps in connection with this fact, rather large volumes of resources are being used for the design, conducting and and finally the results processing of such surveys. The recent learning outcomes surveys include the Programme for the International Assessment of Adult Competencies (PIAAC) designed by the Organisation for Economic Co-operation and Development (OECD). This survey has been designed to provide results which can be used for cross-country comparisons and also for comparisons over time in case that the survey is taken repeatedly. For the details on the purpose and the design of the survey see the survey website (PIAAC-OECD, 2014).

The organization of this paper is as follows: first the PIAAC survey is briefly introduced and the data sources used in the analysis are described, then the results of elementary statistical analysis of learning outcomes scores in the survey are reported and finally an attempt to find out if there are some characteristics which are associated with the performance of particular countries in the learning outcomes test is made. Following the work (Kaspříková, 2014), which provides a discussion of basic summary characteristics of the mean numeracy proficiency score and literacy proficiency score, this paper investigates the relation of the learning outcomes scores and the usage of Internet in the country.

## **Materials and methods**

### **Data description**

The data used for the analysis are coming from the World Bank database on Education Statistics, which can be reached via the web interface – see (World Bank DataBank, 2014). The data considered are country level aggregations and are collected yearly.

Regarding the data on performance levels, the most recent (and at this time still the only available) data on the PIAAC survey of learning outcomes are from the year 2012. The PIAAC survey is designed to cover two groups. The first one is the Young adults group and the second one is the Adults group. The focus in this analysis is on the Young adults group only, which includes the people aged 16 to 24 years. It can be assumed that the performance of such young people should reflect the recent situation in the education system of the country more closely than the performance of people over 24 years. The survey outcomes include the Literacy proficiency score, which is supposed to be related to the ability to use and understand written texts, and the Numeracy proficiency score, which is supposed to reflect the ability to use mathematical concepts.

The analysis covers only the countries, for which the relevant data are available at the moment, which are the following: Australia, Austria, Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Japan, Korea, Netherlands, Norway, Poland, Slovakia, Spain, Sweden, United States, that is basically the countries which may be regarded as developed. Data from more countries are expected to be collected in the future after the other countries join the PIAAC survey.

As there are some missing values in the explanatory variables (i.e. the variables not directly reflecting the performance in the learning outcomes tests) included in the analysis and since it makes more sense to consider also the values of the years previous to the year in which the learning outcomes test is taken when working with the variables which are supposed to have an impact on the performance, the values of variables other than the actual learning outcomes are taken as the average values over the values from several previous years in the analysis.

The characteristics of the education system in the country considered in this analysis include the following variables: the duration of compulsory education, the enrollment ratio and the ending age of the compulsory education and finally the tertiary first degree completion ratio. Then also several variables on the general background in the country are included in the analysis, namely the gross domestic product per capita to adjust for the economic development level, the mortality ratio under 5 years and the number of Internet users (per 100 people).

### **Statistical analysis**

Within a basic exploratory statistical analysis, the dependence between the learning outcomes scores in particular fields is reported using the Pearson correlation coefficient and the 95% confidence interval limits for the value of the Pearson correlation coefficient are reported, after an assessment of normality of the investigated variables using the Shapiro-Wilk test and after an inspection of the plots of the probability density estimates to check for normality. Since the values considered are actually mean values of the test outcome obtained from a large sample, it is not surprising that the values can be regarded as coming from the normal distribution. The usage of the Pearson correlation coefficient thus may be regarded as justified in this case.

Since the elementary analysis has shown that the numeracy skills performance and the literacy skills performance are highly correlated, the mean numeracy proficiency score and the mean literacy proficiency score are merged into the total score and only this single score is considered in further analyses as a measure of performance. The dependence structure is further studied using the standard linear models framework with the total score as the outcome variable and the other variables as predictors. The R software for statistical computing (see

(Hornik and Leisch, 2004) and (R Core Team, 2013)) is used for the statistical computations and the 0.05 significance level is used for the assessment of statistical significance. As a reference for the statistical methods used, see e.g. (Venables and Ripley, 2002).

## **Results and discussion**

### **Basic results**

The mean scores in both the numeracy proficiency and the literacy proficiency by country are shown in Picture 1. For example for the teachers and other education process stakeholders in the Czech Republic, the good news is that the mean literacy score in the country (which is 280.5) is not below the average value of the countries and its mean numeracy score, which is 278, is clearly above the average performance level. First, when considering just the learning outcomes variables, we investigate the dependence of the numeracy proficiency score and the literacy proficiency score. In Picture 1 it can be observed that generally the countries with higher scores in one of the fields can be expected to achieve better results in the other field as well. Such result is not unexpected, since associations between particular parts of the tests are often reported, see e.g. (Otavova and Sykorova, 2014). The dependence may be formally assessed using the correlation coefficient analysis, which gives the value 0.84 as the sample estimate of the Pearson correlation coefficient, with the 95% confidence interval limits for the value of the correlation coefficient 0.65 and 0.93. This suggests that the two scores can be merged into a single total mean score for further analyses.

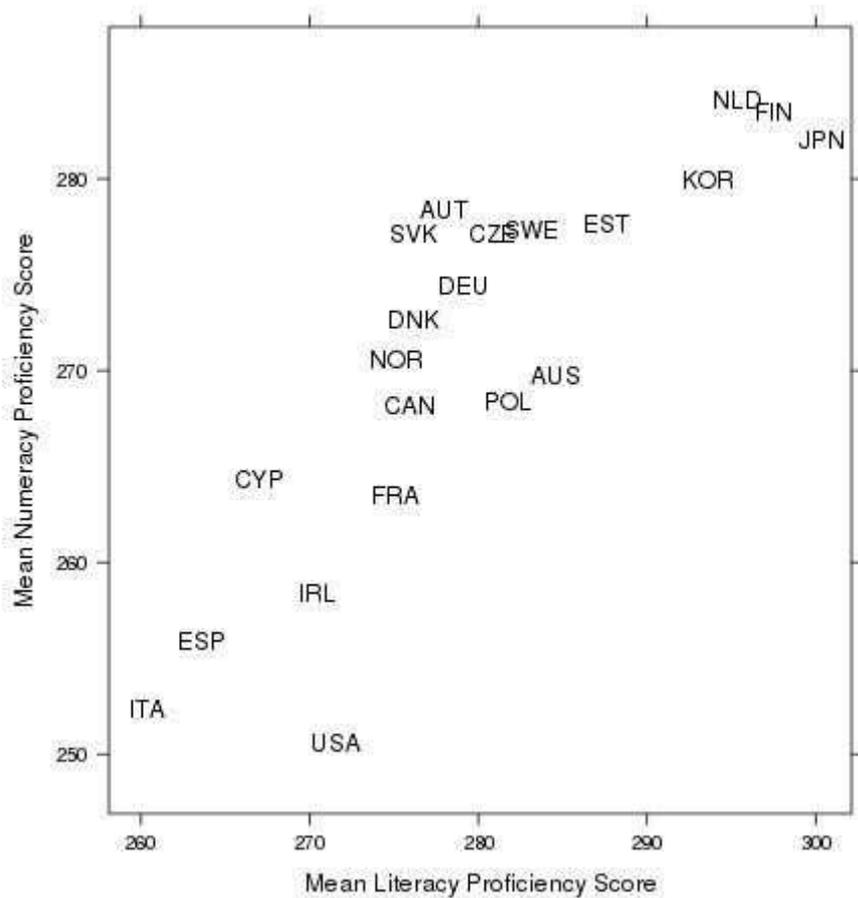
### **Factors of learning outcomes scores**

When building the regression model for the mean total learning outcomes score, the only variable which was found to have a statistically significant nonzero coefficient is the percentage of Internet users (the p-value for the coefficient is less than 0.001), nevertheless, the accuracy of the model with all the predictors included is higher (the adjusted R squared of the model is 0.7) and this more complex model is also preferred when considering the results of the analysis of variance (ANOVA) test of the model with the whole set of predictors in comparison with the submodel including just the Internet users percentage in the set of predictors (since the ANOVA test has given p-value less than 0.05).

The relation of Internet users percentage and the mean learning outcomes scores of the countries is shown in Picture 2, which also includes the linear regression curve which has been fit to the data. In this Picture, the departures from the regression line suggest the evidence of impact of some factors of the learning outcomes scores which are not included in the Internet users percentage variable. For example the Czech Republic or Finland can be considered as having comparatively high learning outcomes scores when adjusting for the percentage of Internet users. This is even more pronounced in case of Japan (which, as a technologically more advanced country, has higher number of Internet users per 100 people). On the other hand the achievements in USA or Spain are rather low. The participants in the survey from these countries have on average been performing below the level which may be considered as corresponding to the percentage of Internet users in the country.

When looking at the dependence of the learning outcome score and the percentage of Internet users in the country, the sample estimate of the correlation coefficient value is 0.58, which may be considered as quite high value. The corresponding t statistics is 3.0975, which with 19 degrees of freedom gives p-value 0.0059. The limits of the 95 percent confidence interval for the value of the correlation coefficient in the population are 0.2 for the lower limit and 0.81 for the upper limit. From this result it follows that there is a clearly positive correlation between the learning outcomes score and the percentage of Internet users in the country, even if the sample is small (and the confidence limits are quite wide) in this case. The results of the analysis suggest that the development of high achievement levels is supported in an environment which builds on a wide-spread usage of the modern information

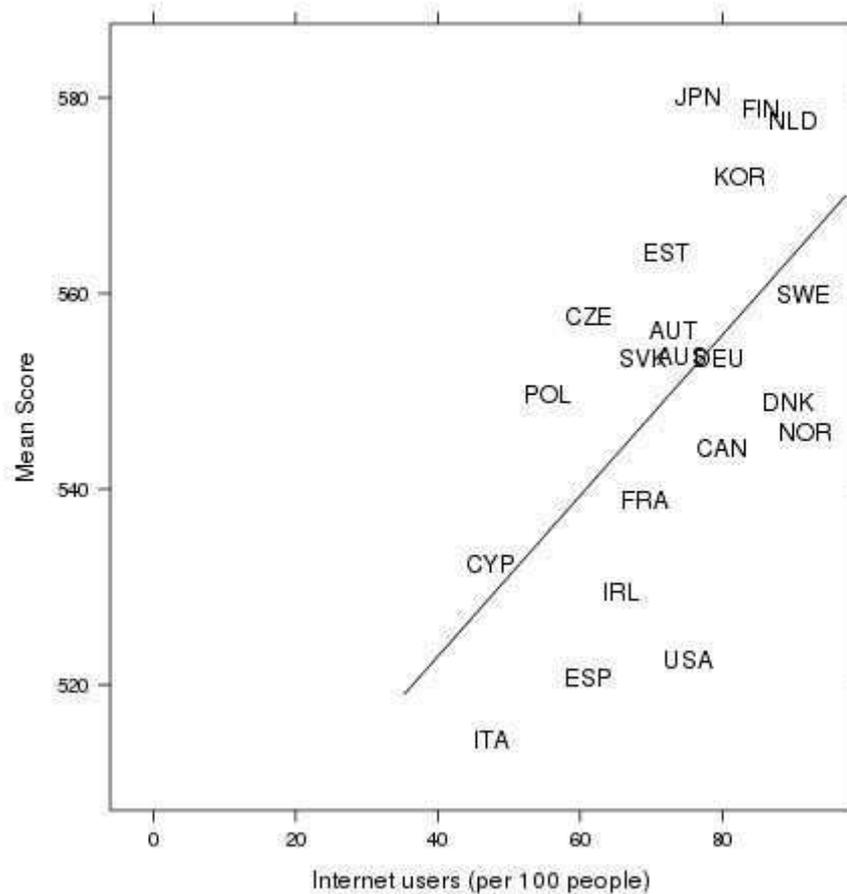
and communication networks. It seems that the point is to make the communication technologies available to rather wide group of people, that is not just make the technologies available to the elite groups in the country. The technologies related to Internet seem to provide an efficient tools for sharing the knowledge and also provide a suitable environment for the development of problem solving skills. This view is supported by other studies which focus on micro level situations: for example the case of social networks, which may relate to informal education process outside schools, is discussed in (Lohr, Tesař and Brožek, 2013). The ICT also started to be heavily used directly in formal education process at schools in the developed countries. The availability of online learning management systems enhances the opportunities for distance learning and also for the life-long learning, including further education of working professionals, among others. Recent discussions and evaluations of the application of such tools in education include (Mořna, 2013) for mathematics teaching and (Majovská, 2013). One of the advantages of using the ICT in education is that it allows performing experiments easily, but still it is not straightforward how to use the full potential for education (Robová and Vondrová, 2013).



**Pic. 1 Dependence of literacy and numeracy scores**

The results obtained in this analysis show strong association of the characteristics considered, but on the other hand, taking a critical view of the results just obtained in the analysis, the question may be what is actually measured by the learning outcomes surveys like the PIAAC survey, even if the tests may have high reliability. These surveys are not always accepted without reservations. For example Tsatsaroni and Evans (2014) provide a similar surveys for the educational governance and they argue that the competency model of knowledge, which is a basis of such surveys, is too narrow. The case of the Programme for International Student Assessment (PISA) survey, which is another

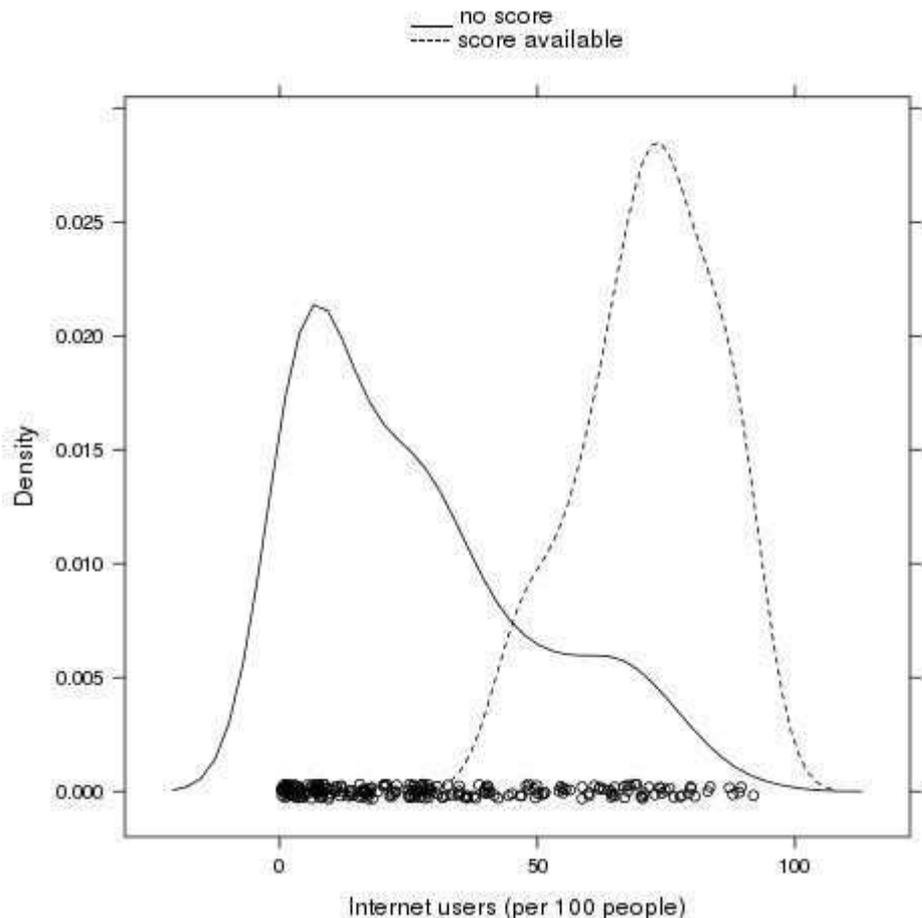
initiative by OECD, is discussed in paper by Gorur (2010). And similar questions may be raised in case of the data on Internet users percentage, since there is probably no 100% safe method of data collection even for this rather basic characteristic. The issues related to methodology for the Internet usage measurements in case of rural China are addressed in paper (Ting and Sandel, 2014). Nevertheless, the data on internet users percentages in the OECD countries should hopefully be precise enough for the purpose of our analysis. If the data were severely contaminated, the correlations would probably not have shown up at all.



**Pic. 2 Dependence of literacy and numeracy scores**

**The situation in the developing countries**

We have discussed a rather homogeneous group of countries in our analysis so far. The countries included in the analysis above may all be regarded as rather developed ones. The question is, what would be the situation regarding the learning outcomes test performance in countries, for which there is no PIAAC score available to this date. When looking at the percentage of Internet users data across all the 229 countries for which the information on the percentage of Internet users is available - see the plot of the probability density estimate of Internet users percentage, shown by the learning outcomes score availability in Picture 3, it is obvious that the density of percentage of Internet users is bimodal (even if the countries were not split into the two groups by the learning outcomes score availability). And that there exists a natural classification structure regarding the percentage of Internet users – there are two segments with a cut-off value at approximately 50%. This further supports the hypothesis that the percentage of Internet users variable may be a valuable one when discussing the learning outcomes performance levels and other characteristics. It may be expected, that the performance in the countries which were not included in the PIAAC survey so far would be lower. This could be verified in the future in case that the developing countries join the survey too.



**Pic. 3 Density estimate of he number of Internet users by score availability**

### Conclusions

The results of the analysis suggest that when considering the countries with a rather comparable level of development, it seems that the development of high performance levels in numeracy and literacy skills is strongly supported in an environment which builds on a wide-spread usage of the modern communication networks. There is a clearly positive dependence between the learning outcomes scores and the percentage of Internet users in the country. Obviously the technologies related to Internet provide efficient tools for sharing the knowledge and also provide a suitable environment for the development of problem solving skills. From this it follows that the availability of such technologies in the society should be supported if the goal is to reach higher levels some characteristic which is reflected in the learning outcome scores. An important point is that if one is performing the evaluations of learning outcomes scores and relates the performance to other characteristics of the education system to make decisions on the directions of improvements of the education system and the teaching practice, the data on ICT usage should definitely be included in the analysis as covariates.

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# **How do banks really recruit job candidates? “The Sieve Model” in the context of recruitment and dismissal strategies in banks in Poland**

## **A new tool to measure it - the Integrated Sieve Model Index**

**Jerzy KAŻMIERCZYK<sup>1</sup>**

### **Abstract**

Banking is one of the fastest-growing sectors in the Polish economy. The involvement of foreign capital contributed to the use of modern organizational and management solutions coming from the West. The society, bank employees and also researchers used to assess employment in banks as demanding. Bank employees are frequently called knowledge workers. It is often said that the requirements for positions in the banking sector are high. The prevalence of higher education among banks' employees clearly affected this opinion. On the other hand, what can be observed in Poland is the popularization and depreciation of BA and MA education.

Earlier surveys and the results of interviews conducted with employees of banks confirm the high requirements placed on the workers<sup>2</sup>. The author challenges the thesis that the personnel policy in Poland's banks is characterized by high requirements placed on applicants and employees. Considerations need to be supported by theory. Given the author's earlier analysis, it seems that it would be appropriate to anchor the considerations and empirical observations in the sieve model presented by M. Kostera. It is one of the two models (besides the human capital model) of personnel policy proposed by this author. The following are the main assumptions of the sieve model: high requirements on workers, competition between employees, high professionalism, constant personnel fluctuations, personnel's lack of loyalty. This paper's aim is to confirm or deny the fact that the sieve model exists in the process of recruitment and selection of candidates for banking positions in Poland.

### **Key words:**

banks, banking, recruitment, human resources, Integrated Sieve Model Index

### **'The sieve model' with regard to the recruitment and dismissal strategies**

The sieve model is one of the two models of human resource management (apart from the human capital model) presented in 1999 by M. Kostera in her book entitled 'Personnel Management'. Numerous models of this type have been created by researchers from the USA and Western Europe. It was no different in this case. The Polish author made use of materials coming from Sweden and created two models, which quickly became widespread in Polish literature on management. One can also find similarities between the sieve and the human capital models on the one hand and the Michigan and Harvard models<sup>3</sup> on the other

The central premise of the sieve model is the assumption that adult job candidates and then employees are already fully developed with no prospect for further development and

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<sup>2</sup> Kaźmierczyk, J. (2011). Technologiczne i społeczno-ekonomiczne determinanty zatrudnienia w sektorze bankowym w Polsce, Warsaw: CeDeWu; Kaźmierczyk, J. (2011). Banks' Expectations on Banking Labour Market: The Polish Case. Proceedings of the Fourteenth International Conference, American Society of Business and Behavioral Sciences, ed. Wali I. Mondal, Pari, American Society of Business and Behavioral Sciences; Kaźmierczyk, J. (2012). Information technology systems and their impact on the employment level (in the Polish banking sector). Journal of Security and Sustainability, No 1 (3).

<sup>3</sup> More characteristics of these models can be found in: Król, H. (2006). Podstawy koncepcji zarządzania zasobami ludzkimi. In: H. Król, A. Ludwicyński (Eds.), Zarządzanie zasobami ludzkimi. Tworzenie kapitału ludzkiego organizacji, Warsaw: Wydawnictwo Naukowe PWE, p. 60-63; Golnau, W. (2004). Zagadnienia wstępne. In: W. Golnau (Ed.), Zarządzanie zasobami ludzkimi, Warsaw: CeDeWu, p. 50-52.

that competition between them can be motivating. As a result, any investment in employees is perceived as economically unsound. The only chance to have personnel who meets the desired standards is by 'acquiring' it by recruiting the best employees. Thus job candidates must go through several sieves. Only those recruits are selected who meet the high requirements regarding experience, knowledge, skills, competence etc. as confirmed by their diplomas, certificates and other documents. Due to the high requirements for job candidates and employees, recruitment must be carried out frequently. That, of course, generates certain costs. A detailed recruitment process and the creation of a recruitment team inevitably incurs costs. Once recruited, employees are subject to further assessment and only the best pass through subsequent sieves. What happens to the others? People unable to meet further requirements are made redundant. The sieve model itself speaks little about possible outplacement, yet it may be assumed that monitored dismissal costs would not be rational in it. After all every enterprise by employing the cost leadership strategy seeks costs reductions. The savings postulated by the sieve model (f.ex. in the area of development) make it correspond to the cost leadership strategy. It is applied on the employer market [M. Kostera 1999, p. 25-27]. It is not difficult to notice that the sieve model is characterized by the objectification of employees [Słownik zarządzania kadrami 2005, p. 86].

### **Competitive labour market in a bank**

Banking is one of the fastest-growing sectors in the Polish economy. It is based on techniques and technologies employing modern IT tools. Over the past 25 years electronic access to the bank account, online banking and call centres have become a standard. Scoring has become a prevalent method in the assessment of borrowers' creditworthiness and instant transfers are growing in importance. The emphasis on competitiveness and the speed of the offered services has forced the banks to employ technologies that are not used in the majority of economy sectors, and that was unknown in the banks themselves even 15 years ago [J. Kaźmierczyk, Nowe kanały... 2011, p. 59-60]. That in turn is reflected in the professional requirements imposed on banks' employees. Bankers had to obtain new qualifications. Naturally, the ability to sell banking services is still essential. It may even be assumed that the employment in the Polish banking sector is divided into two groups: sales employees and the others, most frequently specialists. One may assume that employment in banks combines the characteristics of both the sieve model and the human capital model<sup>4</sup>. The former is evident in the restrictive approach to employees, high requirements during recruitment and the course of employment. The latter is manifested in the great importance that is attached to the human capital, trainings etc.

The popularization of management by objectives (MBO) in commercial banks caused that working in a bank has become task-oriented in character. What counts is the achievement of strictly defined business purposes. For an average bank employee it means the necessity to sell bank loans, credit cards and cross-selling. Banks organize best seller competitions and create best seller rankings. It brings both positive and negative consequences. The introduction of MBO and commission systems of remuneration allowed for the increase in the sales of banking services. On the other hand, it sometimes had a negative impact on the ethics and morale of the employees. Since sales comes first, why bother about the client's welfare? Sometimes short-term objectives took precedence. The problem became so widespread throughout the European Union that the European Parliament issued a Directive 2010/76/UE (i.e. CRD III), which was then transposed by the Polish supervisor into the Polish banking sector. On 1 January 2012 resolutions No. 258/2011 and 259/2011 of the Banking Supervision Commission entered into force. They were aimed at adapting the Polish regulations to the provisions of that Directive. The regulations obliged banks to change their strategy of remuneration management [<http://www.knf.gov.pl/regulacje/praktyka/uchwaly/uchwaly.html>].

For example, at ING Bank, in the first place, a list of positions that have a significant impact on the risk profile of the bank was created. A maximum ratio of variable to fixed

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<sup>4</sup> Roughly, human capital model is the opposite to the sieve model, and assumes continuous development of employees.

remuneration was established [The Management Board's report on the ING Bank Śląski S.A. activities in 2012, p. 58].

The competitiveness of the banking labour market was also reflected in the polls for the best employer. In many of these, banks came in leading positions. A job in banking was associated with high status and a high salary (which is confirmed by the high average salary in banking, higher by several dozen percent than the national average). This occupational prestige was somewhat damaged by the high sales demands that bank managers imposed on the employees. The role of typical employee at a bank's branch was reduced to that of a salesperson.

## **Methodology**

This article uses objective data from reports, strategies, prospectuses and other documents by Polish banks, the Polish central bank, the Polish banking supervisor (KNF – Komisja Nadzoru Finansowego – the Financial Supervision Commission) and other related institutions from Poland. Recruitment-related publicly available documents were analyzed. A questionnaire survey of bank employees in Poland was also used. The survey examined the bank employees' opinions on employment in the sector. Each survey question was analyzed using several criteria. A pilot study was conducted among students (50 questioned) and bank employees (100 questioned). The author decided to use a non-random sample selection. The snowball sampling technique was used in the main study – the questioned were asked to complete the questionnaire and then to ask other bank employees to take part in it. The questionnaire included 20 closed questions and an imprint on the last page. The questions referred to several areas, such as recruitment, motivation, organizational culture, training and outplacement. The questionnaire was conducted from October 2013 to March 2014. More than 12,000 inquiries were sent to banking employees (using goldenline.pl, e-mails, etc.). A web version of the survey was created and used ([www.interankiety.pl/interankieta/20797a6aabd431cf1cc5691075d46c00.xml](http://www.interankiety.pl/interankieta/20797a6aabd431cf1cc5691075d46c00.xml)). A doc file version was also used. In the course of the study, two series of e-mail reminders were sent. 797 replies were received (of which 29 were rejected due to their low accuracy and reliability). The analysis does not include the central bank, the National Bank of Poland, because of its superior character and specific functions as compared with other banks.

Based on the collected survey data, the Integrated Sieve Model Index was calculated. Calculations have been made in the areas of recruitment, motivation, organizational culture, training and outplacement. Of these, only issues related to recruitment and the selection of candidates were presented in this paper - the Integrated Sieve Model Index for recruitment and the selection of candidates. For the collected survey and ISMI results the following were calculated: Pearson Chi-Square, Continuity Correction, Likelihood Ratio, Fisher's Exact Test, Linear-by-Linear Association, N of Valid Cases, Levene's Test, t Test.

Criterion		In percentage	Number of questioned
Sex of the respondent	Female	64,71	497
	Male	29,69	228
	No data	5,60	43
Respondent Education	BA/MA diploma (economic education)	43,88	337
	Other BA/MA diploma	34,90	268
	High school (economic education)	9,90	76
	Other high school	5,08	39
	No data	6,25	48
The position of the respondent	Senior-managerial	1,43	11
	Middle-managerial	5,99	46
	Low-managerial	6,38	49
	Non-managerial	81,12	623
	No data	5,08	39
Organizational unit	Headquarter	14,32	110
	Regional office	19,01	146
	Branch	62,63	481
	No data	4,04	31
Type of bank	Commercial bank	71,88	552
	Cooperative bank	14,45	111
	No data	13,67	105
Together		100,00	768

Source: own research.

## Recruitment and outplacement experience in banks<sup>5</sup>

The survey revealed several interesting patterns. The polled bank employees assessed that successful recruitment for a banking job was due equally to the candidate's professional qualifications as to one's attitude, willingness to work and involvement (table 2). For their part, bank managers expressed the opinion that 'in Poland there is strong competition in acquiring qualified banking personnel and specialists in financial services, especially at the middle and senior management level' [The Prospectus of Powszechna Kasa Oszczędności Bank Polski S.A., 2009, p. 18]. At Millennium Bank '...one of the groups of particular interest in the recruitment process are the most talented graduates and senior students. When successfully recruited, the bank provides them with a program of professional development. The following programmes illustrate the Bank's efforts to promote itself in the academic community and to assist its young employees in further development: 'Come and Grow with Us', 'People Grow', 'e-Expert Start Up' and 'IT Expert Start Up' (more information on these programmes can be found in the Social Responsibility Report)' [The Management Board's report on Bank Millennium S.A. activities for the period of 12 months completed on 31 December 2012, p. 37]. 'The effectiveness of the personnel policy is largely dependent on the Bank's appropriate employer branding. For years the Millennium Banking Group has been focused on building its employer branding. Since 2003 the Banking Group has been an active participant of job fairs targeted at students and graduates of prestigious universities across Poland. During the fairs the Bank promotes various development programmes addressed to these groups. Since 2002 the 'People Grow' management competence development programme has been run. Over the 2-year span of the programme its participant

<sup>5</sup> The presented results are part of a wider study, which was conducted at the Department of Education and Human Resources Development Poznan University of Economics. Detailed test results are available in the publications by: J. Kaźmierczyk, A. Ustianowska, A. Gorajska, D. Grabowska, K. Pułrolczak, P. Michalczuk.

have an opportunity to learn the Bank's various operation areas. Thanks to the rotation scheme and the 'training on the job' principle, they gain experience in a variety of organizational units. The Expert Start-Up programme, targeted at senior students and graduates, recruits people with precise defined professional interests in the area of risk-taking, process management, information technologies and e-banking (more information on these programmes can be found in the Social Responsibility Report). Since 2013 the Bank has increased its presence on social networks' [The Management Board's report on the Bank Millennium S.A. Capital Group activities for the period of 12 months completed on 31 December 2012, p. 44]. In turn, 'the ING Bank Śląski S.A. continued its efforts towards appropriate employer branding. These efforts included the Bank's participation in job fairs, cooperation with higher education institutions and student organizations. It conducted the second edition of its ambassador programme intended for students of all years. It carried out recruitment for the Practice with the Lion programme addressed to second-year students who wish to pursue their future professional career in banking. 55 students took part in this programme in 2012. It also completed the second edition of the ChallengingIT programme, intended for students interested in professional development in the area of IT' [The Management Board's report on the ING Bank Śląski S.A. activities in 2012, p. 53].

As the above-cited reports demonstrate, bank managers are aware of the importance of the segment of young employees. The implementation of the above-mentioned objectives, including sales objectives, requires high efficiency. Young employees are often equipped with appropriate skills and competence and are unspoilt by negative working habits. That makes them easily adaptable to new conditions, a new employer and due to their limited experience they can be paid less. That is why banks hold recruitment programmes aimed at this group of job candidates. Knowing that professional development is very important for young employees, banks organize training programmes for them. One must however remember that modern technique and technology have split the decision-making processes, f.ex. there are several bank employees working on a lending decision, each of them being responsible for a fragment of the procedure. One person accepts the loan application and serves the client, another one processes the documents and still another one controls the whole process. This division of duties is aided by technique and technology (f.ex. scoring programs). The fragmentation of tasks favours tighter control over the process of granting credits and job specialization (work efficiency) but at the same time limits the employee's overview of the process. It may then be assumed that it has a negative impact on his professional development. To acquire employees who can meet the demands, banks watch their employer branding, one which allows its employees to develop professionally. The already mentioned technique and technology are of help again in this respect and the growing importance of the Internet causes banks to become present on social networks.

When addressed to headquarters employees, the question concerning the factors decisive in recruitment<sup>6</sup> brought significant differences (table 2). Within this group, professional qualifications were assessed more frequently to be decisive in recruitment. Most probably, it is caused by the specific character of work at the headquarters. While work in regional and local sales offices accentuates enthusiasm and selling skills, the specialist positions at the headquarters require concrete, specific skills and qualifications.

		In percentage	Answers
Successful recruitment for a banking job was due mostly to the candidate's professional qualifications.	Together	47,3	363
	Employees to 25 years	35,6	16
	Headquarter *	60	66
	Commercial bank	48,2	266
	Cooperative bank	43,2	48
Successful recruitment for a banking job was due mostly to the candidate's attitude	Together	47,7	366
	Employees to 25 years	60	27
	Headquarter *	35,5	39

<sup>6</sup> About the criteria of recruitment can be found in: Schmidt, J. (2011). Charakterystyka zatrudnionych i specyfika zatrudniania w organizacjach pozarządowych. In: Gospodarka. Technologia. Kapitał społeczny, Poznań: Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu (UEP), p. 232-245.

and willingness to work and the commitment of the candidate	Commercial bank	45,7	252
	Cooperative bank	55	61

Uwaga: \* significant differences determined at the level of 0,05.

Source: own research.

What about employees who do not have the qualifications required by the bank? A majority of respondents stated that in such a situation they were given the opportunity to participate in training, which allowed them to improve their professional skills. This opinion found most supporters among the employees of cooperative banks. That confirms the common opinion that employment at cooperative banks is characterized by more stability and a lesser risk of job loss. Similar results were obtained in a survey in 2010. It was confirmed then that the growing popularity of direct sales was less important in cooperative banks, which translated into less competition between employees and staff turnover [J. Kaźmierczyk, Technologiczne... 2011, p. 212].

**Tab. 3 Employees with inadequate skills**

		In percentage	Answers
They usually were fired, and were hired new competent persons in their place.	Together	22,7	174
	Employees 46-55 years	7,9	7
	Employees 56-65 years	13	3
	Commercial bank *	24,5	135
	Cooperative bank *	10,8	12
They were given the opportunity to participate in training, which allowed them to improve their professional skills.	Together	53,5	411
	Employees 46-55 years	62,9	56
	Employees 56-65 years	43,5	10
	Commercial bank *	51,3	283
	Cooperative bank *	71,2	79

Uwaga: \* significant differences determined at the level of 0,05.

Source: own research.

Employment stability in banks is also confirmed by the responses concerning the duration of employment. Bank employees could choose between two statements: that people are employed in the long term or that there is a high staff turnover<sup>7</sup>. A vast majority of respondents supported the former statement claiming that long-term employment is prevalent. Importantly, this response was more frequently given by the employees of banks with a majority domestic rather than foreign capital, and more often cooperative banks than commercial banks. The obtained results confirm that banks with majority domestic capital and cooperative banks are characterized by more employment stability.

<sup>7</sup> More characteristics of dismissal risk can be found in: Shelest, O. (2013). Inwestowanie pracodawcy w szkolenia a dobrowolne odejścia pracowników z firmy: przegląd wybranych teorii. In: B. Borusiak (Ed.), Zarządzanie relacjami organizacji z interesariuszami, Poznań: Polskie Towarzystwo Ekonomiczne (PTE), p. 121-133.

**Tab. 4 Duration of employment**

		In percentage	Answers
People are employed in the long term.	Together	62,5	480
	Domestic capital *	71,3	159
	Foreign capital *	60	289
	Commercial bank *	59,8	330
	Cooperative bank *	77,5	86
There is a high staff turnover.	Together	29,6	227
	Domestic capital *	22,9	51
	Foreign capital *	32,6	157
	Commercial bank *	31,9	176
	Cooperative bank *	18	20

Uwaga: \* significant differences determined at the level of 0,05.

Source: own research.

Regardless of the level of stability and staff turnover, any employment agreement will someday be terminated. The question then arises what support the dismissed employees can receive from their former employers. Within the scope of this study the respondents were questioned about the outplacement schemes used in their bank. One of the response options stated 'there are no forms of support for dismissed employees'. It was selected by nearly ¼ of the surveyed. Interestingly, there were twice as few supporters of the statement among the headquarters employees and the middle and senior management. This suggests that outplacement benefits are addressed mainly to these groups.

**Tab. 5 No support for redundant workers**

		In percentage	Answers
There are no forms of support for dismissed employees.	Together	24,9	191
	Employees 56-65 years	13	3
	Headquarter *	13,6	15
	Regional office *	30,1	44
	Domestic capital *	31,4	70
	Foreign capital *	22,2	107
	Senior-managerial *	9,1	1
	Middle-managerial *	8,7	4
	Low-managerial *	20,4	10
	Non-managerial *	27,0	168

Uwaga: \* significant differences determined at the level of 0,05.

Source: own research.

The interviews conducted with employees at the end of their employment period show the high importance of the human capital in banks and the low importance of the sieve model. For some banks they are source of information on the employees' reasons for resignation and their opinions on possible implementable changes in employment. Such interviews (exit interviews) are f.ex. conducted at Bank Millennium [The Management Board's report on Bank Millennium S.A. activities for the period of 12 months completed on 31 December 2013, p. 39].

## The Integrated Sieve Model Index

The Integrated Sieve Model Index constitutes a fair summary of the considerations concerning the recruitment and dismissal of bank employees (ISMI). It was created on the basis of the employees' responses to the questions analyzed above. There was one point assigned for each response indicating the presence of the sieve model. There was maximum one point assigned per question. In accordance with the previously defined characteristics of the sieve model it was assumed that the following responses are indicative of its presence:

successful recruitment for a banking job was due mostly to the candidate's professional qualifications,

employees with insufficient professional qualifications were usually dismissed and replaced with competent workers,

there is high staff turnover,

there are no forms of support for dismissed employees ('the right to severance payment payable by operation of law' was considered an equivalent response, meaning that the bank only fulfills its minimum obligations towards the dismissed employees).

Then the arithmetic mean of the total sum was calculated for each employee. That allowed one to calculate the ISMI for each respondent individually. The ISMI ranged from 0 (extreme denial of the presence of the sieve model) to +1 (extreme confirmation of the presence of the sieve model). Due to the possible total score for each question the final ISMI value varied at 0.125 intervals and equalled: 0; 0.125; 0.25; 0.375; 0.5; 0.626; 0.75; 0.875; 1. The average ISMI value for the whole analyzed group was 0.448. This means that the respondents are less supportive of the sieve model than they are against it (ISMI slightly below 0.5). The table below presents the distribution of the obtained results. All results were broken down and analyzed along the following criteria: sex, education, position held, place of work (the headquarters, a regional office, an operating unit), the type of the employing bank (a commercial bank, a cooperative bank), the type of majority capital of the bank where employed, the respondent's length of service in banking and total length of service. The breakdown of results according to the above criteria confirmed that the ISMI for cooperative banks is markedly below the average. Similar results, confirming the less rigorous approach of cooperative banks towards their employees, were obtained in the previous study [J. Kaźmierczyk, *Technologiczne...* 2011, p. 211]. Significant differences in means were also obtained for the headquarter - regional office group and the regional office - branch group. For the other criteria the differences between groups were not so striking, which means that even when one criterion placed a given bank or employee closer to the sieve model, a response to another question ultimately averaged the result (for the whole analyzed groups) or that different employees' responses self-cancelled within a group.

**Tab. 6 Calculations of Integrated Sieve Model Index**

		Together	Male	Female	Headquarter	Regional office	An operating unit - branch	Commercial bank	Cooperative bank	Domestic capital	Foreign capital
ISMI	Average	0,448	0,466	0,442	0,485	0,423	0,450	0,462	0,376	0,434	0,454
	0	36	13	20	6	4	26	23	6	9	24
	0,125	93	24	63	8	14	64	64	20	30	55
	0,25	124	36	82	14	29	75	79	26	40	75
	0,375	113	26	76	16	26	65	85	12	29	73
	0,5	163	48	111	25	37	97	121	22	46	106
	0,625	95	30	60	18	24	47	65	16	43	43
	0,75	88	30	53	13	10	64	69	7	13	67
	0,875	32	14	16	5	0	27	30	0	4	27
1	24	7	16	5	2	16	16	2	9	12	
	Together	768	228	497	110	146	481	552	111	223	482
In percentage											
ISMI	0	5	6	4	5	3	5	4	5	4	5
	0,125	12	11	13	7	10	13	12	18	13	11
	0,25	16	16	16	13	20	16	14	23	18	16
	0,375	15	11	15	15	18	14	15	11	13	15
	0,5	21	21	22	23	25	20	22	20	21	22
	0,625	12	13	12	16	16	10	12	14	19	9
	0,75	11	13	11	12	7	13	13	6	6	14
	0,875	4	6	3	5	0	6	5	0	2	6
	1	3	3	3	5	1	3	3	2	4	2

Uwaga: differences in means between the regional office and branch significant at 0.05 level; difference between headquarter and regional office significant at 0.10.

Source: own research.

## Conclusions:

This paper presented a theoretical sieve model for the purpose of assessing its occurrence in banking practice in Poland. Recruitment and employment were selected as the research area as these are some of the most important domains in which the occurrence of the sieve model can be assessed. The conducted research confirms that in the process of recruitment in banks in Poland the sieve model is of crucial importance. The requirements placed on employees are relatively high. This is partly due to the relatively high rate of unemployment in Poland (above 12%) and the growing popularity of higher education. One may question the quality of the education because in the past dozen or so years its popularization was accompanied by the decline in the quality of education. There are many job candidates available but it is difficult to select the best ones.

After recruitment, the human capital model seems to be prevalent. This is confirmed by the long-term duration of employment in banks (although additional research is needed in the area because general observations point to the possibility of the segmentation of employees into 'the better ones' - the long-term employed and 'the worse ones' - the short-term employed, mainly including sales, call centre service, most frequently students and recent graduates). The low importance of the sieve model during the employment relationship is further reflected by the offer of training courses available to the employees

who are not suitably qualified. It turns out that also in the case of outplacement the pure sieve model, characterized by the lack of support for the dismissed employees, can seldom be applied as it concerns only ¼ of the surveyed.

Certain symptoms of employment segmentation in banks have emerged from the study. As long as the breakdown by sex, the level of education or professional experience in banking were of minor importance for the obtained results, the study shows that there is a significant difference between cooperative banks and commercial banks as well as between banks with a majority foreign capital and a majority domestic capital. For example, cooperative banks are characterized by lower employee turnover. The changes in the level of employment in cooperative banks in the years 1996-2010 were much less dynamic than in commercial banks (although this study does not confirm this with objective data concerning duration of the length of service, which may be an interesting area for further research). Given the fact that management and organizational changes have usually been initiated by commercial banks, cooperative banks just following in their wake [J. Kaźmierczyk, *Technologiczne...* 2011, p. 111, 213], it is safe to predict that employment in cooperative banks will increasingly resemble that in commercial banks. This is confirmed by the examples (few as yet) of cooperative banks, conducting their activities on similar principles to commercial banks (f.ex. NeoBank), i.e. expanding its activities beyond the local area and becoming strictly profit-oriented. On the other hand, the clients of cooperative banks, who are often farmers and beneficiaries of EU funds, still have a significant influence on their offer and thus their organization and management. The question arises whether, having adopted further technical, organizational and managerial solutions from commercial banks, cooperative banks will be able to preserve their specificity?

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# Environmental Management Transfer and Environmental Performance by Japanese Firms in Thailand

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## Abstract

This paper analyzes the determinants of environmental management transfer and environmental performance by Japanese firms in Thailand. For sustainable development, all actors need to contribute to the reduction of environmental loads. This requirement is part of being a responsible business and is recognized as a corporate social responsibility. Data obtained from a questionnaire survey on Japanese subsidiaries in Thailand are used in the analysis. Government regulation, environmental strategy, organization and environmental performance are the key factors in the analytical framework. This paper uses ordinary least square (OLS) method for estimation. The results of the analysis indicate that the environmental management system and green procurement by parent firms are significantly related to the international transfer of these practices. Top leadership and the goal of environmental management in the subsidiary are also significantly related to the transfer. The emphasis of environmental strategy leads to improved environmental performance. Specifically, water and air performance are related to top initiative. In contrast, CO<sub>2</sub> and waste performance are related to the priority of environmental management. This paper presents new findings in environmental management.

## Keywords:

Environmental management; transfer; determinant; environmental performance; Thailand; Japanese firm

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# **Environmental Management Transfer and Environmental Performance by Japanese Firms in Thailand**

## **1. Introduction**

Firms are substantially supported by various kinds of stakeholders, such as investors, consumers, customers, employees, government, communities and NPOs, and firms need to meet stakeholder requirements. Since the 1990s, the triple bottom line (Elkington, 1994), Global Compact and ISO26000 indicate that firms must achieve social responsibility of economic, social and environmental dimensions. In particular, environmental requirements have become important for the sustainability of Earth. Since the last decade of the twentieth century, many countries have introduced environmental laws and regulations. In the EU, the Restriction of Hazardous Chemicals (RoHS) directive prohibits including some toxic chemicals in the electric and electronic products.

Thus, firms have to perceive environmental measures as a social responsibility. To respond to social demand, they have started to address environmental measures in various ways. Environmental issues are diverse and complex so that no one means can completely solve the issues. Each activity at each stage of the total process, raw materials, logistics, manufacturing, sales, waste and recycling, impact the natural environment. In this sense, actions in the whole supply chain as well as the manufacturing process within an organization are needed to improve eco-efficiency in domestic and overseas operations. SCOPE 3, which was published in 2011, asks businesses to estimate greenhouse gas emission in their supply chain, and to make efforts to reduce emission.

We conducted survey research in Thailand to examine the determinants of international transfer of environmental management practices in Japanese subsidiaries. Thailand is in the early group of ASEAN industrialization. Thai per capita income was 5,678 USD in 2012, and the country received a huge amount of investment by Japanese firms after the 1985 G5 Plaza Accord. There is now a large automobile industrial cluster. The business experience of subsidiaries in our sample is, on average, approximately 20 years. In this sense, subsidiary firms in Thailand built the business so that a subsidiary's environmental practices are at the recognizable level. In this paper, we analyze environmental management by Japanese subsidiaries in Thailand and the factors that enhance the transfer of environmental management and its performance.

## **2. Literature review**

The question is why a firm transfers its environmental management practices to overseas operations. The overseas operations of multinational enterprises (MNEs) are a premise of this transfer. In principle, corporate environmental management is carried out in the broader framework of corporate management as part of business activity. Therefore, investment decisions are made under the management decisions of a firm. The question posed can be answered from the perspective of why firms operate globally. Internalization theory, transplant management and organizational capabilities theory provide a useful basis for our analysis.

First, a number of theories have been developed to explain why firms make foreign direct investment (FDI). Among theories, the internalization theory by Buckley and Casson (1976) and the eclectic theory by Dunning (1988) are widely discussed in the relevant studies. These theories explain why firms make investment, by focusing on competitive advantage.

Second, transplant management was investigated. When US corporations increased FDI in the 1960s, Koontz (1969) argued the universal validity of the US management method and principles. The management system and production system of Japanese firms also attracted

much attention in the 1980s since there was a large trade imbalance between Japan and the US. In the increasing competitiveness of Japanese industry, yen evaluation after 1985 and trade negotiations with the US strongly pushed Japanese firms into transferring their plants to the US and ASEAN. In these studies, arguments tend to stress the uniqueness of Japanese management and its limitations of application. However, empirical case research indicates that there are many Japanese firms operating globally and achieving good performance such as the automobile industry's New United Motor Manufacturing, Inc. (NUMMI) in Fremont, California. NUMMI has been pointed out as successful case of transplant (Liker, 2004)

In the 1980s and 1990s, the Japanese production system and its overseas transfer attracted the attention of researchers and management. The production system with high productivity and close assembler-supplier relationships was analyzed in the automobile and electric industries. Florida and Kenny (1991) indicated that the US transplant of Japanese multinational firms transfer and adopt similar environmental practices as in Japan.

Third, the resource-based view argues that resources and capabilities are the basis of growth and performance (Barney, 1991; Rugman and Verbeke, 1998). This view suggests that direct investment is an effective means to transfer resources and capabilities to overseas operations so that the transfer generates competitive advantages. Firms obtain sustainable competitive advantage when direct investment is complemented by organizational capabilities (Hart, 1995). Here, organizational capabilities are defined as the ability that creates a new product, technology, service or business system by integrating organizational activities and resources. Subsidiary operations can swiftly obtain the necessary capabilities by the transfer of practices from parent firms to handle environmental issues. Consequently, it is effective to save input resources and to decrease environmental risk. The transfer of environmental management to developing countries will contribute to first mover advantage on the one hand and competitive advantage of the subsidiary or local suppliers on the other (Jeppesen and Hansen, 2004).

Here, we define environmental capability as the organizational, technological and institutional ability to reduce environmental burden. Environmental capability implies the ability to reduce environmental impact at the level of process, product, organization and institution. As environmental issues have various aspects, the transfer of environmental management to overseas operations is implemented in a variety of ways using a variety of practices. Firms transfer numerous practices such as equipment, technology, know-how, policies, procedures, the ISO14001 system, green purchasing guidelines, environmental reports, life cycle assessment (LCA) and environmental accounting. These practices are broadly classified into administrative activity such as ISO14001, green purchasing and environmental accounting, and technological activity such as waste water treatment, eco-design and recycling.

With relation to organizational capabilities, knowledge transfer is analyzed in the study of multinational enterprises (Cohen and Levinthal, 1990; Gupta and Govindarajan, 2000; Lane *et al.* 2008; Pèrez-Nordvet, 2006). This knowledge transfer is closely related to the organizational capability of the foreign subsidiary, where organizational capability is defined as organizational routine (Nelson and Winter, 1982). In this sense, the transfer of organizational capability is the transfer of organizational routine and is to learn new organizational routines such as ISO14001, green purchasing and recycling. When the learning of new organizational routine implies the building of new organizational capability, the learning of new organizational routine transfers new knowledge to subsidiary firms. Consequently, the learning of a new organizational routine implies new organizational capability (Phene and Almeida, 2005). Organizational capability then has positive impact in increasing competitiveness.

### **3 Methodology**

#### **3.1 Data**

For analyzing the transfer of environmental management practices, we conducted a questionnaire survey of Japanese manufacturing subsidiaries in Thailand. We prepared a questionnaire. Questionnaires were delivered by post to Japanese manufacturing subsidiaries in August 2010. We used the Company Directory from Toyo Keizai Shiposha (2010). This is the largest directory of Japanese overseas operations. We listed 460 firms for questionnaire survey. 51 effective responses were obtained. The Japanese managing directors or managers of the subsidiary were the respondents.

The samples were classified in terms of the number of employees. Small firms, which had 1-299 employees, accounted for 8 firms (15.7%), medium firms, which had 300-999 employees, accounted for 29 firms (56.9%), and large firms, which had more than 999 employees, accounted for 14 firms (23.5%). As to industrial classification, we could not classify the samples at the 2 digit level. We classified samples into three groups to confirm the general characteristics of the industry: raw material, assembly and living-related. Each group accounted for 10 (19.6%), 29 (56.9%) and 12 (23.5%), respectively.

FDI from Japan to Thailand was 10.03 million bahts in 2010. This accounts for 35.9% of all FDI to Thailand followed by the EU (26.7%) and Singapore (6.9%). In 2013, investment from Japan to Thailand jumped to 63.5%, followed by the EU (6.1%) and Singapore (3.5%) (JETRO, 2013). Thus, Japan accounts for the largest investment in Thailand. FDI transfers various resources such as capital, technology, machines, equipment, systems and human resources. With this FDI, we assume that various types of environmental management practices will shift to subsidiaries.

We define multinational enterprise as a firm that operates in more than two countries (Buckley and Casson, 1976). This definition, therefore, does not necessarily mean a large firm. It sometimes includes smaller firms with less than 300 employees in the food, garment and stationary industries. Our focus is the Japanese subsidiary in Thailand operating in the manufacturing sector. For these firms, we examine the transfer of environmental practices from parent to subsidiary.

#### **3.2 Analytical framework**

Although studies in the international transfer of environmental management are limited, previous studies of FDI and multinational management provide a useful basis for our analysis. We developed an analytical framework that consists of external factors, strategy, organization and environmental performance. This framework was developed from preceding studies in management. Market, strategy, organization and performance are the main dimensions in the study of strategic management and organization theory (Grant, 2008). Viewing theories of management transfer under FDI, three factors are important as a determinant for the international transfer of environmental management practices. These are government, customer/market and internal resources/strategy of the firm (Jeppesen and Hansen, 2004). These factors are profoundly related to internalization theory and resource-based view. There is previous research on the influence of these three factors, but quantitative evidence for these factors is limited. The effect of each factor, the interaction between the factors and the transfer process remain to be examined.

Therefore, we intend to analyze the determinants of environmental management transfer and environmental performance of overseas subsidiaries quantitatively using the data from Japanese subsidiaries in Thailand. This framework focuses on the effect of external factors, practices of parent firms and environmental strategy of the subsidiary in the transfer and environmental performance of subsidiaries.

### 3.3 Variables

First, in this framework, we adopted three variables of external factors: government regulation (GOV), demand by local community (COM) and customer and market demand (CUS). Government is a key stakeholder that enacts regulation for corporate activities (Henrique and Sadorsky, 1996). Government regulation (GOV) measures the degree to which government environmental policy and regulation are strict. Community pressure (COM) is the degree to which the local community requests strict environmental standards. Customer and market pressure (CUS) is the degree to which customer request is strict. Regulations, such as RoHS, for controlling chemical substances urge firms to implement green procurement in the whole supply chain process. Such environmental regulations are also reflected in market and customer demand.

Second, preceding studies often point out that strategy is one of the main factors that determines the transfer of management practices (Jeppesen and Hansen, 2004). Strategy means guidelines that direct the decision-making and integrate various resources and activities. It is a framework to integrate behavior in the organization and helps motivate members and clearly states the goal. When strategy is clear on what to achieve and how to implement the strategy for the organization, it contributes to motivating members of the organization. As a strategy variable of subsidiary firms we adopt top leadership (LDS) and environmental goal (GOAL) of the subsidiary firm. Top leadership for environmental management means the degree to which the top leadership plays an important role in environmental issues. The goal of environmental achievement indicates the degree to which the subsidiary aims to achieve for the environment.

Third, organizational factors can be classified into either administrative practices or technological practices. We use the two practices as an indicator: environmental management system and green procurement. Green procurement by parent firms (PGREN) means the degree to which parent firms implement green purchasing. The acquisition of the ISO14001 certificate (ISO) and environmental report (REP) are combined to obtain the environmental management system (MANA). For parent firms, PISO and PREP are combined into PMANA. Ownership ratio (JOWN) measures the degree of ownership control.

Fourth, four indicators are used for environmental performance: water pollution (WPER), air pollution (APER), CO<sub>2</sub> (CO<sub>2</sub>PER) and waste (WSTPER). The environmental performance indicator is typically greenhouse gas (GHG), chemical substances, solid waste, and CO<sub>2</sub>/energy (WBCSD, 2000). However, there is difficulty not only integrating different indicators but also obtaining objective data. In this paper, a Likert type scale is used to measure environmental performance.

From the descriptive data in Table 1, we recognize that the ownership ratio by Japanese parent firms is, on average, 87.3%. This implies that the ratio is sufficient for the parent firm to maintain control of the subsidiary. Then, for external factor, CUS (3.569) shows higher score than GOV (3.039). This implies that the customer is perceived as more influential in the environmental management of the subsidiary than the government. Subsidiary firms feel greater pressure from the customer than the government.

In Table 2, the correlation between LDS and GOAL is high ( $r=0.531$ ,  $p<0.05$ ). Because of the high correlation, we use LDS and GOAL separately in Model 1 and Model 2. The relationship between PGREN and GREN is not significant. PMANA and MANA are significantly correlated. We discuss this point in the next section in relation to the results of Model 1 and Model 2.

Table 1 Descriptive statistics

Variable			Mean	SD
External factor	GOV	Government environmental regulations and mandates are strict	3.039	(0.916)
	COM	Community's demand in Vietnam for environmental performance is strong	3.220	(1.075)
	CUS	Customer's demand in Vietnam market for environmental performance is strong	3.569	(1.063)
Organization of parent firm	PISO	Your parent company has obtained ISO14001 certification	2.706	(0.701)
	PREP	Your parent company has an environmental report or a sustainability report	2.625	(0.733)
	PGREN	Your parent company is implementing green procurement	3.000	(1.616)
	JOWN	The ownership ratio of Japanese parent firms	87.319	(16.837)
Environmental strategy	LDS	Leadership on environmental issues by top management is strong	4.216	(0.856)
	GOAL	Your company has specific goals for reducing environmental burdens	4.118	(1.306)
Management system	ISO	Your company has obtained ISO14001 certification	2.627	(0.747)
	REP	Your company's emission data is reflected to parent company's environmental report	2.260	(0.876)
	GREN	The green procurement level of your company is equal to those of companies in Japan	3.458	(1.148)
Environmental performance	WPER	The level of waste water treatment in your company is good	4.140	(1.050)
	APER	The level of air emissions reduction in your company is good	3.896	(0.881)
	WSTPER	The level of solid waste emissions reduction in your company is good	3.980	(0.869)
	CO2PER	The level of CO2 emissions reduction in your company is good	3.894	(0.914)

Note: The items are measured in a Likert type 5 point scale, except for ISO and REP, which are measured at 3 points.

Table 2 Correlation among variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 GOV	1.00													
2 COM	0.28	1.00												
3 CUS	0.22	0.52 **	1.00											
4 PMANA	-0.05	-0.11	-0.11	1.00										
5 PGREN	-0.14	0.15	0.01	0.44 **	1.00									
6 JOWN	-0.12	-0.15	-0.12	-0.21	-0.06	1.00								
7 LDS	0.04	0.13	0.06	0.30 *	0.32 *	-0.35 *	1.00							
8 GOAL	0.05	0.21	0.33 *	0.54 **	0.41 **	-0.36 **	0.53 **	1.00						
9 MANA	-0.06	0.16	0.37 **	0.42 **	0.37 **	-0.26	0.35 *	0.67 **	1.00					
10 GREN	-0.16	0.01	0.05	0.02	0.23	0.25	-0.16	-0.01	0.03	1.00				
11 WPER	-0.05	0.04	0.00	0.19	0.22	-0.11	0.37 **	0.20	0.11	-0.01	1.00			
12 APER	0.11	0.11	-0.05	0.04	0.16	-0.14	0.45 **	0.27	0.10	0.33 *	0.42 **	1.00		
13 WSTPER	-0.15	-0.02	-0.05	0.33 *	0.42 **	-0.39 **	0.44 **	0.54 **	0.40 **	0.16	0.30 *	0.48 **	1.00	
14 CO2PER	-0.18	0.04	-0.01	0.26	0.24	-0.30 *	0.38 **	0.43 **	0.34 *	0.14	0.31 *	0.69 **	0.58 **	1.00

Note: ISO and REP are combined and summed up as MANA, and PISO and PREP are combined and summed up as PMANA.

\* p < 0.05

\*\* p < 0.01

## 4. Results of analysis

### 4.1 Transfer of practices

Our objective of analysis is to reveal the determinants and process of the transfer of environmental management to overseas subsidiaries. The model uses MANA and GREN as the dependent variables. External factors (GOV, COM and CUS), organizational factor of the parent firm (PMANA, PGREN and JOWN), strategy (LDS or GOAL) of the subsidiary as independent variables are as shown in Model 1 and Model 2. The ordinary least squares (OLS) method was used for estimation. As the correlation between LDS and GOAL was high ( $r=0.531$ ,  $p<0.01$ ), we estimated by separately using LDS or GOAL. The dummy variable

indicates 0 when the number of employees is less than 299 and 1 when the number of employees is greater than 300.

Model 1:

$$\text{MANA} = \beta_{m1}\text{GOV} + \beta_{m2}\text{COM} + \beta_{m3}\text{CUS} + \beta_{m4}\text{LDS (or GOAL)} + \beta_{m5}\text{JOWN} + \beta_{m6}\text{PMANA} + \beta_{m7}\text{Dummy} \quad (1)$$

Model 2:

$$\text{GREN} = \beta_{g1}\text{GOV} + \beta_{g2}\text{COM} + \beta_{g3}\text{CUS} + \beta_{g4}\text{LDS (or GOAL)} + \beta_{g5}\text{JOWN} + \beta_{g6}\text{PGREN} + \beta_{g7}\text{Dummy} \quad (2)$$

The results of the analysis shown in Table 3 indicate that PMANA is significantly positive with environmental management system (MANA) of the dependent variable. Top leadership (LDS) as an indicator of strategy, however, was not significant with environmental management system (MANA). On the contrary, GOAL is significantly positive with MANA, which implies the transfer of environmental management to the subsidiary.

In Model 1, CUS has significantly positive relation with MANA in both LDS and GOAL as a strategy indicator. PMANA is not significant with MANA in Model 1 with GOAL. On the other hand, green procurement (GREN) is positively related to the green procurement of the parent firm. Even though it is positive, both PGREN and CUS are not significant to GREN for the subsidiary. The F value was relatively small.

From these results, we conclude that the environmental practices of an overseas subsidiary are closely related to the parent firm practices. The results indicate that when a parent firm is committed to environmental management, this commitment tends to be transferred to the foreign subsidiary. When the parent firm implements an environmental management system, the commitment is likely to be transferred to the overseas operation. However, the relationship between PGREN and GREN is not significant.

Table 3 Results (MANA, GREN)

	Model 1 (MANA)				Model 2 (GREN)				
	Coefficient	t value	Coefficient	t value	Coefficient	t value	Coefficient	t value	
GOV	-0.147	-1.179	-0.098	-0.839	GOV	-0.151	-0.944	-0.163	-0.999
COM	-0.055	-0.373	-0.083	-0.606	COM	0.049	0.266	0.035	0.186
CUS	0.466	3.172 **	0.302	2.079 *	CUS	0.102	0.572	0.168	0.858
PMANA	0.365	2.908 **	0.159	1.128	PGREN	0.301	1.897	0.308	1.734
JOWN	-0.102	-0.806	-0.065	-0.558	JOWN	0.187	1.159	0.221	1.374
LDS	0.194	1.515			LDS	-0.208	-1.239		
GOAL			0.465	2.969 **	GOAL			-0.155	-0.759
D_scale	0.169	1.360	0.124	1.062	D_scale	-0.010	-0.068	-0.006	-0.036
Constant	1.825	0.249	1.470	1.004	Constant	1.773	1.631	1.489	1.289
Adj R <sup>2</sup>	0.398		0.481		Adj R <sup>2</sup>	0.030		0.007	
F value	5.241 **		6.968 **		F value	1.204		1.044	
DW	2.349		2.365		DW	1.556		1.616	

Note: \*\*p <0.01, \* p <0.05

## 4.2 Environmental performance analysis

Next, we examine the determinants of environmental performance of a subsidiary in Thailand. The dependent variables are water performance (WPER), air performance (APER), CO2 performance (CO2PER) and waste performance (WSTPER). The independent variables are same as in Model 2. The models are developed as (3), (4), (5) and (6) below. As LDS and GOAL of the strategic factor were highly correlated to each other, estimation was done separately as mentioned above. The dummy variable was same as in Model 1.

Model 3:

$$WPER = \beta_{w1}GOV + \beta_{w2}COM + \beta_{w3}CUS + \beta_{w4}LDS \text{ (or GOAL)} + \beta_{w5}JOWN + \beta_{w6}Dummy \quad (3)$$

Model 4:

$$APER = \beta_{a1}GOV + \beta_{a2}COM + \beta_{a3}CUS + \beta_{a4}LDS \text{ (or GOAL)} + \beta_{a5}JOWN + \beta_{a6}Dummy \quad (4)$$

Model 5:

$$CO2PER = \beta_{c1}GOV + \beta_{c2}COM + \beta_{c3}CUS + \beta_{c4}LDS \text{ (or GOAL)} + \beta_{c5}JOWN + \beta_{c6}Dummy \quad (5)$$

Model 6:

$$WSTPER = \beta_{ws1}GOV + \beta_{ws2}COM + \beta_{ws3}CUS + \beta_{ws4}LDS \text{ (or GOAL)} + \beta_{ws5}JOWN + \beta_{ws6}Dummy \quad (6)$$

The results in Table 4 indicate that top leadership is significantly positive with water performance (WPER) and air performance (APER). These results suggest that top management compliance consciousness and initiative positively influence environmental performance. F value, however, is not significant in Model 3 and Model 4. In Table 4, it is shown that the model using GOAL as an independent variable is not significant in terms of F value and coefficient.

The results in Table 5 indicate that environmental goal (GOAL) is significantly positive with waste (WSTPER) and CO2 (CO2PER). In general, regulation for solid waste and CO2 emission are not practiced, and the responsibility requires discretionary commitment by organizations to contribute to sustainable development. Therefore, goal and commitment under the management initiative are essential. Differing from WPER and APER, which depend on end-of-pipe technology or cleaner production, CO2PER and WSTPER depend more on administrative measures.

From these data, we recognize the strategic factors that influence the environmental performance of water and air under the explicit emission criteria are compliance consciousness and top management behavior. Alternatively, as to CO2 emission and solid waste, voluntary goal setting and commitment towards this goal influence environmental performance. LDS is significantly related to WSTPER, but not significant with CO2 (CO2PER). These results show

that GOAL plays a more important role than LDS in the performance of waste and CO2 emission.

Table 4 Results (WPER, APER)

	Model 3 (WPER)				Model 4 (APER)			
	Coefficient	t value	Coefficient	t value	Coefficient	t value	Coefficient	t value
GOV	-0.056	-0.376	-0.046	-0.290	0.100	0.690	0.111	0.715
COM	0.008	0.044	0.043	0.237	0.109	0.646	0.116	0.642
CUS	0.016	0.092	-0.071	-0.383	-0.146	-0.857	-0.228	-1.247
JOWN	0.022	0.141	-0.049	-0.303	0.011	0.072	-0.039	-0.243
LDS	0.393	2.553 *			0.451	3.039 **		
GOAL			0.223	1.283			0.329	1.866
D_scale	-0.078	-0.529	-0.101	-0.633	-0.055	-0.386	-0.139	-0.870
Constant	1.590	1.446	1.402	2.988 **	1.279	1.447	1.145	3.012 **
Adj R <sup>2</sup>		0.031		-		0.123		0.007
F value		1.256		0.427		2.079		1.058
DW		1.802		1.777		2.100		1.863

Note: \*\*p <0.01, \* p <0.05

Table 5 Results (WSTPER, CO2PER)

	Model 5 (WSTPER)				Model 6 (CO2PER)			
	Coefficient	t value	Coefficient	t value	Coefficient	t value	Coefficient	t value
GOV	-0.194	-1.423	-0.152	-1.200	-0.198	-1.321	-0.166	-1.156
COM	-0.010	-0.066	-0.001	-0.005	0.019	0.112	0.028	0.172
CUS	-0.080	-0.525	-0.238	-1.647	-0.011	-0.066	-0.194	-1.144
JOWN	-0.272	-1.926	-0.238	-1.861	-0.231	-1.507	-0.210	-1.463
LDS	0.337	2.408 *			0.310	2.009		
GOAL			0.521	3.772 **			0.470	2.928 **
D_scale	0.143	1.080	0.053	0.428	-0.091	-0.620	-0.130	-0.921
Constant	1.203	3.573 **	0.913	5.110 **	1.376	3.085 **	1.061	4.465 **
Adj R <sup>2</sup>		0.220		0.337		0.114		0.198
F value		3.250 *		5.058 **		1.961		2.854 *
DW		2.191		2.289		1.685		1.488

Note: \*p <0.05, \*\*p <0.01

## 5. Conclusion

In this paper, we analyzed the determinants of environmental management transfer and environmental performance, using data obtained from the subsidiaries of Japanese firms in Thailand. First, it is revealed that environmental management system in a subsidiary is developed depending on the transfer of practices from the parent firm. When the overseas operation experience becomes longer and the firm size increases, the subsidiary tends to adopt a system similar to the parent firm.

Such organizational capability of the subsidiary can typically be built and learned by the transfer of practices from the parent firm. Without the organizational routine provided by the parent firm, it is generally not possible for a subsidiary to independently develop the

organizational routine. Therefore, there is a certain time gap of adoption of environmental practices between the parent and the subsidiary.

Second, environmental goal (GOAL) has significant positive relation with environmental management system. However, GOAL is not significantly related to green procurement. Rather it indicates a negative relation. The reason is that green procurement is mandatory for firms since it is necessary by regulation and for transactions with the customer.

Third, top leadership (LDS) was significantly related to water and air performance, but environmental goal (GOAL) was not significantly related to water and air performance. On the contrary, GOAL is significantly related to CO2 (CO2PER) and waste performance (WSTPER). LDS did not have a significant relation to these indicators.

Our analysis indicates new findings in the international transfer of environmental practices. The research, however, has limitations in that it is an analysis of one specific country, and the number of samples is limited. We need to test the findings using a larger sample to generalize the results. However, a logical model for the international transfer of environmental management is explained, and evidence for the transfer shows consistent results.

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# The Global Culture and Economical Values: The Corporation Responsibility in the Fragmentary Global Culture

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## Abstract

The main goal of this article is to describe the problem of ethical values and their impact on economic life. The initial problem therefore is the issue of justifying the autonomy of ethics in the light of the claims of applied ethics especially applied economic ethics of value. Not only due to epistemological and methodological issues, but also due to its urgency with regard to the human existence, which brooks no delay. An emphasis, which would prefer one discipline on the detriment of another, could have undesired impacts on the lives of individuals.

However, our effort is to approach ethics as a doctrine which treats good, evil, the values and faith in the future in their relation to the totality of the lives of individuals and the entire society. The problem encountered in contemporary ethics is the exact opposite of such efforts. The example we will mention as the first one is particularly significant today. It involves the emphasis on pro-social and economic behavior of each individual on their own.

It is quite adequate to strengthen the pro-social role ethics of values as every man actualizes himself in economic relationships. In this context, ethics is tasked to serve as one instrument of economic life. Since every individual is supposed to be a part of the economic life, they must be participated on the ethics of values.

The question of any ethics must be preceded by an analysis of man and his culture in the world. Philosophical/linguistic examinations capable of showing the situation which surrounds and determines man. Only after that can it be shown to what extent the following sentence applies and where it ceases to be valid: We must be held accountable for the consequence of our actions. This paves the way to the justification of any moral and ethical requirement. But it only does so after the autonomy of man in the world is proved. Therefore, man holds the key to his situation in his own hands and may freely choose and decide as well as carry full responsibility for his actions.

The behavior of corporates in different countries is regulated by the different state laws. Different civic societies, in some countries more, in some less, generate press on the corporates for their bigger social responsibility and ethical behavior. From this position it is easy to understand that words global corporate responsibility or global ethical behavior are mostly philosophical constructs which surpass reality. Our effort is to bring the idea of responsibility closer to economic reality. Methodologically this article is divided into three parts. The first part is a philosophical analysis of main terms, which we are interested in. We would like to analyze the terms ethics, morality, ethos and values from etymological and epistemological position. We will search for the real meaning of this word and compare with recent discourse. The major interest of this article is explained this phenomena from the philosophical positions.

The second part of the article is economic analysis of the situation of the corporate in different regions – countries, mainly in European Union. This step is a description and comparison of the same corporate behavior in different regions and their social politics

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through the contents and states. This description should give the real position for ethical phenomena. The third part is the conclusion. In conclusion we try to propose the solution of this situation suggesting hermeneutical understanding of values.

### **Key words:**

Culture, Economy, Ethics, Ethos, Fragmentation, Global, Morality, Values.

### **The Theoretical Background of the Research**

It is not usual to design research or write scientific paper by economist and philosopher. At first sight there are two methodologies, one is empirical and the other one more theoretical. However we have decided to turn weakness of this cooperation into the strength. It means that we would like join the most important and the strongest points of both disciplines and use them in the research. That is the reason why the first paragraph opens philosophical analysis of the problem.

In the moment, when we start to talk about ethics in the business relationships or corporate responsibility, we should consider the problems of terminology. So, the first and most important question is, how we define ethics for the research in economy? How can various ethical systems that evolved in various historical eras and in various civilizations and cultures be classified? Therefore, we will adhere to the classification proposed by Arthur Rich in his *Economic Ethics* (Rich, A. 1990). He divided all ethical systems not into philosophical and religious, archaic and modern, but his division is based on gnoseological interests.

Arthur Rich split ethics from the perspective of gnoseological interest for three parts:

- Methaethics,
- Descriptive ethics,
- Normative Ethics.

This article presents only partial results of the research written by both authors, which describes the relationship between values and global economic life. For this article we use the combination of two methods, methaethical and descriptive ethics. From the methaethical position we would like to define the main concepts, like ethics, ethos, morality, values and postmodern culture. Then we start to work descriptively, it means, that we would like to classify corporate responsibility in ethical codex. As an example we analyse banks in the Czech Republic and their ethical codex. In conclusion we would like to describe how corporations understand their responsibility as one of the ethical values.

### **The Philosophical Analysis of the Main Terms**

In the beginning it is important to define ethics. It seems to be common in many books to find fragmentary explanation, that ethics is a branch of philosophy interested in moral issues, good or wrong. Sometimes it is defined as a part of axiology. For this article we would like to define ethics, especially in the connection with business, as a special branch of social studies which is interested in reasoning about good, evil, believes and values.

Next, we would like to distinguish MORALITY from ETHOS. In normal parlance, those two words are almost identical in meaning. In specialized usage and practical philosophy they must be clearly set apart. The reason is simple: they are not synonyms, but two very different ideas. The thinkers who distinguished was Immanuel Kant (Anzenbacher, 1985).

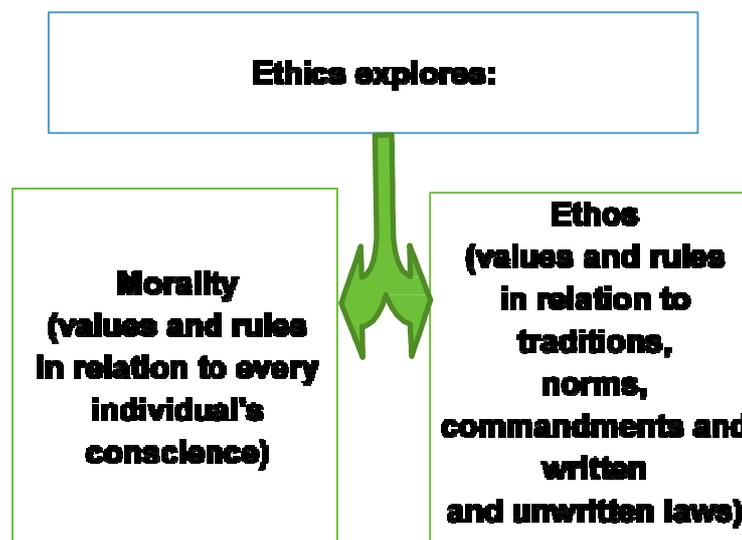
The first word is morality. This word comes from Latin word *mos*. Apart from the moral principle that binds people to strive for virtue, there is also a personal urge for individual virtue. Immanuel Kant describes the urge as *Moralität*. Morality is what an individual's conscience regards as good. Thinking, talking or acting is regarded as long as it is in harmony with the individual's conscience. Therefore, ethics based on morality is generally known as autonomous ethics.

The second word is ethos. This word comes from Greek language *ἦθος*. We already know that thinking and action were originally driven by customs or customary law, so

righteous or wrong behavior was assessed according to how society stuck to certain rules. Aristotle noticed that these moral regulations are twofold: in Greek, νομοι γραφοι και νομοι αγραφοι (NOMOI GRAFOI KAI NOMOI AGRAFOI) – ‘written and unwritten law’ (Aristotle, 2006). Moral code is inseparable from every culture and typical of every era of human existence. The question is how the written moral code and rules are spread. These can be passed on through traditional scripts, customs, commandments or even as part of religious liturgy. A myth, story or religious commandment can all become mediums that carry a moral message. Philosophy and philosophical essays are also capable of this. Today there are new ways of communication, especially social networks, which create their own ethos within a communications universe. Kant took notice of morality within its content. For instance, the ethos of Thou shalt not kill as an imperative are given from inside and apply to individuals and the whole of society. We are talking about heteronomous ethics that Kant calls Sittlichkeit. Ethical behavior adheres to generally accepted laws, norms and rules. The law is a motive for thinking, talking and acting, be it in a written or unwritten form. A very good example of moral ethics is the Ten Commandments in Judaism. This is a written ethos that has been passed on by both scripts and religious liturgy. Another example of a well-preserved written ethical code comes from the time of the Sumerian Empire and is more than five thousand years old. It is very precious because it reveals working relations in a civilization that ceased to exist two thousand years BC.

We are seeing a definition of ethics here. However, it can easily be explained. Ethics is a discipline that explores all moral and ethical aspects of human life like reasons, reasoning good and evil, values and also the reason of all humans’ actions. It explores thinking (motives), speech (cognitive motives) and actions (motives put into action) in relation to conscience (morality) and traditions, rules and laws that represent the ethos of any given society.

**Fig. 1 Ethics explores**



(Source: Klimsza, 2014)

### The term of value

The reference of the term value appears as a serious problem. It can be defined as a good or happiness for those who use some kind of value. There is also a definition, that value is what man as a man produce and use. It seems that the term itself is used diversely not only in various fields of human activity, but also within philosophy or ethics itself. We do not mean diversity in the concept of value between various philosophical schools of thought nowadays. We consider the philosophical discussion between Fenomenology and Neo-Kantian schools to be the most important.

- Neo-Kantianism perceives values as being part of a strange world that exists beyond the real world. The following can be ascertained in line with this thinking: It speaks of WHAT VALUES SHOULD BE. In other words, it refers to an ideal world that is meaningful and valuable and should therefore be put into practice in real life (Klimsza, 2014).
- The second school is Phenomenology. This regards values as real and present in things in everyday usage. The following can be ascertained from this school of thought: IT ATTACHES QUALITY TO WHAT IS. It emphasizes empirical experience. Both approaches are important for economic life because they deal with the tension we are soon going to examine in the following chapters. In the context of ethics in the realm of economics, these approaches are important in terms of innovative business behaviour (Klimsza, 2014).

In other words, the plurality of approaches to understanding values is not the issue. Our aim is to criticise the mixing and confusion of the words 'good' and 'valuable'. As well as the confusion of the words 'valuable' and 'value' for 'ethics' in the field of aesthetics. 'Beautiful' tends to get confused with 'valuable' and 'beauty' with 'value'. The concepts of 'value' and 'valuable' abandon their own content framework. Yet another rather unfortunate mix-up involves the confusion of the terms 'value' and 'valuable'. The difference between the sentences that is a value and that is valuable is rather striking. From the linguistic point of view, these are two different claims. The former is a value judgment. The other sentence represents a statement, which involves value judging. The example Bocheński (2000) gives here is the difference between a count and counting. The former involves the final value judgment. While the latter represents the process of the judging. In everyday common language, values are ascribed a certain aspect of the value and the same applies to judging. One example of this tendency is the ascribing of the valuable to that only which is of material nature.

### **The Postmodern Culture as a Fragmentary Culture**

The question of any ethics must be preceded by an analysis of man and his culture in the world. Philosophical/linguistic examinations capable of showing the situation which surrounds and determines man. Only after that can it be shown to what extent the following sentence applies and where it ceases to be valid: We must be held accountable for the consequence of our actions. This paves the way to the justification of any moral and ethical requirement. But it only does so after the autonomy of man in the world is proved. Therefore, man holds the key to his situation in his own hands and may freely choose and decide as well as carry full responsibility for his actions. Especially the problem of responsibility in all decisions and actions is showed well in everyday business life. The impact of all decisions is exposed in everyday life of the whole society. But the question is how decisions play the role in society life.

The French philosopher Jean-François Lyotard was the one to describe and conceptualise the reality of the postmodern world in a manner which captures the current discourse (Lyotard, 1993). In Europe, Lyotard identifies the emergence of the postmodernist thought with the completion of the post-war reconstruction. Postmodernity consciously renounced even the last story that had the capacity to unify in an artificial way. Lyotard first pointed to the fragmentation of the often artificial unity. In other words, in the present, it is no longer possible to dwell on the single great story, which is of universal validity and morally and ethically binding upon everybody. In this it is not only the traditional institutions such as the church and the state that come down. It is the very significance for all institutions. They are slowly, but inevitably becoming dispensable. In the past, individuals were integrated into the cultural context via the metanarrative. Lyotard shows we are witnessing of this trend. The society is going through a process of fragmentation, or pulverisation into individual entities. Figuratively speaking, the story is pulverised into a number of minor stories.

And everyone wants to tell such stories, regardless how banal they may be. The immediate effects of fragmentation of the society is its trivialisation. That is the reason why Lyotard spoke of a crisis of philosophy as well as of a crisis of the western culture or the entire society. The actual problem of ethics is that with the fragmentary nature of the word, it cannot pass on its normative content. It may analyse the state of man; it may analyse terms. But it may not pass the normative content in any way; in order to be conceptualised and passed on, it needs a narrative. The reason is that a narrative visualises the actual field of action of ethics. Its field of action however must be nothing that has a fragmentary nature; on the contrary, it must have a holistic/integrating nature.

A society, which founds its own culture on the fragmentary, loses that which Tillich terms the depth of life (Tillich, 1975). The loss of depth in culture leads to increased superficiality of life, which may ultimately manifest itself through a moral and ethical crisis. The Polish sociologist Zygmund Bauman describes the same event, i.e. fragmentation of the world, as Liquid modernity (Bauman, 2004). Culture lost its grand narrative and replaced it with a number of small narratives, it has suffered a loss of values that used to keep the underlying rules of behaviour within the consciousness of the entire society. The postmodern world is a world of small fragmented communities which present their specific small interests as global interests. The most important question for business ethics is what kind of impact will have the fragmentarisation on the social responsibility of every global corporate?

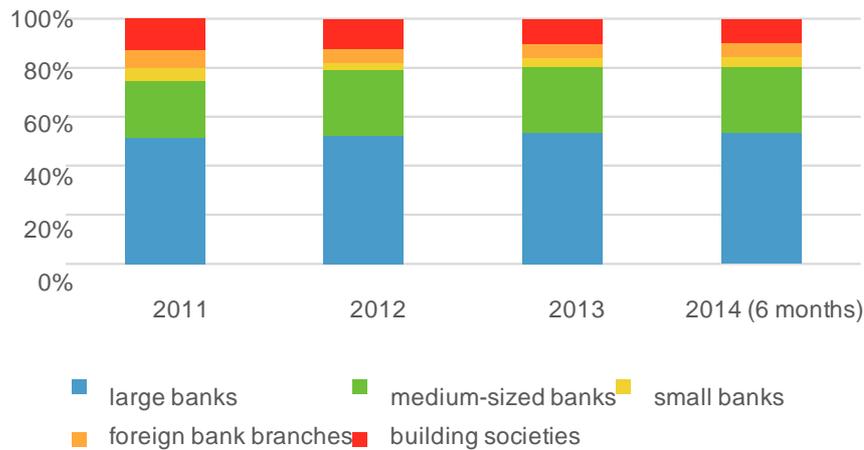
## **Economic Analysis**

We chose banking sector of the Czech Republic for analysis, because we expected that this sector is the most developed in the corporate culture, where ethics belongs. We ask four important questions:

1. How many banks are there in the Czech Republic, which of these banks are significant and what is their share at Czech banking market.
2. How many banks in Czech Republic explicitly express ethical rules or ethical codex on their websites?
3. Is there any difference between parent's ethical codex and subsidiary ethical codex in Czech Republic?
4. How do banks express the value of responsibility in ethical codex?

Nowadays, there are 45 banks in the Czech Republic in total. Czech National Bank (CNB) divides banks into groups based on the amount of their total assets and on aspects of their organization and specialization. As from 2012, the breakdown of banks by total assets is the following: large banks are those with total assets of more than CZK 250 billion, medium-sized banks have total assets of between CZK 50 billion and 250 billion and small banks have total assets of less than CZK 50 billion. (CNB, 2014). The following figures show basic banking indicators (as shares of bank group in banking sector), which are monitored by Czech National Bank, respectively, which all banks have to report to Czech National Bank. These reported indicators include total bank assets, total (gross) clients receivables and total clients deposits.

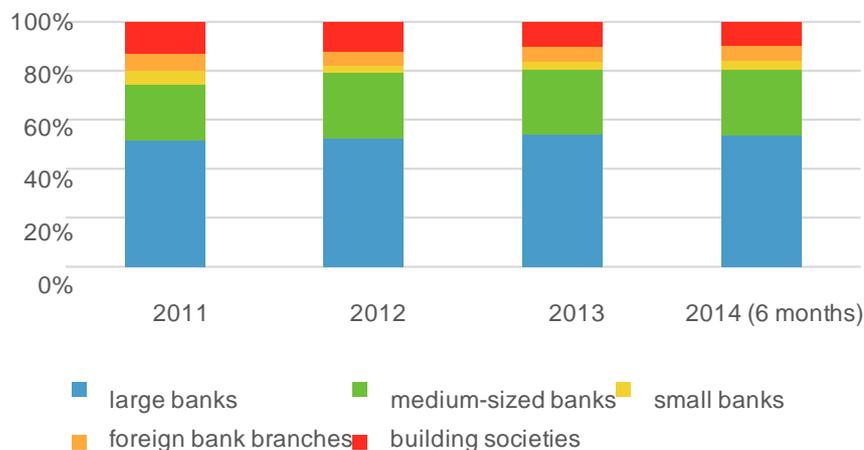
**Figure 2: Shares of bank groups – Total Assets indicator**



Source: based on the data of the CNB (2014)

Figure 2 shows that large banks have almost 60 % of the total assets of the banking market in the Czech Republic. During last 4 years, their position has not significantly changed. Contrary small banks, foreign bank branches and building societies have only about 20 % of the market.

**Figure 3: Shares of bank groups – Total clients receivables indicator**

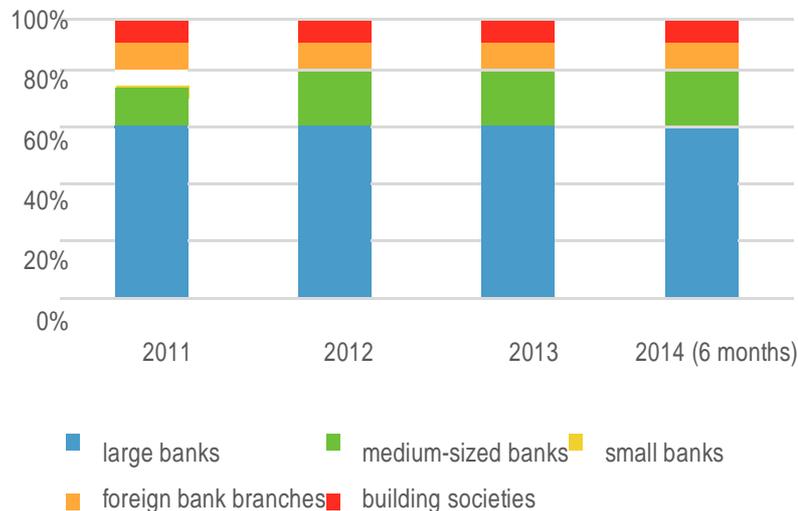


Source: based on the data of the CNB (2014)

Figure 3 shows that the dominance of large banks in total clients receivables is not as high as in the case of total assets (it is “only” about 50 %). Clients use rather medium-sized banks. Their share is (in 2014) almost 27 % of banking market. Relatively small significance of building societies, which is used primarily to the providing loans may be surprising. Their share decreases over the years from 12,72 % (2011) to 9,76 % (2014). This trend is probably due to a significant decrease in interest rates that are currently lower, than the guaranteed on building savings contracts. The final monitored indicator is Total clients deposits (see figure 4). From figure 4 two different trends can be observed. The first, conservative clients’ believe in large and verified banks. The second, clients seeking higher yield deposit their money in small banks, foreign bank branches or building societies. Although the proportion

of these groups is decreasing in time, it can be still relatively high (about 24,5 % in 2014). Very slowly increase share of medium-sized banks. Large banks keep about 60 % of deposits market in the Czech Republic.

**Figure 4: Shares of bank groups – Total clients deposits indicator**



Source: based on the data of the CNB (2014)

To sum up what has been mentioned, we make several conclusions. Czech clients are mostly conservative and believe in large banks (for most indicators, the share of large banks are almost 60 %, while it should be noted that this group includes only 4 banks, what is less than 10 % of the total number of banks in the market). In the credit market, together with large banks, have an important role medium-sized banks, but in the deposit market have an important role rather small banks, foreign bank branches and building societies. A certain explanation of the difference between credits a deposit market may be varied composition of clients. While the credit market is used by corporation clients (companies), deposit market is used mostly by private clients (households). Companies try to find the best loan, which currently offers more medium-sized banks. Households try to find the best interest rate for their savings and are not afraid to use small banks, because their deposits are insured up to 100 000 EUR.

During the banks analysis, we found that some banks are focused only on corporate clients (it is 17 of 45 banks, including Czech National Bank). The remaining 28 banks have corporate and private clients. On the basis of this finding, we expected that:

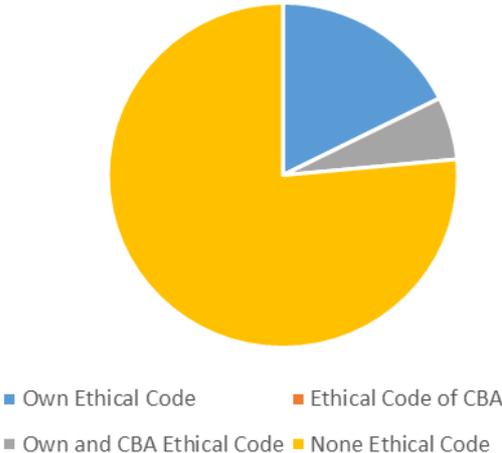
- All large banks have Ethical Code,
- All (or mostly) banks having corporate and private clients have Ethical Code,
- Not all foreign bank branches have their own Ethical Code, but at least they have an identical Ethical Code with his mother.

After the website analysis of individual banks, it was found that only 15 banks have their own ethical codes published on their websites. Eight banks declared affiliation to Ethical Code of the Czech Bank Association. Some of the banks declared both, their own ethical code and also declare affiliation to Ethical Code of the Czech Bank Association. In the research we did not take into consideration, because for our research is important the positive match. Now, the negative result. During the classification we did not found any notice on the websites of 25 banks in Czech Republic (that is 55 % of all), about ethical code

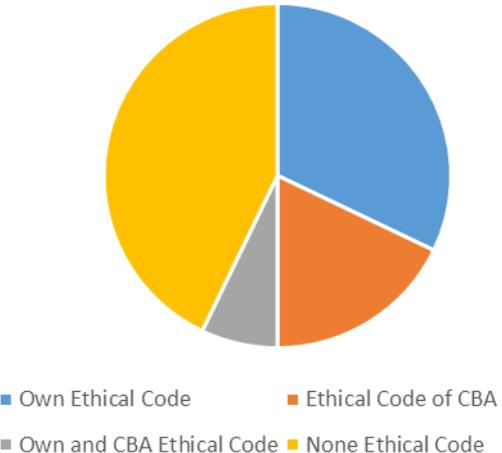
or declaration of affiliation to Ethical Code of the Czech Bank Association (CBA). Because we did not know the exact composition of the groups that used Czech National Bank, we could not classify individual group of banks to find out group with biggest flaws in the code of ethics. Despite of the fact, we were able to divide the bank by clients (corporate or private and corporate) and the results shows figure 5.

**Figure 5: Banks with published Ethical Code**

Banks with Corporate clients



Banks with Corporate and private clients



Source: own data based on banks web pages (2014)

We can see that more than 75 % of banks with corporate clients in the Czech Republic do not have any ethical code or did not declare affiliation to Ethical Code of the Czech Bank Association. The situation in the second sector is slightly better (private and corporate clients). Even there are almost 45 % of the bank without ethical code.

One of our hypotheses was that banks with majority in the market (large banks) will have a code of ethics. We compared these bank, mainly from the ethical perspective. Three of them have got their own ethical code and says, how important the ethical code for their future Ethical Code of the Czech Bank Association. This finding was a negative surprise

for us, especially due to increasing market share of this bank in the banking market. Does it mean that for Czech clients are more important different values (like interest rate, profit or security of parent bank)? The question was if the parent of this bank has ethical code posted on its website and if it is the answer yes – why this ethical code does not take by subsidiary banks? Respectively, are there some differences between ethical codes of parent bank (foreign banks) and subsidiary bank (domestic banks)?

## **Conclusions:**

The postmodern fragmentary structure of the culture is evidently seen in ethical codes of the companies. Our research analysed one important sector of the culture – financial sector.

The first conclusion is that we found the differences between the parent companies (foreign banks) and subsidiary companies (domestic banks). This fact did not meet our expectations. If we consider that parent company and also subsidiary company are part of the global culture, it means that they both have the same ethical code. However, it is not the reality. The major idea of globalisation is that “Globalisation describes a process by which national and regional economies, societies, and cultures have become integrated through the global network of trade, communication, immigration and transportation.” (Financial Times, 2014). Analysed showed something different. There are differences between values declared by parent companies and subsidiary companies. These results provoke new questions, like: Are these differences caused by different ethos of the nation? Or, is it the different environment of the bank sector in the Czech Republic, which causes the difference in values? We have no answer to these, they need to be answered in the follow research.

The second conclusion is the character of the ethics between the parent company and subsidiary companies. If we define ethics as the science which studies good and evil, values and beliefs then we have to say, there must be differences.

In German banks ethical code is written as a tool of employee's behavior. It consist of instructions. In Czech environment we can observe ethical code as a set of rules which have heteronomical character. If we break the rules, we can be sure that we will be punished. It is. One of them does not have any ethical code and also has no declaration of affiliate to means, that breaking rule will have an impact in the form of specific consequences, which are specified in ethical code. From Kant's philosophical position it is hypothetic imperative (Kant, 1996).

In comparison with the parent companies there is a big difference. Most German parent banks understand ethical code as an inspiration system of norms and values, which inspires behaviour of employees. Ethics is a good in itself, to which, from the positions of Kant's philosophy, one must aspire for its own sake (Kant, 1996). It is close to categorical imperative of Kant's philosophy. All rules and values, included in ethical code, regulate the behaviour and values. It should not be understood: “If somebody breaks the rule, he/she will be persecuted by cutting the salary dawn or he/she will be speak with human resources director of the company”. But very often we can read the formulation like: “Our company's behaviour represents our believes and values”. There is a big difference in the sentence:

1. We have to keep the rules, if not, some of us will be punished.
2. We have to keep the rules, because it is the part of our culture.

The first sentence calculates with bad intention of the employees. The second example calculate with the good intention of the employees. This difference has a big impact on our research.

The third conclusion is concerned with corporate responsibility. However, banks in Czech Republic declared responsibility primarily to the clients and stakeholders. On the second or the third position they declare social and ecological responsibility. It means that

the goal of responsibility, as banks understand it, is the responsibility in relationship into their clients. But we miss more responsibility to the whole culture and also ecology and society.

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# Factors of Development of Agriculture on the Farm Level: Case study from the Czech Republic

Ondřej KONEČNÝ<sup>1</sup>

## Abstract

Farming is influenced by a number of factors, and each individual decision taken at the farm level involves a comprehensive picture of the state and development of agriculture in the higher territorial units. Sometimes a farmer decides to make such alterations in farming that reflect developments in the whole Czech Republic, sometimes a farmer's decisions may be seen as opposing such developments since they are initiated by a specific situation or attitude of the farmer. Factors influencing farmers' decision making can vary greatly from "universal", general ones, such as importance of the competitive market and the Common Agricultural Policy (CAP), to the individual and interpersonal factors closely associated with the personality of each farmer. This paper therefore aims to assess the transformations observed in agriculture in the Czech Republic since 2000 with regard to the official data and to the perspective of farmers, and subsequently to identify factors influencing decision-making according to the perception of farmers. A research conducted among 77 farmers showed that farmers perceived as crucial similar changes that have indeed taken place at the level of the whole Czech Republic, such as the changes in the structure of sowing, heading towards more sustainable agriculture and enhancement of farm multifunctionality. On the other hand, the assessment of the progress towards multifunctionality is difficult to verify in the Czech Republic; the frequently mentioned trend towards higher intensification of farms directly contradicts the observed trend of extensification of the Czech agriculture or the farmers' perception of enforcement of sustainability of agriculture. A perception of strengthening of the multifunctionality of farms and moving towards sustainability can be connected with the impact of agricultural policy, which was identified as the second most important factor influencing any farmer's decision-making, following the factors connected with the market (pricing, consumer preference and customer-supplier relationships).

## Keywords:

Agriculture, multifunctionality, sustainability, factors of development, farm, the Czech Republic

## Introduction

Czech agriculture has undergone many changes during the transformation period; these developments continue even in the period of the Czech integration into the European Union (Bičík and Jančák, 2003; Svobodová et al., 2011; Věžník and Konečný, 2011; Věžník, Král and Svobodová, 2013). However, the nature of some changes and factors influencing transformation of the Czech agricultural sector in these two periods is different. If we set aside the "primary" physical-geographical location factors of agriculture which have a relatively immutable nature, socioeconomic factors, much more variable in time, play a pivotal role, especially those related to the market environment and agricultural policy (Bečvářová, 2005; Spišiak, 2007; Věžník, 2008).

The changing role of individual factors and the changing nature of the factors themselves reflect in the development of agriculture or rather rural areas and are visible in the changing approach of the authors who had tried to theoretically explain these changes. Therefore, many

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Anglo-Saxon authors describe the transformation of agriculture and rural development as a transition of European agriculture from productivism to the postproductivist transition (Ilbery and Bowler, 1998). A difficulty of the theoretical formulation of the changes in the country is however reflected in a series of critical texts (e.g. Evans, Morris and Winter, 2002), therefore some authors speak about the transition towards multifunctional agriculture/multifunctionality in agriculture and rural areas. "Fragmentation" of discussions about multifunctional agriculture and multifunctionality and the fact that some authors understood it as a defence of the European agricultural subsidy system (McCarthy, 2005; Potter and Tilzey, 2005; Holmes, 2006), which can be suitably modified according to the different needs of individual states (see Lowe, Buller and Ward, 2002; Cairol et al., 2009), motivated some authors to use the normative approach to understanding of multifunctionality (e.g. Holmes, 2006; Wilson, 2007).

According to Wilson (2007), different trajectories of agricultural change (in the regions) can be identified and the direction and development of a farm is then possible to explain via the „multifunctional path dependency” of the farm. It is dependent on external factors such as environmental and agricultural policy or market forces, and therefore multifunctionality in agriculture is spatially differentiated in various territorial hierarchy levels (Wilson, 2009). Sudden changes in the direction of a farm (e.g. sale of the farm, the loss of animals or extreme examples like diseases of animals or crops) leading to an increase or decrease of multifunctionality are described by this author as transitional ruptures. It is obvious that such ruptures are also significantly affected by external factors especially.

Thus a question suggests itself, what fundamental changes at the farm level can be recognized, in case that farms head towards to the proclaimed sustainability and multifunctionality, and whether the set of changes as perceived by farmers themselves could represent a true picture of developments in the Czech agriculture, or rather it is merely a set of unique individual experiences. This paper’s main objective is not the identification of the ongoing changes itself; primarily it aims to capture the perception of the significance of the factors that motivate and influence farmers in their decisions about the direction of their agricultural business. For this purpose, a survey among 77 farmers was held in the autumn of 2013.

## **Method**

Identification of changes in agriculture on the farm level and factors influencing farmers’ decision making is based on opinions and attitudes of Czech farmers captured in a research which was managed as a component of the long-term work and interest of the author in this field of study (see e.g. Věžník and Konečný, 2011; Konečný, 2013; Konečný, 2014a). The partial results of the research and the methods applied were presented in the conference *Agrarian Perspectives* (in Prague in 2014), therefore the description of the research methodology is quoted from the paper presented there (Konečný, 2014b).

The research was conducted in October 2013 applying the following procedure. The author of the article prepared a set of questions composing three research topics: multifunctionality in agriculture (1), changes in farming and factors determining the changes (2) and the importance of the Common Agricultural Policy for agriculture (3). Appropriateness of interview questions was first tested upon the answers of four relevant respondents in the pilot research. Based on the findings, the answer sheet was finalized into a form that was used for the collection of attitudes and opinions of Czech farmers in the research.

Since the data collection was organized in the framework of the educational training of students of the course “Marketing in Regional Development” (study program Regional Development and Entrepreneurship at Mendel University in Brno), the questionnaire and research was introduced to students which were trained in the method of recording and questioning (personal interview) and in the selection of respondents. Participating respondents were selected by students (i.e. research cannot be indicated as representative), however, the selected respondent was required to fulfill these criteria – the respondent had to represent a person employed/active in the agricultural sector, either as a representative of the legal entity

or as a private farmer. Agriculture had to represent the respondent's sole or main activity (main income), or it could be their secondary activity generating at least 30% of their income. Except the vineyards, the respondent had to cultivate at least 5 ha of agricultural land.

All students who enrolled to this survey (participating of students in the research was voluntary), conducted it in October 2013 and handed in two completed record sheets with the names indicating the agricultural subject (this identification was used only for verification of the respondent – the survey results are summarized and survey is anonymous). Based on the verification of the fulfillment of the given criteria, answers of 73 respondents were analysed (7 respondents were excluded).

This paper analyses two questions connected to opinions and experiences of farmers describing changes observed in their agricultural activities with view to seven defined characteristics (respondents indicated the nature of change)(1) and identifying the importance of the twelve given factors influencing the changes on the scale from 1 to 10 (value 1 indicates the most important weight of the factor) expressed as a sum (sum of these values multiplied by their weight) and as an average value of the mentioned weight (2).

Based on the analysis of the identification questions, the set of respondents can be described via the following characteristics:

Respondents farmed more than 60 thousand hectares.

30% of participating farmers cultivated an area smaller than 50 ha, but 21% of respondents reported 80% of captured agricultural land.

33% of cultivated land was located in some of the less favoured areas (LFA) for agriculture.

82% of the land of farmers was represented by the arable land and 15% of respondents possessed vineyards due to the fact that half of the respondents were localized in the South Moravia Region.

However, respondents were situated in eight Czech regions.

Half of the participating subjects had a status of legal person.

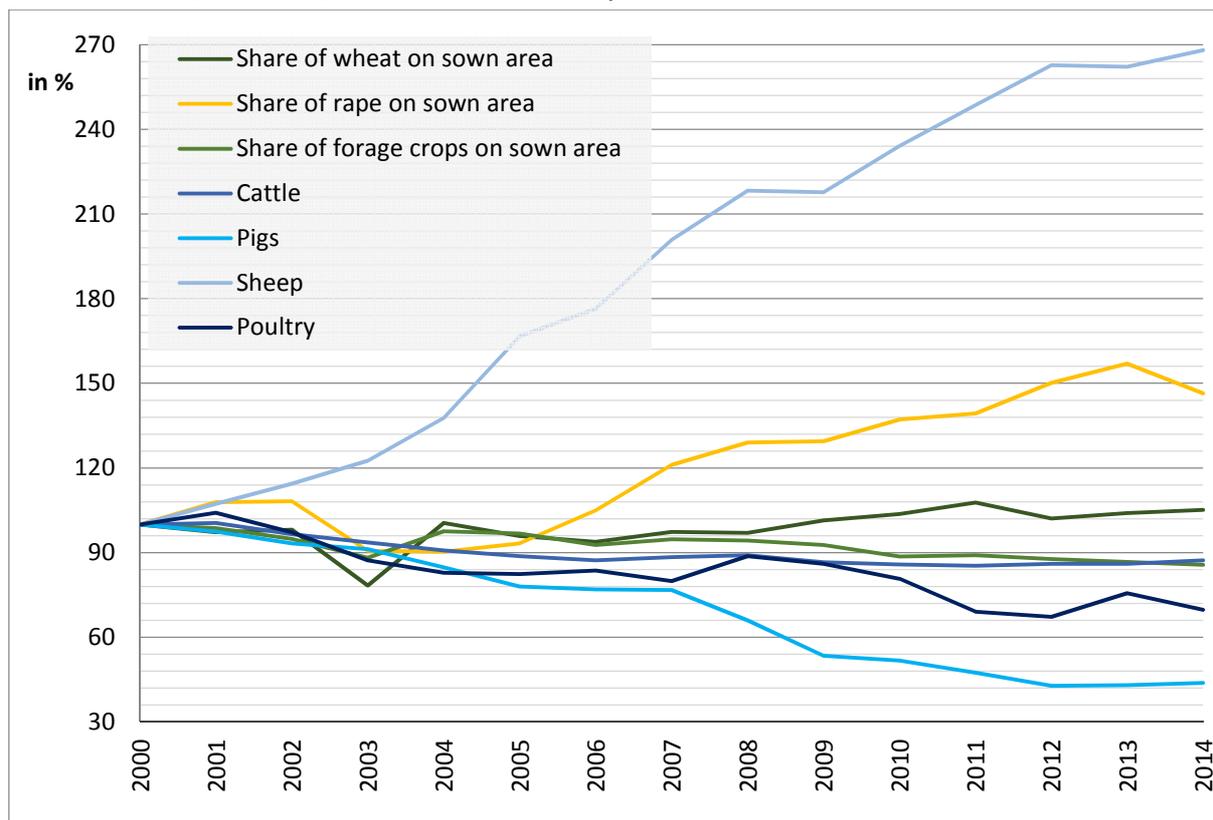
92% of respondents reported agriculture as their sole or main activity.

At least one head of cattle was mentioned by 48% of respondents.

## **Changes in agriculture in the Czech Republic and in farmers experiences**

The developments in the Czech agriculture could be seen as a "summarized" set of changes which individual farmers undertook based on their own decisions influenced by certain factors. Depending on the nature of the unit and its scale, in case of changes on the level of the Czech Republic, these may be described as continuous and gradual developments in agriculture, while "step" changes could be reported on the farm level (ruptures according to Wilson, 2009). However, even on the level of the Czech Republic, some significant shifts that have occurred in agriculture since 2000 are obvious. Assumptions about halting of the decline of numbers of pigs, which had started in the transformation stage of the Czech agriculture (Bičík and Jančák, 2003), did not fulfil since the number of pigs reduced by more than half. Reduction in the number of cattle (13%) and poultry by 30% is also gradual. These downward trends, that many authors describe as gradual extensification of Czech agriculture (Svobodová et al., 2011; Věžník and Konečný, 2011), cannot be seen in the case of sheep, because a 2.5 fold increase is evident from the statistics. Extensive breeding of sheep or cattle, which manifests itself in increase of the number of sheep and suckler cows, is developed especially in areas with less favourable conditions for agricultural production –the total stocking density of cattle (number of animals per area) has thus been constantly decreasing (Věžník and Konečný, 2011). This image of the development of Czech agriculture and reducing of its intensity can be supplemented by the fact that simultaneously decline in the acreage of arable land is reported and share of grassland in agricultural land increases which indicates the continuation of the trend started in 1990 (Bičík and Jeleček, 2009).

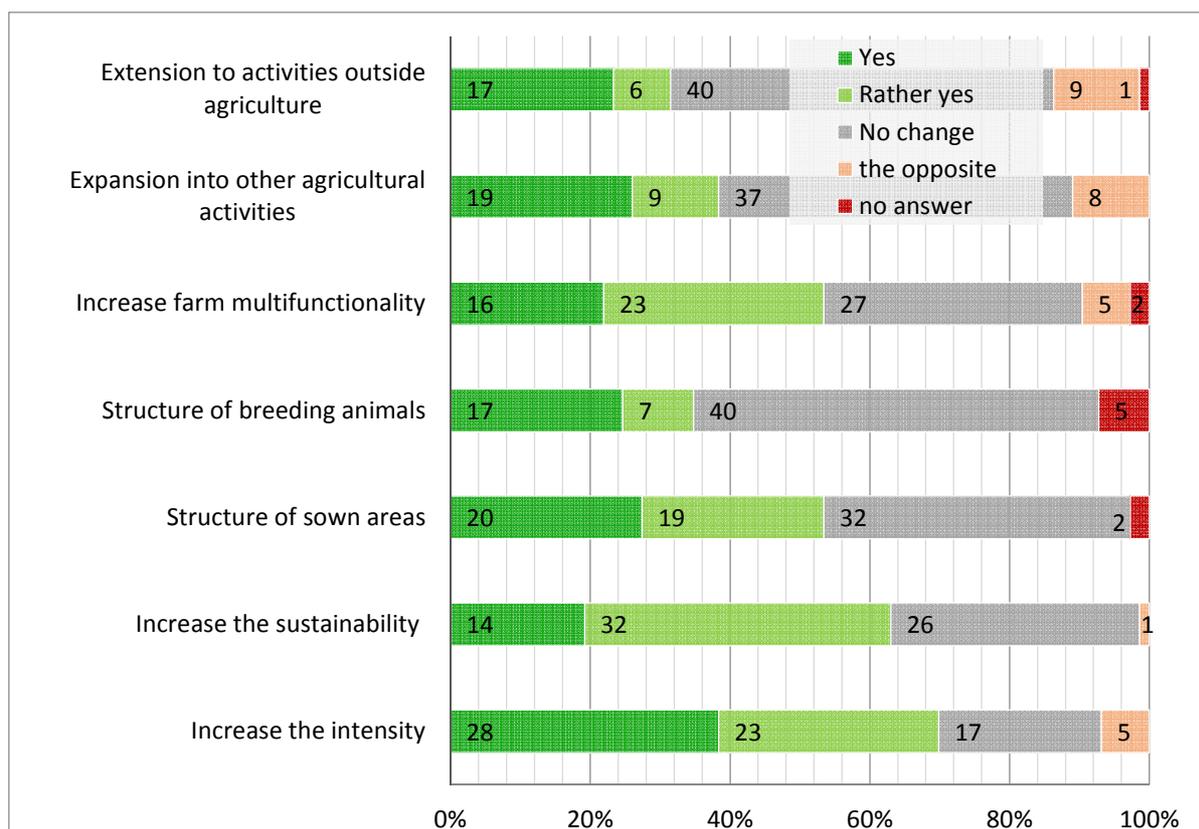
Alongside this, changes in the structure of sown areas are obvious. Restructuring of crop production initiated in the period of transformation of Czech agriculture (Bičík and Jančák, 2003) has continued after 2000. Despite slight variations in the given period, we can speak about the gradual strengthening of the position of wheat and in particular rape on the sown areas. Although the area of wheat has decreased by 16% since 2000, due to the decreasing acreage of sown areas, the wheat accounted for more than one third of the sown area. Rape was sown on 16% of the sown area, which amounts to almost 20% increase of sown area of rape. Also the sown area of maize grown for grain enlarged and sugar beet remains relevant in absolute values. On the other hand, a large decline in absolute values and also in significance within the structure of the sown area was documented in the case of forage crops on arable land, however, most of the other crops showed a decrease in the size of sown area.



**Pic. 1 Development of the number of animals and the share of crops on sown area in the 2000-2014 in the Czech Republic (value of year 2000 represents 100%)**

Source: Czech Statistical Office, 2014 [on-line].

The research had the ambition to uncover not only the above-discussed characteristics of agricultural development in the Czech Republic, but also to identify other changes, which are difficult to describe on the basis of official statistical data. Regarding the structure of animals, responses did not confirm the need for change in the structure of bred animals (however, results are not reflective of the development of the number of animals), since "no change" answer was chosen by more than a half of the survey respondents (the most of "no change" answers among the defined characteristics). However, the need to change the structure of crops was expressed by more than half of the farmers who participated in the research.

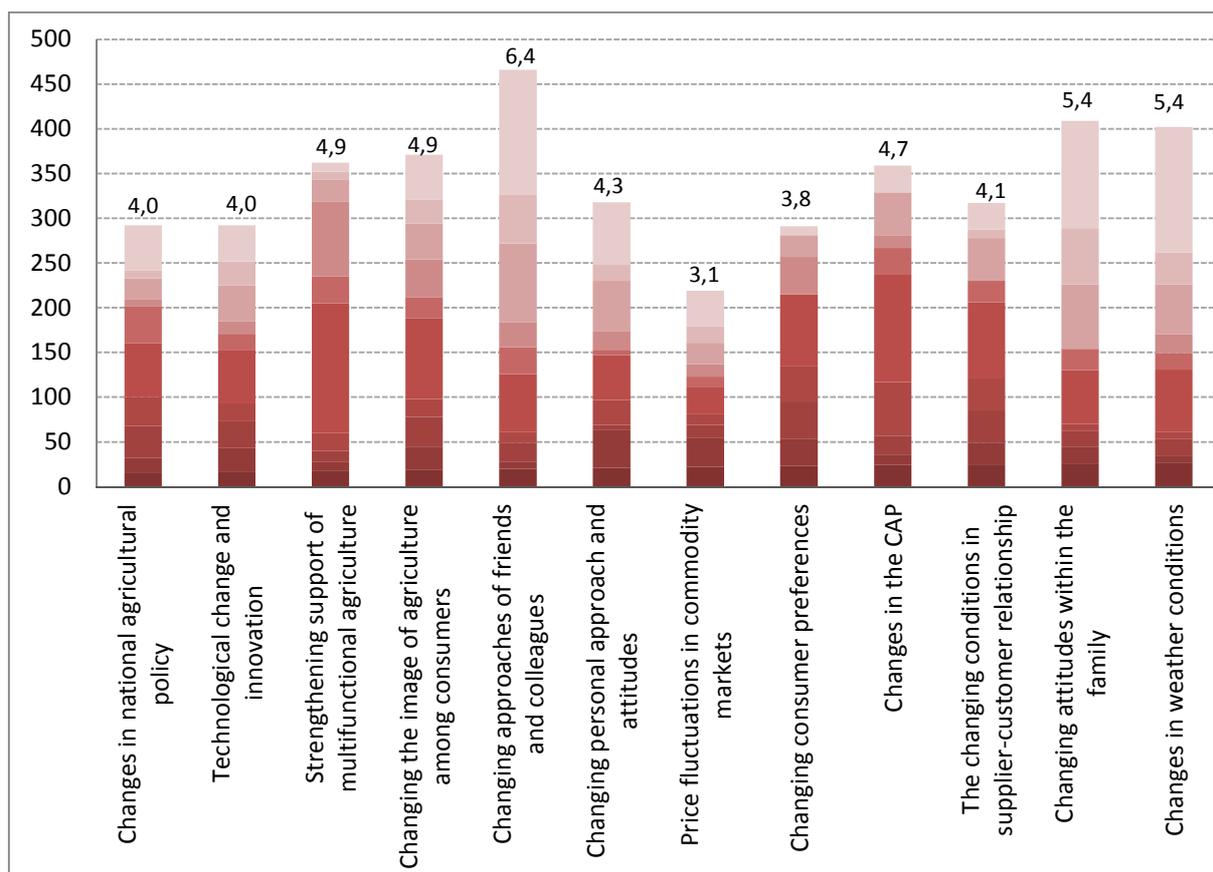


**Pic. 2 Farmers perspectives of development of defined characteristics of agriculture since 2000**

Certain discrepancies can be found between the research findings and the trends captured at the national level and also among the answers themselves, as 70% of the respondents reported an increase in the intensity of agriculture and only 24% mentioned the contrary, i.e. extensification of their farming rather than intensification. On the other hand, 63% perceived that their business development aimed to greater sustainability (both defined characteristics recorded the highest proportion of answer "yes" and "rather yes"). More than half of the respondents also spoke about the trend towards higher multifunctionality of farms. However, such multifunctionality cannot be associated with the expansion of activities into other agricultural activities or outside agriculture (diversification) since no more than 40% farmers expressed their intention to diversify their activities (the lowest values among the characteristics) and also the weak association of the term of multifunctionality and diversification of activities was observed (Konečný, 2014b).

### Factors of changes in agriculture on the farm level

However, an important question is what factors influence these changes, whether voluntary or forced ones, general or individual. As the survey revealed, the most important group of factors (according to the sum of weights and average values) can be seen in market environment, technological factors of production and agricultural policy. "Market" factors expressed by price fluctuations in agricultural commodity markets and changing consumer demands were recorded as the strongest (the role of supplier-customer relationship, which was identified as the fifth most important factor is possible to add into this group). It is interesting that the factor "changes in national agricultural policy" was recognized as stronger than the factor "changes in the EU Common Agricultural Policy", which is probably associated also with the perception of the factor "strengthening support of multifunctional agriculture" and "change in the perception of agriculture among consumers" also at a moderate level.



**Pic. 3 The significance of the factors according to their importance to influence the direction of agricultural activity since 2000, according to the perception of the respondents (the low column resp. low average value means greater importance of factor; the most saturated colour represents the highest weight of the factor).**

Regarding personal levels and social contacts, these were perceived as the least important group of factors influencing the changes in farming by respondents - however only in the case of influences by friends and colleagues and family. Changing personal attitudes and approaches was identified as an average significant factor (sixth in the order). Probably due to the long term nature of this factor, change in weather conditions was evaluated as a factor of low importance, not significant from the perspective of farmers in their business.

## Conclusions

The article aims to uncover and describe the perception of the most important factors influencing development of agriculture at the farm level in a relatively short period beginning in 2000. Based on the official statistic data, some significant trends were observed at the national level, whether they are expressed by the shift in the structure and quantity of bred animals or in the structure of sown areas (Věžník, Král and Svobodová, 2013). Results of the conducted survey revealed stability of the structure of animal husbandry; however, on the other hand, changes in the structure of crops were seen as the most significant by farmers themselves. Changes in the structure of sown areas at the farm level illustrate the overall developments at the level of Czech Republic and probably reflect the fact that the change of sowing structure is much simpler for farmers than any alterations in the structure of animals.

Farmers participating in the research did not reflect the progressive extensification of Czech agriculture as arising from the official statistics (Svobodová et al., 2011; Věžník and Konečný, 2011), since most of them classified the processes that their businesses have

undergone since 2000 as increasing intensification. The intensification trend of farming can be associated with the continued release of the labour and thus increasing the labour productivity.

Although the farmers perceived the growing importance of sustainable and multifunctional agriculture as supported under the CAP (more than half of the respondents claimed some progress towards these forms of agriculture), multifunctionality is still strongly associated with the core of their business - food production and their own work on the farm. Even the survey results published earlier revealed this association (Konečný, 2014b). Therefore, the expression of "multifunctional path dependency" of farms described by Wilson (2009) is very difficult and it could be agreed that multifunctionality in agriculture is spatially differentiated in various levels of territorial hierarchy. A perception of the farms' orientation towards larger multifunctionality may be primarily associated with changes in the environmental field, not with diversification into other activities in agriculture or outside this sector. Heading towards more sustainable farming as perceived by farmers themselves can also be interpreted as a "forced activity" initiated through various subsidy schemes under which the financial support is only provided once certain environmental standards and regulations are fulfilled by farmers (e.g. *Cross compliance*).

Although the respondents perceived the CAP as an important factor driving the developments in farming, the market operation was identified as a far more significant factor (pricing, requirements and consumer preferences and customer-supplier relationships). Interestingly enough, the national agricultural policy changes were reflected as a stronger factor than changes in the Common Agricultural Policy of the EU. National agricultural policy can be understood as a "clash level" in the state-farmer view which is closer to the position of farmers. Farmers may perceive the national agricultural policy as a set of specific regulations, decisions about additional financial support, the current calls for applications for grants, and thus it represents a political agenda that applies and subsequently modifies and guides each regulation and direction adopted by the Common Agricultural Policy. The factors defined as "strengthening support of multifunctional agriculture" and "changes in the CAP" (rated as average) were perceived as equally significant which may document the close relationship of the CAP and this form of agriculture; this term was in fact often used by the CAP and many authors refer to multifunctionality as to a form of hidden, yet legal support of the EU agriculture, as a defense of the European agricultural system against competitors on the world market in front of the WTO (Losch, 2004; McCarthy, 2005; Potter and Tilzey, 2007).

The importance of interpersonal factors was rated as relatively weak by the farmers (except the changes in a farmer's attitudes) and similar result was reported in the case of the factor of changing weather conditions. In case of sudden natural extremes and fluctuations, farmers must respond relatively quickly, therefore these changes rather modify the performance achieved in the agricultural production yet they do not represent a factor affecting a farmer's decision-making in the long-term view (in the eyes of the farmers, weather conditions were perceived as relatively stable in the long term). The question is whether the increasing cases of extreme weather, droughts and changes of soil moisture conditions (Balabán, 2008; Brázdil et al., 2009) will not affect the role and importance of this factor.

## **Acknowledgements**

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# Marketing Factors Affecting Fresh Coffee Buying Decision

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## Abstract

This paper aimed to study marketing factors influencing decision on fresh coffee buying. It's because fresh coffee is one of the most famous and popular beverages, it brings prosperity in economy, and there is increasing in demand and intense competition continually. In order to compete and develop fresh coffee business, marketing factors are very important because they influence customers' buying decision. The study was based on descriptive research design by using questionnaire survey as the instrument for data collection method. A sample of 385 consumers who bought fresh coffee in Bangkok and vicinity areas, Northeastern area, and Northern area was drawn by convenience sampling method. The result showed that physical evidence was the most important factor perceived by consumers. In addition, it was found that marketing factors affecting buying decision were significantly different between/among consumers with different gender, age, education level, occupation, and monthly income.

## Keywords

Fresh coffee, marketing factors, 7Ps, consumption behavior, buying decision

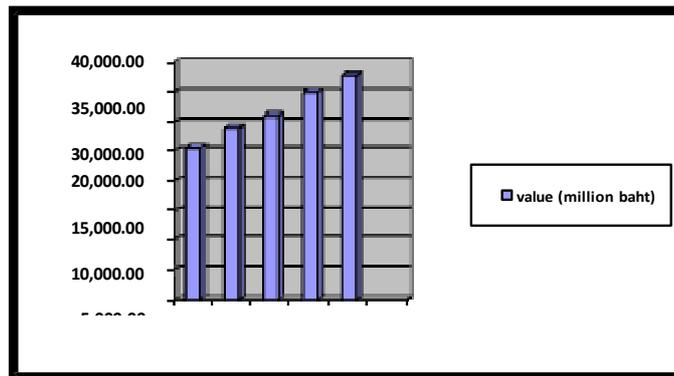
## Introduction

Nowadays, fresh coffee consumption in Thailand has grown rapidly, followed the changing of people lifestyle. Since the second quarter of 2012, demand in Thailand rebounded quickly, due to the resilience of consumers confidence in the positive economic indicators amid the slowdown in the global economy. Many Thai consumers were addictive to the exquisite aroma of coffee and they demanded higher quality coffee, including the formulas with specific benefits to begin their routine, resulting in the surging value consumption of coffee during the review period (Euromonitor International, 2013).

Coffee is also one of the products which are popular and its business grew rapidly in Thailand both Arabica and Robusta coffee species, because of the increasing of consumers and drinking value shifted to coffee gradually, people drank coffee for different reasons, such as for being more awoken, boosting up energy, or sensing rich taste and aroma. As demand grew rapidly, supply was needed to serve the demand; hence fresh coffee shops are growing rapidly as well.

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**Figure 1 Coffee market growth in Thailand (Euromonitor International, April 2010)**

From rapid expansion of coffee shop (figure 1), it built strong competitiveness in the market, for those medium and small coffee shops, they didn't have much capital to invest competing with the big ones. There were many marketing strategies to build up awareness of the brand and to make customer loyalty like the well known coffee shops that they don't sell just quality coffee or brand, but they sell either experience.

Marketing factors play an important role in customer's decision making to buy fresh coffee. Marketing factors are product, price, place, promotion, people, process, and physical evidence. Marketing factors are the elements that make customers perceived special value more than just buying one cup of coffee, more than that customer perceived experience which fresh coffee shops provided such as great services, uniqueness and differentiation of the brand, great relationship between customers and coffee seller. Coffee shop is not just a coffee shop anymore, but it's the attractive place to hang around. These things build great experience to customer perceptions among coffee shops.

Marketing factors affecting fresh coffee buying decision was chose to study because of more understanding in various customers' behavior and factors influencing customers to buy fresh coffee. It builds potential to coffee business to compete in competitive market, long relationship with customers, satisfy customer, and it's an important tool to boost up sales.

### **Objectives of study**

1. To study fresh coffee consumption behavior.
1. To study marketing factors influencing decision on fresh coffee buying.
2. To compare marketing factors influencing decision on fresh coffee buying between/among consumers with different characteristics including gender, age, education level, occupation, and monthly income.

### **Literature Review**

The literature review included the topics of consumption behavior, marketing mix (7Ps), consumer's buying decision process, and related research.

## Consumption behavior

Consumption behavior includes 4 important factors which affect to people's buying behavior as followed;

*Situational factors* are temporary conditions that affect how buyers behave. They include physical factors such as a store's buying locations, layout, music, lighting, and even smells. Companies try to make the physical factors in which consumers shop as favorable as possible. If they can't, they utilize other tactics such as discounts. The consumer's social situation, time situation, the reason for their purchases, and their moods also affect their buying behavior.

*Personal factors*, personality describes customer's character as other people see it. People buy products to enhance how they feel about themselves. Gender also affects what you buy and how you shop. Women shop differently than men. However, there's some evidence that this is changing. Younger men and women are beginning to shop more alike. People buy different things based on their ages and life stages. A person's cognitive age is how old he —feelsll himself to be. To further understand consumers and connect with them, companies have begun looking more closely at their lifestyles (what they do, how they spend their time, what their priorities and values are, and how they see the world).

*Psychological factors*, psychologist Abraham Maslow theorized that people have to fulfill their basic needs—like the need for food, water, and sleep—before they can begin fulfilling higher-level needs. Perception is how you interpret the world around you and make sense of it in your brain. To be sure their advertising messages get through to you, companies often resort to repetition. Learning is the process by which consumers change their behavior after they gain information about or experience with a product. Consumers' attitudes are the —mental positionsll people take based on their values and beliefs. Attitudes tend to be enduring and are often difficult for companies to change.

*Societal factors*, culture prescribes the way in which you should live and affects the things you purchase. A subculture is a group of people within a culture who are different from the dominant culture but have something in common with one another—common interests, vocations or jobs, religions, ethnic backgrounds, sexual orientations, and so forth. To some degree, consumers in the same social class exhibit similar purchasing behavior. Opinion leaders are people with expertise in certain areas. Consumers respect these people and often ask their opinions before they buy goods and services.

## Marketing Mix (7Ps)

Nowadays a more developed 7 P's adds a much needed additional layer of depth to the Marketing Mix. Marketing factors help business understand customer's satisfaction and customer's behavior in purchase decision making. There are 7 elements of 7Ps as below;

1. Product - The Product should fit the task consumers want it for, it should work and it should be what the consumers are expecting to get.

2. Price – The Product should always be seen as representing good value for money. This does not necessarily mean it should be the cheapest available; one of the main tenets of the marketing concept is that customers are usually happy to pay a little more for something that works really well for them.

3. Place – The product should be available from where your target consumer finds it easiest to shop. This may be High Street, Mail Order or the more current option via e-commerce or an online shop.

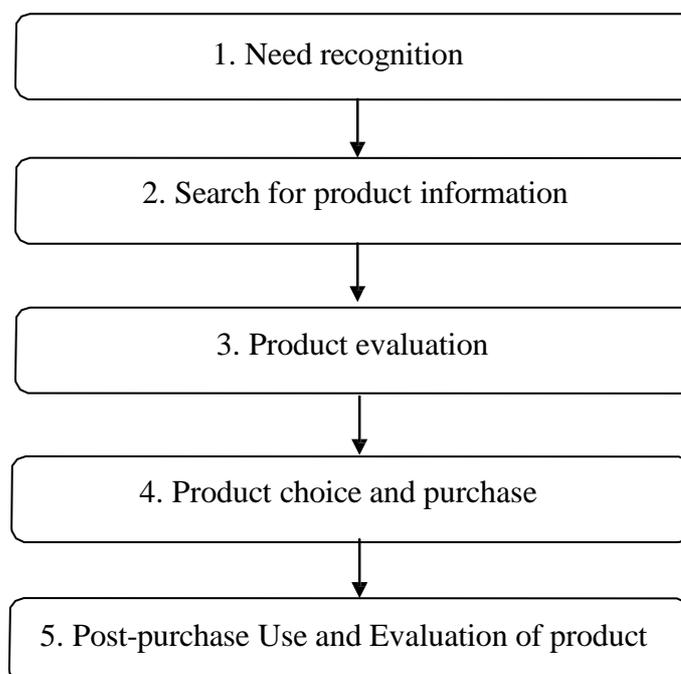
4. Promotion – Advertising, PR, Sales Promotion, Personal Selling and, in more recent times, social Media are all key communication tools for an organisation. These tools should be used to put across the organisation's message to the correct audiences in the manner they would most like to hear, whether it be informative or appealing to their emotions.

5. People – All companies are reliant on the people who run them from front line Sales staff to the Managing Director. Having the right people is essential because they are as much a part of your business offering as the products/ services you are offering.

6. Processes – The delivery of your service is usually done with the customer present so how the service is delivered is once again part of what the consumer is paying for. Physical Evidence – Almost all services include some physical elements even if the bulk of what the consumer is paying for is intangible. For example a hair salon would provide their client with a completed hairdo and an insurance company would give their customers some form of printed material. Even if the material is not physically printed (in the case of soft file) they are still receiving a —physical productll by this definition.

### Customer's purchasing decision

Customer purchase decision is preliminary issue which shops or business should concern because power of purchasing is directly come from customer decision. There are 2 things motivating customers, including internal factors (individual differences in this research) and external factors (environmental influences in this research). These 2 main factors influence and have an impact to customer decision making apart from product itself. Different people, no matter how similar they are, make different purchasing decisions. 5 stages of purchase decision are included;



**Figure 2 Stages in consumer's purchasing process (Kotler, 1999)**

In stage 1: Problem recognition, customers have 2 stimuli which are internal stimuli such as natural needs like feeling hungry and external stimuli such as effects from product marketing communication. In stage 2: Information search, customers search information of the products that they interested from different sources; Customer information sources include personal sources such as family, friends, and colleagues. Commercial sources such as advertisement in media channels, on internet, salesperson. Public source is like mass media. Experiential sources such as experience of using product. Then customers start evaluating alternatives in stage 3, customers want to satisfy needs and seek for preferable product, such as to purchase coffee, they seek for good taste, aroma, or experience from coffee, which different shops provide. In this stage, customers will evaluate bundle of choices and set their own brand belief. In Stage 4: Purchase decision, customers design what they need. But there are 2 interventions occurred during purchase decision stage, —other attitudesll may refer to attitudes, opinions of others which lead to bad opinion over the product if customer pleased those opinions so it might be biased customers' thought. Another intervention that arouse customer to change or confuse is external factors such as salesperson. These factors caused postponing, avoiding to purchase the product. And in stage 5: Post-purchase behavior, which consists of 3 elements; 1) Post purchase satisfaction, is a function of the closeness between the buyer's expectations and the product's perceived performance 2) Post purchase action, customers tend to repurchase if they satisfy the product, if they don't satisfy, they started to take a public action like blaming the company, and 3) Post purchase use and disposal – if the products don't satisfy customers, they will never use the product and keep it far away from their hands.

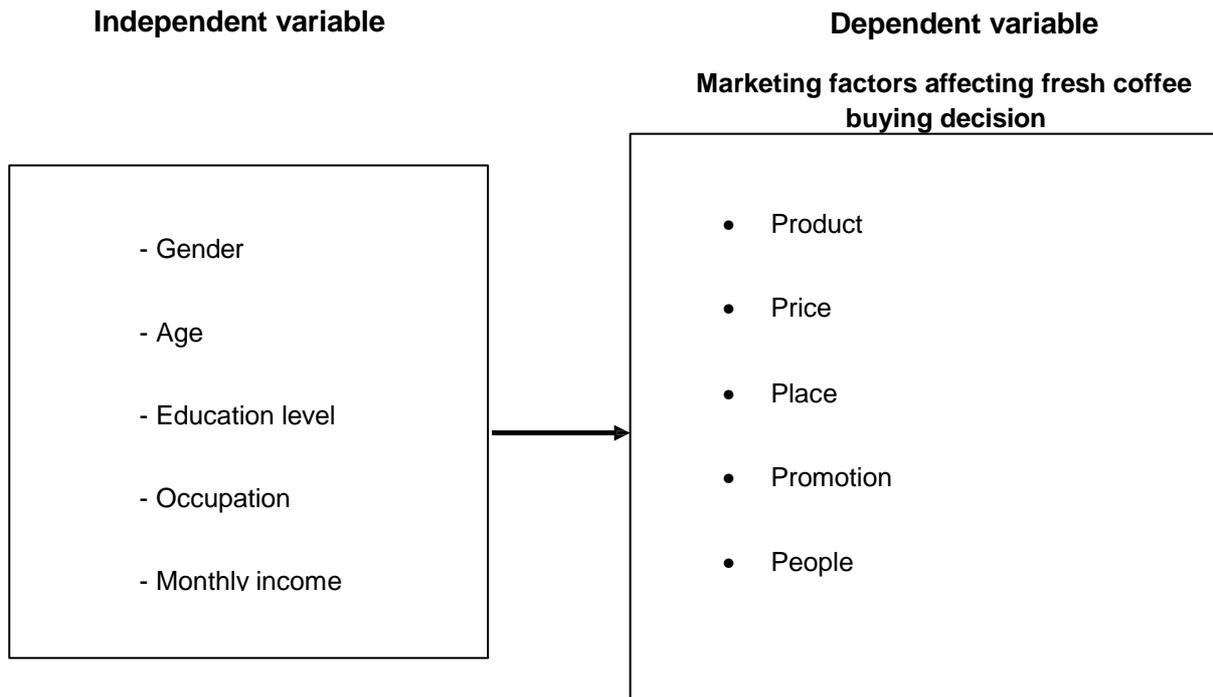
### **Related research**

Pimparian (2004) studied consumer behavior and factors affecting buying decision of the roasted coffee drink in Bangkok, the result showed that the most of the respondents drank the roasted coffee drink at the various times and drank 1-2 cup(s) in a week. The shop that they bought the roasted coffee drink was the shop in department stores and mostly drank with friend (s). They made the buying decision by themselves and the popular type of the roasted coffee drink was Espresso. The reason of drinking was the preferring of the roasted coffee drink's taste. They mostly drank before worked and/or took activities. They paid 20-29 baht for a cup of roasted coffee drink and the brand name/shop varied. The study on the factors affecting buying decision of the roasted coffee drink showed that the most important factor was the roasted coffee drink's taste. The hypothesis test showed that sex and income of samples related to the frequency to drink, the location of shop, and the occasion to drink. The design of packaging, the knowledge and service of employee, the location and the size of shop were more important factors on the female than male.

Furthermore, income of consumers affected on the important level of the roasted coffee drink's taste, the variety products, the brand name/shop, price, the location and size of shop, the design and cleanliness of shop. Therefore, the marketing strategy should focus on improve the roasted coffee drink's taste, cleanliness of shop and training the employee about knowledge of roasted coffee drink and service. Besides, Treewechwinij (2009) studied marketing mix factors affecting consumer's buying decision towards fresh coffee at Mueang Nakhonsawan district, the result showed that factors regarding product, price and place influenced the purchasing decision of the consumers at high level on the overall basis. However, the factor on market promotion aspect had the influence at the moderate level. The highest average level of the product factor was quality and safety of fresh coffee which included the utilization of quality raw materials. The highest average level of item on the price aspect was the reasonable price. The highest average mean on the place aspect was the acceptable cleanliness inside the coffee shop. On the factor of promotion aspect, the highest average factor was corresponded to the service of staffs.

## Conceptual Framework

To study marketing factors affecting fresh coffee buying decision, dependent variable consisted of level of marketing factors affecting fresh coffee buying decision, marketing factors (7Ps) include product, price, place, promotion, people, process, and physical evidence. The relationship of independent and dependent variables showed as below;



**Figure 3 Conceptual Framework**

## Hypothesis

*H1:* There are significant differences in the level of importance for marketing factors affecting fresh coffee buying decision between consumers with different gender.

*H2:* There are significant differences in the level of importance for marketing factors affecting fresh coffee buying decision among consumers with different age.

*H3:* There are significant differences in the level of importance for marketing factors affecting fresh coffee buying decision among consumers with different education level.

*H4:* There are significant differences in the level of importance for marketing factors affecting fresh coffee buying decision among consumers with different occupation.

*H5:* There are significant differences in the level of importance for marketing factors affecting fresh coffee buying decision among consumers with different monthly income.

## Methodology

The descriptive research design was employed to study marketing factors affecting fresh coffee buying decision. Target population in this research was people who drink fresh coffee in coffee shops where contain space and area 20m<sup>2</sup> or more (large size coffee shop) in Thailand. A sample was drawn by convenience sampling in Bangkok metropolitan area, Northeastern area, and Northern area, where high coffee consumption occurred in Thailand, 33.0%, 23.0%, and 21.7% respectively (Video Research International, Thailand) during period of December 2013 and January, 2014. Questionnaire was used as data collection method through both paper survey and online survey. The questionnaires consisted of 3 parts including Part 1: Personal information of respondents such as gender, age, education level, occupation, and monthly income; Part 2: Coffee consumption behavior, and Part 3: marketing factors (7Ps) influencing fresh coffee buying decision, using rating scale which determined level of importance from 1 to 5 (1 = unimportant, 2 = less important, 3 = neutral, 4 = important, 5 = very important). Cronbach's Alpha statistics was used to test reliability of the measure. The 30 try out questionnaires were launched to population with similar characteristics of sample group. Cronbach's Alpha was > 0.7 which satisfy the reliability of the scale. The 385 set of questionnaires were distributed to the target group and all of them were returned accounting for 100 percent response rate.

Data was analyzed by using descriptive statistics (frequency, percentage and mean) to describe the respondent characteristics and the importance level of marketing factors affecting fresh coffee buying decision. The level of importance in marketing factors affecting fresh coffee buying decision interpreted as table below;

**Table 1 Level of importance in marketing factors affecting fresh coffee buying decision**

Points	Level of importance
4.21-5.00	Very important
3.41-4.20	Important
2.61-3.40	Neutral
1.81-2.60	Less important
1.00-1.80	Unimportant

## Result

Researcher collected 385 questionnaires. There were significant differences on the level of importance for marketing factors affecting fresh coffee buying decision related to different gender, age, education level, occupation, and monthly income. The result in this research included 3 parts as follows;

### Part 1 Demographic characteristics

In this part, the result of the study exhibited demographic characteristics of respondents including gender, age, education level, occupation, and monthly income, showed as detail below:

The study showed that, of 385 respondents, there were 137 males and 248 females or 35.6% and 64.4% respectively.

The majority of the respondents were aged between 26-34 years old accounting for 210 respondents or 54.5%, followed by 17-25 years old (123 respondents or 31.9%), 35-43 years old (25 respondents or 6.5%) 44-52 years old (15 respondents or 3.9%) and 53-60 years old (12 respondents or 3.1%).

Regarding to education level, the respondents with undergraduate degree were the majority (267 respondents or 69.4%), followed by those with graduate level (90 respondents or 23.4%) and with lower than undergraduate level (28 respondents or 7.3%).

The main occupation of respondents were company officer (198 respondents or 51.4%), state enterprise officer (118 respondents or 30.6%), students (26 respondents or 6.8%), government officer (14 respondents or 3.6%), freelance and people who don't work (11 respondents each or 2.9%), followed by others (7 respondents or 1.9%).

The majority of respondents were people with income ranging 20,001-25,000 baht (115 respondents or 29.9%) and closely followed by 15,001-20,000 baht (112 respondents or 29.1%), then more than 40,000 baht (75 respondents or 19.5%), and lower than 15,000 baht (35 respondents or 9.1%), 25,001-30,000 baht (29 respondents or 7.5%), 30,001-35,000 baht (13 respondents or 3.4%), and the least amount was people with an income of 35,001-40,000 baht (6 respondents or 1.6%). See table 2 for details.

**Table 2 Demographic Characteristics of the respondents**

Demographic Characteristics	Frequency	Percentage
<b>Gender</b>		
Male	137	35.6
Female	248	64.4
Total	385	100.00
<b>Age</b>		

17-25 years old	123	31.9
26-34 years old	210	54.5
35-43 years old	25	6.5
44-52 years old	15	3.9
53-60 years old	12	3.1
<b>Total</b>	<b>385</b>	<b>100.00</b>
<b>Education</b>		
lower than undergraduate level	28	7.3
undergraduate level	267	69.4
graduate level	90	23.4
<b>Total</b>	<b>385</b>	<b>100.00</b>
<b>Occupation</b>		
company officer	198	51.4
government officer	14	3.6
state enterprise officer	118	30.6
entrepreneur freelance	6	1.6
students	11	2.9
don't work	26	6.8
others	11	2.9
others	1	0.3
<b>Total</b>	<b>385</b>	<b>100.00</b>
<b>Income per month</b>		
lower than 15,000 baht	35	9.1
15,001-20,000 baht	112	29.1
20,001-25,000 baht	115	29.9
25,001-30,000 baht	29	7.5
30,001-35,000 baht	13	3.4
35,001-40,000 baht	6	1.6
40,001-45,000 baht	75	19.5
<b>Total</b>	<b>385</b>	<b>100.00</b>

## Part 2 Coffee consumption behavior

In this part, the result of the study exhibited consumption behavior of respondents including coffee expense per month, how often respondents purchased coffee per week, coffee shop location, price per cup, which promotion suited you, reason to change. The detail was shown in table 3.

The results revealed that majority respondents spent 300-600 baht / month (144 respondents or 37.4%), then lower than 300 baht/than 1,200 baht/ month (54 respondents or 14.0%), 601-900 baht/ month (39 respondents or 10.1%), and the least one was 901-1200 baht/ month (34 respondents or 8.8%).

If consider frequency of purchasing coffee per week, the result showed that mostly respondents were purchased coffee 4-6 times/week at a frequency of 119 respondents or 30.9%, lower than once a week 96 respondents or 24.9%, 1-3 times/week 86 respondents or 22.3%, and purchased everyday 84 respondents or 21.8%.

Concerning the location where respondents frequently bought fresh coffee, the results showed that majority of them often purchased fresh coffee from department stores (157 respondents or 40.8%), followed by the shop nearby office (138 respondents or 35.8%), the shop nearby respondent's home (70 respondents or 18.2%), and university or education centre (20 respondents or only 5.2%).

About price per cup that respondents were likely to pay, the majority of respondents spent more than 100 baht per cup (178 respondents or 46.3%), 35-60 baht per cup (110 respondents or 28.6%), 61-100 baht (90 respondents or 23.4%), and lower than 35 baht (only 7 respondents or 1.8%).

Promotion preference found in the study included discount at the most (273 respondents or 70.9%), membership (72 respondents or 18.7%), trial of new menu (26 respondents or 6.8%), and sending news via SMS and email (14 respondents or 3.6%).

It is also found that main reasons to change to other shops described by respondents was quality changed (160 respondents chose or 41.6%), services changed came second (68 respondents or 17.7%), too crowded people in a shop (46 respondents or 11.9%), price increased (45 respondents or 11.7%), unclean shop (34 respondents or 8.8%), inconvenient to access (25 respondents or 6.5%), and decreased in promotion and discount 7 respondents or 1.8%.

**Table 3 Frequency and percentage of respondents, divided by consumer behavior.**

<b>Behavior</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Coffee's expense per month</b>		
lower than 300 baht	114	29.6
300-600 baht	144	37.4
601-900 baht	39	10.1
901-1200 baht	34	8.8
	54	14.0
<b>Total</b>	<b>385</b>	<b>100.00</b>
<b>How often respondents purchased coffee per week</b>		
Everyday	84	21.8
4-6 times/wk	119	30.9
1-3 times/Wk	86	22.3
lower than once a week	96	24.9
<b>Total</b>	<b>385</b>	<b>100.00</b>
<b>Coffee shop Location</b>		
in department store	157	40.8
university or education centre	20	5.2
nearby office	138	35.8
nearby your home	70	18.2
<b>Total</b>	<b>385</b>	<b>100.00</b>
<b>Price per cup</b>		
Lower than 35 baht	7	1.8
35-60 baht	110	28.6

61-100 baht	90	23.4
more than 100 baht	178	46.3
<b>Total</b>	<b>385</b>	<b>100.00</b>
<b>promotion preferred</b>		
member card	72	18.7
discount	273	70.9
sending news via sms	14	3.6
and email	26	6.8
<b>Total</b>	<b>385</b>	<b>100.00</b>
<b>reason to change to other shops</b>		
quality changed	160	41.6
price increased	45	11.7
services changed	68	17.7
decreasing in promotion and discount	7	1.8
crowded people in a shop	46	11.9
unclean shop	34	8.8
	25	6.5
<b>Total</b>	<b>385</b>	<b>100.00</b>

### Part 3 marketing factors affecting fresh coffee buying decision

In this part, the result of the study exhibited level of importance of marketing factors affecting fresh coffee buying decision including product, price, place, promotion, people, process, and physical evidence as showed in the table 4 below:

**Table 4 Level of importance of marketing factors affecting fresh coffee buying decision**

Marketing factors (7Ps)	Mean	S.D.	Interpretation
<b>Product</b>			
A kind of coffee	3.54	1.028	Important
(Ex. Arabica or Robusta)	2.93	1.167	Neutral
Local brand coffee	2.87	1.230	Neutral
Imported brand			
coffee	3.43	1.056	Important
Attractive package	3.56	.988	Important
Broad coffee			
supply	4.02	.930	Important
Quality in coffee			
bean	3.78	.864	Important
Various beverages			
<b>Total</b>	<b>3.447</b>	<b>1.038</b>	<b>Important</b>
<b>Price</b>			

Reasonable Price	4.18	.893	Important
Low price	3.36	1.109	Neutral
<b>Total</b>	<b>3.77</b>	<b>1.001</b>	<b>Important</b>
<b>Place</b>			
Drive Thru	2.82	1.146	Neutral
<b>Total</b>	<b>2.82</b>	<b>1.146</b>	<b>Neutral</b>
<b>Promotion</b>			
Promote environmental friendly	3.33	1.040	Neutral
Discount and	3.88	1.061	Important
<b>Total</b>	<b>3.605</b>	<b>1.051</b>	<b>Important</b>
<b>People</b>			
Staffs are respectful to you	4.33	.676	Very important
Barista friendliness	4.03	.800	Important
Barista remember your name or your favourite cup coffee	3.50	.987	Important
Staffs are helpful	4.07	.805	Important
Staffs are well presented	3.36	.925	Neutral
Staffs are well trained and know information about shop and	4.06	.809	Important
<b>Total</b>	<b>3.892</b>	<b>.834</b>	<b>Important</b>
<b>Process</b>			
Various refreshments are served	3.67	.953	Important
Free books are available inside a coffee shop	3.48	.984	Important
Always improve quality, taste, new menu	3.98	.867	Important
Develop brand to serve customer satisfaction, production line not destroy environment	3.69	.899	Important
Provide product and service as they promise	4.28	.739	Very Important
Short distance from coffee bar to your seats	3.18	1.014	Neutral
Few time for ordering	3.94	.812	Important
	3.74	1.045	Important

<b>Total</b>	<b>3.745</b>	<b>.914</b>	<b>Important</b>
<b>Physical evidence</b>			
	4.38	.768	Very
Rich and smooth taste	4.16	.872	Important
The strength of coffee	4.24	.803	Important
Coffee aroma	3.68	.954	Very
Hit songs available	4.28	.663	Important
Suitable environment	3.65	.887	Important
Modern facility	4.18	.821	Very
Relax atmosphere	4.02	.826	Important
Noise level	3.85	1.033	Important
Wi-fi accessibility	4.08	.863	
Comfortable environment	4.02	.901	Important
Unique coffee taste	3.89	.842	Important
Cozy atmosphere	4.21	.752	Very
Enough seats and space	4.65	.603	Very Important
<b>Total</b>	<b>4.092</b>	<b>.828</b>	<b>Important</b>

The result showed that respondents valued physical evidence as a priority factor influencing their decision making to buy fresh coffee. The results of importance level of each factor were detailed as followed;

1. Product factor. The overall mean score was 3.447(important). The mean score of each item including purchase decision, including quality in coffee bean, various beverages and snack foods in a shop, broad coffee supply, kind of coffee (Ex. Arabica or Robusta), and attractive package, the level of importance were 4.02, 3.78, 3.56, 3.54, 3.43 respectively.

2. Price factor. The overall mean score was 3.77 (important). The mean score of each item including reasonable price, and low price, the level of importance were 4.18, 3.36 respectively.

3. Place factor. The overall mean score was 2.82 (neutral). The mean score of each item including drive thru, the level of importance was 2.82.

4. Promotion factor. The overall mean score was 3.605 (important). The mean score of each item including discount and promotion, promote environmental friendly, the level of importance were 3.88, 3.33 respectively.

5. People factor. The overall mean score was 3.892 (important). The mean score of each item including staffs are respectful to you, staffs are helpful, staffs are well trained and know information about shop and coffee, barista friendliness, and barista remember your name or your favourite cup of coffee, the level of importance were 4.33, 4.33, 4.07, 4.06, 4.03, 3.50 respectively.

6. Process factor. The overall mean score was 3.745 (important). The mean score of each item including provide product and service as they promise, always improve quality, taste, and new menu, few time for ordering (queue management), free wireless network, develop brand to serve customer, various refreshments are served, free books are available inside a coffee shop, the level of importance were 4.28, 3.98, 3.94, 3.74, 3.69, 3.67, 3.48 respectively.

7. Physical evidence factor. The overall mean score was 4.092 (important). The mean score of each item including cleanliness of the shop, rich and smooth taste, suitable environment, coffee aroma, enough seats and space, relax atmosphere, the strength of coffee, comfortable environment, noise level, unique coffee taste, cozy atmosphere, Wi-Fi accessibility, hit songs available, modern facility, the level of importance were 4.65, 4.38, 4.28, 4.24, and 4.21, 4.18, 4.16, 4.08, 4.02, 4.02, 3.89, 3.85, 3.68, 3.65 respectively.

## **Discussion**

The study showed that marketing factors influenced customer's buying decision was physical evidence as a priority important factor, people, and price were important respectively. The result was similar to related research of the study of Pimparian (2004), which showed that the design and cleanliness of shop, improve the roasted coffee drink's taste, and training the employee about knowledge of roasted coffee drink and service were important. However the findings did not support the study of Trewechwinij (2009) showing that the highest average level of item on the price aspect was the reasonable price. The highest average mean was the acceptable cleanliness inside the coffee shop and the highest average corresponded to the service of staffs.

## **Recommendation**

The result showed that physical evidence had importance level affecting to customer's buying decision the most. Physical evidence is important factor in doing business especially in service business like fresh coffee shops; the important factors in physical evidence included cleanliness of the shop, rich and smooth taste, suitable environment, and coffee aroma. Hence, coffee shops had to concern in provide good service and memorable experience to customers in order to influence and satisfy customers for sustainable growth. For cleanliness of the shop, fresh coffee shop owner should train employees to check the cleanliness inside the shop, and tools for roasting coffee also. For rich and smooth taste and coffee aroma, coffee shop owner should use quality coffee bean and maintain similar standard of roasted coffee process and ingredients to serve great coffee to customers. In order to develop suitable environment, coffee shop owner should organise the shop to be flexible and relax such as provide space among tables in the shop (not to crowded), provide enough light in the shop, cozy and relax atmosphere.

For further study, researcher may need to study more factors in physical evidence which influence to fresh coffee buying decision in deep detail. And study well known fresh coffee shops in Thailand about their marketing factors affecting to customer's buying decision and satisfaction to develop marketing strategy efficiently.

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# Regional Economy Specialisation and Industry Concentration in the Slovak Republic

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## Abstract

The paper aims to quantify and analyze changes in the Slovak economy structure on national (SR) and regional NUTS II (Nomenclature of territorial units for statistics) levels, over 1995 – 2010. We analyze development of specialization, industry concentration and examine impact of selected factors on industry concentration development. We use yearly data of sectoral employment and gross value added at the national and NUTS II regional levels for Bratislava Region (BA), Western Slovakia (WS), Central Slovakia (CS) and Eastern Slovakia (ES), classified according the NACE Rev. 2 (Statistical classification of economic activities). Specialization and industry concentration were quantified by entropy index. Selected factors effect on industry concentration development was estimated by econometric model (Vogiatzoglou 2006) modified by Konyova, Bartova (2013). We used three explanatory variables: technological differences, differences in relative factor endowments and economy of scale. Generally, the western part of the country, including Bratislava (capital) region has been more economically developed. We found, that the Slovak economy became more specialized before the SR accession to the EU. After the accession, the most diversified was Bratislava regional economy, but its specialization has been increasing. The most specialized was the Western Slovakia economy. Industry concentration had been declining significantly in the Western Slovakia, while growing in the Middle and stagnating in the Eastern, less developed part of the country and in Bratislava region. Impact of differences in relative factor endowments, scale economy and technological differences variables on sector concentration was highly significant and had, as expected, a positive effect on geographic concentration in the Eastern Slovakia region. We found negative significant effect of relative factor endowments in the Middle Slovakia and negative significant effect of scale economy in the Western Slovakia. Accession of Slovakia to the EU had statistically positive significant effect on sector concentration and negative effect on economy specialization on national level and in the Eastern Slovakia region. Development of sector concentration economy specialization in the remaining parts of Slovakia corresponded with the European Commission (2004) findings that European integration impact on specialization and concentration had been rather insignificant.

## Keywords:

regional analysis, economic specialization, industry concentration, entropy index, econometric model, Slovakia

## Introduction

Integration into the EU single market provided opportunities to the Slovak Republic for better exploitation of the comparative advantages and led to changes in the structure of the Slovak economy and reallocation of economic activities. A general concern of the European integration process is associated with growing regional specialization, making regions more vulnerable and prone to adverse shocks (Amiti, 1999, WIFO, 1999 Hallet, 2000). Traditional trade theory

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suggests country specialization in activities, in which it has a comparative advantage and predict a monotonic relationship between income and diversification. Several empirical studies however found U-curve development of country specialization depending on country income per capita (Kalemli-Ozcan, Sorensen and Yoshie, 2003; Imbs and Wacziarg, 2003). At higher levels of GDP per capita trend of diversification slows down and re-specialization is observed. Some studies argue that the process of diversification continues and there is no re-specialization of production (De Benedictis, Gallego and Tamberi, 2007). Conclusions on industry concentration development differ by studies. Amiti (1999), Hallet (2000) and Midelfart-Knarvik et al. (2000), Barrios – Strobl (2002) argue that industry concentration is likely to increase as a result of integration. Midelfart-Knarvik, Overman et al. (2000) found concentration growth of industries in peripheral areas of the EU with cheap labor-intensive and less skilled labor force in the EU before 2004. Industries with higher economy of scale and with strong relations in the vertical tended to locate in central regions, but this effect has diminished over time. For some industry movement the country endowment with skilled workers and researchers is becoming increasingly important. According to theory, economic integration would lead to increased spatial sector concentration. Empirical studies investigate different deterministic factors effect on sector concentration.

Empirical studies on specialization and concentration development as a result of integration are rare and not very convincing due to unavailability of data at regional level (Kaulich, 2012). At the same time the results of individual studies may differ because of different approaches to measurement, drawing data from various databases, various indicators e.g. data on production, employment, gross value added, imports and exports. De Benedictis et al. (2003) argue that the production and export forces differ. Simplified assessment of specialization through shares of employment assumes equal production functions in different countries. There is insufficient empirical evidence on the evolution of specialization and industry concentration as a result of the EU integration. The goal of our study was to investigate the SR regional economic specialization and concentration of economy sectors before and after the SR accession to the EU.

## Methodology

We used yearly data on sectoral employment and sectoral gross value added (SK NACE Rev. 2) at the NUTS I, NUTS II and NUTS III (Nomenclature of territorial units for statistics) region in the period 1995 to 2010 (SO SR, RegDat, 2012). Sectors were classified according to the NACE Rev. 2 classification and we selected 11 sectors: Agriculture, Forestry and Fisheries (Agriculture) (A); Industry in total (B-E); Industrial production (C); Construction (F); Wholesale and retail trade, repair of motor vehicles, transportation and storage, accommodation and food services (Trade, transport and services) (G); Information and communication (J); Financial and insurance activities (K); Real estate activities (L); Professional, scientific and technical activities; Administrative Services (Science and Administration) (M-N); Public administration, defence and social security obligations; education; health care and social assistance (Government) (O-Q); Arts, entertainment and recreation; other activities (the Culture) (R-U).

Specialization of regional economies and concentration of industries in the regions were assessed by the entropy index (Eq. 1), a measure of disorder (inverse) which can take values from the interval  $(0, \infty)$ . High entropy expresses a low degree of organization or random grouping. If  $SPEC_j = 0$ , the economy is specialized in one sector, or industry is a monopoly if  $CONC_i = 0$ . The highest values of entropy index indicates that the economy is diversified if  $SPEC_i = \ln(n)$ , or industry is dispersed in regions if  $CONC_i = \ln(n)$ .

$$SPEC_j = - \sum_i \left( \frac{E_{ij}}{E_j} \right) \ln \left( \frac{E_{ij}}{E_j} \right) \quad CONC_i = - \sum_j \left( \frac{E_{ij}}{E_i} \right) \ln \left( \frac{E_{ij}}{E_i} \right) \quad (1)$$

Where:  $SPEC_j$  is the index of specialization;  $CONC_i$  is the index of concentration;  $E_{ij}$  is employment in economic activity  $i$  in region  $j$ ;  $E_j = \sum_i E_{ij}$  is total employment in all economic

activities in the region  $j$ ;  $E_i = \sum_j E_{ij}$  is total employment in all regions in the economic activity  $i$ ;  $\ln$  is the natural logarithm.

Selected factors impact on concentration of sectors has been investigated by econometric model (Vogiatzoglou 2006) modified by Konyova, Bartova (2013) (Eq. 2). Were included in the model 3 explanatory variables: technological differences (Eq. 3), differences in relative factor endowments (Eq. 4) and scale economy (Eq. 5); that according to trade theories are responsible for differences in geographical concentration. The first two belong to the main factors affecting the concentration according to traditional trade theory. Economy of scale is driving force of the concentration according to new trade theory.

$$CONC_i = (TECHDIFF_i, FACTOR_i, SCALE_i, \mu) \quad (2)$$

where:  $CONC_i$  - sectoral concentration;

$TECHDIFF_i$  - Technological differences in economic activity  $i$ ;  $VA$  - value added;  $E$  - employment;  $i$  - industry;  $j$  - country (Eq. 3)

$$TECHDIFF_i = \sum_j \left| \frac{\frac{VA_{ij}}{E_{ij}}}{\frac{\sum_j VA_{ij}}{\sum_j E_{ij}}} - \frac{\frac{\sum_i VA_{ij}}{\sum_i E_{ij}}}{\frac{\sum_j \sum_i VA_{ij}}{\sum_j \sum_i E_{ij}}} \right| \quad (3)$$

$FACTOR_i$  - Relative factor endowments; (factor intensity);  $VA$  - value added;  $E$  - employment;  $i$  - industry;  $j$  - country (Eq. 4).

$$FACTOR_i = \left| \frac{\frac{\sum_j E_{ij}}{\sum_j VA_{ij}}}{\frac{\sum_j \sum_i E_{ij}}{\sum_j \sum_i VA_{ij}}} \right| \quad (4)$$

$SCALE_i$  - Scale economy in industry  $i$ ;  $VA$  - value added;  $E$  - employment;  $i$  - industry;  $j$  - country (Eq. 5).

$$SCALE_i = \frac{\sum_j VA_{ij}}{\sum_j E_{ij}} \quad (5)$$

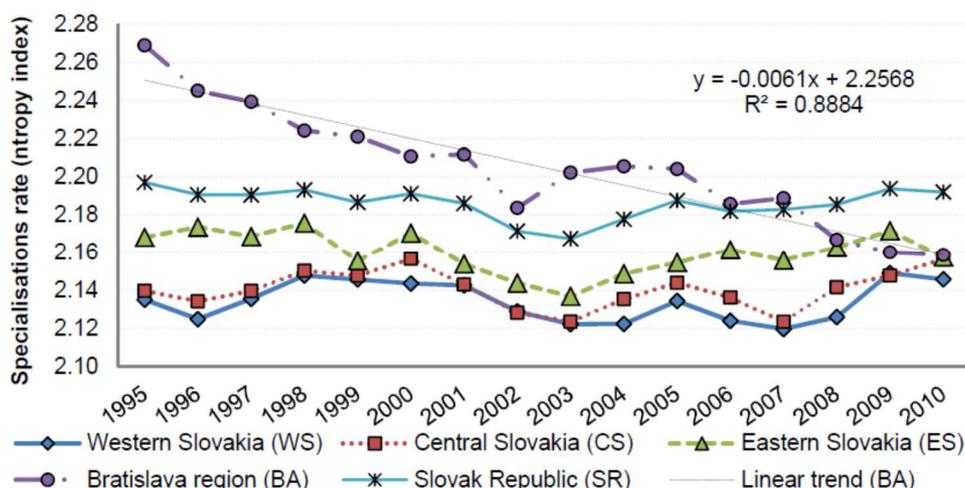
Selected independent variables are expected to have positive effect to geographic concentration.

Heteroscedasticity was tested using White's heteroscedasticity test and Breush - Pagan test. Autocorrelation was tested using Durbin-Watson, Breush-Godfrey's test. Multicollinearity was diagnosed using the variance inflation factor. In the paper we present only significant models and parameters. For parameter estimations by OLS we used Gretl.

## Results

The western part of the Slovak Republic (SR), particularly the area of the Bratislava region used to be economically more developed than the eastern part. According to our study, Bratislava Region (BA) was the most diversified economy and the Western Slovakia (WS) (NUTS II) was the most specialized (*Figure 1*) (inverse rate) in 1995 – 2010. Western and Central Slovakia specialization have not changed significantly, in contrast to the specialization growth observed in the old EU Member States. Specialization of Slovakia and the Eastern part of country increased before the accession to the EU. After the accession there were no

significant changes in specialization. Growth of specialization was observed only in the Bratislava region ( $y = 2.257 - 0.006x$ ;  $Sign.F = 4.74E-08^{***}$ ;  $R^2 = 89\%$ ) (Figure 1).



**Figure 1 Development of economic specialization in the Slovak Republic. Entropy index. 1995 – 2010**

Source: Own calculations

The average level of sectoral concentration in the SR and in Central Slovakia (CS) increased ( $y = 0.69 - 0.0012x$ ;  $Sign. F = 1.45E-06^{***}$ ;  $R^2 = 81.91\%$ ). The opposite trend was observed in the Western Slovakia (WS) ( $y = 1.08 + 0.0006x$ ;  $Sign. F = 3.53E-05^{***}$ ;  $R^2 = 71.68\%$ ). Slovakia's accession to the EU had a statistically significant positive effect on the concentration of industries on national level.

Selected factors effect on industry concentration development we estimated by econometric model (Vogiatzoglou 2006) modified by Konyova, Bartova (2013). We used three explanatory variables: technological differences ( $TECHDIFF_i$ ), differences in relative factor endowments ( $FACTOR_i$ ) and economy of scale ( $SCALE_i$ ).

The most concentrated sector in the SR was the Financial and insurance activities (K). The OLS regression model of this sector since heteroskedasticity and autocorrelation are present, is inefficient and misspecified.

**Tab. 1 Factors of sector concentration measured by entropy index in Slovakia. 1995 – 2010**

NACE Section	SK NACE <sup>2</sup> Rev 2.	Const.	TECHDIFF	FACTOR	SCALE	R <sup>2</sup> /Adj R <sup>2</sup> (0.010. 1)
Agriculture	A	2.02***	-0.01***		1.27***	0.77(***)
Industry total	B-E	2.08***	-0.01***	0.0001***		0.71(***)
Industry	C	2.07***			-0.46***	0.45(***)
Construction	F	2.04***			0.71***	0.65(***)
Trade, transport and services	G-I	2.02***	0.03***	-0.0001*	-0.53***	0.70(***)
Information and communication	J	2.04***			-1.50***	0.77(***)
Real estate services	L	2.00***	-0.05*	0.0017*	-0.72**	0.52(***)
Science and administration	M-N	2.15***		-0.0017**	-10.14***	0.43(**)
Government	O-Q	2.07***		-0.0002**	-1.03***	0.38(**)
Culture	R-U	1.97***	0.02***			0.49(***)

Note: \*/\*\*/\*\* coefficients are statistically significant at the 10% / 5% / 1%;

Source: Own calculations

On the country level we found simultaneous effect of all examined factors for Trade, transport and services (G-I) and Real estate activities (L) (Tab. 1) concentration. New technologies had a statistically significant positive effect on concentration of Agriculture, Industry in total and Real estate activities. Negative effect of factor New technologies was found on the concentration for Trade, transport and services, which means that sector became geographically dispersed.

Differences in relative factor endowments, particularly higher factor intensity (labor) had statistically significant negative effect on concentration of Industry and Real estate activities. Positive impact was found on concentration for Trade, transport and services, Science and administrative and Government (*Tab. 1*). Negative impact of higher factor intensity on sector concentration in Central and Eastern Europe was found by Hildebrant a Wertz (2004). The labour-intensive industries and industries with a relatively low employment to output ratio were dispersed equally in the region. Industries with an average use of labour as a production factor were more concentrated.

Scale economy had statistically significant positive effect on concentration of all sectors, except for Agriculture and Construction with negative relation (*Tab. 1*). Similar development was observed by Traistaru et al. (2002). They found in the Central and Eastern European region that industries with high Economies of scale were more concentrated than average in all countries of the region. Concentration were however slightly decreasing, except for Slovenia with increasing trend and Romania, where all industries had the same level of concentration.

Observed negative impact of examined factors does not correspond to the expectations. Some empirical studies e.g. Haaland et al. (1999), Vogiatzoglou (2006), Todorovic et al. (2010) deal with the same problems and argue that unexpected findings could be related to difficulties with interpretation of some relative or absolute measures.

**Tab. 2 Factors of sector concentration measured by entropy index.  
NUTS II regions of SR, 1995 – 2010**

NACE Section	SK NACE2 Rev 2	Const.	TECHDIFF	FACTOR	SCALE	R /Adj R (Sign. F)
<b>Western Slovakia (WS)</b>						
Agriculture	A	1.08***		-0.001**	-0.694*	0.77(***)
Industry in total	B-E	1.07***		0.0013***	0.24**	0.69(***)
Industry	C	1.09***				0.04()
Construction	F	1.10***	-0.01*		0.34***	0.36(**)
Trade, transport and services	G-I	1.08***		0.0003**	0.76***	0.68(***)
Information and communication	J	1.09***	0.02**	-0.0002*		0.34(**)
Financial and insurance services	K	1.08***	0.02*	-0.0002***	0.30***	0.86(***)
Real estate services	L	1.10***		-0.0001*		0.19(*)
Science and administration	M-N	1.10***		-0.0004**		0.29(**)
Government	O-Q	1.12***		-0.0003***	-0.88***	0.82(***)
Culture	R-U	1.08***		0.0001**	0.75***	0.55(***)
<b>Central Slovakia (CS)</b>						
Agriculture	A	-2.17**	1.42***			0.41(***)
Industry in Total	B E	0.07	0.31*		0.67***	0.85(***)
Industry	C	0.71***		-0.0003**	1.20***	0.79(***)
Construction	F	0.65***				0.11()
Trade, transport and services	G I	0.70***	0.51**	0.27(**)		
Information and communication	J	-0.32	0.51***	0.44(**)		
Financial and insurance services	K	0.69***	-8.7E 06**	0.21(**)		
Real estate services	L	0.69***				0.06()
Science and administration	M N	0.69***				0.05()
Government	O Q	0.69***		2,7E 05***	0.19***	0.62(***)
Culture	R U	0.47***				0.04()
<b>Eastern Slovakia (ES)</b>						
Agriculture	A	0.68***	0.05***	0.0001***		0.67(***)
Industry in total	B E	0.69***				0.07()
Industry	C	0.69***		0.0003*	0.06*	0.18()
Construction	F	0.70***	-0.03***		-0.67***	0.81(***)
Trade, transport and services	G I	0.68***			0.70***	0.54(***)
Information and communication	J	0.74***		-0.0008***	-0.94***	0.41(**)
Financial and insurance services	K	0.70***	-0.04***		-0.22***	0.48(***)
Real estate services	L	0.69***	-0.08***			0.68(***)
Science and administration	M N	0.68***	-0.05***			0.63(***)
Government	O Q	0.70***				0.07()
Culture	R U	0.69***		-3.5E- 05*	-0.22**	0.24(*)

Note: \*/\*\*/\*\* coefficients are statistically significant at the 10% / 5% / 1%;

Source: Own calculations

Expected positive effect on industry concentration growth had factor New technologies (TECHDIFF) on regional level, e.g. in Western Slovakia for Construction; in Eastern Slovakia for Financial and insurance services; Real estate services; Science and administration and Construction. Negative impact of new technologies on sector concentration in Western Slovakia was found for Information and communication; Financial and insurance services; in Central Slovakia for Industry in total, Information and communication; in Eastern Slovakia for Agriculture (Tab. 2).

Differences in relative factor endowments (FACTOR) (higher factor intensity) had statistically significant positive effect on concentration growth of most Western Slovakia sectors and several sectors (e.g. Industry and Financial and insurance services; Information and communications) in Central and Eastern Slovakia (Tab. 2). In Western Slovakia there were some sectors with higher factor intensity (labour) and declining concentration e.g. Industry in total; Trade, transport and services.

Factor Economy of scale had statistically significant negative effect on sector concentration in WS (Agriculture; Government). Positive effect of this factor we found on concentration growth for Industry; Trade, transport and services (CS) and Construction; Information and communication; Financial and insurance services (ES) (Tab. 2).

**Tab. 3 Factors of sector concentration in Slovak NUTS II regions.  
Standardized rates. 1995 – 2010**

Factor	Coefficient	Standardized coefficient	t stat	P value
Slovak Republic (SR)				
Const.	2.017	9.19E 15	1.47E 13	1.000
TECHDIFFi	0.022	0.073	1.125	0.262
FACTORi	-0.001	-0.173	-2.718	0.007***
SCALEi	-1.719	-0.588	-9.050	3E-16***
Western Slovakia (WS)				
Const.	1.088	0.000	0.000	1.000
TECHDIFFi	-0.001	-0.008	-0.103	0.918
FACTORi	-0.000	-0.187	-2.321	0.021**
SCALEi	0.082	0.288	3.576	0.000***
Central Slovakia (CS)				
Const.	0.858	0.000	0.000	1.000
TECHDIFFi	-0.088	-0.149	-0.575	0.566
FACTORi	0.000	0.273	3.277	0.001***
SCALEi	-0.040	-0.152	-0.566	0.572
Eastern Slovakia (ES)				
Const.	0.699	0.000	0.000	1.000
TECHDIFFi	-0.049	-0.559	-10.846	0.000***
FACTORi	-0.000	-0.142	-2.971	0.003***
SCALEi	-0.137	-0.303	-5.683	0.000***

Note: \*/\*\*/\*\* statistically significant at the 10% / 5% / 1%;

Source: Own calculations

Factor Economy of scale, followed by Relative factor endowments were the most important factors of sector concentration in Slovakia, according to the standardized coefficients (Tab. 3). New technologies had no statistically significant effect on sector concentration at both national and regional levels, except for Eastern Slovakia region.

Statistically significant simultaneous effect of examined factors on sector concentration was found only in the Eastern Slovakia region (ES). Here Factor New technologies was the most important, followed by Scale economy and Relative factor endowments (Tab. 3). The most important factor of sector concentration decline (growth of sector dispersion) in Western Slovakia was factor Scale economy (SCALE<sub>i</sub>). Relative factor endowments was the most important factor of sector concentration in Central Slovakia.

## Conclusions

Economic specialization growth we observed in the Slovak Republic and particularly in Eastern Slovakia region in the period before the accession to the EU. Over all observed period 1995 – 2010, specialization increased only in Bratislava (capital) region. There was no significant specialization change of the Slovak economy after accession to the EU. The most diversified was the economy of Bratislava region (BA), while the most specialized was Western Slovakia region.

The average level of sector concentration increased at the national level and in the Central Slovakia region. Higher dispersion of sectors was observed in the Western Slovakia. The average concentration of sectors did not change significantly in less developed Eastern Slovakia region and in Bratislava region. At the national level we found relatively highest concentration of Financial and insurance activities and the most dispersed was Industry.

Accession of Slovakia to the EU had statistically significant effect on sector concentration and economy specialization at the Slovak national level and in Eastern Slovakia region. This finding is in contrary to the European Commission (2004) conclusions that the European integration impact on sector concentration and economy specialization was rather insignificant.

Factor Economy of scale, followed by Relative factor endowments were the most important factors of sector concentration in Slovakia, according to the standardized coefficients. New technologies had no statistically significant effect on sector concentration at both national and regional levels, except for Eastern Slovakia region.

Statistically significant simultaneous positive (as expected) effect of examined factors on sector concentration was found, only in the Eastern Slovakia region (ES), where Factor New technologies was the most important, followed by Scale economy and Relative factor endowments. Negative significant effect of Relative factor endowments was found on sector concentration in Central Slovakia. This negative impact suggests increased geographical sector dispersion.

Most our findings at the Slovak national and regional levels are in accordance with theoretical predictions and complement findings at the EU Member States level.

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# PMI versus IPMA: use of standards in the business practice

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## Abstract

This paper aims to explore the main differences and synergies of PMI and IPMA standards and to find out their usability in the business practice. On the basis of analysis of main standard's resources - A Guide to the Project Management Body of Knowledge (PMBOK Guide) and IPMA Competence Baseline (ICB) there are explored the main differences and synergies of PMI and IPMA standards in the paper. Results of the analysis are used for answering the question - Which standard should be chosen for given business? From the business point of view for managers it is crucial to realize what is more important for their business. Whether more attention on process skills or on people skills will lead them to project's success? Even though both of them seems to be at the same importance when to choose one of the standards the answer must be found however it is complicated. There can be found a key to solution in the type of business. Where the business is met with larger, hard projects the process approach can be the answer and on the contrary where the business is met with smaller, soft projects the personal skills approach might be of crucial importance.

## Key words

IPMA standard, PMI standard, project management, business, small-medium enterprises, multi-criteria analysis

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## **Introduction**

Project management plays a key role in both global environment and on the local level. Either there are large, medium or small projects all of them will face the same problems. How to reach the goal with limited resources and under the given period of time? The success depends on two main facts. How effectively are the processes managed and how and who are the people involved. Both of them are given by the experience earned from project management practice and skills to apply them. But the successfully finished project with limited resources and time is not the only criteria what we can and should not simply measure. In recent days the emphasis is stressed more and more on ethics thus on ways how the projects are managed, under which rules. That is why the standards of project management has been started to be developed. Nowadays two main standards are worldwide distinguished - Project Management Institute (PMI) and International Project Management Association (IPMA). Whereas PMI is based on the processes approach, IPMA is more targeted on the project manager's skills. Both of them are widely internationally recognized with their natural differences and mutual synergies. But which one of them should company choose for running given business? What particularities of the standards are useful for various branches? Looking for the answers is the topic of this paper.

## **Methodology**

For the purpose of this paper there are used several methods of scientific work. This was particularly the case of analysis of two main expert sources PMBOK Guide for PMI standard and ICB for IPMA standard. With the use of synthesis of these results, the results of the synthesis are used as inputs for the multi-criteria analysis. The multi-criteria analysis is used to find the best option for various possibilities of type of business and type of product combination. The paper is conceived as a scientific text demonstrating the importance of IPMA and PMI standards for business practice in small and medium enterprises (SME) using principles of project management.

## **Characteristics of Project Management Standards**

### **PMI Standard**

Project Management Institute (PMI) is a worldwide non-profit organization associating members of project, program or portfolio management professions. It was founded in 1969 in USA (Pennsylvania) and associates more than 2.9 million professionals from almost all the countries in the world in the areas such as law, cooperation, education or research. Through its activities PMI provides standards, certifications, resources, tools, academic research, publications, seminars or networking to advance professional careers<sup>2</sup>. The main parameters are anchored in A Guide to Project Management Body of Knowledge, so called PMBOK Guide which defines basic principles of project management according to the world recognized standards. Standard of project management represents a formal document that defines rules, methods, processes and practice which should be obeyed to manage project ethically and morally.

PMI standard is professional oriented, is based on the best practices of project managers and can be applied on the majority of projects. PMBOK Guide (5<sup>th</sup> ed.) defines process as set of related activities that are conducted to create specified product, service or outcome. Each process is characterized by its inputs, tools and techniques and outputs. These processes are managed and executed by the project team with the cooperation of key stakeholders. PMI standard is focused on processes of project management which ensure effective execution of the project during its life cycle. To ensure effective project management it is also crucial to be aware of product oriented processes that specify and create project's product. PMI standard

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<sup>2</sup> Project Management Institute. [online]. [cit. 2014-09-18]. Available on: <http://www.pmi.org/About-Us.aspx>

does not define these processes nevertheless it stresses the importance to be aware of them during project life cycle.

PMBOK Guide (5<sup>th</sup> ed.) develops five process groups as follows:

- *Initiating Process Group* where new projects or project phases are defined,
- *Planning Process Group* where scope, goals and activities of the project are defined,
- *Executing Process Group* where project work is executed,
- *Monitoring and Controlling Process Group* where monitoring and controlling is executed with the aim to manage changes of the project,
- *Closing Process Group* where all project activities are finalized and project is formally closed.

Within these five Process Groups there are defined 47 processes in total according to PMI standard. These processes are further divided into 10 Knowledge Areas which represent a set of concepts, terms and activities creating professional areas. Knowledge Areas comprise:

- *Project Integration Management,*
- *Project Scope Management,*
- *Time Management,*
- *Project Cost Management,*
- *Project Quality Management,*
- *Project Human Resource Management,*
- *Project Communication Management,*
- *Project Risk Management,*
- *Project Procurement Management and*
- *Project Stakeholder Management.*

PMI standard is focused on the mutual interactions of Knowledge Areas and Process Groups as shown in the Figure 1.

**Figure 1: Project management Process Group and Knowledge Area Mapping**

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring Process Group	Closing Process Group
<b>Project Integration Management</b>	Develop Project Chart	Develop Project Management Plan	Direct and Manage Project Work	Monitor and Control Project Work Perform Integrated Change Control	Close Project or Phase
<b>Project Scope Management</b>		Plan Scope Management Collect Requirements Define Scope Create WBS		Validate Scope Control Scope	
<b>Project Time Management</b>		Plan Schedule Management Define Activities Sequence Activities Estimate Activity Resources Estimate Activity Durations Develop Schedule		Control Schedule	
<b>Project Cost Management</b>		Plan Cost Management Estimate Costs Determine Budget		Control Costs	
<b>Project Quality Management</b>		Plan Quality Management	Perform Quality Assurance	Control Quality	
<b>Project HR Management</b>		Plan HR Management	Acquire Project Team Develop Project Team Manage Project Team		
<b>Project Communication Management</b>		Plan Communications Management	Manage Communications	Control Communications	
<b>Project Risk Management</b>		Plan Risk Management Identify Risks Perform Qualitative Risk Analysis Perform Quantitative Risk Analysis Plan Risk Responses		Control Risks	
<b>Project Stakeholder Management</b>	Identify Stakeholders	Plan Stakeholder Management	Manage Stakeholder Engagement	Control Stakeholder Engagement	
<b>Project Procurement Management</b>		Plan Procurement Management	Conduct Procurements	Control Procurements	Close Procurements

**Source:** PMBOK Guide (5th ed., p. 61)

## IPMA standard

International Project Management Association (IPMA) is the association of more than 55 members in five continents. Members of IPMA develop project management competences and build relations with companies, governments, universities and education institutions and consultants. IPMA was founded in 1965 in Switzerland<sup>3</sup>.

IPMA is oriented on competences of project managers and during certification process competences technical, behavioral and contextual are tested. The main parameters are anchored in IPMA Competence Baseline (ICB) that defines main competences for effective project management. IPMA ICB is not focused on precise definition of processes and its application but on abilities and skills of project, program and portfolio management.

According to ICB (Pitaš et al., 2012) competences are divided into three main groups that should be mastered by the project managers, such as:

- *technical competences* which describes 20 elements of basic competences of project manager,
- *behavioral competences* which describes 15 elements of project managers' skills in the area of managing and executing projects and
- *contextual competences* which describes 11 elements of contextual project environment such as legal basis, company relations etc.

There are 46 competences in total according to ICB which are summarized in figure 2.

**Figure 2: Project manager's competences**

ID	Technical competences	Behavioral competences	Contextual competences
1	Project management success	Leadership	Project orientation
2	Interested parties	Engagement and motivation	Program orientation
3	Project requirements and objectives	Self-control	Portfolio orientation
4	Risk and opportunity	Assertiveness	PPP implementation
5	Quality	Relaxation	Permanent organization
6	Project organization	Openness	Business
7	Teamwork	Creativity	Systems, products, technology
8	Problem resolution	Results orientation	Personnel management
9	Project structure	Efficiency	Health, security, safety and environment
10	Scope and deliverables	Consultation	Finance
11	Time and project phases	Negotiation	Legal
12	Resources	Conflict and crisis	
13	Cost and finance	Reliability	
14	Procurement and contract	Values appreciation	
15	Changes	Ethics	
16	Control and reports		
17	Information and documentation		
18	Communication		
19	Start-up		
20	Close-out		
<b>46 competences in total</b>			

**Source:** ICB (Pitaš et al., 2012, p. 11)

<sup>3</sup> International Project Management Association. [online]. [cit. 2014-09-18]. Available on: <http://ipma.ch/about/>

Even though both standards are focused on the whole life cycle, when we look at characteristics of PMI and IPMA standards one question arises. What is more important for project management - people skills or process skills? Generally it can be said that project cannot be executed without people so people skills would be far more important to the success of projects than process skills are. But of course people skills alone are simply not enough. Therefore to achieve balance of people skills and process skills for the specific team and project is crucial. But dilemma arises when one should choose standard to be certified in. Which standardization should business company choose - IPMA or PMI? To answer this question we need to define what is meant under the term of business company.

## Small and Medium Enterprises (SME)

### Definition of SME

For the purpose of this paper we will use the EU definition of Small and Medium Enterprises (SME), as stipulated in Commission Recommendation concerning the definition of micro, small and medium-sized enterprises<sup>4</sup>. This document defines:

- *microenterprise* - an enterprise which employs fewer than 10 persons and whose annual turnover and/or annual balance sheet total does not exceed EUR 2 million,
- *small enterprise* - an enterprise which employs fewer than 50 persons and whose annual turnover and/or annual balance sheet total does not exceed EUR 10 million,
- *medium enterprise* - an enterprise which employs fewer than 250 persons which have an annual turnover not exceeding EUR 50 million and/or an annual balance sheet total not exceeding EUR 43 million.

Even though there are other definitions of SME, such as US definition of small enterprise, the EU definition meets requirements for the purpose of this paper better because it classifies SME in three suitable and measurable categories.

### Characteristics of SME

SMEs represent a specific group of business enterprises which have to face particular limits but also advantages coming out their definition in comparison with large companies (over 250 employees). As we are focused on project management the main factors what we are interested in are mainly about finance and human resources. These particularities are well summarized in research report about Specifics of human resource management in small and medium-sized enterprises and non-profit organizations (Václavková and Švecová and Smrčka and Krejčíková, 2007).

The research report states limits of SMEs as follows:

- SME owners plays usually company managers role as well,
- IT installation is slower than in large companies,
- employees of SMEs are usually of multidisciplinary qualification,
- lower flexibility to hire new employees due to lower budget,
- due to lower flexibility to hire new employees worse conditions to plan human resources,
- small number of employees,
- more frequent changes of tasks and structure,
- higher risk of selection of an unsuitable candidate,
- insufficient attention to staff training,
- lower wages and smaller range of employee benefits,
- worse conditions for dismissal etc.

On the contrary among advantages of SMEs there are included:

- favorable conditions for informal assessment,

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<sup>4</sup>EU. Commission Recommendation concerning the definition of micro, small and medium-sized enterprises. In: Official Journal of European union. 2003. Available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:124:0036:0041:en:PDF>

- personal involvement of SME owners,
- higher autonomy and decision flexibility,
- greater job satisfaction for employees,
- better balance between personal and work life etc.

These given particularities of SMEs are taken into account during the application of multi-criteria analysis in order to select best option for given business.

### **Types of product**

To be able to choose best option of the project management standard there is used method of multi-criteria analysis. In the last section there are defined several types of enterprises defined for the purpose of the analysis. Now we assume that these three types of business - microenterprises, small and medium enterprises produce several types of product. Types of product are chosen on the basis of most common products in recent economies. We assume these types of products which differ in their production complexity:

- *consumer product* - relatively simple product not demanding complicated processes of production ,
- *business and industrial product* - more complex product demanding special steps during production processes,
- *capital items* - simple or more complex products demanding special knowledge to be produced,
- *suppliers and services* - relatively simple product or service not demanding complicated process or special knowledge and
- *research and innovation* - complex products demanding special knowledge and complex processes.

These types of products are produced by microenterprise, small enterprise or medium enterprise. For each combination of business company and type of product the analysis of IPMA or PMI option is executed.

## **Multi-criteria analysis of best option´s choice for given business**

### **Evaluation criteria**

On the basis of IPMA and PMI standards analysis stated in the last chapter, there are chosen specific steps of project management that are common for majority of projects. Following project management steps are included among the evaluation criteria which differ in the complexity of execution for given enterprise and given type of product:

- *project integration* - managing successfully project as a whole,
- *time management* - creating and managing schedule or resource calendars,
- *cost management* - creating and managing project finance, budget, costs,
- *quality management* - managing quality of products, goods and services,
- *human resources (HR) management* - managing HR, project team and other people in the project involved,
- *risk management* - managing project risks directly influencing project work,
- *monitoring and controlling* - monitoring and controlling of project work,
- *behavioral competences of project manager* - soft competence needed to manage project and project team,
- *stakeholders management* - communicating and managing work with stakeholders,
- *procurement management* - managing buys for the needs of project and
- *communication* - overall communication during the project with all people involved.

These given steps of project management are chosen as criteria of assessment for the analysis. Each of them has different weight for given type of enterprise and given type of product. For instance HR management will have higher weight for the medium-sized company with 100 employees than for microenterprise with 5 persons or procurement management will be more important (and thus will have higher weight) to focus on during the production of

complex product in mechanical engineering than during the production of simple consumer product such as household goods or services providing.

### **Assessment scale**

To be able to choose particular standardization for the enterprise producing specific products we have to assess how the standard is applicable in the variously sized enterprise and in the production of variously complex product. Therefore we establish first assessment scale for IPMA and PMI standard and how they are applicable according to their etalons within the enterprise:

- *Value 1* - the given criteria is hardly applicable, it is not easy to implement methods and techniques described in etalon for the enterprise, their setting is too complex and heavy to implement to be used for given business. The company may face a lot of problems when trying to implement standard's methods and techniques because of the character of the company.
- *Value 2* - the given criteria is quite easily applicable, methods and techniques described in etalon are applicable for the enterprise nevertheless company still can face some problems with its implementation coming out of it character and size.
- *Value 3* - the given criteria is easily applicable within the enterprise, methods and techniques described in etalon are easily applicable for the enterprise and the company does not need to face any problem with its implementation.

The second assessment scale for IPMA and PMI standard is established for the type of product produced by the enterprise and how the standard guides project management steps to produce particular type of product:

- *Value 1* - the explanation of the given criteria is unclear or insufficient; it is not easy to implement methods and techniques described in etalon to produce given product. The explanation is too complex and heavy to understand to be used for given type of product. The production process may face a lot of problems when trying to implement standard's methods and techniques as described in etalon because of the character of type of product.
- *Value 2* - the explanation of the given criteria is quite clear and sufficient, methods and techniques described in etalon are well described and therefore applicable for the particular product nevertheless the production process faces some problems with the implementation coming out of product specification.
- *Value 3* - the explanation of the given criteria is clear and sufficient, methods and techniques described in etalon are well described and therefore easily applicable for the particular product. The production process does not face any problem with its implementation.

The assessment scale is created on the basis of IPMA and PMI etalons' analysis (ICB and PMBOK Guide), how they are explained and described, how they are understandable and what methods and techniques are recommended to use.

### **Results of the analysis**

There are displayed the results of the multi-criteria analysis calculated on the basis of given criteria and scales in the figures below.

**Figure 3: The applicability of IPMA and PMI standard for microenterprises**

Microenterprise	IPMA			PMI		
	Weight 1	Value	Result	Weight 2	Value	Result
Project integration	1	2	2	1	2	2
Time management	0,8	3	2,4	0,8	2	1,6
Cost management	0,8	3	2,4	0,8	2	1,6
Quality management	0,7	2	1,4	0,7	2	1,4
HR management	0,9	3	2,7	0,9	3	2,7
Risk management	0,5	2	1	0,5	2	1
Monitoring a controlling	0,4	3	1,2	0,4	3	1,2
Behavioral competences of PM	0,6	3	1,8	0,6	1	0,6
Stakeholders management	0,3	3	0,9	0,3	2	0,6
Procurement management	0,1	3	0,3	0,1	1	0,1
Communication	0,4	2	0,8	0,4	2	0,8
<b>Summarization</b>	x	x	<b>16,9</b>	x	x	<b>13,6</b>

Source: author's calculations

According to the results of the multi-criteria analysis IPMA standardization is more suitable for microenterprises (it has higher score than PMI standard) than PMI standardization. In other words IPMA etalon is more suitable and applicable in the company with small number of employees.

**Figure 4: The applicability of IPMA and PMI standard for small-sized enterprises**

Small-sized enterprise	IPMA			PMI		
	Weight 1	Value	Result	Weight 2	Value	Result
Project integration	1	2	2	1	2	2
Time management	0,8	3	2,4	0,8	3	2,4
Cost management	0,8	3	2,4	0,8	3	2,4
Quality management	0,7	2	1,4	0,7	2	1,4
HR management	0,9	2	1,8	0,9	2	1,8
Risk management	0,6	2	1,2	0,6	2	1,2
Monitoring a controlling	0,5	2	1	0,5	2	1
Behavioral competences of PM	0,7	3	2,1	0,7	1	0,7
Stakeholders management	0,4	3	0,4	0,4	2	0,8
Procurement management	0,3	1	0,3	0,3	2	0,6
Communication	0,5	2	1	0,5	3	1,5
<b>Summarization</b>	x	x	<b>16</b>	x	x	<b>15,8</b>

Source: author's calculations

As follows from the figure 4, the results of the analysis show that it does not matter which standard is chosen for small-sized enterprise. Even though results give the preference to IPMA etalon, the results are so close that can be interpreted as stated.

**Figure 5: The applicability of IPMA and PMI standard for medium-sized enterprises**

Medium-sized enterprise	IPMA			PMI		
	Weight 1	Value	Result	Weight 2	Value	Result
Project integration	1	2	2	1	3	3
Time management	0,8	3	2,4	0,8	3	2,4
Cost management	0,8	3	2,4	0,8	3	2,4
Quality management	0,8	3	2,4	0,8	3	2,4
HR management	0,9	2	1,8	0,9	3	2,7
Risk management	0,7	2	1,4	0,7	2	1,4
Monitoring a controlling	0,6	2	1,2	0,6	2	1,2
Behavioral competences of PM	0,8	3	2,4	0,8	1	0,8
Stakeholders management	0,6	1	0,4	0,6	2	1,2
Procurement management	0,5	2	1	0,5	3	1,5
Communication	0,8	1	0,8	0,8	2	1,6
<b>Summarization</b>	x	x	<b>18,2</b>	x	x	<b>20,6</b>

Source: author's calculations

Following from the figure 5, the PMI etalon is more suitable and better applicable for the medium-sized enterprise. It can be said that larger company in terms of number of employees requires more precisely defined single processes of project management therefore PMI standardization is better applicable than IPMA standardization.

**Figure 6: The applicability of IPMA and PMI standard for consumer products**

Consumer product	IPMA			PMI		
	Weight 1	Value	Result	Weight 2	Value	Result
Project integration	1	3	3	1	3	3
Time management	0,8	3	2,4	0,8	3	2,4
Cost management	0,8	3	2,4	0,8	3	2,4
Quality management	0,9	2	1,8	0,9	2	1,8
HR management	0,7	3	2,1	0,7	3	2,1
Risk management	0,5	2	1	0,5	2	1
Monitoring a controlling	0,7	3	2,1	0,7	1	0,7
Behavioral competences of PM	0,4	3	1,2	0,4	1	0,4
Stakeholders management	0,2	2	0,4	0,2	3	0,6
Procurement management	0,6	2	1,2	0,6	2	1,2
Communication	0,4	2	0,8	0,4	1	0,4
<b>Summarization</b>	x	x	<b>18,4</b>	x	x	<b>16</b>

Source: author's calculations

As follows from the figure 6, IPMA standardization suits better to consumer products which might mean that project that is producing less complex product is better managed on the basis of competences approach.

**Figure 7: The applicability of IPMA and PMI standard for business and industrial products**

Business and industrial product	IPMA			PMI		
	Weight 1	Value	Result	Weight 2	Value	Result
Project integration	1	2	2	1	3	3
Time management	0,8	2	1,6	0,8	3	2,4
Cost management	0,8	3	2,4	0,8	3	2,4
Quality management	0,8	2	1,6	0,8	3	2,4
HR management	0,7	2	1,4	0,7	3	2,1
Risk management	0,7	2	1,4	0,7	3	2,1
Monitoring a controlling	0,7	3	2,1	0,7	2	1,4
Behavioral competences of PM	0,6	3	1,8	0,6	1	0,6
Stakeholders management	0,5	2	1	0,5	2	1
Procurement management	0,6	2	1,2	0,6	2	1,2
Communication	0,6	3	1,8	0,6	3	1,8
<b>Summarization</b>	x	x	<b>18,3</b>	x	x	<b>20,4</b>

Source: author's calculations

Following from the figure 7, PMI standardization is better applicable for the more complex business and industrial products because PMI results have higher score than IPMA results.

**Figure 8: The applicability of IPMA and PMI standard for capital items**

Capital Items	IPMA			PMI		
	Weight 1	Value	Result	Weight 2	Value	Result
Project integration	1	3	3	1	3	3
Time management	0,8	3	2,4	0,8	3	2,4
Cost management	0,8	2	1,6	0,8	3	2,4
Quality management	0,8	2	1,6	0,8	3	2,4
HR management	0,7	2	1,4	0,7	3	2,1
Risk management	0,9	2	1,8	0,9	3	2,7
Monitoring a controlling	0,7	3	2,1	0,7	3	2,1
Behavioral competences of PM	0,5	3	1,5	0,5	1	0,5
Stakeholders management	0,5	2	1	0,5	3	1,5
Procurement management	0,3	2	0,6	0,3	2	0,6
Communication	0,6	3	1,8	0,6	2	1,2
<b>Summarization</b>	x	x	<b>18,8</b>	x	x	<b>20,9</b>

Source: author's calculations

As follows from the figure 8, PMI etalon suites better to capital items or financial products. This might be given by the fact that financial products usually require more special knowledge to be produced. Managing such a project is better to establish on the process approach.

**Figure 9: The applicability of IPMA and PMI standard for suppliers and services**

Suppliers and Services	IPMA			PMI		
	Weight 1	Value	Result	Weight 2	Value	Result
Project integration	1	2	2	1	3	3
Time management	0,8	3	2,4	0,8	3	2,4
Cost management	0,8	3	2,4	0,8	3	2,4
Quality management	0,5	2	1	0,5	2	1
HR management	0,9	2	1,8	0,9	3	2,7
Risk management	0,9	2	1,8	0,9	2	1,8
Monitoring a controlling	0,5	3	1,5	0,5	3	1,5
Behavioral competences of PM	0,7	3	2,1	0,7	1	0,7
Stakeholders management	0,7	2	1,4	0,7	2	1,4
Procurement management	0,3	3	0,9	0,3	2	0,6
Communication	0,6	3	1,8	0,6	3	1,8
<b>Summarization</b>	x	x	<b>19,1</b>	x	x	<b>19,3</b>

Source: author's calculations

Following from the figure 9, it does not matter which standard will be chosen for production of the suppliers or services. Even though the results give more preferences to PMI etalon, they are so closed that project management might be effective to be based on both options.

**Figure 10: The applicability of IPMA and PMI standard for research and innovation**

Research and Innovation	IPMA			PMI		
	Weight 1	Value	Result	Weight 2	Value	Result
Project integration	1	2	2	1	3	3
Time management	0,8	3	2,4	0,8	3	2,4
Cost management	0,9	3	2,7	0,9	3	2,7
Quality management	0,8	2	1,6	0,8	2	1,6
HR management	0,8	2	1,6	0,8	3	2,4
Risk management	0,9	2	1,8	0,9	2	1,8
Monitoring a controlling	0,5	3	1,5	0,5	3	1,5
Behavioral competences of PM	0,5	3	1,5	0,5	1	0,5
Stakeholders management	0,8	2	1,6	0,8	2	1,6
Procurement management	0,4	3	1,2	0,4	3	1,2
Communication	0,6	3	1,8	0,6	3	1,8
<b>Summarization</b>	x	x	<b>19,7</b>	x	x	<b>20,5</b>

Source: author's calculations

As follows from the figure 10, PMI standardization is better applicable and more suitable for the research products. It might be given by the fact that products or outcomes of research and innovation process are more complex and require special knowledge to be produced therefore process approach seems to be more effective.

**Figure 11: The applicability of IPMA and PMI standard for different combinations**

Enterprises	Type of product	Standard	
		IPMA	PMI
<b>MIKRO</b>	Consumer product	35,3	29,6
	Business and industry product	35,2	34
	Capital Items	35,7	34,5
	Suppliers and Services	36	32,9
	Research and Innovation	36,6	34,1
<b>SMALL</b>	Consumer product	34,4	31,8
	Business and industry product	34,3	36,2
	Capital Items	34,8	36,7
	Suppliers and Services	35,1	35,1
	Research and Innovation	35,7	36,3
<b>MEDIUM</b>	Consumer product	36,6	36,6
	Business and industry product	36,5	41
	Capital Items	37	41,5
	Suppliers and Services	37,3	39,9
	Research and Innovation	37,9	41,1

**Source:** author's calculations

The figure 11 shows the most suitable etalon for various combinations. There are picked out the results most suitable for given combination in the red boxes. Generally it can be said that IPMA standardization is more suitable and better applicable for the companies with smaller number of employees. As the number of employees arises, PMI etalon starts to play more important role. According to the results it is likely better to focus on the process approach when the number of people in the project involved arises. From the results we can also see, that PMI etalon's importance arise the more demanding product is produced within the project. In other words less demanding and complex product is better to manage on the basis of competence approach and to invest money into IPMA certification. On the contrary when the product is complex as such it is better to invest into PMI certification and project management knowledge according to this standard based on process approach.

As follows from the figure 11 there are two cases when the choice of standardization does not matter. It is in the cases when small-sized enterprise produces suppliers or services and when medium-sized enterprise produce consumer product. Both are cases when the company generates not demanding or less complex product. The clue for the choice can be found in the size of company. Less employees company employs IPMA standardization suits better and on the contrary more employees company employs PMI standardization is better to use.

## Conclusion

When we are looking for the right answer for the questions - Which project management standard to choose for given business? or What particularities of the standards are useful for various branches? - we have to well understand the project management practice and conception of given standard. Time to study anything is very expensive commodity and for the possibilities of SME it is out of their reality. This paper aims to provide SMEs with information about standards most suitable for their business. If they have to spend not small amount of money for the certification they should know which one to choose for their business. It is not easy answer and the results of this analysis are not dogma. Of course in the business practice project managers will be always looking for balance between people skills and process skills but this paper can help them what to focus on in their daily reality.

Generally concluded when the enterprise manages projects with smaller number of people or not demanding or less complex product it is more effective to spend money for IPMA certification. And when the enterprise manages projects with higher number of people or demanding products with complex process or special knowledge it will be more effective to spend money for PMI certification.

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# Private label: the chance how to increase the consumer's interest in a proper retail chain<sup>1</sup>

Ingrida KOŠIČIAROVÁ<sup>2</sup>

Ľudmila NAGYOVÁ

## Abstract

The strategy of foreign, but also of domestic companies is to reach all groups of customers – to satisfy those customers, who are critical for low costs, but also those who prefer when buying high quality goods. All designated requirements have to be satisfied by private label products, whose share in Europe, particularly in Slovakia, is constantly increasing. Private label brands have established their market in the United States and Europe in the past few decades. Consumers tended to perceive private label brands as a substitute or option to the national brands because of their white – black packs, location somewhere on the bottom shelves and low price. However, over the time, there have been several significant changes, which have made private labels acceptable alternatives for the purchase. Development of private labels is now a global phenomenon, which brings both – advantages as well as disadvantages. The most apparent expansion of private labels, for the year 2013, was noticed in Switzerland with 37.7 %, unchanged in USA and the lowest one in China (0.4 %). The aim of the present paper was to point out the basic trends in development and consumption of private label products in the USA, Europe and Slovak republic and to determine Slovak consumer's preference of private label products. As research methods, there have been used the methods of survey and structured questionnaire consisting of 11 questions. The total number of respondents was 1.380 randomly selected respondents buying in international retail chains Tesco Stores Slovakia, Billa, Lidl, Kaufland and domestic retail chains COOP Jednota Slovensko and CBA Slovakia (that means 230 respondents per one retail chain). For a deeper analysis of the obtained results, there have been set out assumptions, which have been tested with the use of Pearson's chi-square test, Fisher's exact test, Mann-Whitney U-Test and Cramer's contingency coefficient. The results of the present paper show, despite the fact, that the market share of private labels was in the USA in the year 2013 at the level of 18 % and in the Europe at the level over 50 % and that the Slovak consumer's consumption and preference of private label products are on a really high level (45 % of respondents said that they are buying private label products and 27.46 % of respondents said that they prefer private label products before products of traditional brands), there are still some possibilities how to achieve more satisfactory results at the market of private labels.

## Key words:

Private label, Development, Consumption, Preference, Retail chain.

## Introduction

Private labels, sometimes also called as retail brands, store brands, national brands or own brands, are nowadays considered to be a global phenomenon, which is widespread all over the world and which history has started in the year 1880, when the brand of The Great Atlantic

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and Pacific Team Company (A & P) has marketed its own brand of baking powder. Unfortunately, the very beginnings of the development of private labels were not easy. Since their beginning, they have been considered to be just a "poorer brother" of branded products and have achieved only very low marketability of shares (Lincoln and Thomassen, 2008). The reason of their failure was that they were just replicas, which have imitated the leading brands not just in the packaging, but also in the colours and used font types (Kumar and Steenkamp, 2007). According to Lupton et al. (2010), private labels have established their market in the United States and Europe only in the past few decades, when consumers tended to perceive them as a substitute or option to the national brands because of their white – black packs, location somewhere on the bottom shelves and a lower price. The history of private labels can be in general divided into three main periods:

1. The period of price competition in the 70th years, which is also named as the era of generic brands, and for which were typical increase of competition and emergence of commodity products with a pricing fighters, which's aim was the increase of sales and market shares and increase of customers' price sensibility.
2. The period of competitive differentiation in 80th years associated with the era of own and exclusive brands, as well as with the era of imitation of branded products in view, quality, packaging (phase "me too").
3. The period of overall corporate image-building in the 90th years, when to the fore front are becoming own brands or own labels and when to the competitive market of private labels entered also the British market and has been misled special type of organic product lines, various health-promoting products (healthfoods) and others ([www.gov.mb.ca](http://www.gov.mb.ca), 2010; Môtiková, 2000).

The basic reasons, why the private labels have developed and become so extended can be simply explained as (Paine, 2010):

1. The shift of power from national brand marketers to national retailers – previous to the days of modern distribution capabilities and multi-market promotional capabilities, national brand marketers had the edge and the muscle to divide and capture retailers who were not able to mass large amounts of purchasing power to demand lower prices. In the United States, even leading retail chains such as Kroger and Safeway were mostly unable to mount successful corporate purchasing efforts due to their lack of national presence and their local, ground-up organization. In the United States, Walmart (following the Sears model) has forever changed the landscape by leveraging massive buying power through a single point of purchasing. The same phenomenon occurred earlier in Europe when Carrefour has opened SuperCenters in France and Migros in Switzerland, leading the drive for national, rather than local, dominance.
2. The ready availability of high quality, low priced private label production capacity – most of the early private label sales did not come at the expense of nationally branded, highly marketed products. Private labels fed on regional or under promoted price brands. As "own brands" increasingly forced upon these businesses, company owners quickly offered up their manufacturing capacity for private label products (such as Royal Crown Cola switching its capacity to President's Choice). Once retailers found they could fetch the placement of third, fourth and fifth brands, they became more aggressive about seeking for more of these opportunities. As global logistics came to the fore, this added no expensive and high quality capacity for everything from food to automobiles.
3. The historical perspective of key retailers that a strong "house brand" that consumer could only purchase at their store would drive loyalty (i.e., the aforementioned Sears and Tesco) – any of the retailers want to maximize customer loyalty (share of retail visits) and revenue (share of wallet); brands that can be purchased exclusively at their stores can accomplish both those objectives, many times in tandem with enhanced profitability. Retailers have developed and marketed their "own" brands or "private labels" as the ultimate guarantee of obtaining customer loyalty in a highly competitive market, resulting in more trips and an increased share of wallet.

As it is written by Štensová et al. (2006), private labels have arose as an attempt to replace the tight relationship which was in the previous period between the customer and the seller. The main reasons for their implementation are as follows:

- unification of products from a large number of small producers,
- simplify the customer's orientation among a large number of products from unknown manufacturers,
- support for low prices,
- ensure the differentiation from other retailers,
- deepen the loyalty to this product and also retailers.

### **Basic forms of private labels and strategic approaches to their communication**

Because of the need of minimization of problems stemming from misunderstanding of the question of private label brands, were different signs and symbols controlled by retailers commonly named as private labels and divided into four basic groups (Pradhan 2010; Kumar and Steenkamp 2007; Štensová et al. 2006; Hesková 2006; Nagyová 2000):

1. Generic private labels, which have started in the United States and Europe as cheap and inferior products with lower quality and which historically did not carry the name of the store, but the name of the product, such as 'milk' or 'butter', in plain black script on a white plain background. These cheap, shoddy products, did offer lower income and price sensitive customers a purchase option, and as result enabled the retailer to expand its customer base.
2. Copycat store brands, which carry the name of the proper retailer and tend to have packaging and price points very close to the products, which they compete with. Retailers tend to target branded products, which are already successful then produce a copycat, which has similar ingredients, packaging and pricing. Copycat retailers can thereby cash in on the success of the branded product without having to incur the costs associated with developing the product and researching the market.
3. Premium store brand – historically the term premium in premium private labels seems to have referred mainly to the contrast with the copycat brand rather than with leading manufacturer brands. The premium store brands are said to be superior in price and quality to the traditional brands. The latest trend is to establish high quality products with distinctive packaging, presented as a whole new product line by the retailer, targeted at competing with the top brands in the range. In general we can distinguish between two types of premium store brands:
  - a. premium private label, which is exclusive, higher in price, and superior in quality to competing brands, and
  - b. premium-lite store brand, which is promoted as being equal or better in quality to the competing brands, while being cheaper.

While premium private labels are their customers still just looking for, premium-lite store brands has in recent years become very popular.

4. Value innovators – retailers, which are following this approach have to focus on cutting down costs and processes to simplify the production and marketing of product ranges, so that a good quality product could be offered at very low prices. This approach greatly differs from the generic, copycat and premium label approaches. There are a number of key principles, which must be adhered to become successful:
  - a. limited number of products,
  - b. low costs of production and marketing,
  - c. good quality products at low prices.

Retailers promote private label products strategically in response to national brand pricing promotions to protect private label market share during national brand promotions. However, the extent of the retailer response varies widely across supermarket departments, which mostly depends on the chosen communication strategy of a private label. Based on the results of Coriolis research, conducted in 2002, we can distinguish between three strategic approaches to the communication of private labels:

1. Strategy of Quasi brands, when it comes to the use of their own brand names, which are not similar to the name of the store in which they are sold. Such labelling is appropriate only in a limited range, in order to create the illusion of a large selection. The advantage of this strategy is that it creates the impression of a large selection of products and a wide range, when a defect in a product is not directly linked with the store. On the other hand, there are some drawbacks – customers do not associate the product with the chain, which do not strengthen their loyalty to the given trade; for that, that these brands could be sold, they must be the cheapest from products offered in this category; this strategy is used only if the own brand make up 18 – 20 % of the total number of sold products.
2. Strategy of store brand, where all brand names match to the name or retail chain. This strategy is especially suitable in the case of high penetration of private label in retail. As the advantage of the use of this kind of strategy can be considered the fact, that products are visually, in the eyes of consumers, associated with a chain, what makes them easily identifiable; it helps to increase sales and revenues; it makes it possible to set a higher price than in the case of quasi-brands. On the other hand, as the disadvantage can be considered the fact that low quality product can be connected with the store; reduction of the perception of wide choice of products and large amounts of time, resources and investment to make it successful.
3. Strategy of group brand, in which all own brands are known under a single name, but it is not the name of the retail in which they are sold. Group brand strategy is particularly suitable for chains which have several types of stores with different names. For the benefits of group brand strategy can be considered the fact that it can be used for multiple transactions; creates group identity marks, and may arouse consumer association with the chain (depending on indication). On the other hand, as a disadvantage can be considered the fact, that the product is not directly linked to trade where it is marketed, as well as that it requires high investments in research, development, management and advertising.

## **Data and Methods**

The aim of the research was to point out the basic trends in development and consumption of private label products in the USA, Europe and Slovak republic and to determine Slovak consumer's preference of private label products. In order to achieve the aim, the research was conducted in selected international retail chains – Tesco Stores Slovakia, Billa, Lidl, Kaufland and in selected domestic retail chains – COOP Jednota Slovensko and CBA Slovakia. To obtain the necessary primary data was constructed a structured questionnaire consisting of 11 questions formulated as closed, so that respondents (total number of respondents was 1.380 randomly selected respondents, Table 1) had to choose one, alternatively several options. The questionnaire was evaluated by using contingency tables, which were prepared by Excel, under which they were subsequently developed graphic representations.

**Tab.1 Characteristics of respondents**

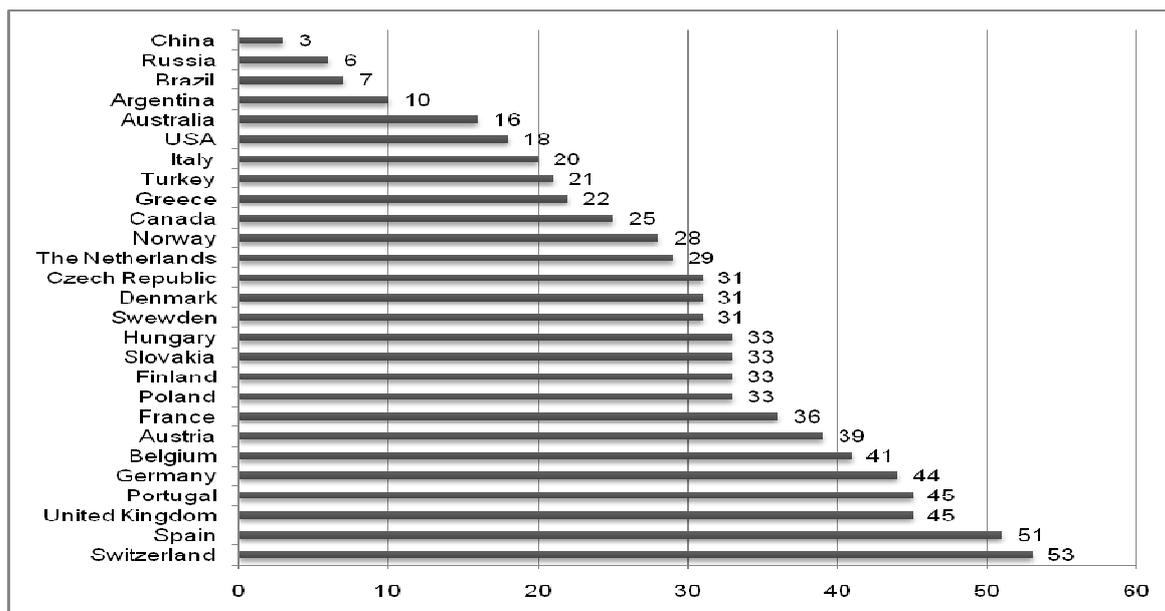
<b>Category of respondents</b>	<b>Number</b>	<b>Place of respondent's residence</b>	<b>Number</b>
Male	666	City	698
Female	714	Village	682
<b>Age structure of respondents</b>	<b>Number</b>	<b>Educational structure of respondents</b>	<b>Number</b>
up to 25 years	246	Primary education	162
26 – 35 years	386	Secondary education without A level	
36 – 45 years	290	Secondary education	268
46 – 55 years	234	Higher education	550
56 and more years	224		400
<b>Economic activity of respondents</b>	<b>Number</b>	<b>Net income of the family</b>	<b>Number</b>
Student	297	up to 500 €	220
On maternity leave	103		334
Unemployed	236	501 – 800 €	384
Employed	592	801 – 1000 €	365
Pensioner	152	1001 – 1500 €	77
		1501 € and more	

Source: Results of the research

For deeper analysis of the obtained results, there were set out assumptions about the correlation between the net income of the family and frequency of purchase in the chain, between the preference of private label products over products of traditional brands and respondent's economic activity, between the preference of private label products over products of traditional brands and respondent's gender, as well as the correlation between the ability of respondents to appoint private labels of a proper retail chain and respondent's gender. To test the dependence were used Pearson's chi-square test, Fisher's exact test, Mann-Whitney U-Test and Cramer's contingency coefficient.

## **Results and discussion**

As it was mentioned by Adamson (2007), one of the most successful strategies of retailers is to sale goods under the retail brand, better said under the private label of a proper retail chain. The purpose of this kind of sale is to attract new customers, which will later become loyal customers, and to build the image of the corresponding retail chain. Private labels, as it was mentioned before, are nowadays considered to be a global phenomenon, which is widespread all over the world. Unfortunately the development of private labels is differing from country to country and from part of the world to the other part. While the most apparent expansion of private labels, for the year 2013, was noticed in Switzerland with 37.7 % and unchanged in the USA with 17.2 %, the lowest one was noticed in China with 0.4 % (blog.euromonitor.com, 2014; IRi Growth delivered, 2013). The reason of these large differences can be very simple – not all the countries are interested in private labels, or they still do not have too many information about them (according to the results of Global Consumer Trends Survey from 2013, private labels are still a little known concept in Russia where as many as 23 % of respondents had never bought private label products).



**Fig.1 The market share of private labels worldwide in 2013, by selected countries**

Source: authors own processing off based on available information

As it can be seen from the Figure 1, the highest level of private labels market share is in European countries, where exactly three countries (Sweden, Finland and Czech Republic) have in the year 2013 crossed the line of 30 % of market share for the first time – while in the year 2011 there were only 10 European countries, which have crossed this line, in the year 2012 their number has increased to 12 (<http://www.plmainternational.com>, 2014) and in the year 2013 to 15 and there is a high possibility that their number will still increase. According to Hale (2014), in the case of United States, it must be mentioned that despite the fact, that the private labels are a significant player in nowadays United States retail landscape, the rising consumer perception of quality and new line hitting stores daily have caused that the private label's growth has not yet reached the potential which was expected (sales in the segment of private labels have increased only for one share point between the years 2009 and 2013). However, it must be also mentioned, that some retailers have despite this fact successfully tapped into private labels potential and their aim is to maintain and if it will be possible, to increase this development.

According to the issue of private labels consumption, perception, quality etc. it must be said, that despite the fact, that in United states have been done many of different researches dealing with mentioned topics, which's results have declared that the mostly bought private label products in the year 2013 were milk and dairy products (32 %), pasta, kasha, rice, flour (30 %), tea and coffee (25 %), meat, cold meat, fish (19 %), sweets (15 %), bread (9 %), spices, sauces and instant soups (7 %), crisps, crackers and muesli (7 %), fruit and vegetables (6 %) and vegetable and fruit preserves (4 %) (<http://www.impactwire.com>, 2014) and that private label products are by American consumers perceived as a good alternative to name brands (71 % of respondents in the year 2011) and that their quality is in many cases as good as name brands (63 % of respondents in the year 2011) ([www.statista.com](http://www.statista.com), 2014), the situation in the Europe is in this field, in the field of private labels, still much more better – up to the results of research conducted by IRi in 2013, it can be noticed that the mostly bought private label categories were milk and dairy products (61 %), fresh eggs (57 %), cups & plates (56 %), trash bags (54 %), natural cheese (49 %), vitamins (48 %), bottles water (38 %), bread & rolls (36 %), frozen seafood (33 %) and toilet tissues (23 %); as well as that the private label share is highest in the grocery channel (21.9 % of unit sales and 18.2 % of dollar sales), which also enjoys the strongest level of private label penetration, by far, at 96.9 % ([www.preparedfoods.com](http://www.preparedfoods.com), 2014). The basic trends in the development of private labels in

Europe are captured in the Table 2 from which can be seen not just the basic trends, but also the recommendations given by the IRI.

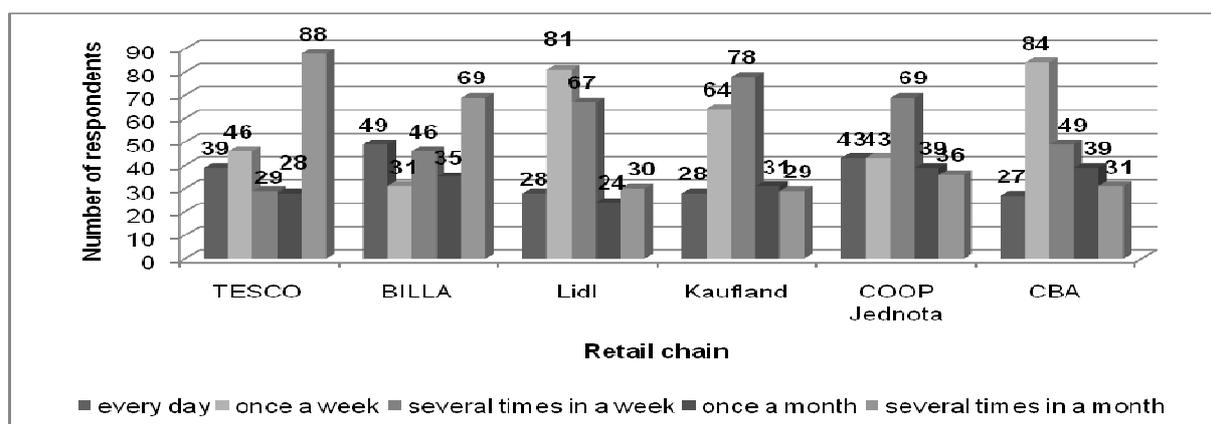
**Tab. 2 Private labels in Europe – current trends and necessary actions**

<b>Trends</b>	<b>Actions</b>
Private labels have increased in all countries in Europe (private label value share is 36.7 % and unit share is 47.1 %.). The only exception was France.	Producers must focus on joint business planning with their retail partners and convince them that hooding their brands benefits everyone, including customers.
Private label sales are increasing across most markets and well performing in countries where overall sales are in decline because of economic conditions.	Producers must build strong brand loyalty with a direct access to their consumers from what retailers will also benefit.
Private label share of food is up across Europe and the share of non-food varies considerably across the continent.	Food producers must review brand propositions to appeal more to shoppers in the face of continues pressure on shoppers – variation by country and category illustrates how crucial is that producers and retailers are working together with predictive analysis.
Private labels were priced on average 29.9 % lower than national brands.	It is needed to set goals and gain appropriate analytical solutions to stimulate price and promotion tactics to improve margins, revenue, category and competitive advantage.
The reduction of the price gap between the national brands and private labels means that private label shoppers are getting a worse deal than they used to, as well national brand shoppers can still save money if they switch.	The price gap will more likely be maintained or widened where a category is shrinking due to recessionary pressure.
Shoppers are buying more private labels based on quality and not just price.	Brands need a clear view of that, what impacts each customer's trip mission for each segment.
Retailers and producers across Europe and in the United States are taking a more analytical approach to range assortment.	The national brand must demonstrate that it not just sells well and generates a healthy margin for the store, but that it entices shoppers through the door in the first place.
Private label sales trends are out-performing national brands in most countries of the world.	Producers must assess the category competitive risk from private label growth and development and adjust their portfolio and retail approach accordingly.

Source: IRI Growth delivered. 2013. *Private Label: Balancing Quality and Value*. Available online: [http://www.iriworldwide.eu/Portals/0/articlepdfs/PrivateLabel\\_2013\\_Full%20Report.pdf](http://www.iriworldwide.eu/Portals/0/articlepdfs/PrivateLabel_2013_Full%20Report.pdf)

For a deeper analysis of the basic trends in development and consumption of private label products in the Slovak republic, there was also conducted a research, which aim was to determine Slovak consumer's preference of private label products. The total number of respondents taking part in the mentioned research was 1.380 randomly selected respondents buying in international retail chains – Tesco Stores Slovakia (49.13 % male, 50.87 % female), Billa (47.39 % male, 52.61 % female), Lidl (46.52 % male, 53.48 % female), Kaufland (47.83 % male, 52.17 % female) and in domestic retail chains – COOP Jednota Slovensko (48.70 % male, 51.30 % female) and CBA Slovakia (50 % male, 50 % female). In terms of the age and education structure of respondents, as well as of their economic activity and net monthly family income, main groups were represented by respondents within the age of 26 to 35 years (27.97 % of respondents), respondents with upper secondary education (39.86 % of respondents),

employed respondents (42.90 % of respondents) and respondents with net family income within 801 and 1000 €/month (27.83 % of respondents).



**Fig. 2 Frequency of purchase (in people)**

Source: Results of the research

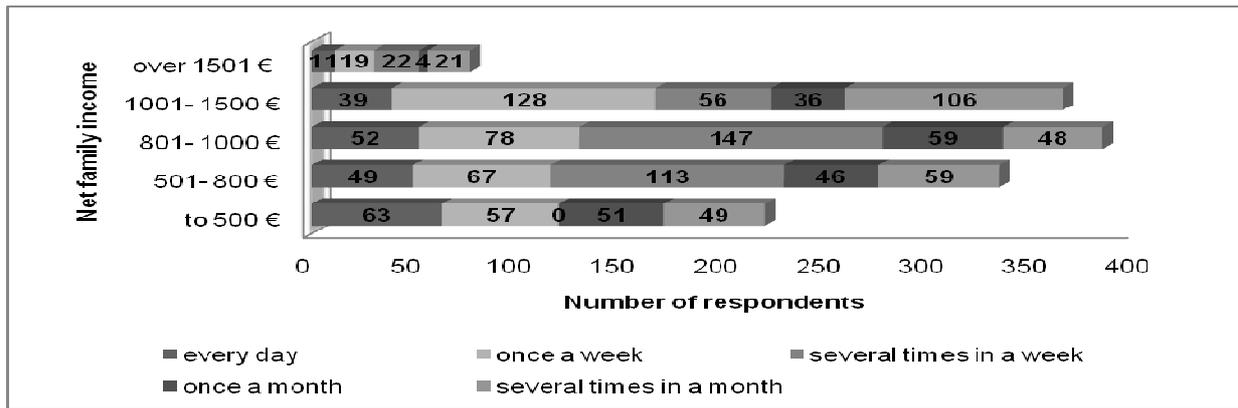
As it can be seen from the Figure 2, most of respondents buying in the retail chains Tesco Stores Slovakia and Billa are buying mostly for several times in a month (38.26 % of respondents and 30.00 % of respondents), in retail chains Kaufland and COOP Jednota for several times in a week (33.91 % of respondents, 30.00 % of respondents) and in retail chains Lidl and CBA Slovakia for once a week (35.22 % of respondents, 33.52 % of respondents). In response to the evaluation of the question regarding to the frequency of purchase was subsequently verified the dependence between the choosen answer and the net monthly family income of the respondent, which has been evaluated with the use of two statistical tests, exactly the Pearson's chi-square test (Table 3) and Cramer's contingency coefficient. Based on the results of both mentioned tests – in the case of Pearson's chi-square test the tested criterion was higher as the critical one ( $TC = 211.371 > CV = 26.296$ ) and in the case of Cramer's contingency coefficient, the result was equal to 0.042441, what can be interpreted as a weak, but statistically significant relationship between tested variables – it can be stated, that the  $H_0$  hypothesis must be on the level of significance 5 % rejected and adopted must be its alternative  $H_1$  hypothesis talking about the dependence between tested variables. The relationship between the frequency of purchase and net family income of the respondent is also reflected in the Figure 3, from which can be seen, that respondents who's net family income is lower than 500 € are buying mostly just for one time in a month, respondents with net family income between 500 and 800 € and between 801 and 1000 € are buying mostly for several times in a week and respondents with net family income between 1001 and 1500 € are buying mostly for one time in a week.

**Tab. 3 The relationship between the respondent's net family income and frequency of the purchase in retail chains**

Frequency of the purchase	Net family income (in €)					Together
	up to 500 €	501 – 800 €	801 – 1000 €	1001 – 1500 €	1501 € and more	
Every day	63	49	52	39	11	214
Once a week	57	67	78	128	19	349
Several times in a week	0	113	147	56	22	338
Once a month	51	46	59	36	4	196
Several times in a month	49	59	48	106	21	283
Together	220	334	384	365	77	1.380

$TC = 211.371 > CV = 26.296$

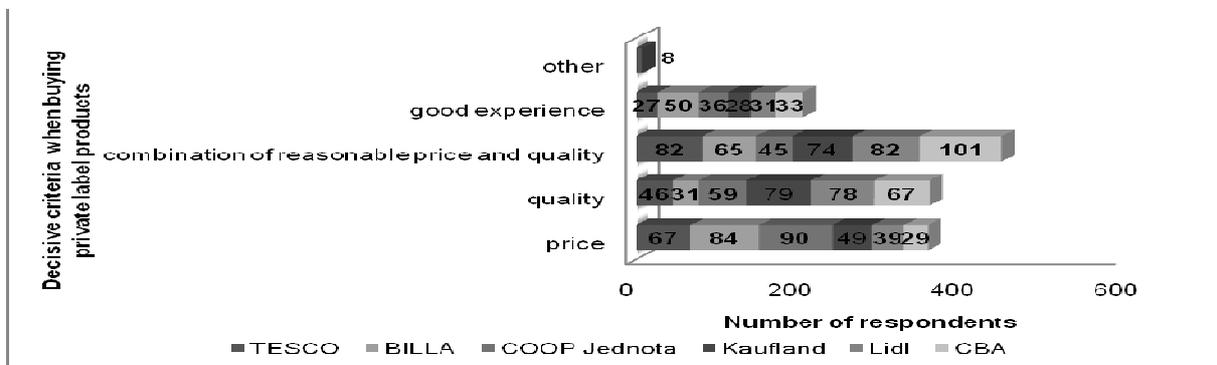
Source: Results of the research



**Fig. 3 The relationship between the respondent's net family income and frequency of the purchase in retail chains (in people)**

Source: Results of the research

Because of the need to realise the knowledge and preference of products bought under private labels, in the questionnaire, there were formulated questions relating to the knowledge of private labels sold by particular retail chain, preference of products bought under the private label, decisive criteria of their purchase, factors discouraging from the purchase of private labels, as well as questions relating to respondents perception of the quality of these products. Based on the results of the research, it can be stated, that the knowledge of private labels is between Slovak consumers on a very high level (62.25 % of respondents could name private labels sold by particular retail chain), that the preference of private label products is pretty high (45.00 % of respondents purchase private label products regularly and 30.00 % of respondents explicitly prefer private label products before traditional/national label products), the decisive criteria in the process of buying products under the private label is the combination of reasonable price and quality (32.54 % of respondents) and that the quality of private label products is rather comparable to the quality of traditional label products, than not (43.48 % of respondents). According to the question of respondent's knowledge of private labels sold by particular retail chain, there has occurred also the question of relationship between the knowledge of proper retail chain's private labels and the gender of the respondent. The mentioned relationship was evaluated with the use of Pearson's chi-square test (Table 4), Cramer's contingency coefficient and Fisher's exact test. Based on the results of all of the mentioned tests it must be stated, that between the tested variables, there is a weak, but statistically still significant relationship (the result of Cramer's contingency coefficient was equal to 0.115306, what can be interpreted as a weak, but statistically significant relationship between tested variables; as well as the result of Fisher's exact test, which was equal to 0 and which is interpreted also as statistically significant relationship), which declares us, that women know the private labels better as men.



**Fig. 4 Decisive criteria when buying products under the private label (in people)**

Source: Results of the research

**Tab. 4 The relationship between the knowledge of proper retail chain's private labels and the gender of the respondent**

Knowledge of the proper retail chain's private labels	The gender of the respondent		Together
	Female	Male	
The respondent could name the proper retail chain's private labels	524	335	859
The respondent could not name the proper retail chain's private labels	190	331	521
Together	714	666	1.380
TC = 78.167 > CV = 3.841			

Source: Results of the research

In connection with the issue of preference of private label products before traditional/national label products, there has been also evaluated the relationship between the preference of private label products and the economic activity of respondents, as well as the preference for private label products and the gender of the respondent. For the evaluation of the dependence between the mentioned variables, there have been used the methods of Pearson's chi-square test (Table 5, Table 6), Cramer's contingency coefficient and in the case of the secondly mentioned relationship also the Mann-Whitney U-Test. Despite the fact, that based on the results of Pearson's chi-square test, as well as on the results of Cramer's contingency coefficient, the null hypothesis, for both investigated relationships, must be on the level of significance 5 % rejected and it can be stated, that between the preference of private label products and the economic activity of respondents, as well as between the preference of private label products and the gender of the respondent, is a weak, but still statistically significant relationship (the results of Cramer's contingency coefficient were equal to 0.039762 and to 0.066848), in case of the secondly mentioned relationship – relationship between the preference for private label products and the gender of the respondent must be, based on the results of Mann-Whitney U-Test, also stated that this relationship is at  $p \leq 0.05$  not significant.

**Tab. 5 The relationship between the preference of private label products and the economic activity of respondents**

Preference of private label products	The economic activity of respondents					Together
	Student	On maternity leave	Unemployed	Employed	Pensioner	
Yes	78	21	59	49	17	224
Rather yes	100	44	63	127	45	379
I do not mind	52	20	47	197	33	349
Rather no	36	11	47	73	32	199
No	31	7	20	146	25	229
Together	297	103	236	592	152	1.380
TC = 162.825 > CV = 26.296						

Source: Results of the research

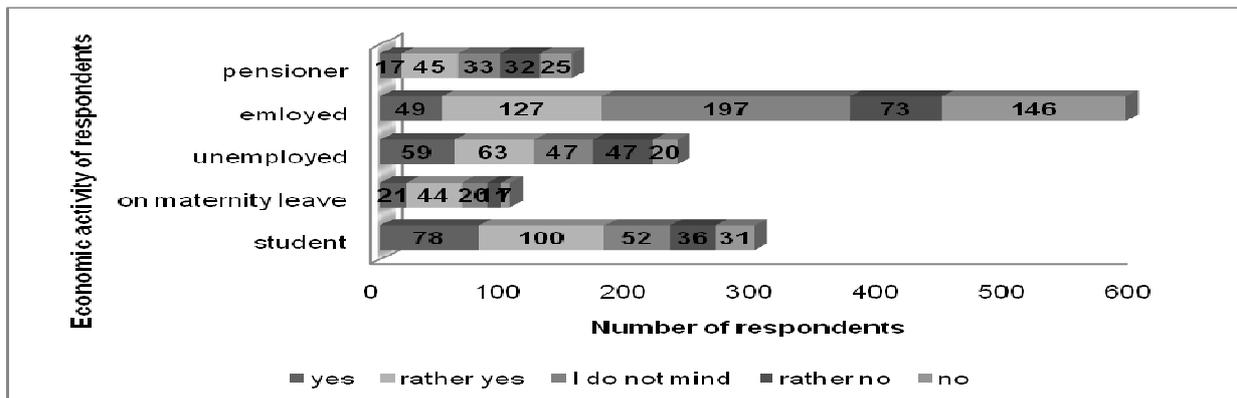
**Tab. 6 The relationship between the preference of private label products and the gender of respondents**

Preference of private label products	The gender of the respondent		
	Female	Male	Together
Yes	149	75	224
Rather yes	232	147	379
I do not mind	145	104	349
Rather no	91	108	199
No	97	132	229
Together	714	666	1.380

TC = 58.681 > CV = 9.488

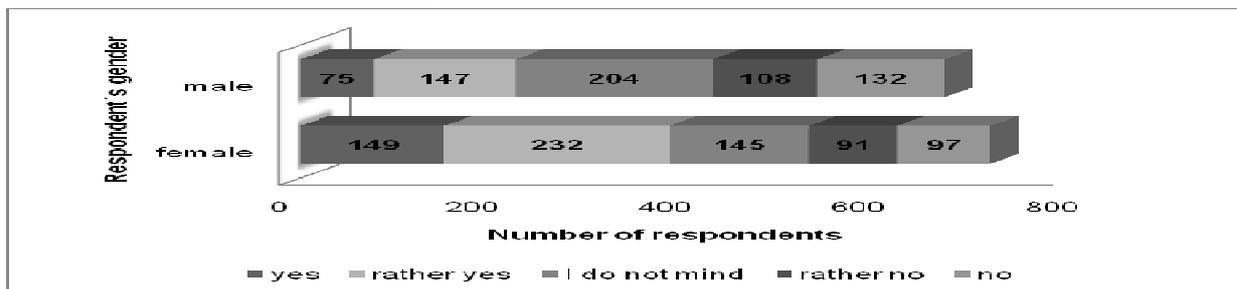
Source: Results of the research

As it can be seen from Figures 5 and 6, respondents from economic categories student, unemployed, retired and women prefer more private label products, which, according to their opinion, are in many cases cheaper and up to their quality comparable to traditional label products, respectively that employed respondents do not place such emphasis on that, which products do they buy. To the question, why is it so (why they do not place such emphasis on it), many of them replied, that private label products because of their lower price invoke in them the feeling of lower quality (27.03 % of respondents) and so they rather pay more for the better quality and buy traditional brands.



**Fig. 5 The relationship between the preference of private label products and the economic activity of respondents (in people)**

Source: Results of the research

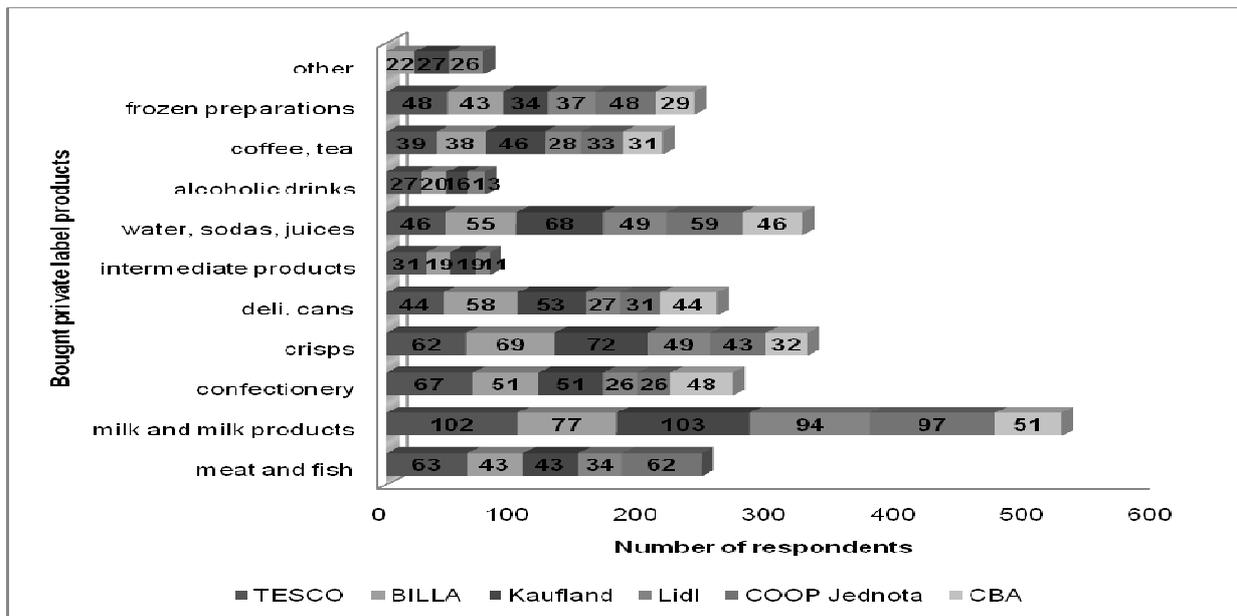


**Fig. 6 The relationship between the preference of private label products and the gender of respondents (in people)**

Source: Results of the research

The mostly bought private label products are shown on the Figure 7, from which it can be seen, that the three mostly bought private label products are milk and dairy products (19.92 % of respondents), crisps (12.43 % of respondents) and water, sodas and juices (12.28 % of respondents), what to some extent confirms the results of the research conducted by IRI in 2013, up to which the mostly bought private label product categories are milk and dairy products (61 %), fresh eggs (57 %), cups & plates (56 %), trash bags (54 %), natural cheese

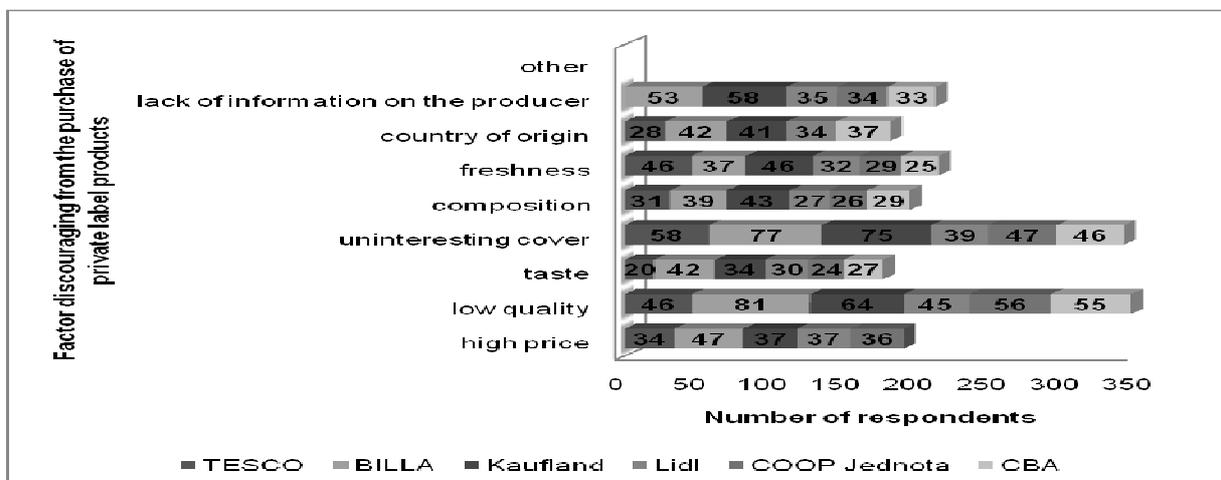
(49 %), vitamins (48 %), bottles water (38 %), bread & rolls (36 %), frozen seafood (33 %) and toilet tissues (23 %) ([www.preparedfoods.com](http://www.preparedfoods.com), 2014).



**Fig. 7 Mostly bought private label products (in people)**

Source: Results of the research

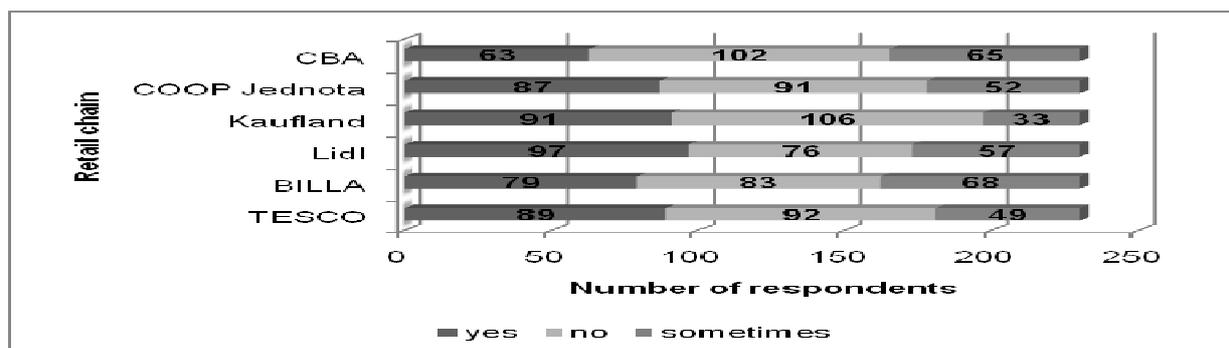
Because of the need to realize not just the decisive criteria of Slovak consumers purchase, but also the factors which are discouraging them from their purchase, in the questionnaire, there was also formulated a question dealing with the mentioned topic. From the results of the realised research is clear, that the most important factors which are discouraging Slovak respondents from the purchase of private label products are – their low quality (almost 19 % of respondents), their uninteresting cover (almost 19 % of respondents) and the lack of information about the producer (almost 12 % of respondents). From the deeper analysis of this question is also clear, that with the quality of products are mostly dissatisfied those respondents that are buying mostly in Billa, Kaufland, Lidl, COOP Jednota Slovensko and CBA Slovakia retail chains and with the uninteresting cover of these products are mostly dissatisfied those respondents that are buying mostly in retail chain Tesco Sores Slovakia.



**Fig. 8 Factors discouraging from the purchase of products sold under the private label (in people)**

Source: Results of the research

Other two questions formulated in the questionnaire were focusing on that, which kind of impression the private labels of a proper retail chain invokes in Slovak consumers as well on that, if they are buying private label products only because of good discounts or competitive packaging. From the evaluation of the mentioned questions is clear, that for most of respondents, exactly 42.10 % of respondents, the private label of a proper retail chain invokes the impression of adequate price and adequate quality and that in the case of buying private label products only because of good discounts or competitive packaging, almost 40 % of respondents do not buy them just because of these two reasons that and less than 24 % of respondents are buying private label products exactly because of good discounts or competitive packaging (figure 9).



**Fig. 9 Purchasing of private label products just because of good discounts or competitive packaging (in people)**

Source: Results of the research

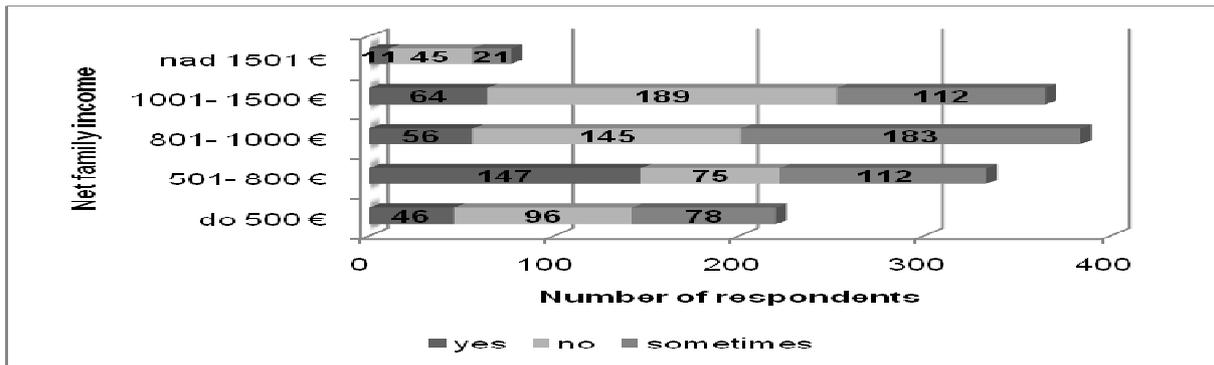
Because of the need of finding out, if there is a relation between the answer to the question of buying private label products only because of good discounts or competitive packaging and the respondent's net family income, in the research, there was tested also the dependence between the mentioned variables up to which evaluation it can be stated, that there is a weak but statistically still significant relationship between the answer to the question of buying private label products only because of good discounts or competitive packaging and the respondent's net family income (the result of Pearson's chi-square test can be seen in the Table 7 and the result of Cramer's contingency coefficient was equal to 0.043963). The tested relationship is illustrated at the Figure 10 from which it can be seen, that respondents with net family income between 501 and 800 € are buying private label products mostly because of good discounts or competitive packaging, respondents with net family income higher than 1.000 € do not do so, or they are doing it only from time to time.

**Tab. 7 The relationship between the answer to the question of buying private label products only because of good discounts or competitive packaging and respondent's net family income**

Purchasing of private label products just because of good discounts or competitive packaging	Net family income (in €)					Together
	up to 500 €	501 – 800 €	801 – 1000 €	1001 – 1500 €	1501 € and more	
Yes	46	147	56	64	11	324
No	96	75	145	189	45	550
Sometimes	78	112	183	112	21	506
Together	220	334	384	365	77	1.380

$$TC = 211.371 > CV = 26.296$$

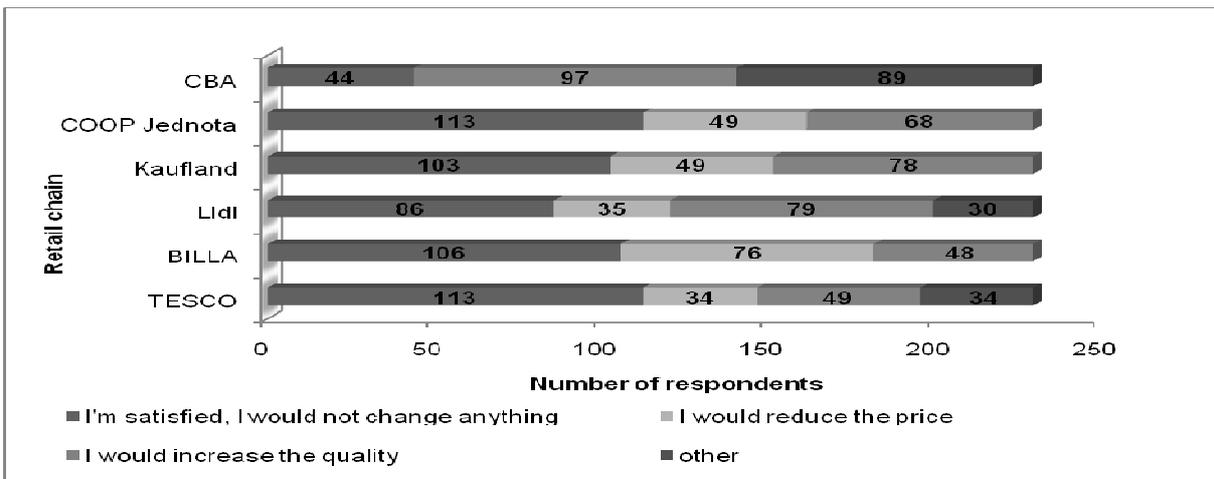
Source: Results of the research



**Fig. 10 The relationship between the answer to the question of buying private label products only because of good discounts or competitive packaging and respondent's net family income (in people)**

Source: Results of the research

The last two questions, which have been formulated in the questionnaire, were concerned on that, what should Slovak respondents change on private label products sold by a particular retail chain and if they would recommend these private label products to other customers. From the evaluation of both mentioned questions is obvious, that Slovak respondents are in general satisfied with private label products (40.94 % of respondents) and they should recommend them to others (30.87 % of respondents will recommend them definitely and 33.84 % of respondents will probably recommend them). The only exemptions were the respondents buying mostly in CBA Slovakia which want to change the quality, the cover and the freshness of these products (42.17 and 38.7 % of respondents).



**Fig. 11 Satisfaction with the private label products (in people)**

Source: Results of the research

## Conclusions

Based on the results of our research it can be stated, that the situation in the field of private labels, up to the fact that their history has started in the Europe much later than in the United States is better and there is a high probability that this situation will maintain. This statement can be confirmed by the fact, that while the market share of private labels has in the United States in the year 2013 reached the level of 18 %, 15 of European countries have in the same year crossed the line of 30 % of their market share, as well as by the fact, that while in the United States the mostly bought private label products in the year 2013 were milk and dairy products, at the level of 32 %, in the case of Europe it were also milk and dairy products, but their level was 61 %. From the results of questionnaire survey aimed at determining Slovak consumer's preference of private label products is clear, that the preference of private label

products is in the Slovak republic on a pretty high level, because 45 % of respondents have declared, that they are purchasing private label products regularly and 30 % of them have declared, that they explicitly prefer private label products before traditional/national label products, because they think that their quality is rather comparable to the quality of traditional label products, than not (almost 44 % of respondents) and because of the combination of reasonable price and quality (almost 33 % of respondents), which is for these products typical. Despite the fact, that these results are indeed gratifying, there are still some problems which could be eliminated as for example the consumer's perception of the private label's quality, which has to be improved by producers/ retailers, who can promote their products especially from this perspective, the uninteresting cover of these products, where there can be used more colours and more interesting ink to attract consumers, as well as the missing information about the producer, which could be shown on the package of private labels to let customers know, who is the proper producer of them, so that they could decide if they want to buy the same product for a higher price (when they buy traditional/ national brand products), or for the lower price (when they buy the same product, but under the private label of the proper retail chain).

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# Organic Farming in Slovakia: Twenty Years of Progress and Development

Jana KOZÁKOVÁ<sup>1</sup>

## Abstract

Organic farming as an alternative land management has many different definitions. In principle, it means the belief or philosophy of return to the nature and can be defined as a balanced agro-ecosystem which based on local and renewable resources. This system is using technology of plant cultivation and animal husbandry which minimize damage to the environment. It is also ensuring the production of quality and wholesome food and ultimately takes account of future generations. Austria is considered as a cradle of organic farming. The polymath, founder and anthroposophic Rudolf Steiner has created the spiritual and philosophical land management later called „bio-dynamic farming“ in 1924. In the forties (last century) this movement spread to France, Netherlands and USA. The system has expanded worldwide after extension of the idea of environmental protection in seventies. Later many countries began to apply organic principles in their legislative and IFOAM (International Federation of organic Agriculture Movements) was created in 1972.

In Slovakia organic farming has approx. 15 to 20 years younger history compared with the organic leader states (as Germany, Netherlands, Austria or Denmark). This lag was caused by the political arrangement of the country and the subsequent regime change in 1989. Development of organic farming was initiated in 1991 by the „Ministry of Agriculture and Food of the Slovak Republic“ following the trends abroad. Then the legislative basis „The Organic Farming Application Form for Slovak Republic“ was enacted. This based on the principles, policies and requirements formulated by the IFOAM. Later the first organic farmers organized themselves into society NATURAL ALIMENTARIA, which was accepted as a member of IFOAM in 1992. Whereas in that time the three-year conversion process was respected, the first harvest of organic production was certified in 1994. Unfortunately, the domestic processors have not shown a sufficient interest in organic products, which launched the orientation of Slovak organic producers to export.

This article provides an overview of the implementation of organic farming in Slovakia from its beginning in 1991 to present. An important part is devoted to the legislative rules and formal arrangement of governing bodies. The domestic law and standards are showed in following to the European Union legislation. In addition, attention is paid also to the national and EU development documents (Common Agriculture Policy, Plan of Rural Development in SR, The Action Plan of Organic Farming in Slovakia). In consequence of this we also shows the certification system of organic products in Slovakia and the need of Slovak producers to cooperation with foreign certification organisations. Attention is also paid to the system of product marking, organic logo using and control. This article also captures the development of basic organic indicators in Slovakia with special attention on reveals and government interventions. Research included the data of whole Slovak republic available from the official government publications (The Green Reports, the data of CCTIA and Naturalis SK, l.t.d.). The reporting period was chosen from 1991 to 2011, considering the data availability. As the first indicator we examine the organic agricultural land (including land in conversion), respectively the increasing of land use in organic farming from 14 718 ha in 1991 to 180 261 ha in 2011. Then we watch the share of organic agricultural land in % and achieving the border ratio fixed by European Commission. After we are paying attention to the number of organic producers in Slovakia which increase from 37 producers in 1991 to 458 in 2009. Very interesting is the average farm size calculation which shows „the extreme large“ farms in Slovakia (in 2001 it

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was more than 724 hectares per farm) and also the land use structure which shows more than 67 % proportion of permanent grasslands in 2011 (as a consequence of state subsidy policy).

### **Keywords:**

organic farming, organic land use, number of organic producers, share of organic land

### **Introduction**

Organic farming as a system of land management has a several definitions. The most suitable one presented Paška (2003): "Organic farming is the philosophy of return to the nature. It can be defined as a balanced agro-eco system of a permanent nature, which is based mainly on local and renewable resources." Organic farming as a sustainable agro-ecosystem which utilizing local and renewable sources define several authors: Ballonova (2000), Adamišín - Andrejovský - Huttmanová (2006). They further agree that "it is using technology of plant cultivation and animal husbandry which minimize environmental damage. Organic farmers are using intercropping, biological plant protection, varied crop rotation, mechanical weeds control and ultimately takes account of future generations ". Drímajová (2005) adds: "Organic farming is based on a functional approach to the use and land management assessed to the environmental fundamentals". Jánšký (2006) attached that: "the raw material for organic food is obtained from the organic farming system without the use of fertilizers, chemicals and chemical sprays. In consequence, an organic crop production must based on analyzes of environmental pollution". Organic farming in Slovakia (Lehocká - Klimeková, 2004) means a prospective management system with positive impact of the environmental, economic and social aspects of agri-business. It is creating the new market (market for organic products) and new jobs. And last but not least organic farming implementation is helping to the development of rural areas and the protection of all components of the environmental. Despite the good potential of organic farming in Slovakia, there are several weaknesses related to the insufficient implementation of legislative, institutional and economic limits.

Organic farming in Slovakia began to develop 15 to 20 years later compared with the developed Europe countries. This is connected with the fact that until 1989 intensive conventional farming was used exclusively (Vanková & Baláž, 2005). Slovak organic farming followed the European traditions and our organic crop production is currently one of the fastest growing segments of agriculture in Europe (Williams et al., 2011). It is evident from several studies, that the Slovak Republic has in terms of geography and soil quality a good potential for the development of organic farming (Kováč et al., 2008).

This paper provides an overview of the twenty years of implementation organic farming in Slovakia. It is based on the fundamental indicators as area under organic farming, the number of organic producers or the share of organic land. This development we shows in the consequences of politic and economic changes in the county. State forming this system from its beginning in 1991. This forming is connected mainly with the subsidies policy implemented according to the principles of Common Agricultural Policy. This systematic supports are used in every EU member state and they are caused changes also in the system of organic certification and logo using. Mentioned regulations made an organic farming system as we know it today. The long way of its creation in Slovakia is showed in this paper.

### **The beginning of the organic farming in Slovakia**

Organic farming in Slovakia has 15 to 20 years younger history compared with the developed European countries. This development was initiated by the Ministry of Agriculture and Food of Slovakia (today Ministry of Agriculture and Rural Development of the Slovak Republic) in the 1991. This process was builded on the experiences and trends in developed countries. As a basis of this initiation ministry comes with the first organic legislative document "Rules of organic farming valid for the territory of the Slovak Republic". This based on principles and requirements formulated by the IFOAM (International Federation on Organic Farming

Movements). In fact, in this time there were not organic products available on the market and no public knowledge according organic principles.

Government effort caused formation of the first organic farms in 1991. As we can see on the graph 2.. the system starts in Slovakia with 37 organic farming farmers. This individual entities gradually began to form themselves into society NATURAL ALIMENTARIA, which was accepted as a member of IFOAM in 1992. In this time they respected the three year conversion process. The first harvest of organic products was provided in 1994. The certificate from Ministry of Agriculture enabled them to label their products as "organic foodstuff". After placing the first organic products on the market, domestic processors have not shown a sufficient interest in their treatment. According this, only a very small part of this production was carried out in the domestic market. Next years Slovak organic producers focused mostly on export to Western Europe. In 1995, the ministry adopted „The Conception of Organic Farming in Slovakia“. This fundamental document determined the basic direction of organic farming until 2010 and adopted a series of measures for its implementation. Subsequently, in 1998 the „Act no. 224/1998 on Organic Farming“ undertaking the measures of the “White Document” in line with EU legislation which laid the foundations of organic farming in Slovakia as we know it today. There was a fundamental change occurred in the 2003, when the “Act no. 415/2002 on Organic Farming and Organic Food Production” establish the first certification organization from January 1, 2003. The one and only Slovak certification organization became the company NATURALIS SK, Ltd. – The Inspectors Association of Organic Agriculture (SK-01-BIO). This runs under the Central and Testing Institute in Agriculture (CTIA) supervision.

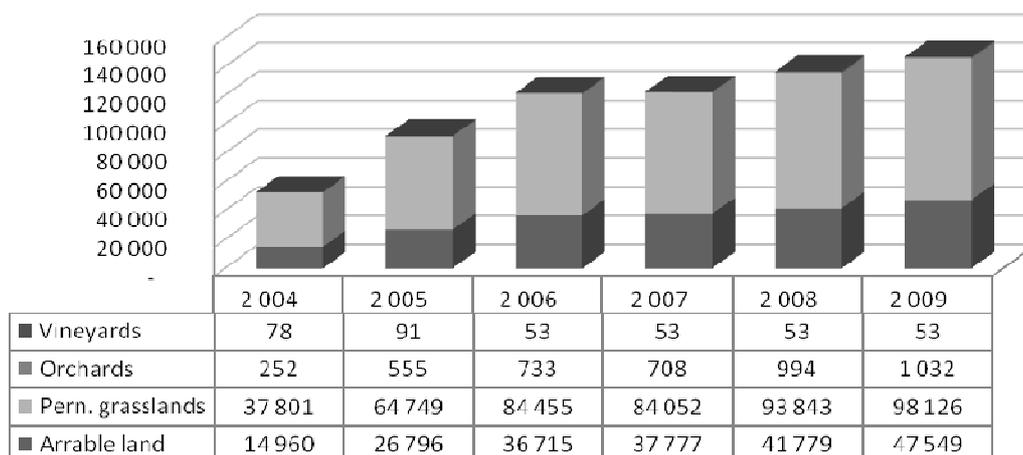
Although some of the first organic farmers has given up, nowadays there is a large interest of Slovak farmers in organic expansive. Organic farming in Slovakia is rising, even though it has a strong demands on organization, technology and legislative implementation. Compared with the conventional system. In 2010 there were 497 organic farmers in Slovakia. Unfortunately, there are no official informations about actual number of them. Certification body (NATURALIS SK, Ltd.) administrates an official register, but there are the lack information available to the public. The trend in the number of entities working in the organic farming system displays a graph 1. This captures the functioning of organic production in Slovakia since its launch in 1991.

As we can see, the development of organic farm has an exponential course. The value of the reliability equation is  $R^2 = 0.8819$ . In the 1991 system involved 37 companies and their number continues to grow year on year rule. Without on-year changes was observed only one period (1995 compared with 1994). The decrease in their number occurred just four times. There has been a slight decline since 2003. The maximum increase over the previous years was recorded in 2005 when compared to 2004. It has increased to 74 subjects from the original 131 subjects in 2004 to 205 subjects in 2005. This was caused by the ministry regulation which urged organic producers to initiate and extend their production. The goal of this subvences was to emulate the developed EU countries. In consequence of this support the organic farming in Slovakia began to be applied on almost 15 000 hectares of agricultural land. Participating producers was supported by Common Agriculture Policy, which implements EU followed by Slovak state subsidy policy. State provided subsidies of 4, 000 SKK (132.77 EUR) per hectare of arable land and 2,000 SKK (66.38 EUR) per hectare of permanent grasslands under organic rules. This grants were provided for the entire three-year conversion process, later shortened to two years. The shorten of conversion period has been undertaken in relation to the significant decrease of fertilizers, which occurred throughout the agricultural production. Calculated per hectare of agricultural land, the dose of NPK decreased from 230 to 60 kg and chemical preservatives from the level of 2.5 to 3.0 kg of active substances from 1.0 to 1.5 kg per hectare.

The similar trend as the number of organic producers is recorded also in case of the land area under this system, as shows chart 2. The number of organic farmers and land area utilized in this system have a similar functional course. Both can be described by exponential function with a high degree of reliability. This similarities we judge on the base of trend lines and values

of reliability equations. Organic area indicator has a reliability equation  $R^2 = 0.9504$ . There is a significant increase since 2004, due the implementation of Government commitments under the Rural Development Plan 2004–2006 and Rural Development Programme 2007–2013. These aimed to achieve the implementation of organic farming for at least 5 % of the total agricultural land area. Therefore we can conclude that the regulatory stimulation by state (to introduce organic farming) has helped to the development of organic farming in Slovakia.

**Chart 3 Cultures on agricultural land under organic farming in Slovakia in hectares (2004-2009)**

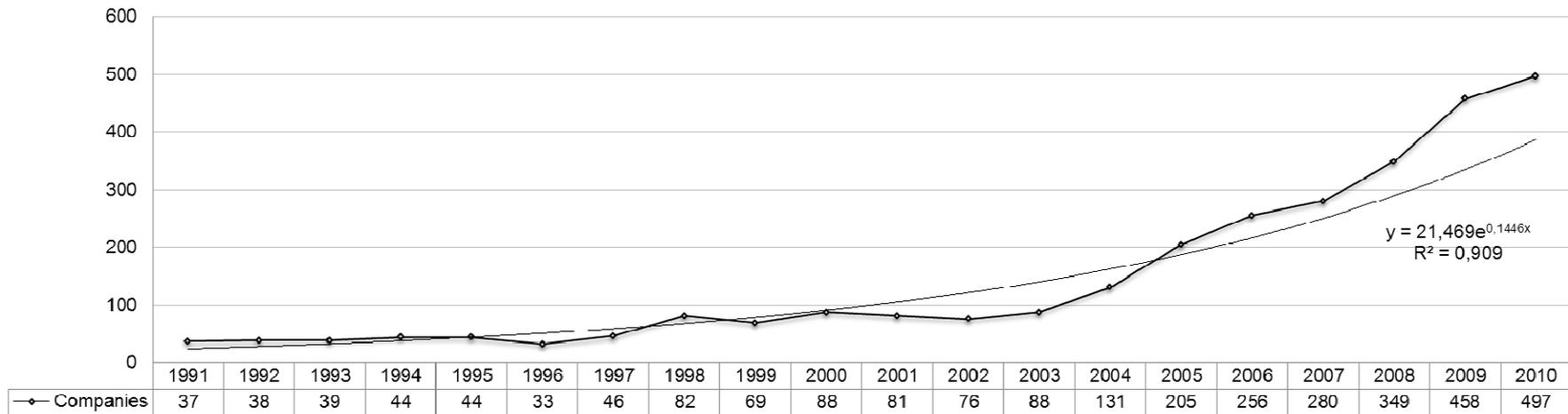


Source: CCTIA 2013, own calculations

An agricultural land used in organic farming in Slovakia consists of grasslands, arable land, orchards and vineyards. This shows chart 3. The high proportion of grasslands is caused mainly by the geographic differences of Slovak regions. In terms of geographical distribution of farms is their greatest density in mountain and foothill areas. The most number of organic farms taking place particularly in the districts: Čadca, Kysucke Nové Mesto, Svidník, Bardejov, Stropkov and Humenné. These areas are used primarily for grazing cattle and sheeps due to the altitude and nature of the terrain.

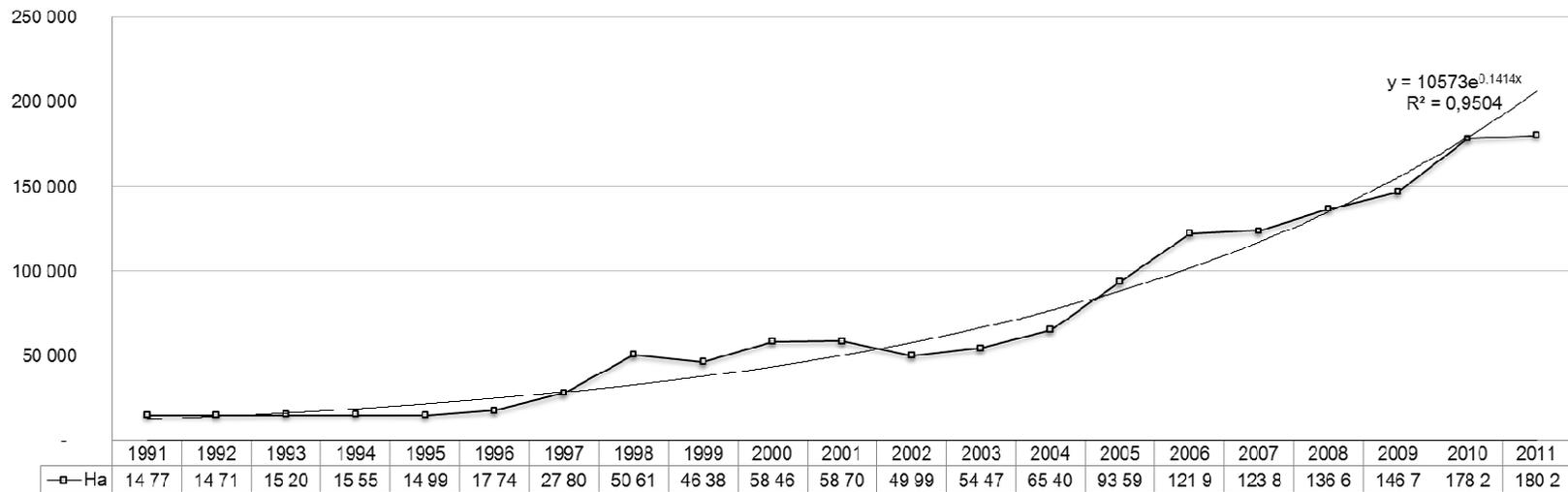
As the next indicator we calculated the average acreage of organic farm in Slovakia. This indicator is graphically captured on the chart 4. The course line of this parameter is not consistent with the course lines of previous indicators (number of organic farmers and the land area under organic farming). This means that it can not even describe the same positions held. The average farm acreage indicator reached a peak value in 2007 representing 724,77 hectares per one entity in this system. This had upward trend from the beginning of the period in 1991 until 2001. In the later period there was a decrease and in the end of the reporting period it significantly went closer to the situation in 1991. This trend is caused by State regulations with the goal to decrease this enormous farm areas. Historically we have a large farms in Slovakia caused by the collective farming system used in communism period. But, EU organic rules prefer smaller (family) farms with extensive production, which is in strong conflict with the large (very often intensive) farms in Slovakia. As we can see (chart 4) there is an increase of farm area in 2010 (358,42 hectares per organic farm), compared with the year 2009 (320,44 hectares per organic farm). This is caused by the subsidy policy which actually implemented as the system of payments per area.

**Chart 1 The number of organic farmers in Slovakia (1991-2011)**



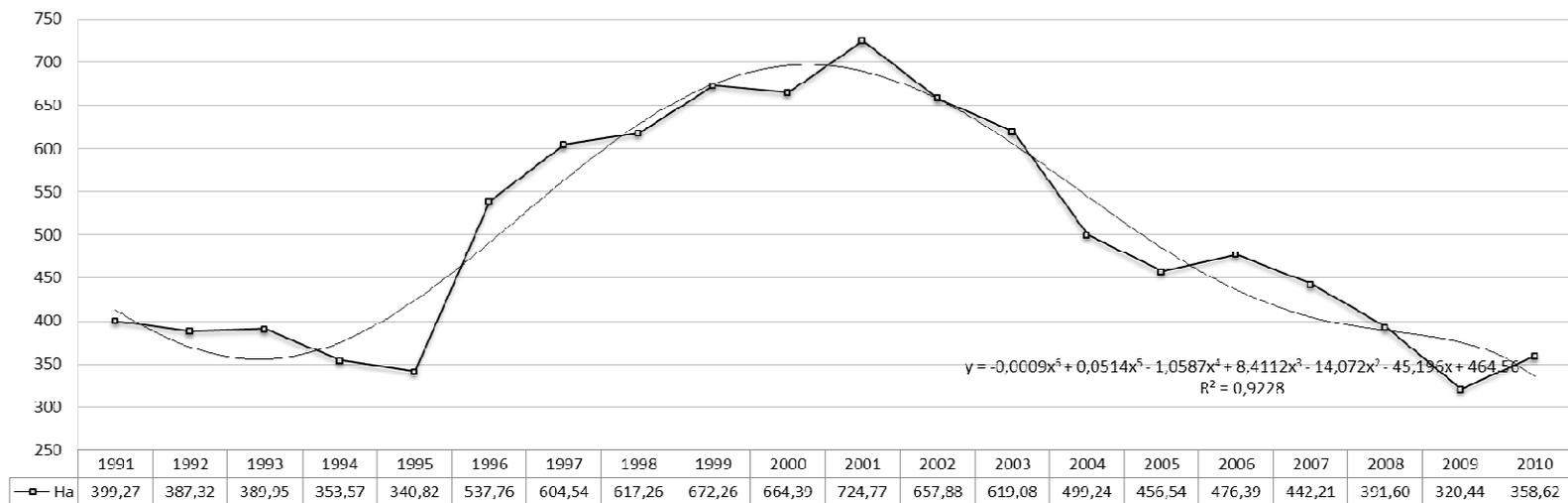
Source:CCTIA (2014), The Green Report (2006-2012)

**Chart 2 Fully converted organic farming area in Slovakia in hectare (1991-2011)**



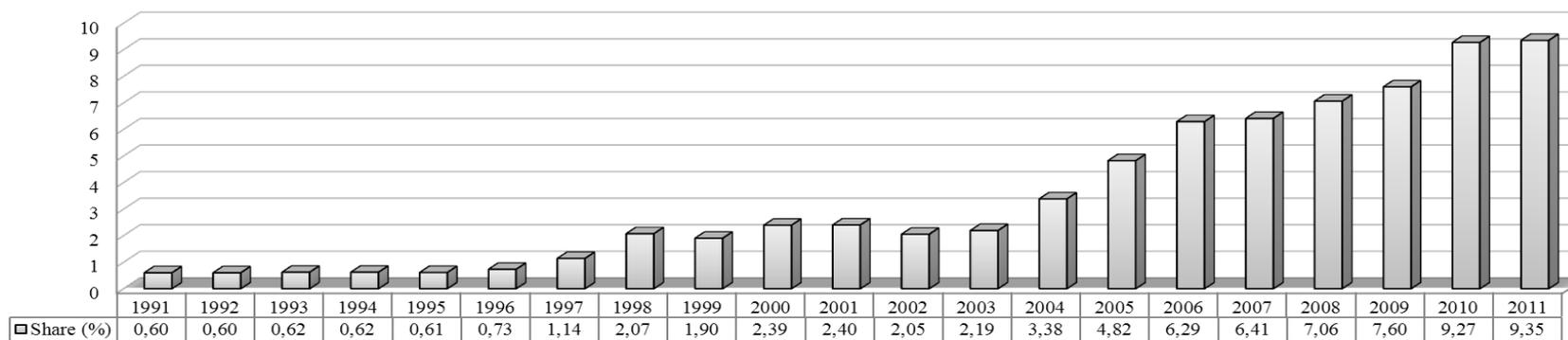
Source:CCTIA (2014), The Green Report (2006-2012)

**Chart 4 Average organic farm size in Slovakia in hectares (1991-2010)**



Source: CCTIA (2013), The Green Report (2006-2012), own calculations

**Chart 5 Average organic farm size in Slovakia in hectares (1991-2010)**



Source: CCTIA (2014)

## Agri-environmental payments for organic farmers in Slovakia

Increasing interest in organic farming can be considered as a gradual increase of environmental awareness of farmers. On the other hand, there is also an economic aspect which means the possibility of drawing various supports as a motivation.

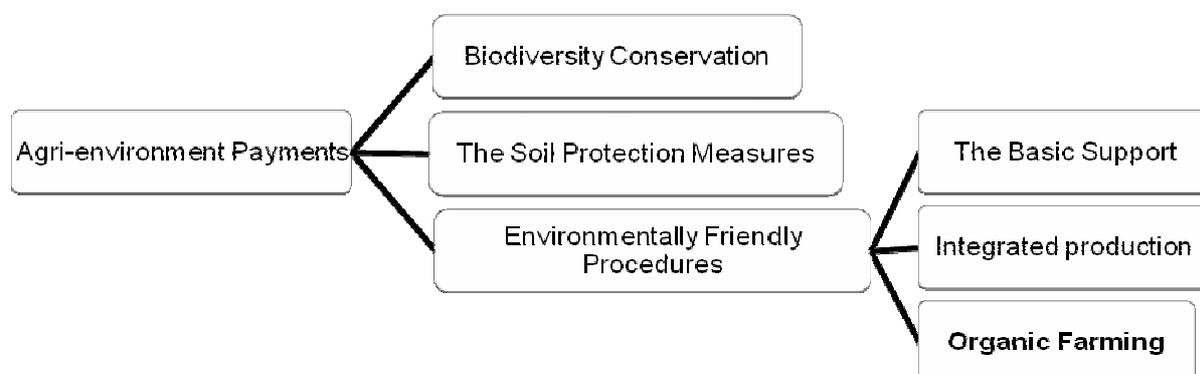
There was a several mechanisms in the Rural Development Programme 2007-2013 time period. Eligible applicants for this assistance were entities engaged in primary agricultural production. Support was provided in the form of grant. It was a standard payment per hectare of agricultural land in agri-environmental commitments. This period was preceded by the „Short programming period 2004 – 2006“ under the Rural Development Plan of Slovak Republic. Support for organic farming in this period was covered by the agri-environment and animal welfare subsidies. There was submitted 842 projects and 132 extension of the original project during the 2004 – 2006 period. Overview of the supports given the tab. 1.

**Tab. 1 Supported areas under the Rural Development Plan of the Slovak Republic 2004-2006 (EUR.ha<sup>-1</sup>)**

Agri-environmental commitments	2004	2005	2006
Cropland	8 914,88	1 1237,55	9 866,81
Vineyards and orchards	243,52	59,06	328,99
Vegetables and medicinal plants	469,58	28,62	180,71
Permanent grassland	2 5977,09	3 1050,44	2 2460,55
<b>Organic farming total</b>	<b>35 605,07</b>	<b>42 375,67</b>	<b>32 837,06</b>

Source: The Rural Development Plan of the Slovak Republic 2004-2006

The Rural Development Programme 2007 – 2013 promotes organic farming under Axis 2 "Improving the Environment and Countryside," measure: "Agri-environmental Payments", in particular sub-measure: "Organic Farming". The aim is to implement agri-environmental production methods compatible with the protection and improvement of the environment, landscape and natural resources. These imply a relatively wide issue and potential applicants were systematically divided into various sub-measures. Organic farming as a dynamically developing, quite separate agriculture management is currently not systematically supported by a separate measure. Formally, this area is included in the sub-measure " Environmentally friendly procedures " as scheme 1 indicates.



Scheme 1 Agri-environment payments under the RDP 2007-2013

Source: Rural Development Programme of the Slovak Republic 2007-2013, own processing

Measures in the new programming period was linked to previous period in the effort to extend and strengthen positive effects of their implementation. They can be combined with other activities in 2007-2013 period which enlarging area of intervention as indicated tab. 2.

**Tab. 2 Possible transformation of agri-environmental sub-program period 2004-2006 to the period 2007-2013**

<b>Rural Development Plan 2004-2006</b>	<b>Rural Development Programme 2007-2013</b>
Organic farming	Organic farming
	Organic farming (Permanent grassland) + Protection of habitats and semi-natural grasslands.
	Organic farming + Protection of habitats of birds.

Source: Rural Development Programme of the Slovak Republic 2007-2013, own processing

The support in this two programming periods are provided as a payments to producers for their participation in the environmental management system (organic farming). This payments are connected to the soil, respectively is paid per hectare of cultivated land in EUR.ha<sup>-1</sup>. Payment is different for in-conversion and fully converted areas. In general, we can say that the payment for organic farming in the conversion process is always higher. The highest support in both programming periods have been given for orchards and vineyards (up to 900 EUR.ha<sup>-1</sup>). Payments overview for organic farming in both programming periods provided tab. 6.

**Tab. 2 Payments for organic farming under The Rural Development Plan 2004-2006 and the Rural Development Programme 2007-2013 (EUR.ha<sup>-1</sup>)**

<b>The portion of agricultural land</b>	<b>Payment for areas under conversion</b>		<b>Payment for fully converted areas</b>	
	<b>2004-2006</b>	<b>2007-2013</b>	<b>2004-2006</b>	<b>2007-2013</b>
Cropland	199,16	218,12	99,58	152,69
Orchards and vineyards	265,55	900,00	132,78	671,15
Vegetables, medicinal, spices and aroma growth	331,94	487,75	165,97	376,75
Permanent grassland	132,78	137,39	66,39	96,16

Source: CTIA (2009), own processing

To the area of agri-environmental payments went in 2007 more than 13.31 % of allocated public funds, in 2010 it was up to 13.64 %. Totally in the period 2007-2013 goes to agri-environmental field 354 255 543 EUR from budget of The Rural Development Programme of Slovak Republic 2007-2013 .

Organic farming in Slovakia is currently legislated in the Act no. 189/2009 on organic production of June 1, 2009. This was drawn up in full compatibility to the European legislation and therefore Council Regulation (EEC) No. 834/2007 of June 28, 2007 – Regulation on organic production and labeling of organic products. This regulates the functioning of the system, responsible authorities, process and conditions for registration. Only products which fulfilling the conditions can be certified and consequently labeled as "organic" by placing the logo. The special logo for organic production is single for whole EU and it has an uniform look.

This logo is valid from June 2010. Before, countries used national logos with the title „Organic farming“ in national languages.

### **Control and certification system in Slovak organic farmers**

Organic farming control system in Slovakia is legally authorized by CCAI (Central Control Agricultural Institute), and it is realized through the inspectors. The direct control of producers and processors is practically realized by NATURALIS SK, Ltd. This company is the one and only inspection organization in Slovakia and it is exclusively covered by the CCAI. Each organic farmer in Slovakia must complete the registration process realized by CCAI. Just after this, he can sign the The Contract of Control Realization with the control organization. As mentioned, in Slovakia there is one and only testing and control organization which ultimately penalizes an organic producers. There are usually two and more official testing and control organizations in EU member states. When producer would like to sell his products in foreign state he have to receive the product certificate from that state relevant organization. Slovak producers are primarily oriented on export, because the lack of national demand. Practically it means that Slovak organic producers have to have our national certificate and some from other states too.

In the process of certification inspector checks: compliance with all statutory rules for the production, processing, packaging, storage, labeling and marketing of organic production, including keeping accurate documentation of all performed operations and accounting. Organic farmers paid the contract between him and the testing organization by their own resources. After checking entity, the control authority shall forward the results to CCAI. On the basis of compliance with all the rules CCAI issue to the applicant a certificate of conversion (first two years), respectively certificate of organic origin production.

Obrázok o počtoch jednotlivých prevádzkovateľov

### **Control and certification system in Slovak organic farming**

Agricultural producers can not use the designation „BIO“ or „ORGANIC“ arbitrarily. There are common rules for labeling and logo using in Slovakia as well as in whole EU. As organic product can be described crop and livestock products for which the certificate of organic origin was issued. According this, the Logo is not just an information about product origin. Organic logo is also the trade mark which ensures customer that products are inspected at every step of production, respectively on every step of the way from producer to the final consumer.

An increasing number of organic farmers and area under organic registration means also an increasing of the range of organic products and foods on the market. The highest share of the growing areas of organic farming system represented in Slovakia cereals (wheat, rye, barley, oats, corn). Moreover, the planting of orchards and vineyards create realistic conditions for the expansion of production organic fruit in recent years.

Organic farming is also applicable in the extensive areas of mountain with a high proportion of permanent grasslands. Production in this area is focused on cattle and sheep grazing. There is a lack of the certified organic products of animal origin in the Slovakia. In livestock production prevails sheep, goats and cattle, mostly realized as a suckler. The most of organic products from Slovakia is exported to Western Europe.

It follows that Slovak organic producers are able to produce enough quality and quantity of organic foods for domestic consumption and for export as well. But, a substantial part of them are realized on foreign markets, especially in Western Europe in the form of raw materials. Our market does not show enough interest in processing and finalization of organic food, yet. Organic food market in Slovakia is still (more or less) just being born. There is a narrow organic products range available in several specialized health food stores and some supermarkets. These stores offers (according Naturalis SK, Ltd.) vegetable products: mainly cereals (wheat,

rye, spelled), vegetables (carrots, parsley, parsnips, celery, onion, beetroot), asparagus, potatoes and fruit (apples, pears, plums, nuts). In the field of organic food: pasta, flour (wheat, rye, spelled), bread, apple juice, organic wine, medicinal herbs and herbal teas, sheep and cow's cheese (lump) and cheese strings.

The demand for organic food is localized in the dependence of: concentration of the population, age structure, educational level, social structure, and (last but not least) the population's purchasing power. Research done in this area (The Green Report) stated that in terms of age structure the most interested in organic foods is lower age category (20-35 years). This category means especially the college students and people with higher levels of education. There is also a correlation in the relative real per person income and interest in organic foods. Researches also clearly shows that the consumers of organic products are mostly from the higher category. Consumers from lower income categories would often be interested in balanced diet, but their level of income does not allow this.

## Conclusions

In Slovakia, organic farming started in 1991 when the system involved 37 subjects, and since then their number is increasing at an exponential rate to the current 349 organic farmers. The same course we also recorded in acreage used in this system, which since 1991 from 14.773 hectares risen to the current 136.669 hectares. This area is mostly used as grasslands, which is connected with the geographical allocation of organic farms in mountain and foothill areas. There is also a differences in the composition of production process. In lowlands there are a good natural and microclimatic conditions for traditional crop production oriented on cereals usually with no connection to livestock. On the other hand in foothills producers focuses mainly in farm animal production, realized by grazing on the grasslands. (Kozáková, 2012).

Actually, organic producers in Slovakia are supported under Agri-environmental part of the Rural Development Programme 2007-2013. This provides the set of agri-environmental payments granted per hectare of cultivated land. The payment is different for various cultures: arable land, orchards and vineyards, vegetables, aromatic and spice plants, or grasslands. The maximum of these payments is provided for orchards and vineyards during the conversion period (900.00 EUR.ha<sup>-1</sup>), the minimum payment goes to fully converted grasslands (96.16 EUR.ha<sup>-1</sup>). According this we can agree with Paľšová et al. (2013): „more significant increase is evident from the accession into the EU when Slovakia adopted the commitment to increase the acreage of agricultural land for the implementation of organic farming. At the same time it was possible to draw farmers subsidies for the establishment and functioning of organic production. This factor played an essential role in 2004 and between 2008–2009 when the most significant impact on the development of active farmers was evident“.

The actual legal standard for for organic farming in Slovakia is the “Act no. 189/2009 from Juny 1, 2009“. This determines the rules for farmers and penalties for non-compliance. It also defines the state authorities in this area (Ministry of Agriculture and Rural Development and CCTIA). Act regulates the process of registration, certification and rules of the product labeling. The certification process and other activities in the system is carried out by accredited inspection and testing organization NATURALIS SK, Ltd., the one on only organic testing organization in Slovakia. Agrucultural primarily production under organic certification is relatively developed in Slovakia. On the other hand there is a problem with the processing, the next step of production verticale. Because there are not the sufficient number of organic processors, our producers are mostly oriented in export. Cosequently, our traders buying organic foods outside of Slovakia and our consumers eating imported organic foods possibly made from Slovak organic products. Despite the fact that organic farming in Slovakia existed for almost two decades it still has a several problems which elimination is a challenge for the horizon 2020.

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# Merger control transactions and implementation of Merger Regulation and European Union Merger Directive into the Slovak legal and tax legislation

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## Abstract

The definition of a merger transaction plays an important role in a well-functioning merger review regimes that seek to be effective, efficient, and transparent. In general, the purpose of the article is present the interpretation of European Union ("EU") legislation in respect of merger control transactions and merger regulations and its implementation into the Slovak legislation. The standards methodology methods, such as selection, analysis and comparison methods are used in order to meet the above mentioned, specifically, these are used for selection of literature sources, presentation current legal acts and EU legislation. The results and conclusions of the article are presented by deduction method. The article deals with the issue of merger control transactions of selected types of commercial companies. It analyzes the concept of merger transactions under the Competition law of EU and deals with its implementation into the Slovak legislation. The legal basis for EU merger control is Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings ("the EC Merger Regulation" or "regulation"). The regulation prohibits mergers and acquisitions which would significantly reduce competition in the single market. Merger control, as well as other areas of competition law, is in the Slovak Republic, substantially governed by the Act on Protection of Economic Competition. The relevant authority for merger control is the Antimonopoly Office of the Slovak Republic. Having compares the EC Merger Regulation and the Slovak law we came into conclusion that the Slovak legislation is to a great extent in line with the European law. Further, from the tax point of view the article deals with the merger transactions within the EU legislation. The article presents the main rule of EU Merger Directive in the EU legislation and presents implementation of EU Merger Directive into the Slovak tax law. The merger transactions are regulated by The Council Directive 2009/133/EC of 19 October 2009 on the common system of taxation applicable to mergers, divisions, partial divisions, transfers of assets and exchanges of shares concerning companies of different Member State and to the transfer of the registered office of an SE or SCE between Member States ("EU Merger Directive"). The main rule of the EU Merger Directive is that a merger, division, or partial division shall not give rise to any taxation of capital gains. The EU Merger Directive is transposed into the Slovak Income Tax Act ("Slovak ITA"). Following the Slovak implementation of EU Merger Directive, merger transactions are generally treated as not giving rise to a capital gain calculated by reference to the difference between the real values of the assets and liabilities transferred and their values for tax purposes. As a result, it can be summarized that the income received by the shareholders from acquiring new shares and income from exchange of the shares on merger transactions is not subject to income tax. The Slovak ITA essentially deals with mergers transactions. The Slovak ITA presents that the merger transactions are to be made (i) in original (historic), or (ii) in the real value. Thus, in addition, the article formulates the main tax implications of the merger transactions depending on the chosen alternatives, i.e. whether the fair value of the assets and liabilities or their original values are taken over by new successors upon the merger transaction.

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**Keywords:**

competition, concentration, merger transactions, merger control, income tax, merging company, successor company, fair value

**Introduction**

The merger transaction plays an important role in a well-functioning merger review regimes that seek to be effective, efficient, and transparent. Therefore, the article presents the legal framework of EU legislation in respect of merger control transactions and merger regulations its implementation into the Slovak legislation. Further, the article deals with the merger transactions from the tax perspective and compare the current Slovak legislation with the legislation of EU countries. The standards methodology methods, such as selection, analysis and comparison methods are used in order to meet the above mentioned, specifically, these are used for selection of literature sources, presentation current legal provisions and EU legislation. The results and conclusions of the paper are presented by deduction method.

**EC Merger Regulation**

Merger control, as well as other areas of competition law, is regulated by the Act no. 136/2001 Coll. on protection of Economic Competition (further "the Competition Act"). The Competition Act covers concentration control and the prohibitions of competition restricting agreements and the prohibition of the abuse of dominance. The relevant authority for merger control and economic competition is in the Slovak Republic the Antimonopoly Office of the Slovak Republic (further "Slovak Antimonopoly Office" or "the Office").

The Slovak Competition Act entered into force on 1 May 2001. It applies to all undertakings active in all sectors of the economy. Its purpose is to protect competition in the market products, performance, work and services from any restrictions and to create conditions for its further development with a view to promoting economic development to the benefit of consumers and regulating the power and the scope of activities of the Slovak Antimonopoly Office.

On 1 May 2004 substantial amendments to the Competition Act came into force due to the accession of the Slovak Republic into the European Union. The EU Merger Regulation provides a mechanism for the control of mergers and acquisitions at the European level. It should be noted that the original Merger Regulation was adopted in 1989. After a wide-ranging consultation exercise initiated in 2001, it was revised and replaced by the current version of the Merger Regulation<sup>2</sup> which came into force on 1st May 2004. The Merger Regulation applies to any "concentration" which has, or is deemed to have, an "EU dimension". Taken into account the basic definitions such as concentration and control under the provisions of EU Merger Regulation, it appears that the Slovak Competition law is in full compliance with the EC Competition law. Further, therefore, we will analyze the basic definitions and rules of the Slovak Competition Act.

**Slovak Antimonopoly Office**

The task of the Slovak Antimonopoly Office is to promote and protect economic competition in the markets for products, performance, work and services against prevention, restriction or distortion as well as to create conditions for its further development in order to promote economic progress for the consumer's benefit. The Office is entitled to initiate proceedings, to take the administrative measures and to grant individual exemptions. In the event of violation of the Competition Act, the Slovak Antimonopoly Office may impose the fines and penalties.

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<sup>2</sup> Council Regulation (EC) no. 139/2004 of 20 January 2004 on the control of concentrations between undertakings (the EC Merger Regulation)

## **Definition of concentration and control**

According to the Competition Act the concentration means the process of economic combining of undertaking through:

- a merger or amalgamation of two or more separate undertakings (including mergers and amalgamations pursuant to special legislation, as well as, “economic mergers”, i.e. situations whereby the undertakings concerned become economically combined, while retaining their legal independence, especially in the case of joint economic management; or
- the acquisition of direct or indirect control by an undertaking of several undertakings over another undertaking or part of another undertaking or undertakings; or
- the creation of joint venture controlled by two or more independent undertakings, performing on a lasting basis all the functions of an autonomous economic entity.

According to the Competition Act, the control is the ability to exercise a controlling influence on the activities of an undertaking, especially by means of:

- ownership rights or other rights to the undertaking or a part thereof; and
- rights, contracts or other facts allowing the exercising of a controlling influence on the composition, voting or decisions taken by bodies belonging to the undertakings.

## **Acquisition of shares and acquisition of assets**

The Competition Act does not establish any objective criteria, such as percentage thresholds or value of transaction for the definition of certain transactions as mergers.

Regarding the acquisition of assets which does not represent an entire business the Competition Act states the basic rule upon which such transaction is considered as a concentration. The target of the transaction must be the assets based on which turnover is attained according to the Competition Act.

## **Joint ventures**

The Competition Act contains special provisions related to joint ventures. As mentioned above, the concentration also means the establishment of a joint venture jointly controlled by two or more undertakings, if the respective joint venture performs all functions of an independent economic entity on a lasting basis, (a full function joint venture). Within the proceedings regarding this kind of concentration which is aimed at or may lead to coordination of competitive behavior of undertakings, the Slovak Antimonopoly Office shall assess such concentration according to Articles 4 and 6 (conditions for assessment of agreements restricting competition and possible exemption). In such case the Office issues a decision approving a concentration if it does not significantly distort effective competition on the relevant market.

## **Exemptions**

The Competition Act specifies some transactions that are excluded from the definition of a merger transaction. A concentration does not arise if banks, branches of foreign banks, other financial institutions or insurance companies, the normal activities of which include trading in securities on their own accounts or on the accounts of others, temporarily acquire securities with a view to reselling them. This exemption only applies if they do not exercise voting and other rights with a view of influencing the competitive behavior of that undertaking or if they exercise these voting rights only with a view of preparing for the sale of the entire undertaking or part thereof or the sale of securities, provided that this sale is effected within one year of the date of acquisition of the securities. If the disposal is not reasonably possible within this period, it may – upon request – be extended by the Slovak Antimonopoly Office. It should be noted that further exemptions exist under special laws, i.e. regarding the acquisition of control over an undertaking by liquidation trustees in accordance with the

Act no. 513/1992 Coll. Commercial Code as amended or by the bankruptcy trustee under the Slovak Bankruptcy Act.

## EU Merger Directive

The merger transactions are regulated by the Council Directive Council Directive 2009/133/EC of 19 October 2009 on the common system of taxation applicable to mergers, divisions, partial divisions, transfers of assets and exchanges of shares concerning companies of different Member State and to the transfer of the registered office of an SE or SCE between Member States ("EU Merger Directive"<sup>3</sup>). Under the general provisions of EU Merger Directive, each Member State is obliged to apply this EU Merger Directive to the following:

- (i) merger, divisions, partial divisions, transfers of assets and exchanges of shares involving companies from two or more Member States;
- (ii) transfers of the registered office from one Member State to another Member State of a European company (Societas Europea or SE), as established in Council Regulation (EC) No 2157/2001 on the Statute for a European company, and a European Cooperative Society (SCE), as established in Council Regulation (EC) No 1435/2003 on the Statute for a European Cooperative Society (SCE).

The EU Merger Directive<sup>3</sup> is transposed into the Slovak Income Tax Act. As mentioned above, in general, the EU Merger Directive is applicable to mergers, divisions, partial divisions, transfers of assets and exchange of shares involving companies from two or more member states.

For the purposes of the EU Merger Directive the merger transaction means an operation, when:

- one or more companies, on being dissolved without going into liquidation, transfer all their assets and liabilities to another existing company in exchange for the issue to their shareholders of securities representing the capital of that other company, and, if applicable, a cash payment not exceeding 10 % of the nominal value, or, in the absence of a nominal value, of the accounting par value of those securities;
- two or more companies, on being dissolved without going into liquidation, transfer all their assets and liabilities to a company that they form, in exchange for the issue to their shareholders of securities representing the capital of that new company, and, if applicable, a cash payment not exceeding 10 % of the nominal value, or, in the absence of a nominal value, of the accounting par value of those securities;
- a company, on being dissolved without going into liquidation, transfers all its assets and liabilities to the company holding all the securities representing its capital.

The main rule of the EU Merger Directive is that a merger, division, or partial division shall not give rise to any taxation of capital gains calculated by reference to the difference between the real values of the assets and liabilities transferred and their values for tax purposes.

The amendment to the Slovak ITA effective as of 1 January 2010 essentially deals with business transformation, i.e. transactions involving mergers, de-mergers, contributions in kind as well as the sale of business or a part of business transactions.

In general, the Slovak ITA defines that the business transactions are to be made (i) in original (historic), or (ii) in the real value. While the tax treatment of mergers, de-mergers, contributions in-kind allows the tax payers to choose from two regimes of valuation of assets

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<sup>3</sup> Council Directive Council Directive 2009/133/EC of 19 October 2009 on the common system of taxation applicable to mergers, divisions, partial divisions, transfers of assets and exchanges of shares concerning companies of different Member State and to the transfer of the registered office of an SE or SCE between Member States (codified version)

transferred in the course of the above transactions (based on the fair value of assets or based on the original tax value of assets), the amendment of ITA specifies only one possible treatment for the sale of business/part of business transactions.

From the Slovak tax perspective, it could be chosen whether the fair values of the assets and liabilities or their historic values are taken over in respect of the merger transaction. In case of taking over the fair values for tax purposes, the revaluation differences should be a part of the tax base. It could be further decided whether these differences are to be included into the tax base of merging or successor company and included into the tax base (in one taxation period or in parts during maximum seven taxation periods).

In case of taking over the historic values for tax purposes, the revaluation differences are not to be included in the tax base of successor company.

It should be further noted that the Slovak ITA determines also quite detailed procedures of including of provisions and adjustments to the tax bases of both companies depending on the opted alternative of taking over the historic values or fair values of the assets and liabilities.

### **Conclusions:**

Merger control, as well as other areas of competition law, is regulated in the Slovak Republic by the Act no. 136/2001 Coll. on protection of Economic Competition as amended. The relevant authority for merger control and economic competition is in the Slovak Republic the Antimonopoly Office. Taken into account the basic definitions, such as concentration and control under the provisions of EU Merger Regulation, it appears that the Slovak Competition law is in full compliance with the EU law.

The merger transactions from the tax perspective in EU law are regulated by Merger Directive which is transposed into the Slovak Income Tax Act. Following the Slovak implementation of EU Merger Directive, merger transactions are generally treated as not giving rise to a capital gain calculated by reference to the difference between the real values of the assets and liabilities transferred and their values for tax purposes. As a result, it can be summarized that the income received by the shareholders from acquiring new shares and income from exchange of the shares on merger transactions is not subject to income tax.

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Zákon č. 431/2002 Z.z. o účtovníctve v znení neskorších predpisov (The Act no. 431/2002 Coll. on Accounting as amended).

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Zákon č. 595/2003 Z.z. o dani z príjmov v znení neskorších predpisov (The Act no. 595/2003 Coll. on the Income Tax as amended).

# Professional competence of controllers in the Czech Republic: Research Empirical Study<sup>1</sup>

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## Abstract

The article describes the outcomes of the project whose purpose is – on the basis of the “Draft for a Common Statement” – to state generally accepted requirements for the professional competence of managerial accountants and controllers. The paper concludes that, despite the fact that Draft is only the first step, it brings substantial contributions: it has led to a better understanding of the differences which accompany this profession’s development in different parts of globe. It enables better identification of common features, but also differences in profiles and professional orientations of professional accountants, auditors and professional accountants in business, and of managerial accountants or controllers whose quality professional development is the principle aim of this project.

The important part of the project is the empirical research focused on changing the requirements of managers and controllers, and mapping the current situation in the Czech Republic in this area. The research compares the opinions of two groups of respondents – experts who are responsible for the professional competence development of controllers on the one hand, and managers and controllers operating in a business environment on the other. The paper provides results relating to following areas: the general content of controllers’ activities, controllers’ authority and responsibility, requirements for controllers’ education, professional skills and practical experience, ethical aspects of management accounting as well as the quality assurance of the controllers’ work.

Regarding the general content of controller’s activities, both groups of respondents were almost unanimous regarding the desired content of the controllers’/management accountants’ work. The correctness of data which are processed subsequently into the output information used in the managerial control and the successive quality, availability and transparency of the information rendered to company management belong into the responsibility of these experts.

In compliance with the above stated role of the company’s economic conscience, both groups of respondents also agreed that a controller/management accountant should not bear primary responsibility for the company’s financial results; nevertheless, we can notice slightly higher level of average and mode of responses provided by the second group of respondents, i.e. managers and controllers. In our opinion, it is possible to interpret in a sense that while the first group strictly reject this responsibility for financial results, in practice controllers earn a part of their bonuses based on the results. Nevertheless, this tendency comes more from the necessity to communicate interest for the company’s results across all company employees, regardless of whether they directly influence them or not.

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What is remarkable is that the results in the areas of coordination of activities connected with the company aims and means of their fulfilment formulation are significantly different. According to the first group, the role of these experts is crucially important in this area; however, according to the opinion of experts from companies, controllers do not support this area very intensively. In their view, controllers are more focused on the technical and process activities of controllership and information support of management, and they are not involved so much in general questions of strategy formulation and implementation.

Also, a relatively low agreement exists between both groups of experts regarding whether a controller should act as an originator of an information system or its parts.

Conversely, both groups found a consensus that a controller should not have the authority to influence source allocation (e.g. he/she should not decide about the sold products volume and structure, accept make-or-buy decisions or about the development/decline of customer, territory or distribution channels).

In the area of requirements for education, both groups of respondents strongly highlight the knowledge of financial accounting and reporting, management accounting and corporate finance; on the other hand, knowledge of law, auditing, marketing and international aspects of business are considered to have lower importance; in the ICT area, the controller is considered to be mainly a user rather than an originator and verifier of processing and user quality;

In the area of requirements for professional skills and practical experience, both groups of respondents consider soft skills to be important; nevertheless, they perceive technical skills even more relevant for the controllers' professional competence. According to the research, however, the recent situation in the Czech Republic is worse in the area of soft skills of controllers as company managers are not convinced about their importance;

Both groups of respondents also confirm how important for a company it is to define, enhance, support and communicate effectively ethical principles and rules of undertaking; on the other hand, the research also confirms a very poor level of application of ethical principles and rules of business in practice; this is the reason why this aspect should be incorporated into the quality standards as a very important one;

The results of the investigation into controllers' professional development needs confirm that both groups of respondents consider professional development to be quite crucial for the quality of the controllers' work; in this regard, management enables its controllers to continue their professional development, but it does not always verify whether controllers enhance their professional competence;

The statistical results of quality assurance of the controllers' work confirm the necessity of evaluating controllers' work. On the other hand, answers to open questions such as "How is the controllers' work evaluated?" were very general.

### **Keywords:**

professional competence, controller, management accountant, developmental tendencies

## **1. Preface**

Especially the changes in business environment and growing needs for a quality company management but also global crisis leading to recognition how important for the companies' success is the quality of their financial management manifest itself besides others in the growing pressure to competence of professional accountants and – in their frame - also controllers and managerial accountants as experts whose principle aim is to enhance primarily long-term financial effects on the basis of "accounting understanding of the world" and through the general coordination and optimisation of company processes.

From this view-point, the aim of this article is to describe the outcomes of the pilot project whose general orientation is to define quality standards for the work of these experts and consequently to develop a framework for more precise specification of requirements for their education, skills and experience but also for their ethical approaches, values and attitudes.

## 2. Literature Review

Most of researches (Kaplan, R., Cooper, R., 1998, Burns, J. and Yazdifar, H., 2001, Merchant K., 2003) confirm significant role of quality financial management in changing environment which is influenced by following tendencies: inter-disciplinary nature of company management, emphasizing its the strategic horizon, its multidimensionality, integration of all substantial aspects of purposive business management including inter-relationship (but also divergence) between the user and processing areas of quality information systems (Simons, R., 2004, Parker, L., 2002, Merchant K., 2003). This situation has significant impact not only on substance of company management control system including its information support (Carruth, B., 2004) but also on professional education, skills, experience and ethical values and attitudes of financial managers.

- The pressure to enhance professional competence of these experts is apparent in many sizes; it is demonstrated especially by
- Newly formulated requirements of companies which are generalized in textbooks and the other outcomes from academia in which the ability and necessity of qualitative changes in the work of these experts has been stressed;
- Reactions of universities and professional bodies with economic orientation which feels the necessity to implement these requirements into the education curricula and into the pre-qualification certification systems of the professional competence development.

In this regard, some authors devote their special attention to controllers or managerial accountants. For example Kaplan (1998) states that especially ICT development has enabled to liberate these experts from routine data processing, what gives them the opportunity to

- Spend less time by the standardized statements development and – conversely – to devote more attention to analyses and interpretation of submitted information;
- Communicate more intensively companies' aims and means of their fulfilment with those people from departments who participate in the aims' realization; and
- Shift the part of its work from the area of comparison of actual and desired companies' results to the area of decision-making about a future course of business process.

Similarly, according to Grandlund a Lukka (1998), controllers should not act as internal information support providers only, but more as business partners who are co-equal members of decision-making teams and as experts whose authority and responsibility is to explain why a certain type of information is or is not relevant for a certain decision and – consequently – who are expected to enhance the decision-making quality.

Zralý (2007) reacts on changing role of managers, controllers and managerial accountants and the interactions among them, as well as on growing requirements on interdisciplinary approach and linking up inside the management control system by suggestion of the approach titled as the “controlling convergent concept”.

All above-stated changes in the content of controllers' /managerial accountants' work have been manifesting itself also in new requirements to professional competence and capabilities of these experts. Before, they were required to have adequate knowledge, skills and experience of the management accounting instruments and methods and their implementation and use in the frame of company information systems. Recently, they should use these competencies more as means to successive aims – to ability to integrate on interdisciplinary basis management accounting information with non-financial and qualitative one, to capability to justify, interpret and present ascertained results, to give adequate information support for

decision-making and to ability to strengthen companies' synergic effects through the communication and integration relations they develop and cultivate (see for example Burns – Yazdifar, 2001, Yasin 2005, Hoper, 1980, Horvath, 2006 and Zralý 2007).

They are the reasons, why new approaches to systems of professional development have been encouraging by important institutions interested in eliminating business problems, for example by World Trade Organization, World Bank, United Nations and – in connection with that - also by professional organizations as International Federation of Accountants (IFAC), United Nation Conference on Trade and Development (UNCTAD) and International Group of Controlling (,2010) which focus on definition of requirements and standard implementation for financial managers.

Nevertheless, current initiatives are still at the beginning; for example International Education Standards developed by IFAC have the only seven general standards and one special standard for auditors, UNCTAD syllabuses are considered to be too disciplinary oriented, outcomes of the “old school education” are focused primarily on technical skills (familiarity with the methods and tools of management accounting) and they do not focus sufficiently on practical skills and interdisciplinary aspects of financial management.

Moreover: unlike auditors whose activities in the public interest have been the subject of legislative treatment (and afterwards also of worldwide harmonisation of juridical standards), analogous legal harmonisation of requirements for managerial competencies has been perceived to be not only useless but even harmful with regard to creation of barriers for the experts' free movement and monopolies' development for judgment of their quality.

Also historical development difference in the areas of managerial control and applied managerial approaches manifests itself by the fact that these experts are not only titled differently in various parts of the globe but they are also equipped by different level of authority and responsibility and they operate in different levels of a company hierarchy.

More over, according to many research outcomes the level of soft skills (an ability to argue, interpret and present discovered results and to connect financial information with non-financial, intangible and “invisible” sizes of business activities) is important; this aspect is undervalued in all respected materials devoted to financial managers professional competence development (Yasin, M. M. , Bayes, P. E., Czuchry, A. J. ,2005, Pierce, B. and O'Deam T., 2003, Grandlund, M. – Lukka, K., 1998, Jablonsky, F. S., Keating, P. J. and Heian, J. B., 2004).

### 3. Empirical Research Methodology

The aim of the empirical phase of research which follows the definition of conceptual general outcomes is to map how the above stated tendencies manifest themselves in the recent requirements of professional competence of controllers and management accountants; moreover, the question has been analyzed – as previously already stated – from two view angles:

- from the view-point of experts who are responsible for their professional competence development in the pre-qualification stage;
- from the view-point of managers and controllers/managerial accountants operating in a business environment.

The research should give a comprehensive answer to the question to what extent the changing requirements of the professional competence of these experts are perceived in practice and reflected by institutions which are responsible for their universal education.

With regard to this aim the questionnaire was developed in two versions:

- a version concisely titled “**A controller/management accountant should be...**”, designated for the first group of experts; and
- a version concisely titled “**A controller/management accountant is...**”, designated for the second group.

The respondents of the second group are randomly selected companies operating in the Czech Republic (number of employees over 100, turnover over €50m and sales also over €50m). Companies from various industries are included in the sample.

Concerning the content and structure of both versions they are identical to a significant extent. Their basis was derived from the above stated analysis of the “Draft for a Common Statement”. However, other materials have been also used as inspiration sources, especially:

- IFAC International Standards for Professional Accountants (IFAC, 2003);
- Revised Model Accounting Curriculum (UNCTAD, 2011);
- Syllabuses of the specializations “Accounting and Company Financial Management” (Major) and “Controllership” (Minor) taught at the Faculty of Finance and Accounting of the University of Economics, Prague;
- Education and certification programmes of professional competence development of both the Chamber of Auditors and Union of Accountants professional bodies operating in the Czech Republic; and
- Education and certification of the British Association of Chartered Certified Accountants (ACCA).

A relatively broadly focused questionnaire, based mostly on questions, required answers on a scale from 1 (strong disagreement) to 5 (strong agreement), but – to a lesser extent – also required Yes or No answers and open answers. It investigated the experts’ opinions in the following problem areas:

- the position of controllers/management accountants in the companies’ organizational charts;
- the structure of departments of controllership/management accounting;
- the relationship of these departments to accounting, tax and other departments which, from different view-points, are interested in the company’s financial management;
- the general content of the controllers’/management accountants’ activities;
- areas and extent of the controllers’ authority and responsibility;
- the specific content of the controllers’/management accountants’ activities;
- requirements for education;
- requirements for professional skills and practical experience;
- controllers’/management accountants’ role in ethical aspects of undertaking;
- the selection of potential candidates for a controller / management accountant positions;
- quality assurance of the controllers’/management accountants’ work.

The intention of the research team was to work with the questionnaire in two stages:

- the aim of the first stage was to verify the questionnaire’s understandability and completeness in individual interviews with 20 – 30 representatives of both groups of respondents; and
- on the basis of this phase, analyze both questionnaires to formulate a structure which would be appropriate for their electronic distribution and assessment.

#### **4. Research results**

The research is in the stage in which:

- 27 interviews with experts of the first group were conducted and evaluated; 21 of them participated in the first stage (they also judged the understandability and completeness of the questionnaire) and responded to the questions of “A controller/management accountant should be ...” questionnaire; and
- 74 interviews with experts of the second group were conducted and evaluated; 5 of them participated in the first stage (they also judged the understandability and completeness of the questionnaire) and responded to the questions of “A controller/management accountant is ...” questionnaire.

The evaluation of the questionnaires brought the following results.

##### **Controllers’ position in the companies’ organizational charts**

The present research did not produce an unambiguous response regarding questions of controllers’ position in companies’ organizational charts, desired structure of the departments assuring controllers’ functions, or their relations to accounting, tax and other departments engaged in various aspects of companies’ financial management.

In our opinion, it is not only the difficult generalization of progressive tendencies but also the different Anglophone and Germanic approaches to these questions which are applied in the Czech business environment which can be the main reasons for this ambiguity.

Nevertheless, most respondents of both groups supported a solution in which controllers or management accountants act under the supervision of the chief financial officer and stressed that these experts should not have straight-line authority and responsibility, so that they can act more like “the company’s economic conscience”.

##### **General content of the controllers’ activities**

Regarding the general content of these experts’ activities, both groups of respondents were almost unanimous regarding the desired content of the controllers’/management accountants’ work. The correctness of data which are processed subsequently into the output information used in the managerial control and the successive quality, availability and transparency of the information rendered to company management belong into the responsibility of these experts.

In compliance with the above stated role of the company’s economic conscience, both groups of respondents also agreed that a controller/management accountant should not bear primary responsibility for the company’s financial results; nevertheless, we can notice slightly higher level of average and mode of responses provided by the second group of respondents, i.e. managers and controllers. In our opinion, it is possible to interpret in a sense that while the first group strictly reject this responsibility for financial results, in practice controllers earn a part of their bonuses based on the results. Nevertheless, this tendency comes more from the necessity to communicate interest for the company’s results across all company employees, regardless of whether they directly influence them or not.

The outcomes of the investigation are stated in Table 1.

**Table 1 - General content of the controllers' activities**

	"Should be"		"Is"	
	Average	Mode	Average	Mode
Correctness of data processed subsequently into the output information used in managerial control	3.92	5	4.46	5
Quality of information rendered to company management	4.46	5	4.26	5
Availability of information for company management	4.13	5	3.94	5
Transparency of information rendered to company management	4.54	5	4.12	4
Financial results	2.0	1	2.69	2

Source: authors' calculations

### **Areas of the controllers' authority and responsibility**

In relation to the preceding general content, the questionnaire also investigated the desired and actual areas of the controllers' authority and responsibility. The results are stated in Table 2. They show the respondents' agreement with the opinion that a controller should be equipped with an adequate level of authority and responsibility in the areas in which he/she serves as:

- coordinator of activities connected with the company's aims and means of their fulfilment formulation;
- expert preparing scenarios of future solutions for management;
- a methodist who is responsible for company directives on pricing, costing, budgeting and management accounting development and who also pays attention to their adherence;
- an expert facilitating and supporting communication between departments in all areas of company management which require coordination;
- a communicator who is responsible for transferring reached results to the relevant management levels and someone who should comment on, explain and interpret these results to managers; and finally
- an expert who should participate substantially in the regulations of a company financial management development including the system of remuneration and motivation.

What is remarkable is that the results in the areas of coordination of activities connected with the company aims and means of their fulfilment formulation are significantly different. According to the first group, the role of these experts is crucially important in this area; however, according to the opinion of experts from companies, controllers do not support this area very intensively. In their view, controllers are more focused on the technical and process activities of controllership and information support of management, and they are not involved so much in general questions of strategy formulation and implementation.

Also, a relatively low agreement exists between both groups of experts regarding whether a controller should act as an originator of an information system or its parts.

Conversely, both groups found a consensus that a controller should not have the authority to influence source allocation (e.g. he/she should not decide about the sold products volume and structure, accept make-or-buy decisions or about the development/decline of customer, territory or distribution channels).

**Table 2 - Areas of authority and responsibility**

	"Should be"		"Is"	
	Average	Mode	Average	Mode
Coordination of activities connected with the company aims and means of their fulfilment formulation	4.29	5	3.03	3
Preparation of scenarios of future solutions	4.21	5	3.28	3
Development of an information system or its parts	3.67	4	3.13	3
Development of company directives on pricing, costing, budgeting and management accounting development and examination of their adherence	3.91	5	3.74	4
Communication of results reached to relevant management levels	4.33	5	4.21	5
Explanation and interpretation of rendered information to managers	4.54	5	4.37	5
Facilitation and support of communication between departments	3.54	5	3.24	3
Decision on resource allocation	1.79	1	2.19	1
Participation in the regulations of a company's financial management development including the system of remuneration and motivation	3.42	4	2.81	3

Source: authors' calculations

Approximately 25% of respondents mark the financial results value of 4 or 5. The sub-results for this group in relation to areas of controller activities are interesting. The average value of this group for the area of preparation of scenarios of future solutions is 2.72 and for the area of decisions on resource allocation only 2.61. That means a discrepancy between responsibility for financial result and power to influence this result.

### Specific content of the controllers' activities

Regarding the specific content of the controllers' activities, the research has acknowledged the quite crucial role of controllers in ensuring the aims of target information i.e. in planning and budgeting on the strategic, tactical and operational levels, including processing and presentation of forecasts, estimates and expectations. The respondents' answers also stressed the importance of "traditional controllers' task" – adequate information support in assuring business factors and phases (research and development, purchasing, production, logistics, sale, human resources management etc.).

Surprisingly, substantially lower agreement exists regarding controllers' participation in the management accounting system and connected internal reporting system development. The respondents also did not find strong agreement in response to the question "To what extent should controllers bear responsibility for the quality of company project management, risk identification and management and organization structures development?"

We can also notice a fundamentally different answer to the question whether a controller should assure quality information support in the areas of business factors and phases management (research and development, purchasing, production, logistics, sale, human resources management etc.) between experts from academia and practice. Nevertheless, after analysing the data, the difference in this opinion may be caused by the sample of respondents; the companies included in the pilot part of the research have a relatively simple business cycle and these factors didn't apply to them.

The results of this part of the investigation are stated in Table 3.

**Table 3 - Specific content of the controllers' activities**

	"Should be"		"Is"	
	Average	Mode	Average	Mode
Strategic planning and budgeting	4.29	5	4.13	5
Tactical planning and budgeting	4.21	5	4.12	5
Operational planning and budgeting	4.04	4	4.07	5
Expectations and forecasts development	4.29	5	4.46	5
Communication of results reached to relevant management levels	4.33	5	4.12	5
Participation in the development of management accounting and internal reporting systems	4.00	4	4.12	5
Participation in the development of the project management system	3.54	3	2.57	3
Participation in the development of the risk identification and management system	3.33	3	2.79	4
Information support of business factors and phases management (research and development, purchasing, production, logistics, sale, human resources management etc.)	4.17	5	3.44	2
The development and enhancement of organization structures and including connecting activities	2.88	3	2.33	1

Source: authors' calculations

### Requirements for education

The research also focused on the educational requirement of controllers. Regarding the structure of these requirements, the questionnaire came from the structure of knowledge defined by the IFAC International Education Standards as well as the UNCTAD Revised Model Accounting Curriculum; as it has been already mentioned that also the aims, content and structure of initial (pre-qualification) programmes of Chamber of Auditors, Union of Accountants and ACCA, as well as the abovementioned syllabuses of the specializations of Accounting and Company Financial Management and Controllorship taught at the University of Economics, Prague were taken into the consideration.

Both groups of respondents highlight the requirement of financial accounting and reporting, management accounting and corporate finance knowledge. What is surprising is that the second group even prefers knowledge of financial accounting over management accounting one. According both groups of respondents, other areas of controllers' knowledge relevant to their work are taxation, internal control systems, business administration and information and communication technology. On the other hand, knowledge of law, auditing, marketing and international aspects of business have low importance for the controllers' activities, according to both groups of respondents.

The detailed outcomes of the investigation are shown in Table 4.

**Table 4 - Requirements for education**

<b>Controller has been able to use knowledge from the following areas:</b>	<b>“Should be”</b>		<b>“Is”</b>	
	<b>Average</b>	<b>Mode</b>	<b>Average</b>	<b>Mode</b>
Financial accounting and reporting	4.71	5	4.59	5
Management accounting	4.92	5	4.49	5
Corporate finance	4.63	5	4.20	5
Taxation	3.79	4	3.06	3
Business law	3.17	3	2.46	2
Labour Law	2.83	3	2.25	2
Social and health insurance Law	2.75	3	2.33	2
Auditing	3.42	4	3.03	3
Internal control systems	3.96	5	3.53	4
Economics	3.25	3	3.74	4
Management	3.75	3	3.26	4
Business administration	4.21	5	4.00	5
Marketing	2.79	3	2.16	2
Quantitative Methods (Mathematics, Statistics)	3.58	4	3.21	3
International aspects of business	2.88	3	2.73	3
Information and communication technology (ICT)	3.75	3	3.27	3

Source: authors' calculations

The research also examined the correlation between the importance of the controllers' activities and the requirements for their education. The correlation coefficient is 0.49. The research does not confirm a very strong dependence on the importance of controllers' activities and requirements for education. The respondents that gave a high value to the importance of controllers' activities do not support this opinion for education.

### **Requirements for ICT competencies**

Currently, controlling and management accounting practice is very influenced by ICT; this tendency has been stressed in many of the abovementioned sources. This has been the reason why we devoted one special part of our questionnaire to this issue.

Generally, the responses of both groups acknowledged the fact that the development of ICT has changed the substance of controllers' work and –conversely – controllers are required to participate actively in the development of the ICT system.

Regarding more specific areas of investigation, the questionnaire tried to ascertain the role of controllers in the area of ICT, especially whether they act as users of ICT only or whether they also participate actively in ICT development. According to both groups, controllers are considered mainly ICT users rather than originators and verifiers of processing and user quality. Not very surprisingly for us, both groups also agreed with the statement that controllers should not serve as managers of ICT projects.

The results of this part of investigation are stated in Table 5.

**Table 5 - ICT competencies**

In the area of ICT controller acts especially as	“Should be”		“Is”	
	Average	Mode	Average	Mode
User (with stress on areas he/she uses)	4.26	5	4.48	5
Creator (with stress on areas he/she uses)	3.30	4	3.25	4
Originator or verifier of processing quality	3.70	3	3.13	3
Originator or verifier of user quality	3.91	4	3.51	4
Manager of ICT projects or their parts	2.71	2	2.91	3

Source: authors' calculations

### Requirements for professional skills and practical experience

The research also focused on the relation between technical skills (analysed in Table 4) and soft skills (professional skills and practical experience). Their structure is derived from the overview that is mentioned especially in IFAC International Education Standard 3 – Professional skills, but also from the other sources, mentioned in the section devoted to educational requirements.

Table 6 shows the results of this investigation. Both groups of respondents consider the stated soft skills to be important for controllers' activities; nevertheless, technical skills have slightly higher values. What is interesting is that the respondents of the first group consider soft skills to be more relevant in comparison with managers'/controllers' responses. In our opinion, the principle reason for this is the fact that, recently, the soft skills of controllers do not reach required level yet in the Czech Republic. Moreover, “practice” is still not convinced about their importance.

**Table 6 - Requirements for professional skills and practical experience**

It is important for a controller to develop especially	“Should be”		“Is”	
	Average	Mode	Average	Mode
Communication skills	4.38	5	4.10	4
Abilities to act with people and enforce his/her opinions	4.46	5	4.06	4
Presentation skills	4.58	5	4.22	4
Managerial and organizational skills	3.63	3	3.79	3
Language knowledge including ability to use it	3.57	3	3.63	4

Source: authors' calculations

As well as in area requirements for education, the research also examined the correlation between the importance of controllers' activities and the requirements for professional skills and practical experience. The correlation coefficient is only 0.24. The research does not confirm dependence between importance of controllers' activities and requirements for professional skills and practical experience.

### Controllers' role in ethical aspects of undertaking

According to the results of the research, both groups of respondents generally agree with the hypothesis that it is important for a company to define, enhance, support and communicate effectively ethical principles and rules of how they are carried out.

On the other hand, the research confirms quite a poor level of application of ethical principles and rules in business. This fact is quite apparent from the comparison of responses of both groups to the third answer, stated in Table 7: according to the first group of experts, it is very important to incorporate these standards into company standards, codes and guidelines. However, this importance is not followed by the recent situation declared by second group of respondents.

What is quite un-satisfactory, is the role of controllers in the process of ethical aspects of undertaking enforcement. While first group of respondents (and also all generally accepted standards and guidelines interested in ethical aspects of professional accountants' activities) evaluate this section of controllers' work as quite important, according to the second group of respondents, recent stage in companies shows great possibilities for improvement in the future.

The results of this part of investigation are stated in Table 7.

**Table 7 - Controllers' role in ethical aspects of undertaking fulfilment**

	"Should be"		"Is"	
	Average	Mode	Average	Mode
It is important for a company to define, enhance, support and communicate effectively the ethical principles and rules of business	4.58	5	4.13	5
These principles and rules are explicitly incorporated into company standards, codes and guidelines	4.50	5	3.90	5
Controller participates in the development of ethical company standards, codes and guidelines	3.63	4	2.49	3
In the scope of his/her authorities and responsibilities, the controller participates in the inspection of these standards, codes and guidelines fulfilment	3.38	3	3.16	4
Controller serves as an informal authority in the fulfilment of these standards, codes and guidelines – in internal company environment as well as externally	3.38	5	2.68	1

Source: authors' calculations

### Human resource management

The section devoted to human resource management is concentrated in two basic problem areas:

- the selection of potential candidates for a controller position; and
- the attention which is devoted to controllers' continuing professional development.

The questions relating to the selection of potential candidates for a controller position provide especially interesting outcomes.

First: education and practical experience are considered to be more important than personal features and communications skills for both groups of respondents; nevertheless, the difference is small and confirms the high importance of communication and presentation skills.

Second: relatively high importance is also given to language knowledge; to some extent, the mode given by the group of managers of controllers is 5. The reason is probably due to the fact that a lot of companies in the sample belong to multinational corporations, and effective communication with higher corporate levels and other network members has a great importance.

The concrete results of the investigation are shown in table 8.

**Table 8 - Selection of potential candidates for a controller position**

In the process of potential controller selection it is important to take into consideration	"Should be"		"Is"	
	Average	Mode	Average	Mode
Previous education	4.17	5	4.03	4
Present practical experience	4.38	5	4.50	5
Ability to act with people and personality profile	4.08	4	4.06	4
Communication abilities and skills	4.33	5	4.04	4
ICT competencies	3.67	3	3.75	4
Language knowledge	3.57	3	3.44	4

Source: authors' calculations

Analysis of the area devoted to controllers' continuing professional development confirms that both groups of respondents consider professional development quite crucial for the quality of controllers' work. Management enables the continuing professional development of its controllers to some extent, especially when the company controllers are actively searching for such opportunities. However, according to the second group of respondents, company management does not pay adequate attention to whether controllers enhance their professional competence – especially if they are passive in this regard.

Both groups are unanimous that most controlling departments consist of a stable team of experts, one which does not change very much, and that is quite important for the quality of the team's work. Regarding remuneration of controllers, it seems to be slightly higher than the average companies' level.

The results of this part of investigation are stated in Table 9.

**Table 9 - Controllers' professional development**

	"Should be"		"Is"	
	Average	Mode	Average	Mode
Department of controlling consists of stable team of experts which do not change very much	3.75	3	4.11	4
In comparison with employees operating at the same organizational level, controllers are paid above average	3.30	3	3.57	4
Continuing professional development is quite important for the quality of the controllers' work	4.58	5	4.43	5
Company management enables its controllers to continue professional development	4.63	5	3.75	4
Company management verifies whether controllers enhance their professional competence	4.17	5	2.76	3

Source: authors' calculations

## Quality assurance of the controllers' work

Data gained from the part of questionnaire devoted to quality assurance confirm the necessity of regular evaluation of controllers' work. On the other hand, answers to the open question "How is the controllers' work evaluated?" were very general, for example through annual or regular interviews or, in multinational corporations, by the vague explanation "the evaluation is realised on a mother company level". In this regard, it seems to us that development of quality standards for this group of experts could enhance the general awareness of how to assure the future quality of the profession.

The results of this part of investigation are stated in Table 10.

**Table 10 - Quality assurance of the controllers' work**

	"Should be"		"Is"	
	Average	Mode	Average	Mode
Controllers' work quality is regularly checked and evaluated	4.48	5	3.85	5
Controllers' work quality assurance includes				
Correctness of entering data	4	5	4.04	4
Information relevance	4.67	5	3.87	4
Timeliness of rendered information	4.52	5	3.54	4
Formal level of rendered information	4.17	4	3.69	4
Neutrality and objectivity of information	4.71	5	3.71	4
Information flexibility	4.09	5	4.15	5
Information comparability and consistency	4.67	5	4.04	4

Source: authors' calculations

## Conclusions

Although the outcomes of the project investigated the situation in the Czech Republic, in our opinion it already brings some general inspirations both in the area of general usage of ideas which are the subject of the analysis of the "Draft for a Common Statement", as well as the outcomes which it is possible to derive from the empirical research.

Regarding generalization of the "Draft" ideas, it is apparent that the "Draft for a Common Statement" is the first, but nevertheless an important step on the road whose general aim is not only to define, but also to enforce into practice and assure (more non-formal than supported by legislation) recognition of quality standards for managerial accountants' and controllers' work.

Nevertheless, this Draft development has been very beneficial. Its content has already contributed to a better understanding of the differences which accompany the development of this profession in different part of the globe. It also enables better identification of common features, but also differences in profiles and professional orientations of professional accountants, auditors and professional accountants in business (like experts whose professional development has recently corresponded with a higher level of certainty) and of managerial accountants or controllers (whose quality professional development is the principle aim of this project).

Consequently, the Draft content creates a solid outcome for the development of the first set of "Standards of good practice", and discussion materials which can inspire by examples of "best practice", all of which should contain:

- a definition of aims, content and structure of pre-qualification education including requirement for assessment of acquired level of knowledge;
- a determination of requirements for professional skills of these experts including how they are acquired;
- a definition of ways to gain practical experience including the manners and methods of verification whether the experiences have been really accomplished;
- the development of a discussion paper which would define the aims, content, structure and ways to verifying the continuing professional development of managerial accountants and controllers; and last but not least
- the development of a code of ethics as a principle instrument to enforce professional approaches, values and attitudes in the work of managerial accountants and controllers.

Concrete suggestions regarding individual the abovementioned problem areas should be derived from the results of empirical research. Already investigations made in the Czech environment have brought some important stimuli for the controllers' professional development management:

- Controllers are required to be responsible primarily for the availability and transparency of the information rendered to company management; on the other hand they should not be responsible primarily for company's the financial results;
- In the area of requirements for education, both groups of respondents strongly highlight the knowledge of financial accounting and reporting, management accounting and corporate finance; on the other hand, knowledge of law, auditing, marketing and international aspects of business are considered to have lower importance; in the ICT area, the controller is considered to be mainly a user rather than an originator and verifier of processing and user quality;
- In the area of requirements for professional skills and practical experience, both groups of respondents consider soft skills to be important; nevertheless, they perceive technical skills even more relevant for the controllers' professional competence. According to the research, however, the recent situation in the Czech Republic in worse in the area of soft skills of controllers as company managers are not convinced about their importance;
- Both groups of respondents also confirm how important for a company it is to define, enhance, support and communicate effectively ethical principles and rules of undertaking; on the other hand, the research also confirms a very poor level of application of ethical principles and rules of business in practice; this is the reason why this aspect should be incorporated into the quality standards as a very important one;
- The results of the investigation into controllers' professional development needs confirm that both groups of respondents consider professional development to be quite crucial for the quality of the controllers' work; in this regard, management enables its controllers to continue their professional development, but it does not always verify whether controllers enhance their professional competence;
- The statistical results of quality assurance of the controllers' work confirm the necessity of evaluating controllers' work. On the other hand, answers to open questions such as "How is the controllers' work evaluated?" were very general.

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# Management information systems in the process of globalization

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## Abstract

Globalization is a phenomenon of nowadays associated with the development of information and communication technologies, information society and it also influences decisions of managers.

The aim of this article is to point out the benefits and evaluate the quality of management information systems on the base of requirements competitive environment. The realization of this aim is by analysis of management information systems in selected business subjects.

To study this issues we used observation methods and directed interview with researchers of software companies and employees of companies who operate with information systems. In the analysis, we focused on the conception of the system, it's components, integrity and functional properties, quality, possibilities of development and ,of course, we focused on the reliability of systems and it's stability. When we took measure the quality of information systems, we used objective, generally applicable and also subjective, individual criteria to determine the effectiveness of selected information systems.

The important aspect of succesfull use of management information system is to create a task to build or change the company information system. However, people do not like changes and under the successful and effective implementation of management system they are applied for changing the way of their work, and it birngs problems. For this reason, the task should be formulated to be clearly, which part of company and its relationships will be transformed and it has to be criteria for the selection of components of information systems and technology, which it will be deployed and which it will participate on the change.

The example of wrong approach is the task for implementation of the management information system as a superstructure of company information system. This task is usually created by aksing of supplier from individual managers, which information is needed for their work. The list of chaotic information is emerged, which management information system is not possible to provide, because it does not contain this list. It does not take them from anywhere. In many cases, when the management information system was deployed before, nobody did not suppose that requirements of management on the reporting or aggregated information emerge and some management information system will be built. The results of a such implementation is dissatisfaction of managers and according to them management information system is useless and costly, a lot of amount of money and dissatisfaction of implementors who claim that manager is not able to define what they want.

Management information systems represent an amount of organized processes of which main element is a human. When change the information systems and technology it is needed to explain to the people which are influenced by it in their job. For managers benefits are important which are brought by implementation of the new system and the return on investment. To qualify benefits and determine return on investment is difficult. According to the research, quatifiable benefits are in the fields of warehouse management and personal management. Qualitative benefits are in the field of quicker access to the required information, in the possibility of multidimensional analysis, multicriterial reviewes. The biggest

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benefit is in the improve decision-making which leads to competitiveness in the domestic and foreign market. On the base of realised analysis we point out on the demand and possibility of quicker processing of permanently increasing number of information and their more efficient use for direction and deciding of magers using business. In business practise emerge a need for graphically presented data out pots with the possibility of past orientation and changing points of view on it.

Management information systems ensure requirements definition on information, but fullfilment of requirements and information characteristics for the following periods. In conclusion, important assumption of succesfull use of management information systems and the whole information – communication infrastructure is their connection with the company strategy and ralize that this systems are not goals, but measures to ensure information needs.

### **Keywords:**

globalization, information, management, management information systems, software

### **Introduction**

The main goal of each business subject is to reach a profit and to maintain and improve its competitiveness. There are various management methods used by managers to meet the goal; they are affected by time and environment of managers' actions. Nowadays, the use of information systems and technologies is natural. Enterprises build their own information systems in order to acquire information about their operations. However, such systems are not always sufficient. This is related to the globalization processes, considerably affecting the ways of managerial work, while the need for pertinent information and knowledge concerning not only company environment is becoming a priority. Thus, the implementation of management information systems becomes a necessity.

### **Literature review**

Management information system (MIS) is defined by Bébr, Doucek (2005) as a part of internal information system, serving the needs of the company's management and administration at different levels.

The main objective of each company's management is to ensure the long-term preservation of the company's existence together with the highest possible level of profits. According to Becker (2008), high-quality management decisions and swift adaptation to new conditions and changes in markets require a specially developed and tailor-made management information system.

In the process of information systems' integration into the complex management information system, the main role belongs to the system integration. According to Kučera, Látečková (2011) system integration includes:

- data integration, i.e. creation and use of a common database,
- technological integration, forming a single system of hardware and software instruments from different producers via application software independent from hardware operation systems,
- methodological integration, i.e. establishment and use of a single methodology for the reation and development of information systems.

According to Kučera, Látečková (2006), MIS embraces a wide scale of application packages and operational frameworks which enable it to adapt to specific management requirements, supported by the proposed data warehouse and metadata management. Under certain condition, Data Warehousing or Data Mart may contribute to a successful MIS deployment in further data and information processing layers. The ways of data transfer from source information systems to relevant databases is not important for managers. The crucial

difference lies in the fact that managers do not work with spreadsheets; they use MIS tools enabling them to carry out business and statistical analyses of multidimensional information space swiftly enough. This way, it is possible to monitor and analyse controlling and cost management issues in several dimensions according to actual business and management tasks. Thus, the use of data warehouse provides the managers with new opportunities which had not existed earlier, and company information systems have not had sufficient tools to generate such information. It is necessary that MIS focus on the optimization of cost and operational as well as economic processes. It should send out warning signals in case of undesirable developments, too.

Mariaš (2007) state that a well-organized MIS reduces uncertainty and increases the level of managerial work certainty at the same time, especially in the sphere of decision making. It enables users to get a head start in business activities, as good information eliminate dealing with the known issues and time is not wasted on repetition of what has been discovered earlier. Finally, MIS increases the economic benefits of business activities, the most important being improved flexibility and competitiveness.

Benefits of Management Information System:

- Aid in Decision Making – MIS can generate synthesized and processed information from computerized / automated and certain manual systems. Information distribution to all levels of corporate managers, professionals and key executives become quite seamless with streamlined MIS. Managers are able to make quick, timely and informed decisions. Top management and board members can take strategic decisions, plan future growth and business expansion activities based on the data and information generated by MIS.
- Better Planning and Control – MIS is designed and managed in such a way that it aggregates information, monitors the company's activities and operations and enhances communication and collaboration among employees. This ensures better planning for all activities and better ways to measure performance, manage resources and facilitate compliance with industry and government regulations. Control helps in forecasting, preparing accurate budgets and providing the tools and vital information to employees, top management and business partners.
- Core Competencies – MIS provide the tools necessary to gain a better understanding of the market as well as a better understanding of the enterprise itself. Every market leading enterprise will have at least one core competency – that is, „a function they perform better than their competition.“ By building an exceptional management information system into the enterprise it is possible to push out ahead of the competition.
- Quick Reflexes – As a corollary to improved supply chain management comes an improved ability to react to changes in the market. Better MIS enables an enterprise to react more quickly to their environment, enabling them to push out ahead of the competition and produce a better service and a larger piece of the pie.
- Enhance Supply Chain Management – Improved reporting of business processes leads inevitably to a more streamlined production process. With better information on the production process, comes the ability to improve the management of the supply chain, including everything from the sourcing of materials to the manufacturing and distribution of the finished product. (Gupta, 2011)

## **Material and methods**

The aim of this article is to point out the benefits and evaluate the quality of management information systems on the base of requirements competitive environment. The realization of this aim is by analysis of management information systems in selected business subjects. To study this issues we used observation methods and directed interview with researchers of software companies and employees of companies who operate with information systems. In the analysis, we focused on the conception of the system, it's components, integrity and

functional properties, quality, possibilities of development and, of course, we focused on the reliability of systems and its stability. When we took measure the quality of information systems, we used objective, generally applicable and also subjective, individual criteria to determine the effectiveness of selected information systems.

## **Results and discussion**

Management information systems represent a great amount of organized processes, with managers as their central elements. The information managers need must be objective, true and available in real-time. Not all MIS meet the criteria. It happens quite often that the implemented MIS do not offer the expected comfort. Particularly in the sphere of outputs, the achieved reports are not flexible and adaptable enough in relation to changeable market conditions.

The elementary task of MIS is to support the decision-making process of managers. This especially includes the availability of data on problematic issues important for a company, such as: sales, production, acquisition, financial issues, human resources, logistics, and marketing.

The sphere of sales requires information support for monitoring and controlling of products and merchandise expedition and receivables collection, monitoring and controlling of complaints and offered discounts, overviews and analyses of sales in short and long time period in particular.

The sphere of production is always specific and belongs to the most complex with respect to computer control. This sphere must be approached with the foremost attention when implementing MIS.

The information needs from the spheres of accounting, finance, invoicing, asset recording etc. are commonplace nowadays. Managers come with further requirements for the detailed monitoring and analyses of costs. These information requests can be met applying high-quality software. The market offers independent cost management software products; however, most entrepreneurs favor cost management included in the MIS. The establishment of integrated databases serving as an information source for the whole company (all management levels) is one of the reasons behind this preference.

The biggest increase of managers' information requests has recently been oriented on the sphere of logistics. Costs saving in the areas of storage, transportation and acquisition are expected. The most frequent requests on MIS deal with recording and assessment of price quotes, materials and services of individual suppliers, electronic exchange of price lists, electronic ordering and the so-called controlled purchase operations in the company.

The sphere of marketing was quite a neglected one from the viewpoint of MIS tools implementation. Currently, the software solutions of the CRM (customer relationship management) type are available. These cover sharing vital information about customers within a company. This leads to the integration of customer relationships and other marketing activities.

The information connection of the whole economy is characteristic of the recent era. Many companies are automatically connected with their suppliers and customers. Nonetheless, managers are occupied with searching for necessary information, while cost management is becoming a priority, affecting the company economy the most.

When analysing MIS, the emphasis has been put on the cost issue as an important indicator of competitiveness improvement.

The substance of the MIS solution is a database (data warehouse) and the defined analysis methods. A database is made of a management information system itself, and the data analysis methods are normally supplied by software companies, while users have access to their modification and definition of their own analyses. Cost monitoring itself can be minutely performed within an implemented MIS, which makes it possible to identify costs by intra-organizational units, contracts, and performance or calculation units. This way,

accounting as an integrating part of the company information system can be used to the maximum extent. Other options are provided by MIS through incorporated analytical tools able to define the time dimension of costs evolution, costs evolution depending on several aspects at the same time (time and organizational unit or performance or contract), etc.

The creation of outlines is not restricted to one level only. The further text contains the multicriteria analyses most often used in practice:

- detailed chronological analysis of intra-organizational unit costs, signalling and analysing irregularities,
- cost analysis of intra-organizational units, enabling to compare and analyse costs belonging to the same category with the possibility to choose a time period,
- analysis enabling to monitor the proportional composition of costs and evolution trends.

Ex post cost analyses are as important for managers as prognoses of future development. The necessary data is available in MIS. Cost planning results from the requirements set by managers and from analyses of previous periods. Subsequently, it is important to monitor the real situation and to compare it to the planned costs; this can be carried out by MIS after setting respective parameters.

It is necessary to target the monitoring of direct and operational costs on specific contracts within the production process. MIS offers possibilities to monitor the real material, labour and other direct costs and calculation of indirect costs according to cost allocation base in detail. The fact that all costs are recorded on a real-time basis is essential.

Despite all of the above-mentioned advantages, only about a half of the managers finds MIS a qualitative asset. One of the reasons behind the fact is that they do not devote enough attention to the MIS selection. On the basis of the conducted research, it can be stated that there are following issues managers do not consider sufficiently when searching for proper MIS:

- specific conditions of the company,
- type of the company's production operation,
- available technical resources,
- MIS functions and options.

Also, managers often do not find it necessary to explain how the MIS implementation will change the company functioning, whom it will affect and in what way it will influence people's work; this results in dissatisfaction with the implemented MIS.

Success or failure of the implemented MIS often depends on how its efficiency is perceived. It is very difficult to define efficiency and benefits of the MIS. Generally the benefits can be expressed in two dimensions, qualitative and quantitative.

The qualitative benefits include database rationalisation, efficient changes in the company processes, more efficient factors of production, more efficient stock building, improved services for customers, enhanced growth and development, more efficient decision making.

The quantitative benefits include financial expression of the difference between the benefits caused by MIS introduction and the MIS introduction and operation costs. Financial theories offer many methods to calculate economic efficiency. In the authors' opinion, the following indicators can be used:

- *payback period:*

$$I = \sum_{i=1}^a (Z_i + O_i) \tag{1}$$

I = initial investment,

Z = annual profit from the investment after taxation in the years of the expected lifetime,

O = annual depreciation from the investment in the years of the expected lifetime,

I = individual years of the expected lifetime,

a = payback period.

The shorter the payback period, the more profitable the investment (Valach, 2006).

- *average annual cost method*

$$R = O + il + P; \quad (2)$$

R = average annual costs of a variant,

O = annual depreciation (continual transformation of the investment into costs)

I = interest rate (interest in %/100), representing the minimum profitability which must be provided by an economic IS,

l = investment,

P = other operational costs (i.e. total operational costs - depreciation),

- *average profitability:*

$$V_p = \frac{\sum_{i=1}^n Z_i}{n \cdot I_p} \quad (3)$$

VP = average profitability of the investment into IS,

Zi = annual profit from the investment after taxation in the years of the expected lifetime,

IP = average annual value of the fixed asset in its residual value,

n = expected lifetime,

l = individual years of the expected lifetime. (Vlachynský, 2009).

## Conclusions:

A high-quality MIS reflects reality, provides the maximum diversity of information solutions while being equipped with modern information and communication technologies. Its primary task is to ensure the competitiveness of a company.

Currently, mainly big companies have implemented MIS, following economic IS made of several mutually integrated subsystems ensuring the cost monitoring. Each of the subsystems is designed to follow a specific sphere of a company's economic activities (fixed assets, material, merchandise, intra-organizational stock, liabilities and receivables, cash, personal records etc.), thus creating the database for the application of the MIS mathematical apparatus.

The current paper is built on the basis of the research conducted at the Department of Enterprise's Information Systems, Faculty of Economics and Management, Slovak University of Agriculture in Nitra. The emphasis has been put on MIS, their implementation and benefits. The research results confirm that it is not possible to be competitive and profitable without any information support nowadays. The MIS implementation is considered the most suitable, as it is a precondition for successful development and sustainable market position and its efficiency provides its user with a competitive advantage.

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# Identifying the keys of growth in natural resource-driven countries in the knowledge economy

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## Abstract

The effect of natural resources (NR) has been an economic topic widely discussed by scholars and international organizations to provide solid arguments for a successful management of them. Traditional findings show a negative impact of NR on growth due to social, economic and environmental factors. This adverse result can be neutralized if countries promote a better institutional quality, increase human capital and adopt an industrial structure more knowledge intensive. In this paper which seek to know the keys for growth in natural resource-driven countries under the lens of the knowledge economy perspective. We show new evidence that corroborate how a development path based on NR is plausible if it is integrated intangible factors into growth strategies.

Cluster and data panel analyses allow us to identify the determinants of growth in specialized economies, along with a case study focused on Chile as a representative NR-driven country. This provides new clues extensible to other developing countries with an economic structure dominated by NR. The results confirm that there is a group of countries describing a successful growth trajectory based on primary industries while this path is grounded on innovation capabilities and institutional quality. The empirical study also reveals the essential role of openness and FDI as a channel to access foreign technologies and knowledge in these economies. The findings justify the design of a comprehensive framework for understanding the economic evolution of NR nations based on the strengths of intangibles without leaving their natural resource-intensive industries aside. The case of Chile also confirms the importance of intangibles for countries' growth and demonstrates that a weak innovation capability can block progress, despite the successful advance of openness, FDI, investments and NR exploitation. Thus, the key aspect would be the transformation of activities related to NR exploitation in an endogenous process, by strengthening the knowledge-based assets of endogenous nature, into the NR industry.

## Keywords:

Innovation, Chile, Knowledge economi, Knowledge, intangibles, natural resources.

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## 1. Introduction

The recent economic crisis has brought back old questions among economists and accentuating the interest on how to reach a sustainable progress. Although being successful in the past, the most traditional economic approaches seem to be failing to support growth in the long term, even affecting cultural and social arrangements. As Rodrick (2008) pointed out, there are many ways to achieve development, a lot of factors are involved in the process and there are various possible manners to combine them. Some elements are always critics for any trajectory, while others have different performance depending on a set of complementary variables and applied strategies. In this regard, natural resources (NR) traditionally have been considered an important factor for countries' progress; however, these have been also seen as responsible of social, environment and economic collapses, in spite of their importance as productive resource (Frankel, 2010).

Seminal work on NR and growth by Sachs and Wagner (1995,1999 and 2001) indicated that resource-abundant economies tend to grow slower than economies without important resource endowments. The causes of this fact would be in the presence of weak institutions, lack of capabilities, and wrong strategies applied to avoid the consequences of perverse incentives of windfalls and regular profits of NR exploitation, which may result in social conflicts, deindustrialization, civil wars, inequality, excessive public sector indebtedness, and environmental damage (Manzano and Rigobon, 2007; Wright and Czelusta, 2007; Van der Ploeg, 2011).

This negative picture that can be observed in countries such as Angola, Nigeria, Zambia, Sierra Leone, Venezuela, among others, contrasts with some successful cases of economies based on NR industries. Norway, Canada, Australia are examples among them, where NR have served as basis for their development, and even today primary resources remain relevant for the economic performance (Smith, 2007; Saether et al., 2011; Ville and Wicken, 2012). Then, several questions emerge from these contrasting facts: Why natural resources generate such different effects ? What factors are most influential in the NR performance? What trajectory is described by successful NR-driven countries? What are the key elements for policy making? These questions are discussed in this paper in order to assist policy makers and entrepreneurs to deal with the challenges of NR production. Thus, the main purpose is to identify the determinants of growth in NR-driven countries, since the literature does not offer clear clues on how these natural endowments may serve as a lever for progress. To achieve this aim, the research is conducted using the knowledge-based economy framework, which provides new tools to understand economic development in the knowledge era. This perspective assumes intangible assets as core elements of national economies and as source of sustainable development (Edvinsson and Kivikas, 2004; Corrado et al., 2009). These intangibles assets have a cumulative and complex nature, and they are the basis of innovative capability and absorptive capacity, as evolutionary growth theory argued (Nelson, 2008).

The analytical strategy to address this research has three steps. First, to seek to detect countries that describe a positive growth path driven by NR through cluster analysis methodology. Secondly, an empirical growth model to identify the pillars of growth in NR-based economies. This model includes both traditional production factors (capital, labor and NR) and those proposed by the Knowledge Economy framework

(human capital, openness, foreign direct investment –FDI, technology capacity, and institution quality). Finally, a dynamic growth analysis is applied to the Chilean case, following Fagerberg et al. (2007) model, along with a convergence evaluation. Chile is selected as a representative emerging NR-based country to analyze growth dynamics and to suggest future policies that could be implemented in other nations with a similar industrial structure.

The results show that there exists a relevant set of countries that share a successful growth path characterized by a strong dependence on NR-based industries. Model estimation findings confirm that NR can positively affect growth of specialized economies (NR-driven), while in developed economies (OECD) their impact is not significant. The analysis also reveals the importance of the international dimension as a channel for accessing embedded technologies via FDI and trade. In addition, a positive effect of local innovative capabilities has also been detected. This would indicate that not only absorptive capacities, but also innovative capabilities, are required in these economies. Furthermore, institutions were also identified as an important factor for growth, since they facilitate the control of the pressures resulting from the exploitation of NR and provide a stable environment for investors and producers. Thus, this path assumes primary resources as a pillar of the economy, and investment in intangibles within the NR sector as a key driver to get higher added value activities, product diversification and to encourage exports.

The study of the Chilean growth dynamics clearly shows a loss of vitality, and the convergence study explains this fall in term of the weak technology capability, the insufficient institutional quality and the short productive investments. Thus, from empirical analysis and under a Knowledge Economy perspective, it was possible to identify a growth path based on NR and intellectual capital while for a successful development path, these economies necessary combine NR with intangible assets, through openness, FDI, higher innovation capabilities and good institutions.

## **2. Literature background**

Numerous studies have been conducted to know the causes of failure of largely resource-rich countries and specialized in primary industries. Seminal work by Sachs and Warner (1995, 1997 and 2001) opened an important discussion about the impact of NR on growth, and the explicative factors behind it. First contributions argued that NR negatively affected economic performance as consequence of a mix of economic and social causes. Findings showed that NR-based economies grew more slowly than their potential, or fall definitely into recession (Mehlum et al., 2006), results that would be explained by economic imbalances as a consequence of an excessive public spending, macroeconomic instability and a high concentration of exports. In addition, Dutch disease (Corden and Neary, 1982) is another consequence of NR exploitation due to the currency appreciation problem as well as the industrial concentration in resource sectors, ultimately impacting the competitiveness of manufacturing exports that drives towards a deindustrialization process (Manzano, 2012). These economic effects of NR activities, and its causes, were also related to the social scope in a reverse way. Scholars observed a strong relationship between commodity production and social conflicts. NR-rent seeking was considered as the origin of the fights, since conflicting groups try to preserve the property of those profitable endowments as tool to finance illegal acts (Rosser, 2006). As Ross (2004) indicated, this situation appears more frequently when there are social inequalities and weak institutions, especially insufficient rule of law, high corruption levels and the presence of terrorist activities. In these cases, governments are unable or unwilling to change this path, and hence crisis and instability are maintained for decades deteriorating even more institutions quality. This leads to a vicious circle, where NR exploitation damages institutions, while weakened institutions adversely affect the

economic performance of NR. Thus, institutional quality seems to be both the responsible and the result of NR exploitation. Acemoglu and Robinson (2012) defended that institutions are key for growth. They argued that extractive ones cause failure, while inclusive institutions support sustainable progress.

A third dimension has also been considered as a determinant of NR impact. NR could cause negative effects on environment and development if some cautions are not taken into account. Given the finite nature of non-renewable resources, their exploitation reduces the reserves, in turn affecting growth in the long term (WTO, 2010). Moreover, in renewable resources, such as forestry and fishery, the extraction rates can be higher than those of self-regeneration, causing scarcity and environmental degradation. Although this scarcity can be compensated by technical progress in exploration, extraction, and substitution (Van der Ploeg, 2011), these innovations also improve productivity increasing profits and exploitation activities (Smulder, 2005; Stavins, 2011), and a vicious circle could begin. Thus, both degradation and depletion end up being a constraint to development, requiring strong regulatory measures to reduce or mitigate their effects, for which good institutions are essentials.

Recent pieces of literature are recognizing the potential role of NR- for growth, when there is an adequate combination with human capital (HC) (Iizuka and Soete, 2011; Bravo-Ortega and De Gregorio, 2005; Manzano, 2012), good institutions (Mehlum et al., 2006; Frankel, 2010) and an intensive use of high technologies and knowledge that can create windows of opportunity for diversification and development (Lindkvist and Sanchez, 2008). Moreover, Hauser et al. (2011) indicate that the integration of social factors is also required to achieve positive results in terms of sustainable development.

These new perspective is part of the Knowledge Economy (KE) framework, which postulates that intangibles assets are the core of the development process. In the KE, intangibles are as important as physical assets, and the exploitation of technologies becomes more significant than raw materials production or low-cost labor for nations' competitiveness (Dunning, 2000; Edvinsson and Kivikas, 2004; Corrado et al., 2009). In such an economy, sustainable competitive advantages are driven by the creative, innovative and sophisticated use of knowledge and intellectual assets (Passerini, 2007; Mokyr, 2010). Innovation increases competitiveness of firms, industries and nations, and brings disruptive change into the production process and markets (Schumpeter, 1947), breaking the economic determinism of Neoclassic approach (Castellacci, 2006; Dosi and Nelson, 2010) and the potential resource curse described by the literature. Thus, knowledge can be created and incorporated into traditional activities, resulting in new opportunities for low-tech and resource-based industries, diversifying, adding value, and reinventing these sectors.

As a result of the dynamics and relevance of knowledge for the economy, scholars built a theoretical framework in the context of the KE, called Evolutionary Theory, in which innovation is at the core of growth and knowledge is understood as a complex entity that cannot be analyzed in purely economic terms, since it is often tacit, interactive, systemic, breaks the stability, continually upsets equilibrium, and is embodied in people and organizations (Nelson and Winter, 1982; Morcillo, 2006). According to this theory, there is no theoretical optimum and the economy is in permanent disequilibrium, since the possibilities for economic action are always changing through a complex process of co-evolution and transformation in which the dynamic relationships between technological, economic and institutional changes play a determinant role (Dosi and Nelson, 2010; Castellacci and Natera, 2013).

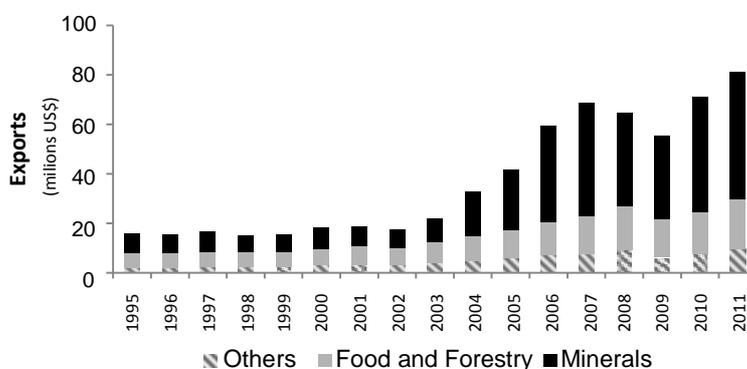
Under this perspective, unlike neoclassical postulates, traditional industries (such as those based on NR) could takeoff - or advance - creating and incorporating innovations in the system of production and management, which may result in new products and

services. This wealth creation would be supported on the intangible assets of NR based sectors, as well as those provided by transverse and supplier industries, as part of spillover effects. Thus, new opportunities may emerge in primary sectors by investing in intangibles within sector, avoiding abandon them as indicated traditional recommendations (Sachs and Vial, 2002; Rosser, 2006; Malone, 2007; Manzano, 2012; Ville and Wicken, 2012).

Empirical studies are seeking to identify clues for NR-driven countries in the knowledge era. Successful evidence in cases such as Australia, Sweden, Norway and Canada would indicate that technical change is a key element (Howitt and Mayer-Foulkes, 2002; Lederman and Maloney, 2007; Crawford et al., 2010; Ville and Wicken, 2012). However, the progress would be possible if a mix of good institutions, suitable policies and innovation capabilities are present into the system (Castellacci and Natera, 2013), but as Rodrick (2008) indicates, there is not only a successful combination of key variables, but rather the evidence offers a number of examples from which several lessons can be learned. In this regard, Chile is an interesting case of a developing an NR-based country, leader in its region and with a recommendable growth path for similar economies (Rosser, 2006; Frankel, 2010). According to the World Bank (2013) countries' classification, Chile is a high-income economy, reaching a per capita GDP in 2012 of US\$15,848, equivalent to 1.8 times higher than in 1980. Chile is the most competitive economy in Latin America, and its successes are result of strong institutional setup, efficient government, macroeconomic stability, and great openness to foreign trade (WEF, 2013).

In addition, NR have also been part of this economic success. According to UNCTAD (2013), NR exports represent more than 80% of total country exports, with mining (mainly cooper) responsible for more than 60%, and renewable resources - food and forestry - around 25% (Graph 1).

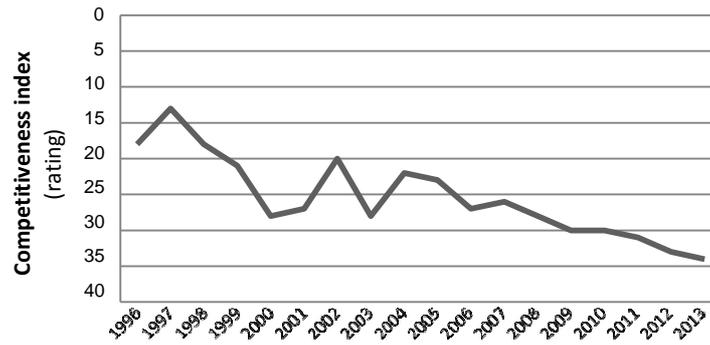
**Graph 1. Exports of Chile between 1995 and 2011**



Source: data from UNCTAD

However, income is far behind developed economies, and some signs of middle income trap (MIT) have been identified in the last decade (Pérez, 2012; Traub, 2013). This complex situation is also reflected in the fall in competitiveness index (Graph 2) as result of structural failures and a strategy closer to an absorptive or “open innovation system” (Lee et al., 2012), instead of an endogenous innovation strategy.

**Graph 2. Competitiveness index of Chile by WEF**



Source: data from WEF's reports

### 3. Research objectives and methodology

The contrasting evidence suggests that there are certain elements that determine the outcomes. These factors would be built on the basis of elements that evolve and change along time. Therefore, our main purpose is to know the keys of growth in natural resource-driven countries in the knowledge economy.

Past lessons do not necessarily provide enough suitable clues for country development, as the base of economy has moved to intangible assets and permanently are emerging new interconnections between them. For this reason, our first specific objective is to identify the pillars of prosperous economies based on NR industries. Unlike most studies on growth and NR that define target sample using rankings built with NR indicators, we apply a cluster analysis to identify a set of countries that meet two main conditions: outstanding economic performance measure by per capita GDP and its growth, and high relevance of NR production in GDP, assessed through mineral rents and the added value of agriculture over GDP. Oil rents, an important source of wealth for many countries, have not been included to avoid bias of oligopolistic behavior. According to the literature, current sources of progress are immaterial factors, as the KE argued (David and Foray, 2002; Foray, 2004). Furthermore, traditional production variables – capital and labor – remain important for NR sectors, as they are capital intensive (e.g. mining) or labor demanding (e.g. agriculture). Therefore, to know the determinants of GDP in countries specialized in NR, we estimate an applied growth model integrating a combination of physical and intangible explanatory variables. Following to evolutionary authors, we use patent as an indicator of innovation capability, while schooling is taken as reflection of human capacity. FDI (stock of inward FDI) and openness (the weight of imports and exports in GDP) were introducing into model as indicators of the international influence because of the importance of them as a way to capture knowledge and technology from advanced countries (Keller, 2004; Bas and Kunc, 2009). An Institutions index, developed according to WB methodology (Kaufmann et al., 2003), is added to introduce the effect of local context. This index is composed of five indicators (Rule of law; Corruption control; Voice and Accountability; Political stability and Absence of violence/ terrorism; Government effectiveness; and Regulatory quality), capturing a wide range of institutional elements. Finally, to identify NR impact on GDP, a Specialization index was calculated as the ratio between natural resource exports and total exports. Unlike Intensity index, defined as the ratio between natural resource exports and GDP (Sachs and Warner 1995 and 2001), the Specialization index offers a better understanding of primary economies and their international trade, common in developing countries and target of this work. A complete description and source of variables is provided in Table 1.

**Table 1. Definition of variables and indicators included in the model**

Variable	Definition	Source
GDP	Per capita GDP, PPP, at 2005 constant prices (US\$)	CANA from Penn World Table
Labor	Labor force, total	WDI
Capital	Investment. Share of per capita GDP (constant prices 2005, PPP) Converted (%)	Penn World Table
Mining	Mineral rents (% of GDP)	WDI
Oil	Oil rents (% of GDP)	WDI
Agriculture	Agriculture, value added (% of GDP)	WDI
Forestry	Forest rents (% of GDP)	WDI
Patents	US Patents granted per country of origin. Number of utility patents granted by USPTO per year and the inventor's country of residence per inhabitant	CANA from USPTO
Schooling	Mean years of schooling. Average number of years of school completed in population over 14	CANA from Barro & Lee and WB
Inward FDI	FDI Inward Stock (%GDP)	UNCTAD
Openness	Openness indicator: (import + export)/per capital GDP ppp	CANA from UNCTAD
Institutions	Index composed of: Rule of law; Corruption control; Voice and Accountability; Political stability and Absence of violence/terrorism; Government effectiveness; and Regulatory quality	World Bank
NR specialization	NR exports as share of total exports	UNCTAD (exports)
NR intensity	NR exports as share of GDP	UNCTAD (exports), CANA and WDI

Source: Authors' elaboration

We use panel data method in the model estimations because it permits to deal with country fixed effects. The estimation is carried out using both static and dynamic Panel data in order to assume a possible endogenous structure, as a consequence of the path-dependent trajectory and the cumulative process of capabilities (Dosi, 1988). Difference and System GMM specification, developed by Arellano and Bover (1995), is performed, which takes the regressors in levels and differences as instrumental variables, making it possible to use all the available moment conditions and thus providing a better estimation. The general specification would adopt the following form:

$$GDP_{it} = \beta_0 + \beta_1 K_{it} + \beta_2 L_{it} + \beta_3 NR_{it} + \beta_4 Pat_{it} + \beta_5 FDIIS_{it} + \beta_6 Op_{it} + \beta_7 Sch_{it} + \beta_8 Ins_{it} + \eta_i + \gamma_t + \varepsilon_{it} \quad (\text{Equation 1})$$

$$GDP_{it} = \beta_0 + \beta_1 GDP_{it-1} + \beta_2 K_{it} + \beta_3 L_{it} + \beta_4 NR_{it} + \beta_5 Pat_{it} + \beta_6 FDIIS_{it} + \beta_7 Op_{it} + \beta_8 Sch_{it} + \beta_9 Ins_{it} + \eta_i + \gamma_t + \varepsilon_{it} \quad (\text{Equation 2})$$

Where:

- GDP: In per capita Gross Domestic Product (GDP)
- $\beta_1 GDP_{it-1}$ : lag of dependent variable (In per capita GDP in t-1)
- K: In Capital, investment
- L: In Labor
- NR: In Natural resources, specialization
- Pat: In Patents
- FDIIS: In FDI, inwards
- Op: In Openness
- Sch: In Schooling
- Ins: Institution index

The subscript it refers to the country i in period t,  $\eta_i$  and  $\gamma_t$  represent individual and time effects, respectively;  $\varepsilon_{it}$ : random error term.

In addition, we incorporate different combined variables with NR; in particular, NR and institutions, patents, FDI and schooling (NR x Ins; NR x Pat; NR x FDI; NR x Sch, respectively) to identify the compound effect of intangibles factors and NR that allows us to capture the interaction between the conventional approach on NR and the KE principles.

The following step of this research was to study the dynamics of growth process in a specialized and developing country such as Chile, where NR have not only been an income generator engine but have also played the role of lever for development. This country is rather a good case of successful economy growth based on NR than an example of succeeding economy according to the KE model while now it is facing a complicated crossroads. Until now, Chile has been successful applying technological innovations from developed countries to its NR industries. Thus, Chile has followed an absorptive or “open innovation system” (Lee et al., 2012), through a “Developmental Network State” approach (Negoita and Block, 2012), instead of an endogenous innovation strategy.

Therefore, the second specific objective here is to know the dynamics of Chilean growth and the convergence process of the key determinant factors, a proposal that seeks not only to look into the past but also detect some future clues for a sustainable strategy in the long term that would be also suitable for other NR countries. We used the methodology presented by Fagerberg et al. (2007) to characterize country performance which grouped economies into four categories: Catching up, Losing momentum, Moving ahead, and Falling behind. Unlike these authors, we take several periods of a same individual – Chile – in order to try to understand the evolution of growth. This analysis allows us to see the growth path of a country and its comparative performance.

To complement this analysis, a convergence study ( $\beta$  convergence) is performed in order to assess in depth the gap reduction of each key component of the Chilean economy and the evolution. For this evaluation, distance between countries was calculated according to Li and Liu (2005):

$$\mathbf{GAP}_{it} = (\mathbf{A}_{\max} - \mathbf{A}_{it}) / \mathbf{A}_{it} \quad (\text{Equation 3})$$

Where:

GAP: is the GAP between the leader and the economy analyzed i in the time t

$A_{\max}$ : data from leader economy

$A_{it}$ : data from economy analyzed (i) in the time t

Meanwhile, the convergence (Sala-i-Marti, 2000) is estimated as follow:

$$\mathbf{A}_{it} = \alpha + \beta t \quad (\text{Equation 4})$$

Where:

A: is the GAP between country i and the leader, in the time t.

$\beta$ : Convergence coefficient

t: time

$\alpha$ : Intersect of the model

$\beta$  coefficient indicates if a country reduce the gap with the frontier economy. We used Canada and Australia as NR leaders, and additionally the Chilean data are also compared with the US because this is one of the most developed nations and its historic trajectory also shows a NR specialized path.

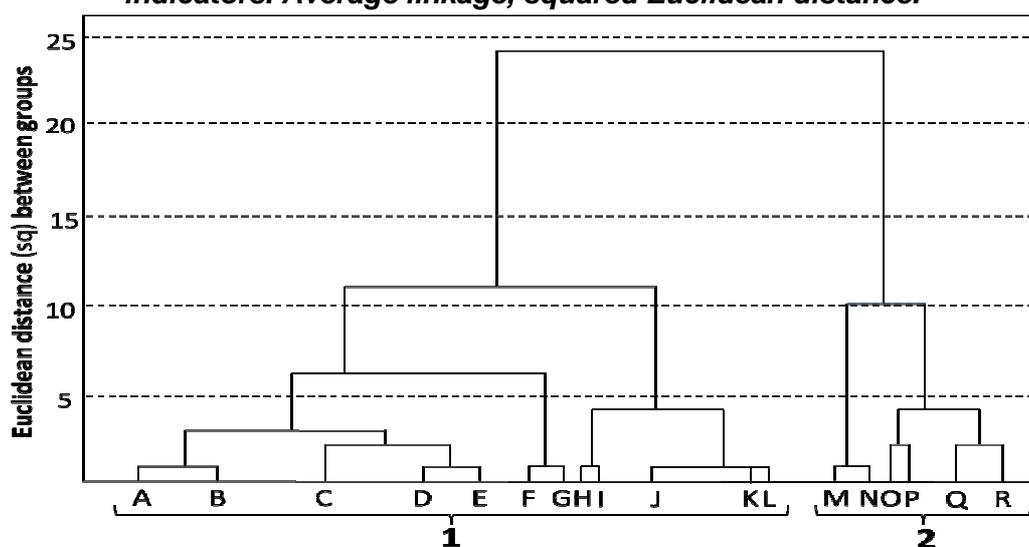
Statistical information has been obtained from different international sources such as WDI, UNCTAD, and CANA (Castellacci and Natera, 2011) databases, for the period 1980 to 2011. The sample is composed by a set of 145 countries.

#### 4. Results and discussion

The cluster analysis used to identify countries that describe a growth trajectory based on NR, resulted in a group of countries formed by nations with an outstanding economy and a productive structure highly dominated by primary industries. This group (named NR-driven) is made up of Argentina, Australia, Canada, Chile, Colombia, Kazakhstan, Mexico, Peru, Russia, Malaysia, and South Africa. Unlike previous studies, this statistical tool has clustered in one group apparently very different countries, located in distinct regions and continents, with distinct cultures and ethnic origins, and contrasting political and governance regimes. This situation agrees with Mehlum et al. (2006) who argue that origin or geographical location is not a determinant of growth, unlike institutional quality, openness and NR. Furthermore, in the NR-driven cluster there are developed and developing countries, which would indicate that NR may have a dual role: driving (big push effect) and supporting growth.

The next figure (Figure 1) shows the cluster dendrogram of country classification according to GDP per capita, growth and NR. Groups A and B include most of the developed and emerging countries with high or medium-high income. In addition, Cluster B is made up of NR-driven and prosperous countries (upper middle and high income countries according to the World Bank classification). A complete list of countries integrated in each cluster can be seen in annex 1.

**Figure 1. Cluster dendrogram of countries according to economic and NR indicators. Average linkage, squared Euclidean distance.**



Source: Authors' elaboration

These results would indicate that NR could lead toward economic development; however, they may also conduct to failure. In order to get a better understanding of the responsible factors behind these opposite results, we perform an applied model of growth, including both tangible and intangible variables that will allow us to provide some insights for managing NR-based countries.

#### **4.1. Determinants of growth in NR-driven countries**

According to results from Cluster analysis, it can be said that those countries grouped in different clusters would be conduct under distinct strategies, probably supported on a diverse combination of resources. The models were performed in order to know the growth determinants in NR-specialized and successful economies, that is the NR-Driven countries sample (in this group, Malaysia is not included due to its different current industrial structure) and in the OECD sample (mainly high income and developed nations). A third group, named NR-dominated, was also incorporated into the analysis to try to identify the possible differences existing within NR-based economies. This set of countries (NR-dominated) is integrated by economies where NR exports represent more than 50% of total exports (see Annex 2 for group composition).

The results show (Table 1) that conventional production factors – capital and labor - have a positive effect on the national product in all the samples, but natural resources show different behaviors. In NR-Driven and NR-dominated economies primary resources positively affect GDP; by contrast, its role in OECD countries is not significant, a result consistent with previous evidence. In fact, theoretical and empirical contributions predict that NR can have different impacts depending on a set of complementary factors and the strategies carried out to exploit and manage NR endowments, affecting institutions, environment and industrial structure (Mehlum et al., 2006; Lederman and Maloney, 2007). However, doubts persist about the determinants of this process. Regarding this, the literature indicates that institutional frame and economic context would be the main responsible of NR performance. In addition, authors argue that the causes are interconnected and have multiple dimensions. Our empirical analysis (Model A) clearly indicates the positive effect of openness and the importance of international trade for any economy as a way to export their products and to take advantages from the access to foreign goods markets with competitive prices.

Model B also shows that internationalization is a mandatory way for development of NR-based countries. In addition to openness, FDI have a significant and positive impact on GDP in both,OECD countries and NR-Driven countries, because it not only provides capital to host country, but also it is a recognized source of foreign knowledge and technology (Kelller, 2004), that are essential resources in this type of economies.

In more complex and advanced countries, such as NR-Driven and OECD, intangibles become relevant assets to support a long-term development path, as demonstrated Wright (1990) for USA, Blomström and Kobbo (2007) for Sweden, Smith (2007) for Finland; Sæther et al., 2011; and Ville and Wicken (2012) for Norway, Negoita and Block (2012) for Chile. Our results confirm that, in NR-Driven countries, innovation capabilities is a key element for countries' growth, indicating that catching up strategies should be combined with local innovation, which would denote a dependence on foreign knowledge to increase local productivity (Mastromarco and Ghosh, 2009), and the need to develop own technologies and knowledge.

In advanced economies, education takes a more active role, as it is shown by the estimation of Model B for OECD. In the case of NR-Driven economies, it is not clear that education does not positively impact on development, but this result would rather reflect that these nations have not yet managed to overcome the threshold above which it becomes essential, as argued by Mehlum et al. (2006). Moreover, labor indicator would be absorbing part of its effect.

The analysis also demonstrates the crucial role of institutions for growth. In fact, when specialized economies progress to higher development stages, institutions become determinants of economic growth, because good institutions avoid corruption, favor social and economic stability, control public indebtedness, reduce risk of social conflicts, and maintain a rational and balanced industrial policy (Rosser, 2006; Van der Ploeg, 2011; Acemoglu and Robinson, 2012). In particular, corruption control, democracy and transparency are essential, because currently these industries require social acceptance and stability.

Special attention should be paid on NR profits. Evidence indicates that interest groups could push government to meet their particular wishes, instead of orienting NR revenues in productive investments or to develop capabilities for future wealth creation. NR profits should be aimed at improving innovation capabilities through a better education level, advanced scientific facilities and infrastructures, R&D investments, or be invested in transversal and promissory technologies for NR industries. In addition, developmental network should be strengthened as a tool to generate greater synergies between actors and spillover effects (Negoita and Block, 2012).

In the case of OECD, the indicator of institutions is not significant and this can be interpreted according to the short variation of the variable values across countries in this group as these nations have already achieved high and stable levels of institutional quality.

**Table 1. Panel data analysis of physical and intangibles factors**

Variable	MODEL						MODEL						MODEL					
	NR dominated		NR-Driven		OECD		NR dominated		NR-Driven		OECD		NR dominated		NR-Driven		OECD	
	coef	se	coef	se	coef	se	coef	se	coef	se	coef	se	coef	se	coef	se	coef	se
Capital (invest.)	0.135*	0.07	0.657***	0.11	0.455***	0.13	0.132*	0.07	0.690***	0.11	0.447***	0.14	0.131*	0.07	0.649***	0.13	0.447***	0.13
Labor	1.086***	0.25	1.004***	0.30	1.701***	0.24	1.085***	0.25	0.680**	0.31	1.529***	0.26	1.085***	0.25	0.409***	0.16	1.530***	0.25
NR (specialization)	0.286***	0.10	0.398***	0.15	0.028	0.06	0.301***	0.10	0.305***	0.09	0.036	0.05	0.303***	0.10	0.383***	0.10	0.036	0.05
Patent	0.048	0.03	0.081**	0.04	0.075***	0.03	0.041	0.03	0.055**	0.03	0.045**	0.02	0.040	0.03	0.077***	0.03	0.045**	0.02
Education (schooling)	-0.004	0.31	0.537	0.41	0.965***	0.36	-0.036	0.31	0.538	0.44	0.784**	0.34	-0.039	0.31	0.607	0.41	0.784**	0.34
Openness	0.148**	0.07	0.167**	0.08	0.365***	0.09	0.130*	0.08	0.152*	0.08	0.230**	0.09	0.129*	0.07	0.245**	0.10	0.230**	0.09
FDIIS							0.043	0.04	0.141**	0.05	0.100***	0.03	0.043	0.04	0.150***	0.05	0.100***	0.03
Institutions													0.010	0.11	0.235**	0.11	0.004	0.11
cons	-7.50**	3.51	-9.09**	4.25	-19.44***	3.49												
							-7.64**	3.53	-4.70	4.38	-17.01***	3.76	-7.66**	3.56	-0.47	2.15	-17.04***	3.75
Hausman test																		
(chi-sq)	84.87***		20.87***		204.82***		84.96***		16.90**		169.97***		131.36***		4.63		56.4***	
R-sq (within)	0.4999		0.7748		0.8028		0.5055		0.8087		0.823		0.5055		0.805		0.823	
R-sq (between)	0.0567		0.0419		0.0022		0.0602		0.1676		0.0009		0.0586		0.8238		0.001	
R-sq (overall)	0.0006		0.0813		0.0037		0.001		0.2506		0.0025		0.0007		0.8191		0.0025	
F (chi2)	16.2***		34.55***		59.93***		15.04***		72.10***		62.15***		15.21***		528.07***		54.44***	
Number of observations	479		128		426		479		128		426		479		128		426	

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Fixed effects, except the last estimation of NR-Driven (random effects). Robust standard errors.  
Source: Authors' elaboration.

These findings reveal that RN may have a positive impact on GDP and these may serve as a "big push", and it is also possible that they provide an ongoing support for growth in the long run. But in order to achieve that goal, national strategies have to combine traditional resources (capital and labor) with intangible assets, the latter including the ability to absorb knowledge and foreign capital, together with local innovation capability within an inclusive institutional framework.

In order to verify the combined effects of intangibles and NR on GDP, of countries driven by NR, we introduce variables that reflect the joint action of NR with institutions, patents, education and foreign direct investment. The results (Table 2) corroborate that the capability for innovation, absorptive capacity and FDI are pillars of growth in specialist-NR economies. In addition, institutions and NR positively affect GDP in NR-Driven economies, confirming the findings of authors such as Gylfason y Zoega (2006); Mehlum (2006); Giménez y Sanaú (2007) and Frankel (2010).

**Table 2. Panel data analysis of physical and intangible factors for NR-Driven countries.**

	Model C		Model C-1		Model C-2		Model C-3		Model C-4		MODEL C-5	
	coef	se	coef	se	coef	se	coef	se	coef	se	coef	se
GDP (L1)											0.496*	0.28
Capital (invest.)	0.649***	0.13	0.681***	0.11	0.724***	0.11	0.648***	0.13	0.693***	0.11	0.357**	0.14
Labor	0.409***	0.16	0.322***	0.10	0.343***	0.12	0.674**	0.29	0.424**	0.17	-0.076	0.42
NR (specialization)	0.383***	0.10									0.256*	0.14
Patent	0.077***	0.03	0.105***	0.03			0.057**	0.03	0.065**	0.03	0.094*	0.05
Education (schooling)	0.607	0.41	0.700*	0.40	0.747*	0.41			0.658	0.42	0.526	0.52
Openness	0.245**	0.10	0.240**	0.10	0.217*	0.11	0.195**	0.09	0.210**	0.10	0.188***	0.07
FDIIS	0.150***	0.05	0.153***	0.04	0.176***	0.04	0.136**	0.06			0.122***	0.05
Institutions	0.235**	0.11			0.143	0.09	0.136	0.16	0.163*	0.10	0.126	0.14
NR x Inst			0.360***	0.11								
NR x Pat					0.092***	0.03						
NR x Edu							0.398**	0.18				
NR x FDI									0.179***	0.04		
_cons	-0.469	2.15	1.329	1.26	0.300	1.78	-4.391	4.62	-1.152	2.42	4.592	5.00
Hausman test (chi-sq)					10.43		26.8***		5.96			
R-sq (within)	0.805		0.7991		0.7886		0.8091		0.8001			
R-sq (between)	0.8238		0.8459		0.8515		0.3745		0.8058			
R-sq (overall)	0.8191		0.8351		0.8402		0.4365		0.7968			
Observations	128		128		128		128		128		60	
Specification	Random		Random		Random		Fixed		Random		Two steps	
Instruments											11	
Arellano-Bond test for Ar(1)											-2.28**	
test for Ar(2)											-0.81	
Sargan test (chi-											0.88	

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Robust standard errors.

Source: Authors' elaboration.

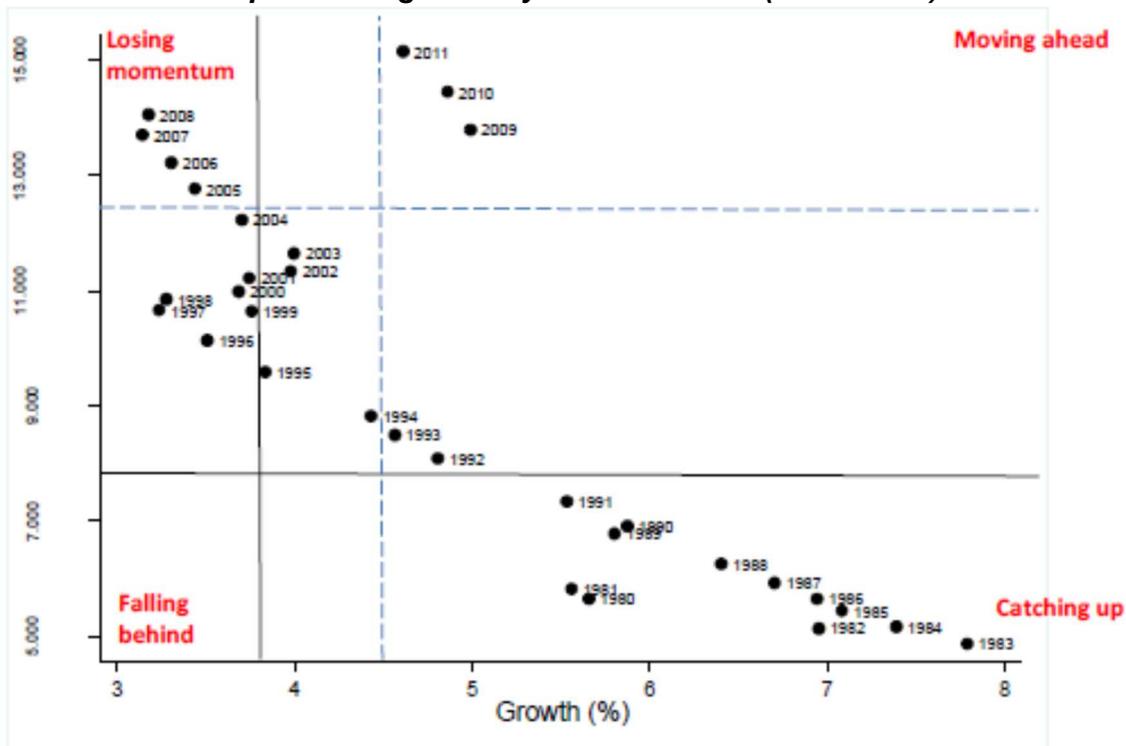
Finally, to test the potential endogenous process and as a test of robustness, we estimated the dynamic panel specification using the Difference and System GMM method for the sample NR-Driven (Table 2, Model C-5). The results show the same tendency as the static models do. However, the estimated coefficients of some variables, like labor and institutions, are not significant due to the strong effect of lagging GDP as the path dependency literature described (Dosi, 1988), which would indicate the importance of long-term policies to achieve sustainable development. The high concordance among the results is remarkable and reflects the strong explanatory power of the proposed model that integrates intangibles as a key determinant of GDP.

## 4.2. Growth determinants of Chile and its main constrains

Literature on NR and growth has provided abundant insights about failures, however the causes and strategies in positive cases are still insufficiently clear and some open questions remain. An exceptional case is Chile, whose economic trajectory shows a jump in per capita GDP and steady growth over the past thirty years. Its industrial structure is clearly dominated by NR industries, producing primarily commodity.

Despite of these remarkable results, a deeper analysis of the dynamics of growth shows an almost continuous fall during the period 1983-2011 (Graph 3), probably because Chile has followed a strategy more absorptive or based on an “open innovation system” view (Lee, et al, 2012) instead of an endogenous innovation strategy based on the KE principles. Therefore, the second motivation to study this country is to reveal hidden facts about its growth path that could serve to other specialized nations. Following the taxonomy presented by Fagerberg et al. (2007) on growth dynamics, we analyzed the case of Chile. This clearly indicates a declining trend in its growth path and this confirms the problems to sustain a high development standard. During the eighties the economy was in a catching up stage, while in the nineties it moved toward losing momentum during the 2000s. At the end of the reviewed period, new signs of dynamism are observed, probably because of high commodity prices (mainly cooper), rather than a real improvement of competitiveness, internal capabilities or structural changes. This is consistent with the competitiveness data reported by WEF (2013), indicating a constant and worrying drop in competitiveness and confirming the low innovation capability of Chile.

**Graph 3. GDP growth dynamics of Chile (1989 –2011).**



Solid lines define the classification of country growth stage according to the criteria offered by Fagerberg and others, while the dashed limits are the average of NR-Driven countries.  
Source: Own elaboration based on World Bank data.

The analysis of convergence indicates that the main weakness is the low innovation capability of Chile (Table 3). Patent indicator achieve a level 70-130 times lower than NR leading countries. This is a reflection of the lack of capacity to create knowledge, which also affects the absorption capacity. In addition, education quality is still poor as show international reports (OECD, 2014), although education gap has decreased.

This findings would indicate that to cross the threshold toward a profile of higher income and development levels, Chile must urgently implement strong policies to foster innovation activities in all fields, but above all in NR sectors, promote collaboration networks, and make a greater effort to accumulate knowledge assets.

**Table 3. Convergence coefficients ( $\beta$ ) between Chile (CHL) and leaders: Australia (AUS), Canada (CAN) and United States of America (US).**

	AUS/CH				CAN/CH				US/CH			
	$\beta$	initial	final	DS	$\beta$	initial	final	DS	$\beta$	initial	final	SD
GDP (per capita)	-0.035***	1.9	1.32	0.27	-0.053***	2.23	1.08	0.37	-0.08***	2.87	1.21	0.51
Investment	0.010**	0.18	0.01	0.12	0	0.06	-0.21	0.1	0	-0.07	-0.34	0.11
Patent	0.919	44	76.9	17.7	-2.372	120.4	130.7	49.5	-9.645	338.6	328.5	151.6
Schooling	-0.014***	0.45	0.16	0.09	-0.008***	0.27	0.11	0.05	-0.013***	0.49	0.25	0.09
Openness	-0.006**	-0.48	-0.5	0.08	-0.008	-0.14	-0.23	0.25	-0.002	-0.69	-0.69	0.04
FDIIS	0	-27.7	-28.7	0.1	0.004*	-0.62	-0.5	0.06	0.008**	-0.81	-0.69	0.1
Institution	-0.002	0.12	0.14	0.03	-0.006***	0.15	0.14	0.04	-0.011***	0.09	0.04	0.05
Scientific articles	-0.209***	11.63	8.87	1.4	-0.360***	13.3	8.12	2.31	-0.346***	12.19	7.06	2.16
Royalties	-0.105***	0.97	0.76	1.01	-0.161***	1.89	0.88	1.49	-0.008	-0.67	-0.39	0.25
GINI	-0.019***	-0.22	-0.51	0.13	0.002**	-0.51	-0.44	0.03	0.003	-0.32	-0.28	0.06
R&D	-0.008	2.02	1.83	0.55	0.037***	1.94	2.02	0.38	-0.017	4.32	3.54	0.55
Infrastructure	-0.075***	1.93	0.53	0.45	-0.053***	1.63	0.67	0.34	-0.083***	3.4	1.72	0.52

\*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%. Two steps. Robust standard errors. Negative coefficient means convergence. Source: Author's elaboration.

Institution quality is another aspect in which Chile has to pay more attention. Although this indicator present some limitaions because the complexity for measuring this concept, the WB institution index offers suitable information about rule of law, corruption, transparency, political and social stability, government effectiveness, and regulatory quality. The coefficient (negative  $\beta$ ) of this variable indicates a reduction of the gap, but important weaknesses remain. According to WB data (World Bank, 2013), these shortcomings are related to lower government effectiveness and the loss of government ability to define and implement policies to promote private business. This would indicate the need to enhance the institutional framework to avoid potential social conflicts, to provide more stability for investments, and contribute to strengthen international and local networks. As Mehlum et al. (2006) argued, good institutions are more relevant when the NR countries are closer to frontier.

Investment in fixed (and productive) capital is also an strategic factor for these sectors, as they are capital-intensive and require important inflows of physical assets. Despite investment gap has increased during the entire period, Chile has narrowed it in the nineties as a result of foreign capital through FDI and other foreign investments, and also due to the reinvestment of NR revenues (Álvarez and Fuentes, 2006; García, 2006; Pérez, 2012). Signs of broadening the gap are found at the end of the period, although the gap values are still around zero. Thus, it is interesting to pay attention to this variable in order to detect the causes of the reduction of Chilean attractiveness for business, and to try to correct them.

The convergence analysis confirms the success of opening policies implemented since the seventies, becoming a core stone of Chilean economy. Chile is leader in inward FDI among NR-Driven economies, which has permitted to finance important productive infrastructure, incorporate foreign technology and know-how, and open new markets for its exports (Negoita and Block, 2012).

This study has revealed the main barriers that Chile should face in order to return to the growth path, maintaining NR sectors as pillars of its economy. As the KE and evolutionary theory pointed out, intangibles are the key for wealth creation, even in NR sectors, and innovation the tool for growth, and it is precisely in this dimension where Chile has the greatest weaknesses, which result in a major concern for the future. This country could continue using foreign sources of knowledge, but the opportunities are reduced to the extent that the country is closing the gap. Therefore, main opportunities come from local innovation, which can be developed in international networks of scientific collaboration.

## **5. Conclusions**

The cluster analysis has permitted to identify a group of countries made up by upper-middle and high income economies and with an industrial structure dominated by NR. Unlike previous studies, cluster technique allowed us to obtain a more robust group of NR-Driven countries to seek a potential new development path. This set of nations does not have a geographic, ethnic, or political pattern, and therefore other factors would be responsible for growth, as it is suggested in this paper.

The estimated model showed that natural resources may positively impact on growth if traditional production factors are appropriately combined with others of intangible nature. In fact, capital and labor remains key factors of growth in NR-Driven economies, as neoclassic literature argues, but intangibles assets are identified as essentials, too. The findings confirm that NR have a positive effect on GDP in some countries, while in others, such as OECD members, their impact is not significant.

In accordance with the Knowledge economy perspective, it is possible to identify a growth path based on RN and Intellectual capital. A positive effect of innovation capabilities on GDP was detected in countries that describe this development trajectory (NR-Driven). This would indicate that not only the presence of absorptive capacity for catching up strategies are important to specialized economies, but also the capability for creating technologies and knowledge, mainly in advanced stages of The empirical study also reveals the essential role of openness and FDI as a development channel to access foreign technologies and knowledge. This can be understood as a mechanism that may facilitate the international diffusion of technologies, with a potentially positive impact on development in resource-specialized economies. In addition, international networks, along with advanced human capital, are key elements to build absorptive capacities, which are critical for these economies.

Good institutional quality positively affects GDP of NR-Driven economies, because better institutions allow countries to overcome potential negative pressures, and achieve a political, social and economic stability that promote investments. In addition, good institutions provide a favorable long-term framework to carry out innovation activities with a long-term vision.

These results justify the design of a comprehensive framework for understanding the economic evolution of nations and the possibilities for defining a different development strategy based on the strengths of intangibles without leaving their natural resource-intensive industries completely aside, but this strategy would require high investment in knowledge assets. Thus, these resources could provide a “big push” and also support a sustainable growth.

The case of Chile clearly represents an example of NR-Driven country that has progressed exploiting its NR endowments and implementing suitable policies of openness and institutional and economic reforms. However, these measures have been insufficient to support a long-term economic development, as was evidenced by the growth dynamics analysis. The causes of this slowdown would be in immaterial factors, confirming the relevance of intangibles resources for NR-Driven economies.

International openness, FDI and capital investment have been the main factors involved in the gap reduction of Chile (GDP per capita) with leading economies. The results of the convergence analyses also indicate that the current main weaknesses of Chile are an inadequate institutional quality, social inequality and a lack of technological capability. This latter aspect is a matter of great concern because the distance is not only very large with the leaders, but also it is increasing. Therefore, the government must pay special attention to the factors that enhance innovation capability, such as education, I+D investments, entrepreneurship, public-private and firm-science networks, science-based employment, and advanced scientific infrastructure. Strategies such as the promotion of smart specialization and the potential for spillover, the increased participation in international innovation networks, and building long-run public-private partnerships, could be implemented.

The study of this case confirms the relevance of intellectual capital in growth strategies in NR-specialized countries. The key aspect would be the transformation of activities related to NR exploitation in an endogenous process, by integrating and strengthening the knowledge-based assets of endogenous nature, into the NR industry. If NR-economies do not assume the task to invest in these elements, their economic development will be blocked and could fall into the NR curse.

Further research will be devoted to analysis at both firm and sector levels, in order to provide more key aspects to policy makers and entrepreneurs. An analysis with micro-data would allow us to include directly innovation variables from surveys and to deeply analyse spillover effects. In addition, a deeper study of education and institutions would be reasonable in order to detect more clues of the accumulative process of innovation capability building. Finally, some limitations of this study that are common in economic research respond to the use of several proxies for the study of technological and intangible factors, NR, and also development, although all the indicators are justified and the results are robust.

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## 7. Annexes

### **Annex 1. Cluster analysis. List of countries of each group.**

1												2							
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R		
BEL	JAM	CHL	MOZ	EGY	GIN	NOR	ARE	CAF	LBR	GHA	ETH	ZAR	NGA	TCO	COG	GNC	BRN	AZE	
DEU	ISL	KAZ	UGA	IDN	MRT	VEN		GNB		MLI	SLE			IRQ		GAB			
CHE	NZL	AUS	KEN	CMR	MNG	ECU				SDN	LAO			AGO		LBY			
JPN	HRV	CAN	TMP		SYR	IRN				AFG	MMR					KWT			
AUT	MUS	MEX	KIR		GUY	YEM				KHM						OMN			
SWE	VCT	ZAF	CIV							NPL						BWA			
IRL	GRD	COL	ALB							RWA						SAU			
LUX	LCA	ARG	BTN							BEN						DZA			
CYP	HUN	PER	ARM							BFA									
FIN	DJI	MYS	PAK							KGZ									
MLT	HND	RUS	ZMB							GMB									
ESP	PHL		TON							NER									
BRB	DMA		VUT							TGO									
PLW	GTM		NIC							BDI									
ITA	BLZ		PRY							SLB									
PRT	LKA		MDA																
BHS	SRB		STP																
DNK	MAR		BGD																
NLD	TUR		IND																
GBR	URY		GEO																
USA	SLV		ERI																
ATG	SWZ																		
HKG	BIH																		
SGP	CPV																		
CZE	BGR																		
KOR	ROM																		
EST	THA																		
LUT	MDV																		
POL	CHN																		
JOR	LSO																		
BRA																			

### **Annex 2. List of countries of each group analyzed**

OECD		NR dominated				NR-Driven	
Australia	Japan	Algeria	Egypt	Madagascar	Saudi Arabia	Argentina	
Austria	Mexico	Angola	Ethiopia	Malawi	Senegal	Australia	
Belgium	Netherlands	Argentina	Fiji	Mali	Sierra Leone	Canada	
Canada	New Zealand	Armenia	Gabon	Mauritania	South Africa	Chile	
Chile	Norway	Australia	Gambia	Moldova	Sudan	Colombia	
Czech Republic	Poland	Azerbaijan	Georgia	Mongolia	Tanzania	Kazakhstan	
Denmark	Portugal	Bahrain	Ghana	Namibia	Togo	Mexico	
Estonia	Slovakia	Benin	Guatemala	New Zealand	Trinidad and Tobago	Peru	
Finland	Slovenia	Bolivia	Guyana	Nicaragua	Uganda	Russia	
France	South Korea	Botswana	Iceland	Niger	Uruguay	South Africa	
Germany	Spain	Burundi	Iran	Norway	Uzbekistan		
Greece	Sweden	Cameroon	Jamaica	Oman	Venezuela		
Hungary	Switzerland	Chad	Kazakhstan	Paraguay	Yemen		
Iceland	Turkey	Chile	Kenya	Peru	Zambia		
Ireland	United Kingdom	Colombia	Kuwait	Qatar	Zimbabwe		
Israel	United States	Coted'Ivoire	Kyrgyzstan	Russia			
Italy		Ecuador	LaoPDR	Rwanda			

# New Evidence of Price Transmission: The Case of Edam Cheese

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## Abstract

The paper focused on the vertical price transmission along food supply chain for Edam cheese in Slovak dairy sector. The price transmission analysis was examined for detecting the asymmetry in prices, measuring market efficiency of agri-food chain. The concept of the price transmission is an important area of the research particularly in relation to the assessment of impact on the welfare of the vertical entities. The Johansen co-integration test and Engle-Granger test were conducted in order to clarify the long-term co-integration between processor-retail marketing channels. The results provided an evidence of co-integration relationship between processor and retail prices of Edam cheese, however the simultaneous relationship between price series was not confirmed. Based on VECM model, imperfect competition and existence of asymmetry were confirmed. Additionally, the results of the study depicted stronger market position and bargaining power of retailers in comparison to processors. The impulse response analysis was performed for illustration of system to shocks. Moreover the paper determined the coefficient of elasticity of price transmission (EPT).

## Keywords:

asymmetry, cheese, price, transmission

## 1. Introduction

Price is the primary mechanism through which the various stages of a market chain are linked according to Reziti and Panagopoulos (2008). They consider the speed with which price shocks are transmitted between producers and consumers and the extent of adjustment to such shocks as important factors which reflect the actions of market participants at different market levels. Meyer and v. Cramon-Taubadel (2004) point out that prices drive resource allocation and output mix decisions by economic actors and price transmission integrates markets vertically and horizontally. Additionally, the interaction of prices along the supply chain provides insights on the efficiency of a commodity's market structure, welfare distribution in an industry as well as the existence of market power among the key players.

Price transmission along many agricultural product market chains are asymmetric in that input price increases are often more quickly or fully transmitted to output prices than price decreases according to Tian and Xianghong (2010). Peltzman (2000) argues that the standard economic theory of markets is wrong due to the lack of prediction or explanation of prevalence of asymmetric price adjustment and concludes that asymmetric price transmission is the rule

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rather than exception. His statement is supported by an extensive study of 282 products and product categories, including 120 agricultural and food products. Jensen and Møller refer to an example from the Danish dairy marketing chain and point out that from wholesale to retail, the price transmission is strong and symmetric in the long run (80-85%) for milk, however, in the short run price transmission is asymmetric. Frigon, Dayon and Romain (1999) find some evidence to support the asymmetry in the context of price transmission. They determine that intermediaries transmit variations in milk farm price in an asymmetric way in the short run due to a high degree of concentration at the retail level and governmental intervention forcing middleman to act in terms of price transmission. On the other hand, authors such as Gauthier and Zapata (2001) and v. Cramon-Traubadel and Meyer (2000) recommend caution due to methodological problems associated with empirical tests for asymmetry. Kinnucan and Forker (1987) examine price asymmetries for four dairy products in the U.S. Their empirical results show that price transmission in the dairy sector was characterized by asymmetry, meaning that increases in the farm price of milk were passed through to the retail level more fully comparing to decreases in the farm price of milk. They find support for their results that industry concentration, government intervention, and differential impacts of shifts in retail demand versus farm supply lead to asymmetric price transmission in the examined sector. Vavra and Goodwin (2005) provide an evidence of investigation of links between retail and farm-gate milk prices in UK, Denmark, France and Germany made by London Economics (2003). The research shows no evidence of price transmission in any direction in case of Denmark. On the other hand, changes in farm-gate prices are mostly, but imperfectly, transmitted to retail prices in France. In Germany and UK, the study reveals imperfect two-way price transmission.

This paper analyses vertical price transmission in the dairy sector of Slovakia between processor-retail marketing channels and identifying whether price movements are symmetric or asymmetric.

## 2. Materials and Methods

The goal of the paper is to analyze the nature of vertical price transmission in case of Edam cheese. Analysis is based on monthly data of processor price (PP) and consumer price (CP) of Edam cheese. The monthly data are collected from The Research Institute of Agricultural and Food Economics online database [www.vuepp.sk](http://www.vuepp.sk) and from an online statistical database SLOVSTAT. The data covers the period from January 2004 to December 2011. The vertical price transmission analysis is performed by the following tests.

Augmented Dickey-Fuller test (ADF) is computed in order to verify the price variables are non-stationary, or  $I(1)$  (Chavas and Mehta, 2002). In this test, a null hypothesis is imposed that the data are non-stationary against the alternative hypothesis of being a stationary variable. Mathematically, the ADF can be expressed as testing  $H_0: \alpha_0 = 0$  against  $H_1: \alpha_0 < 0$  from the following general model used by Hartmann, Jaffry and Asche (2001):

$$\Delta Y_t = \alpha_0 \cdot Y_{t-1} + \sum_{i=1}^{p-1} \alpha_i \cdot \Delta Y_{t-i} + c + \delta \cdot t + \eta_t$$

with  $\eta_t \sim IID(0, \sigma^2)$  (1)

The long-term relationship between the selected price series is tested by Engle-Granger test and Johansen test. Johansen (1991) defines two different test statistics for co-integration under his method: the Trace test and the Maximum Eigenvalue test. The Trace test is a joint test that tests the null hypothesis of no co-integration ( $H_0: r=0$ ) against the alternative hypothesis of co-integration ( $H_1: r > 0$ ). The maximum Eigenvalue test conducts tests on each

eigenvalue separately. It tests the null hypothesis that the number of cointegrating vectors is equal to  $r$  against the alternative of  $r+1$  co-integrating vectors.

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^g (1 - \lambda_i)$$

$$\lambda_{max}(r, r+1) = -T \ln(1 - \lambda_{r+1})$$

(2)

$r$  = number of co-integrating vectors under the null

$\lambda_i$  = estimated  $i$ th ordered eigenvalue from the  $\alpha\beta$  matrices

The Granger causality is employed in order to establish a manner of causality for our case of Edam prices. The VAR model is computed and the direction of causality was decided upon via standard F-test. The Granger causality is based on the assumption that events of the future cannot have an impact on the events in the past. Hajko and Bil (2013) explain that if the explanatory variables represent the events that happen in the past, the aforementioned assumption means that the events in the past could not be caused by the events in the present but rather the events in the past caused the current events.

Vector Error Correction Model (VECM) is performed in order to examine the relationship between PP and CP of Edam cheese. According to Rumánková (2012) VECM is a suitable method for analyzing the long-term relationship between non-stationary time series. The data was transferred in logarithms when analyzing cointegrating relationships between variables (Bakucs & Ferto). According to this, it is appropriate to estimate the cointegration factor which is the long-run elasticity of price transmission and the error correction coefficient reflecting the speed of adjustment.

VECM takes the following general form (Minot, 2011):

$$\Delta p_t = \alpha + \Pi p_{t-1} + \sum_{k=1}^q \Gamma_k \Delta p_{t-k} + \varepsilon_t \quad (3)$$

where:

$p_t$  is an  $n \times 1$  vector of  $n$  price variable;

$\Delta$  is the difference operator, so  $\Delta p_t = p_t - p_{t-1}$ ;

$\varepsilon_t$  is an  $n \times 1$  vector of error terms;

$\alpha$  is an  $n \times 1$  vector of estimated parameters that describe the trend component;

$\Pi$  is an  $n \times n$  matrix of estimated parameters that describe the long-term relationship and the error correction adjustment; and

$\Gamma_k$  is a set of  $n \times n$  matrices of estimated parameters that describe the short-run relationship between prices, one for each of  $q$  lags included in the model.

The impulse response analysis of the VECM is performed for the illustration of the dynamics of the system and the examination of the system's reaction to innovation (shocks). It measures the effect of a one-standard-deviation innovation of a variable on current and future values of the variables in a system of forecast variance and provide information concerning the speed and the way of establishing equilibrium (Čechura & Šobrová, 2008).

### 3. Results

In this chapter the price transmission analysis is undertaken between PP and CP of Edam cheese (EUR/kg). The development of the PP (excl. VAT) and CP (incl. VAT) of Edam cheese in Slovakia during the period 2004-2011 is shown in Figure 1 and the main statistical characteristics of the analyzed time series are recorded in Table 1. Based on the table, the variation coefficient of processor price series equals 10,38 per cent and the variation coefficient of consumer price series reached value of 9,30 per cent. The minimal value of processor price equals 2,83 EUR/kg, while its maximal value equals 4,87 EUR/kg. The minimum of consumer price equals 4,57 EUR/kg whereas the maximum equals 7,09 EUR/kg. The minimum of processor price was reached in March 2009. The minimum consumer price was reached in July 2009. The maximum was recorded in December 2009 in case of processor price. Regarding to consumer price, the maximum was reached in January 2008.

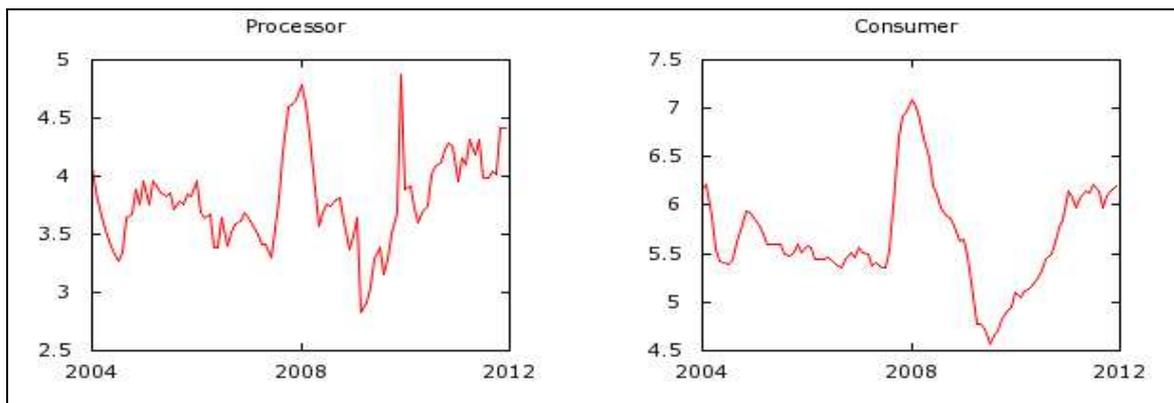
Drought in Australia and new Zealand affecting milk production in the 2<sup>nd</sup> half of the year 2007 causing a decline in milk production and historic high prices at the beginning of 2008. In 2008 the average processor price of Edam block cheese achieved 4,14 EUR/kg, which is an increase by approximately 5,9% against the previous year, however the prices started to decrease in 2009. Historically, the most significant increase in Edam cheese price was reflected in case of retailers, reaching a maximum average value of 6,30 EUR/kg, representing an increase by 7,9% comparing to the previous year. The downward trend in prices of Edam cheese begun in 2009 due to economic crisis resulting in decline of milk consumption. In 2009, average processor prices dropped down by 23,7% and consumer prices decreased by 21,6%. Concerning the year 2010, the processor prices of Edam cheese went up by 0,75 EUR/kg and there was a slight increase reached in 2011 (4,16 EUR/kg). The consumer prices were continually increasing by 0,42 EUR/kg in 2010 and the upward trend was also experienced in 2011 (6,11 EUR/kg).

Figure 2 shows a scatter diagram of the monthly PP and CP of Edam cheese from 2004 to 2011. The coefficient on x (0,514) indicates that for a 1 EUR increase in CP, PP of Edam cheese will increase by 0,514 EUR. There is a medium and positive correlation between processor and consumer prices according to results from correlation analysis. Correlation between PP and CP of Edam cheese was 68,74%.

**Tab. 1 Summary statistics, using the observations 2004:01 – 2011:12**

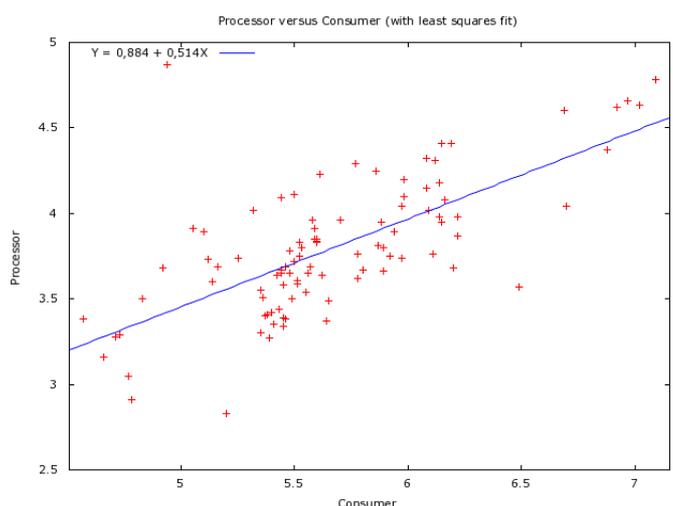
Variable	Mean	Median	Minimum	Maximum	St. Dev.	C.V.
PP	3,7985	3,7500	2,8300	4,8700	0,39412	0.10376
CP	5,6697	5,5750	4,5700	7,0900	0.52704	0.092958

Source: calculated, <http://www.vuepp.sk>, <http://www.statistics.sk>, PP excl. VAT; CP incl. VAT, EUR/kg



**Pic. 1 Development of PP and CP of Edam cheese in SR**

Source: calculated, <http://www.vuepp.sk>, <http://www.statistics.sk>, PP/edam cheese excl. VAT;  
CP/edam cheese incl. VAT; EUR/kg



**Pic. 2 Scatter diagram of PP (excl. VAT) and CP (incl. VAT); (EUR/kg)**

Source: calculated, <http://www.statistics.sk/>

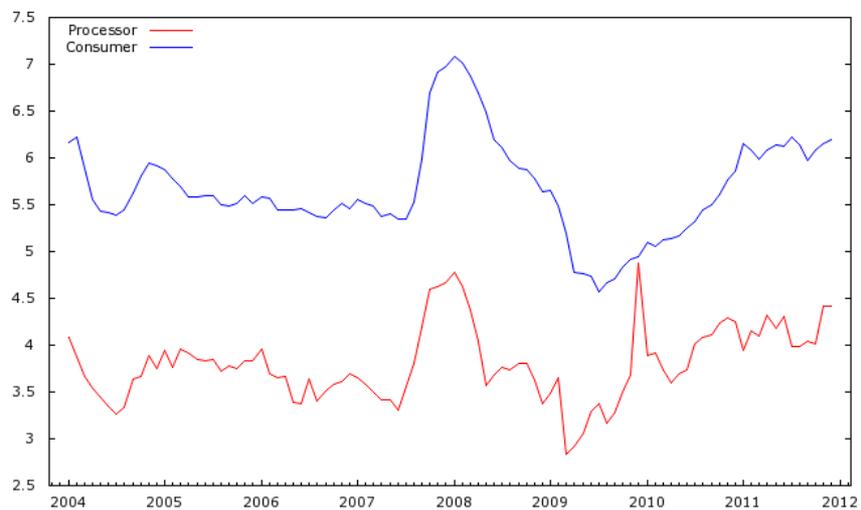
### 3.1. Augmented Dickey-Fuller (ADF) test

The unit root test is performed in order to evaluate stationary properties of the variables. Results are presented in Table 2. Lag length was selected according to Akaike criterion (AIC), Schwartz Bayesian criterion (SBC) and Hannan-Quinn criterion (HQC) (2 lags included in the test). Based on this results all variables in the period 2004-2011 are considered as non-stationary, or I (1) variables. Considering the ADF test on first differences, the unit root null hypothesis is rejected at both 1 and 5% significant level, meaning that they are stationary.

**Tab. 2 ADF test**

Augment Dickey Fuller test			
	without constant	with constant	with constant and trend
	p-value	p-value	p-value
PP	0,7073	0,035	0,07097
dif PP	5,971e-008	1,804e-006	1,926e-005
CP	0,7056	0,09859	0,2994
dif CP	4,789e-005	0,001148	0,008699

Source: calculated, lag length for ADF test =2 lags, <http://www.vuepp.sk>, <http://www.statistics.sk>



**Pic. 3 Development of PP (excl. VAT) and CP (incl. VAT) of Edam cheese in SR**

Source: calculated, <http://www.vuepp.sk>, <http://www.statistics.sk>

### 3.2. Co-integration analysis

Co-integration between the variables is evaluated using Johansen and Engle Granger test. Results presented in Table 3 and Figure 4 clearly indicate the presence of one co-integrating vector both at 1% and 5% significant level.

**Tab. 3 Johansen co-integration test**

Hypothesized No. of CEs	Eigenvalue	Trace test	p-value	Lmax test	p-value
0	0,18310	26,065	0,0059	19,011	0,0134
1	0,072300	7,0544	0,1268	7,0544	0,1266

Source: calculated, <http://www.vuepp.sk>, <http://www.statistics.sk>

Dickey-Fuller test on residuals

p-value 0,00298

There is evidence for a cointegrating relationship if:

- (a) The unit-root hypothesis is not rejected for the individual variables.
- (b) The unit-root hypothesis is rejected for the residuals from the cointegrating regression.

**Pic. 4 Engle Granger test**

Source: calculated, <http://www.vuepp.sk>, <http://www.statistics.sk>

Causality test was run in order to explore if there is “Granger” causality between processor price and consumer price of Edam cheese. The VAR model was computed and the direction of causality was decided upon via standard F-test. Granger causality test shows the presence of bilateral causality. This feedback relationship between the selected variables is strong with a significance level of one per cent (Table 4).

**Tab. 4 Granger causality**

	No. of lags	F- test	p-value	H <sub>0</sub>
PP → CP	2	10,038	0,0001	Reject (causality)
CP → PP	2	9,1520	0,0002	Reject (causality)

Source: calculated, <http://www.vuepp.sk>, <http://www.statistics.sk>

**3.3. Vector Error Correction Model and Impulse-Response Analysis**

According to Figure 5, VECM form with unrestricted constant and two endogenous variables (I-processor, I-producer) was used. The Beta transported vector shows the nature of the long term relationship between processor and consumer price of Edam cheese. Co-integration vector expressing the long-term relation has a following form: (1.0000; -0,47180). The value of 0,47180 expresses price transmission elasticity. The price elasticity says that increase in CP price by 1,00 % results in rise of PP by 0,47 %. The value is lower than 1 and therefore an imperfect market structure is considered; more specifically the market power is on the demand side according to Lloyd et al. (2004). The Alfa parameter is significant only in case of processor price and according to values consumer price seems to be weakly exogenous (adjustment process is very slow). It implies that price transmission is asymmetric. The statement was also confirmed by dummy variable technique in VECM. The results indicate that PP reacts differently to changes in CP in case of examined long-run relationships and vice versa. The relationship between producer and processor price is not simultaneous. The magnitude in the alfa parameter ranges between -0,38446 and 0,0043642, suggesting the intensive and significant adjustment in PP to anticipated shocks away from the long-run equilibrium. The results also confirmed that the agri-food chain could be considered as demand-driven.

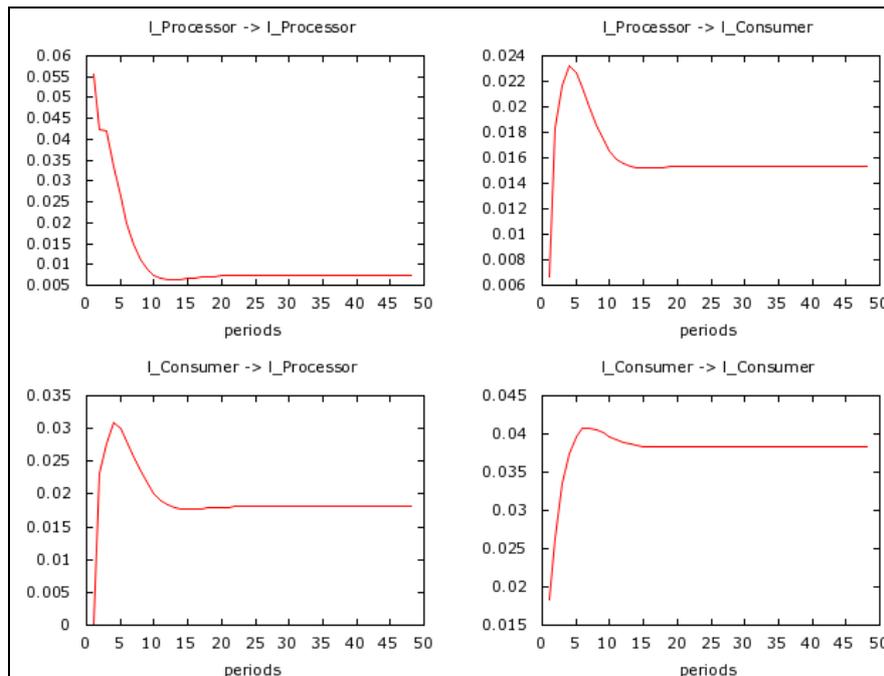
DW statistics confirmed that unnecessary lags were included in the model. The model is efficient and does not include autocorrelation according to Breusch-Godfrey test too. Null hypothesis (homoscedasticity) is not rejected while testing ARCH test only for equation 1. On the other hand, the null hypothesis in case of the test for normality of residual was rejected; however, this might be due to the fact that all variables were transformed by taking a natural logarithm. Additionally, the specification for the model can be considered appropriate and stable according to the VAR inverse roots test which shows the inverse roots of VAR process lie within the unit circle.

VECM system, lag order 2	
Observations 2004:03-2011:12 (T=94)	alpha
I_Processor 1,000	I_Processor -0,38446
(0,00000)	(p-value 0,00005)
I_Consumer -0,47180	I_Consumer 0,0043642
(0,15811)	(p-value 0,89059)
Test for ARCH:	
Equation1 p-value= 0,320648	Test for Normality test
Equation2 p-value= 0,0543457	p-value = 3,58702e-020
Test for Autocorrelation	
Breusch Godfrey	
Equation1 p-value= 0,889	
Equation2 p-value= 0,447	

**Pic. 5 Vector Error Correction Model**

Source: calculated, <http://www.vuepp.sk>, <http://www.statistics.sk>

The results of impulse-response function of VECM are illustrated in Figure 6. PP of Edam cheese has positive respond on a sudden shock in CP of Edam cheese and vice versa. As can be seen from Figure 6, a shock in processor price of Edam cheese would result in a rise of consumer price up to 5 months. After a sudden increase, consumer prices will then start decreasing. Afterwards there is a tendency of the system to oscillate around the certain value after 32 months. Processor responses reach a peak after five months as well as consumer responses of the initial shock and the reaction of processor price on consumer price has similar results. More specifically, it diminishes up to 15 months and then eventually approaches the same value in the long run. On the other hand, the first reaction of processor price to processor shock results in a drop. After about 15 months it starts increasing and remains at the same level close to equilibrium in the long run. As shown in Figure 6, a sudden change in consumer price results in a significant rise of consumer prices up to seven months, then it slightly diminishes and approaches the certain value after 34 periods.



**Pic. 6 Impulse-Response analysis of PP and CP of Edam cheese**

Source: calculated, <http://www.vuepp.sk>, <http://www.statistics.sk>

#### 4. Conclusions

The paper analyzed the vertical price transmission between processor prices and retail prices for Edam cheese in Slovakia. According to the estimated values, the results showed that a long-run relationship exists between the processor and consumer price in case of Edam cheese. However, it can be stated that there is one-way relation meaning that the simultaneous relationship was not found and the consumer price seemed to be weakly exogenous. Thus, the retailers have impact on processors and processors are price takers. The analysis detected an imperfect market structure and agri-food chain is characterized by demand-driven behaviour. Granger causality tests showed the presence of bilateral causality. Additionally, based on results obtained by VECM, the vertical dairy sector chain showed the evidence of asymmetric price transmission. The asymmetry may be the result of poorly organized processors and producers, market power on demand side and imperfect market structure existence (Lajdová, 2013). These findings are in line with the fact that the mark-up pricing model of agri-food chain is in direction from retailers-to-processors-to-producers, meaning that the retailers have the major impact on price determination and ability to place imported dairy goods at competitive prices on the market. Due to the evidence of market failure we recommend state regulations as a possibility to support dairy sector in Slovakia, strengthen its market position against competitive prices of imported products and increase the share of supply of domestic products in retail chains in comparison to imported brands. This is in line with findings that the supply of domestic products on store shelves is less than 50% comparing to supply of imported products on store shelves in case of Slovakia (Food Chamber of Slovakia). Regarding to poor contractual relationship between processors and retailers, there is also a scope for mutual cooperation based on establishment of retail networks by processors. In addition, processors have bad export position due to strong patriotism of purchasing local brands in EU member states thus, it is important to increase an interest in purchasing domestic dairy products by promotions and education of consumers. Additionally, the solution may be also specialization and promotion of domestic products on international markets.

This study can be extended by threshold models of dynamic economic equilibrium (TAR, M-TAR) to gain a more complete picture about the examined issue.

## Acknowledgements

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# Comparison of Production factors in Organic and Conventional Farming in Slovakia

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## Abstract

Organic farming is considered as an alternative to conventional. Organic farming is guided by the principles of sustainability, social responsibility and respect of ecological principles to the production of healthier and better foods. Differences between organic and conventional farming are manifested mainly in the application of production processes and evaluation of product quality. Recently, comparison of both system authors use also in case of various economic indicators.

This article focuses on the economic evaluation of production factors (labour, land and capital) listed in both systems in period 2009-2012. We processed data of more than 1,050 farms of which over 15% were organic farms. Values of the individual parameters are expressed by mean, median and percentiles. For verifying the hypotheses the verification of statistical significance by t-test is used. For analysis, data were selected according to the type of production to subset of the conventional producers and organic producers. We included only active organic producers (those enterprises generating sales from organic farming) into subset of organic producers. Only data for production cooperatives and companies (Ltd., JSC.) were available and no data for family farms and soleholders.

Prerequisite of this study is that there are a statistical significant differences between using factors of production in the organic and conventional farming in Slovakia. This analysis is based on verifying each factor of production separately.

The factor „labour“ was evaluated by indicators employees per hectare (EH) and personal costs per hectare (PC). Factor „capital“ is analyzed truth total assets per hectare (TA) and equity per hectare (EQ). In case of production factor „land“ we considered the total organic land area, the share of organic land and average organic farm size in Slovakia. For comparison we used the data of EU countries with developed organic farming.

Evaluation of the „labour“ in our analyses is based on hypothesis H1 that organic farming is more difficult in sense of manual work and therefore organic farms have a higher number of employees and consequently higher labour costs (both per hectare) than conventional farms. Calculations in this case indicated that we can reject this hypothesis because there is no statistic significant difference between both systems in number of employees per hectare in observed period in Slovakia.

In case of factor „capital“ the hypothesis H2 is set that there is statistical significant higher equity and assets per hectare than in the conventional system. In this article we prove, that this hypothesis can be rejected based on the data of Slovak agriculture farms.

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In the evaluation of the production factor „land“ we focus on the UAA of organic and conventional farms. Except total land use and share of organic land, the average organic farm will be analyzed in broader context of CAP impacts (subsidies) and its specifics in Slovakia. In this part we show the differences between organic land use in EU leaders of organic implementation (Austria, Swiss, ect.) and in Slovakia (where subsidy policy caused extreme organic farming boom).

### **Keywords:**

organic farming, conventional farming, comparison, factors of production, labour, land, capital

### **Introduction**

The theory of resources, or production factors as the inputs to the production process is the basic economic theory. There are three basic resources or factors of production: land, labour, capital (some modern economists also consider entrepreneurship or time a factor of production). These factors are also frequently label as "producer goods" and are required in combination at a specific time to produce goods.

The land is the source or matter from whence all wealth is produced. The labour of man is the form which produces it: and wealth itself is nothing but the maintenance, conveniences, and superfluities of life (Cantillon, 1755). The distinction between land and capital is obviously arbitrary. Land, therefore, even as economically defined, cannot be considered in isolation from capital (Wicksteed, 1910).

Today, most modern textbooks only mention labour and capital (such as machines, buildings or monetary funds) as production factors and make no reference to land (Hubacek and van den Bergh, 2006). Hundreds of books on economics are published with 'land' absent from the index'. There is no attention for the substitutability between land and capital, and it is assumed implicitly that land can completely be replaced by capital. Out of the various ways how land can contribute to production, only one is considered, namely that land provides a place with a particular extent on which production can take place (which plays a significant role in organic farming). However, attention to this issue disappeared from current mainstream economic theory: land is no longer regarded as a separate factor of production. There are micro-economic theories about land and about the possibility of substitution between land and all other production factors, but they take no account of the possible limits to that (Needham et al. 2013).

In this article we focus on economic evaluation of three factors of production (labour, land and capital) in case of conventional and organic farming in Slovakia. There is just minimum theory regarding differences in using production factors in these two agricultural systems. Available resources focus mostly on microeconomic point of view. In this article we are using managerial and economic approach truth using managerial and economic indicators (Paška, 2003; Kozáková, et al., 2012) which are typical for research in organic farming.

Conventional agriculture (farming) has according USDA (United States Department of Agriculture) some typical characteristics: rapid technological innovation; large capital investments to production and technology; large-scale farms; single crops/row crops grown continuously over many seasons; uniform high-yield hybrid crops; extensive use of pesticides, fertilizers and external energy inputs and high labour efficiency. In the case of livestock, most production comes from confined, concentrated systems. On the other hand, organic agriculture (farming) is according IFOAM (International Federation of organic Agriculture Movements) a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic farming combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved.

Prerequisite of this study is that there are statistical significant differences between factors of production in the organic and conventional farming in Slovakia. This analysis is based on the verification of each factor of production separately.

Based on the literature and previous research we formulated following research hypotheses for evaluation production factors labour (H1) and capital (H2):

H1: Organic farms have a higher number of employees and consequently higher labour costs (both per hectare) than conventional farms.

H2: There is a higher equity and assets per hectare in organic farming than compared to conventional.

In the evaluation of the production factor „land“ we focus on comparison of fundamental organic indicators (total area under organic farming, the share of organic area, number of organic farmers and average organic farm size) in Slovakia and its comparison with EU leaders of organic implementation.

## Methodology

For calculations we used the data from database of the Slovak Ministry of Agriculture and Rural Development (IL MoARD, 2013), over the period 2000-2012. The database consists of individual (agricultural) farm data which includes balance sheets and income statements. Primarily data were selected according to the type of production to subset of the conventional producers (farmers) and the subset of the organic producers (farmers). We included only active organic producers (those enterprises generating sales from organic farming) in our analysis. Data for production cooperatives and companies (Ltd., JSC.) only were available. There were no data for family farms and soleholders.

We had to do data adjustments (Klocoková, 2011; Munk et al., 2013). In this process we excluded the data of the following farms from the dataset: farms with negative equity (liabilities exceeding total assets), farms with return on equity (ROE) exceeding, +/- 100% (average profit or loss exceeds equity) over the observed period and outliers (obvious mistakes in filling the financial statements).

After the necessary adjustments 1150 farms remained in 2009 (1037 conventional farmers and 113 organic farmers), 1086 farms in 2010 (970 conventional farmers and 116 organic farmers), 1159 farms in 2011 (1021 conventional farmers and 138 organic farmers) and 1169 farms in 2012 (1029 conventional farmers and 140 organic farmers).

We calculated following indicators for each farm. These indicators are commonly used to evaluate managerial and economic aspects of production factors using (Zoborský, 2006; Bielik, 2008; Paška et al., 2014;):

$$(1) \quad \text{Employees per hectare (EH)} = \frac{\text{number of employees}}{\text{UAA (ha)}}$$

$$(2) \quad \text{Personal costs per hectare (PH)} = \frac{\text{personal costs (EUR)}}{\text{UAA (ha)}}$$

$$(3) \quad \text{Assets per hectare (AH)} = \frac{\text{total assets (EUR)}}{\text{UAA (ha)}}$$

$$(4) \quad \text{Equity per hectare (EH)} = \frac{\text{Total equity (EUR)}}{\text{UAA (ha)}}$$

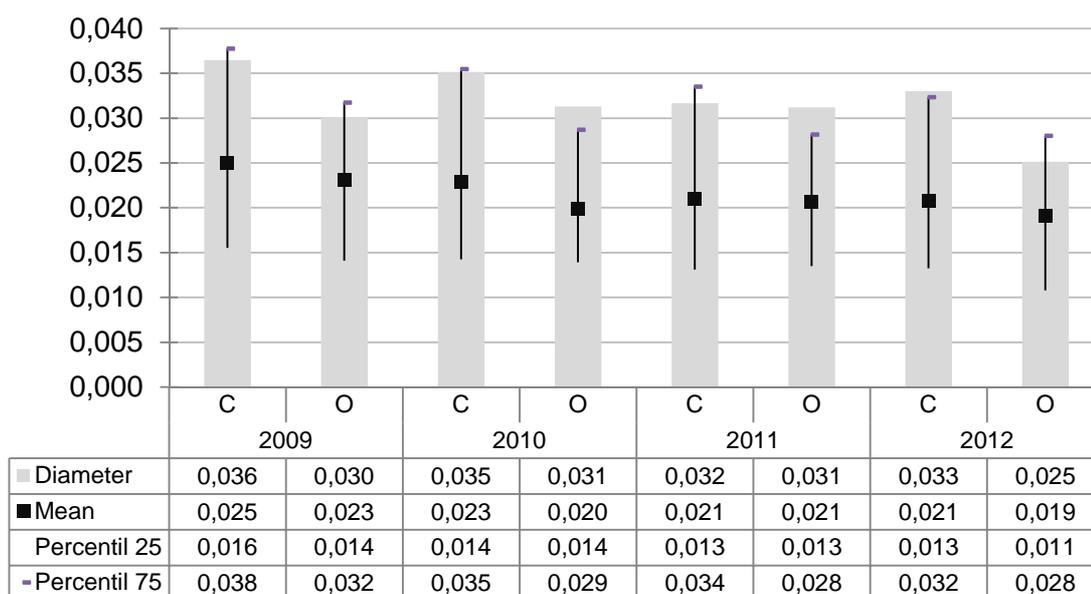
For higher explanatory of this calculations we added indicators of economic efficiency (Rábek and Čierna, 2012; Klieštík and Valášková, 2013; Krechovská and Taušl Procházková, 2014). After describing the two production factors (labour and capital) truth economic and managerial indicators, we can continue with factor land. Using of this production factor can be described truth indicators: fully converted organic area in hectare, share (percentage) of organic land on total agricultural land in percent, number of organic farmers, average organic farm size in hectares per farm (Willer, et al, 2014). In this paper we applying the comparison method. The comaln this case the comparison method will be used. The value of selected indicators for Slovakia we are comparing with the values of another European states. For this comparison we used 23 European countries, which are developed in organic farming implementation (Austria, Belgium, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland, United Kingdom).

### Production Factor “Labour” in Slovak Organic Farming

Labour as one of the three main factors of production and means the use of human energy used to produce economic goods. This definition is valid for both, conventional and organic farming as well. We evaluated this production factor from managerial point of view truth indicator (1) employees per hectare, resp. the number of employees per hectare separately for each year and each farming system. The results are summarized in the table 1. We found out that in each year the average number of employees per hectare is higher in the case of conventional farmers in comparison with the organic farmers in Slovakia (0.036 to 0.030 in 2009; 0.035 to 0.031 in 2010; 0.032 to 0.031 in 2011 and 0.033 to 0.025 in 2012). The differences in median are even lower. This finding is further confirmed by the 25 and 75 percentiles.

We evaluated the existence of statistically significant differences using t-test for independent samples. As the descriptive statistics indicated there is no significant difference in the number of employees per hectare in organic and conventional production (table 1). We conclude that this part of the hypothesis H1 was not confirmed. Obtained result contradicts the theory (Šimčák, 2005) that the organic farming system is characterized by higher amount of manual work which leads to the higher number of employees.

**Chart 1 Employees per hectare in Slovak conventional and organic farming (2009-2012)**



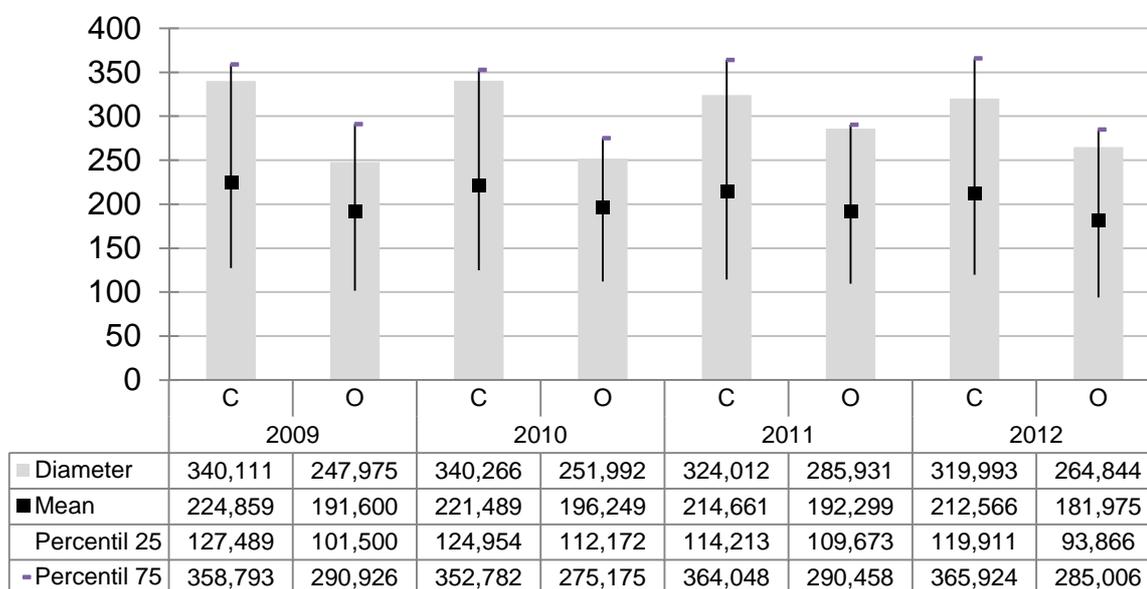
Source: own calculation based on data from the Information Letters of the MoARD SR (2013)

\*C - Conventional farming, O - Organic farming

As an economic part of production factor labour evaluation we evaluated indicator (2) personal costs per hectare. Theory states (Offerman and Nieberg, 2000) that personal costs in organic farming are higher than in conventional. This difference is caused by higher requirements for manual work in organic farming. In our evaluation average personal costs per hectare are lower in organic farming than costs in conventional system (table 2) in every year of the observed period (the difference changes from approximately 93 EUR in 2009 to 55 EUR in 2012).

An evaluation of statistically significant differences using t-test for independent samples does not confirm significant difference in the personal costs per hectare in years 2010, 2011 and 2012. There is just a statistically significant difference in the 2009. Despite mentioned results in absolute terms we can conclude, that there is not difference in personal costs in conventional and organic farming in Slovakia and consequently we can reject this part of hypothesis H1.

**Chart 2 Personal costs per hectare (EUR.ha<sup>-1</sup>)  
in Slovak conventional and organic farming (2009-2012)**



Source: own calculation based on data from the Information Letters of the MoARD SR (2013)

\*C - Conventional farming, O - Organic farming

Based on the obtained results we conclude the hypothesis H1 was not confirmed. Lower personal costs (table 2) in organic farming are connected with lower number of employees per hectare (table 1) in organic farming. In 2009 personal costs in organic farming represented 73 % of personal costs in conventional system. In 2012 this share was 83 %.

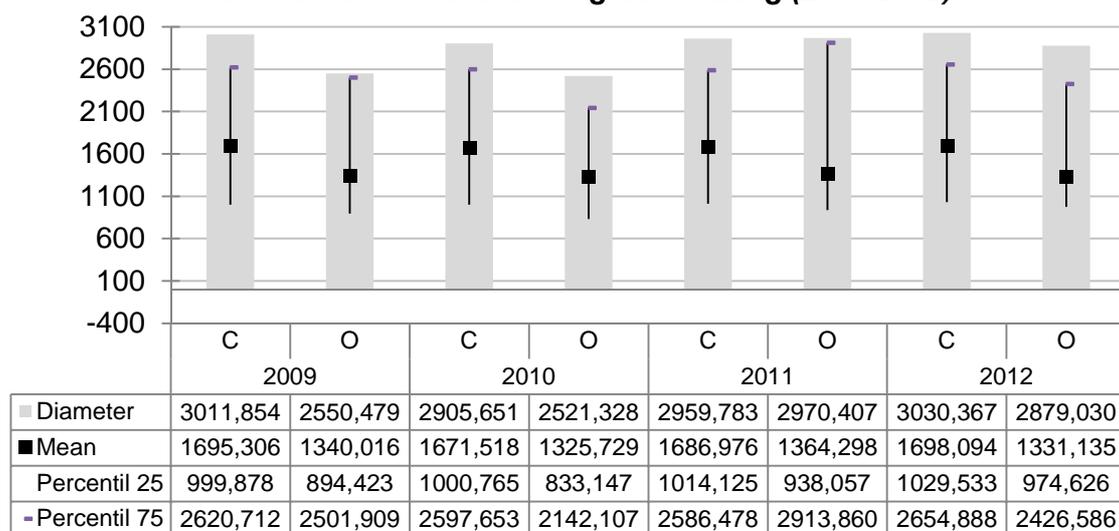
### Production Factor “Capital” in Slovak Organic Farming

Capital has two economic definitions as a factor of production. Capital can represent the financial resources companies use to purchase natural resources and other capital goods (in this point of view the land as well). On the other hand capital also represents the major physical assets of producing goods or services. These assets include buildings, production facilities, equipment, vehicles and other similar items. Individuals may create their own capital production resources, purchase them from another individual or business or lease them for a specific amount of time from individuals.

This production factor we evaluated through two indicators. Total assets per hectare were the third evaluated indicator. In respect to theory (Paška, 2006) organic farmers need lower assets when compared to conventional farmers (in form of equipment and machines) because

the higher share of the manual work in case of organic farmers. In three out of four observed years (2009, 2010, 2012) the total assets per hectare were lower in farms with organic farming system (table 3). Total assets per hectare (mean value) of organic farmers were 2 550 EUR (conventional farmers 3011 EUR) in 2009; 2 521 EUR (conventional farmers 2 905 EUR) in 2010; 2 879 EUR (conventional farmers 3 030 EUR) in 2012. In 2011 the total assets per hectare of organic farms were 2 970 EUR while the total assets per hectare of conventional farmers were 2 959 EUR. According to results of t-test these differences were not statistically significant (table 5) and we can conclude that this part of the hypothesis H3 was not confirmed.

**Chart 3 Total assets per hectare (EUR.ha<sup>-1</sup>)  
in Slovak conventional and organic farming (2009-2012)**

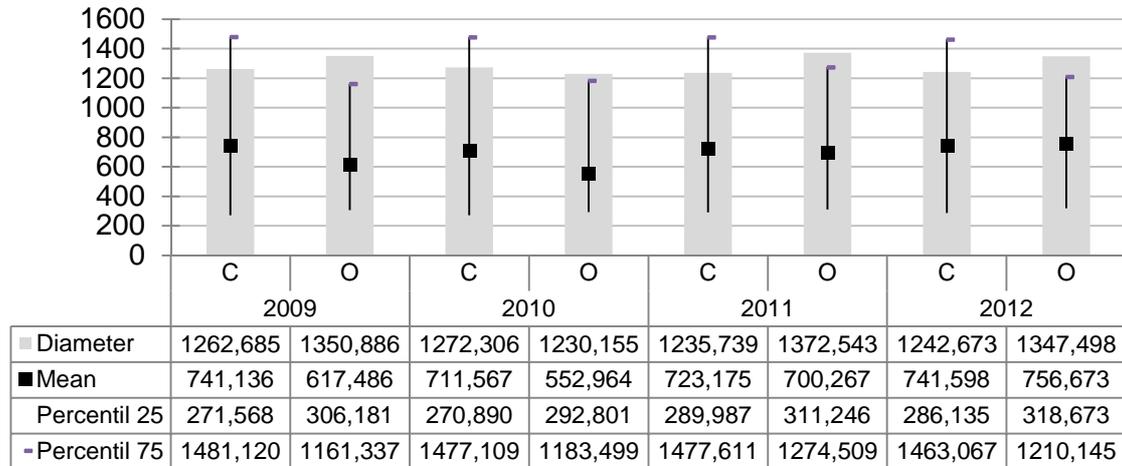


Source: own calculation based on data from the Information Letters of the MoARD SR (2013)

\*C - Conventional farming, O - Organic farming

Within the economic evaluation of production factor capital we calculated indicator (4) equity per hectare. In the theory, there is a connection between lower assets and lower equity need in organic farms compared with conventional farms (Šimčák, 2006). In our dataset average equity per hectare was higher in organic farms compared to conventional system (table 4) in years 2009, 2011 and 2012. There is a higher average equity amount in conventional system in 2010. An evaluation of statistically significant differences does not confirm significant difference in observed period. Despite differences in absolute terms we can conclude no difference in equity amount between conventional and organic farming in Slovakia and consequently, we can reject this part of hypothesis H2.

**Chart 4 Equity per hectare (EUR.ha<sup>-1</sup>)  
in Slovak conventional and organic farming (2009-2012)**



Source: own calculation based on data from the Information Letters of the MoARD SR (2013)

\*C - Conventional farming, O - Organic farming

Based on the mentioned results we conclude the hypothesis H2 was not confirmed. There is no statistically significant difference in the indicators assets per hectare (table 3) and equity per hectare (table 4) between organic and conventional farming in Slovakia.

### Production Factor “Land” in Slovak Organic Farming

The land is the fundamental factor of production in organic farming. Land is the limitation factor and every organic farmer has to select the „right“ land before starting implementation of organic methods. At the beginning usually there has to be a good soil quality and another sufficient qualitative parameters. After utilized area analysis the control institution allows implementation of organic farming methods. The following two years the land is under conversion process to organic farming land management. After this time farmer can receive the confirmation of organic producer on his fully converted areas and he becomes a organic farmer. This process runs under EU framework rules as a part of Common Agriculture Policy implementation. The member states implemented these rules into their national organic law and legislation.

Generally we can conclude that organic farming practices have positive impacts on the environment. Organic systems have lower energy requirements, but higher land use. In order to reduce the environmental impacts of farming in Europe, research efforts and policies should be targeted to developing farming systems that produce high yields with low negative environmental impacts drawing on techniques from both organic and conventional systems. (Tuomisto, et al., 2012).

In this part of the paper we are examining the problem of „land use“ in Slovak organic farming system in comparison with the other (the developed) EU countries. Using of this production factor can be described truth indicators: fully converted organic area in hectare, share (percentage) of organic land on total agricultural land in percent, number of organic farmers, average organic farm size in hectares per farm (Willer, et al, 2014). These quantitative indicators are worldwide used for describing the organic situation in countries or regions. They are used by authors and legal institutions as well. The yearbook: World of organic agriculture, issued by the Research Institute of Organic Agriculture (FiBL) and the International Federation of Organic Agriculture Movements (IFOAM) based on this indicators too.

History of organic farming in Slovakia began 15 to 20 years later compared to more developed countries in Europe due to the fact that until 1989, intensive conventional

farming was used exclusively (Vanková - Baláž, 2005). In Slovakia the number of farms and the acreage of farmed land between 1991–2010 was increasing. There is a significant increase since 2004, due the implementation of commitments of the Government of the SR under the Rural Development Plan for 2004–2006 and Rural Development Program 2007–2013, which aimed to achieve the implementation of organic farming for at least 5% of the total agricultural land. Therefore it can be concluded that the regulatory stimulation by the State has helped to develop organic farming in Slovakia. (Pašová, et al., 2013).

The various forms of organic production are applied in 162 countries worldwide. There is a 37 245 685.63 hectares of land under organic farming management (including in-conversion areas). This represents 0.86 % of the total area of cultivated land in the world. In Europe, there are 10.6 million hectares of organic land, which represents 2.2 % of the total share. More than 9.5 million. hectares out of this are located in European Union. In Europe there are more than 290 000 organic producers and the majority of these (240 000 organic producers) are from EU countries.

**Tab. 1 Fully converted organic area in selected European countries in hectares (2005-2012)**

		2012	2011	2010	2009	2008	2007	2006	2005
1	Spain	1 593 197	1 624 079	1 639 525	1 635 672	1 613 969	1 538 947	1 456 672	1 430 292
2	Italy	1 167 362	1 096 615	1 096 615	1 051 779	1 057 284	1 100 772	1 113 742	1 113 742
3	Germany	1 034 355	1 015 626	1 019 728	1 042 898	1 041 898	1 040 018	990 702	985 215
4	France	1 032 941	975 051	974 976	913 860	902 908	888 033	811 727	811 983
5	Poland	661 956	609 412	612 553	542 460	542 112	532 496	521 970	518 945
6	United Kingdom	590 010	638 528	638 524	655 303	655 391	655 644	699 638	699 643
7	Austria	537 706	542 553	539 686	538 769	539 059	538 749	543 605	538 803
8	Sweden	477 685	480 185	490 399	445 040	444 212	444 191	438 693	444 204
9	Czech Republic	468 670	460 498	473 090	468 464	468 751	467 057	448 202	435 610
10	Greece	462 618	213 276	240 837	244 988	244 519	249 579	309 823	282 257
11	Portugal	200 151	200 151	200 151	200 009	194 403	191 072	201 054	201 054
12	Finland	197 744	188 189	187 739	172 129	168 957	168 825	169 168	167 336
13	Latvia	195 658	184 096	180 998	182 025	181 415	181 526	166 320	169 422
14	Denmark	175 113	162 173	162 211	163 529	163 408	163 442	162 903	162 927
15	Slovakia	166 700	166 700	166 708	188 050	187 875	188 072	174 471	174 463
16	Lithuania	156 539	152 305	155 087	151 689	148 241	148 637	143 644	140 865
17	Hungary	127 780	124 402	124 390	119 620	130 481	131 884	127 605	127 764
18	Switzerland	125 961	122 997	122 997	122 005	121 537	121 537	119 613	119 656
19	Belgium	59 718	55 304	55 306	53 096	53 188	53 217	49 004	49 009
20	Norway	55 260	55 500	49 407	83 658	84 461	84 473	57 219	58 581
21	Ireland	54 122	54 122	54 116	53 755	53 733	53 739	47 864	47 864
22	Netherlands	48 038	47 205	47 529	41 818	42 318	42 649	46 233	48 690
23	Slovenia	35 101	32 148	32 131	32 092	32 101	32 037	30 696	30 713
24	Croatia	34 512	32 036	31 756	26 940	26 643	25 761	23 352	22 990

Source: FiBL - Research Institute of Organic Agriculture (2014)

As the table 1 shows, Slovakia is on the 15 place (from selected countries) in the area of fully converted organic agricultural land. It is strongly connected with the total area of Slovakia, which is smaller in comparison with the countries 1-14 (tab. 1). Despite this, the share of organic land on the agricultural land is 9,35 %. European Commission (EC) sets the minimum 5% share of agricultural land under organic management as one

of the head goals for programming period 2007-2014 (in The Rural Development Programme of the Slovak Republic 2007-2013). This 5 % criteria sets by EC in the proces of Common Agrucultural Policy (CAP) implementation we already passed in 2006.

**Tab. 2 Average organic farm size in selected European countries in hectares (2005-2012)**

		2012	2011	2010	2009	2008	2007	2006	2005
1	Slovakia	456,71	456,71	459,25	518,04	536,79	671,69	625,34	890,12
2	United Kingdom	137,82	137,32	129,02	127,10	121,75	119,08	150,82	164,12
3	Czech Republic	119,96	117,96	134,52	174,21	255,59	354,37	465,42	525,46
4	Sweden	85,29	87,18	94,16	92,41	120,51	155,97	184,32	150,53
5	Hungary	81,91	86,81	78,88	73,98	80,84	94,95	82,17	82,27
6	Portugal	76,89	76,89	82,23	121,14	102,21	98,04	129,71	135,94
7	Denmark	66,06	60,58	60,59	60,70	59,36	57,53	58,30	53,67
8	Lithuania	61,95	58,07	59,13	57,20	53,00	63,30	61,18	77,78
9	Latvia	55,97	52,84	50,38	45,32	43,16	44,19	40,52	58,97
10	Spain	52,30	50,45	58,81	64,67	75,81	84,44	84,62	91,14
11	Finland	45,75	45,74	46,68	42,12	42,33	42,51	42,65	38,39
12	Germany	44,91	45,13	46,47	49,55	52,59	55,61	56,43	57,89
13	France	42,29	42,15	47,32	55,57	67,90	74,14	69,74	71,21
14	Belgium	42,26	43,41	48,51	52,00	59,03	62,46	61,03	66,86
15	Ireland	38,46	38,66	39,62	40,48	45,93	47,14	44,82	50,01
16	Netherlands	29,18	28,23	30,58	28,10	28,73	29,11	31,93	33,17
17	Italy	26,62	26,08	26,23	24,50	23,83	24,34	24,69	24,83
18	Poland	25,51	26,01	29,77	31,74	36,41	44,80	56,82	72,26
19	Austria	24,62	25,15	24,38	25,66	26,83	27,04	26,96	26,42
20	Croatia	22,59	36,00	28,23	32,97	42,16	53,34	63,46	85,47
21	Norway	21,34	20,37	17,61	29,34	31,26	32,35	22,15	23,47
22	Switzerland	20,41	20,40	20,54	20,64	19,99	19,61	18,99	18,64
23	Greece	19,74	10,03	11,32	10,35	10,16	10,50	12,96	19,31
24	Slovenia	13,09	13,60	14,49	15,31	15,53	16,02	15,72	17,88

Source: FiBL - Research Institute of Organic Agriculture (2014), own calculations

The average organic farm size is one of the most interesting from selected indicators. This we calculated as the total organic area divided by the number of organic farmers in the country (based on the FiBL data and methodology). Surprisingly, Slovakia is the first (from selected countries) in this indicator. Unfortunately, first does not means the best. The extremely large farm area is in the conflict with the EC goals for organic farming implementation in EU. Organic farming is set as an alternative (means extensive) land management and the big farms with the mass production are typical for conventional (means intensive) farming. On the other hand, the large farms are the historic fact in Slovakia connected with the collective farming implemented in communism period Transformation to the private ownership (and organic farming management) is then connected with the change of legal form, but not the farm area. (Lančarič, et al., 2013).

**Tab. 3 Cultures on agricultural land in selected European countries in % (2012)- arranged according to the criteria “area of permanent grasslands”**

	Permanent grassland	Agr. land and crops, no details	Arable crops	Other agricultural land	Permanent crops
Netherlands	96,21	0,01	3,68	0,04	0,05
Slovakia	85,75	0	12,38	0,26	1,61
Sweden	84,94	0	10,76	0,03	4,27
Italy	81,88	0,43	17,04	0,46	0,19
Denmark	78,60	0	17,45	3,00	0,96
Czech Republic	71,97	0	25,29	1,86	0,88
Finland	68,74	0	30,38	0,04	0,84
Lithuania	65,71	0	12,75	5,13	16,41
Ireland	62,59	0,84	34,77	0,6	1,20
Austria	59,99	0,09	21,76	2,68	15,48
Latvia	58,88	0,32	38,84	0,95	1,00
Portugal	55,78	0,01	41,57	1,1	1,54
Greece	53,36	0	40,48	2,08	4,08
Croatia	53,16	0	17,46	6,71	22,68
Hungary	45,85	0	51,15	2,47	0,53
United Kingdom	36,78	0	50,22	4,31	8,68
Poland	35,38	2,34	53,42	0,12	8,74
Spain	26,45	0,02	68,9	1,24	3,39
Germany	24,90	0	45,19	3,64	26,27
Norway	22,38	0,63	74,39	2,54	0,06
Slovenia	22,12	8,22	54,98	2,09	12,59
France	18,32	0	79,57	1,62	0,49
Switzerland	14,82	0,02	84,61	0,26	0,29
Belgium	1,07	19,74	65,58	13,35	0,26

Source: FiBL - Research Institute of Organic Agriculture (2014), own calculations

As we can see on table 3, there are 85,75 % share of grasslands on the organic agricultural land in Slovakia. In this indicator we are on the second place from selected countries. The biggest share of grasslands is recorded in Netherlands (96,21 %). The large grasslands are typical for this Nordic country because of the character of weather and landscape in this region. In contrast with this, Slovakia has an ideal nature conditions for crop production, primarily in lowland areas. Grasslands are typical just for foothill regions of Slovakia. Organic (and also conventional) farming in this areas focuses mainly on grazing cattle, horses and sheep. Mentioned high share of grasslands is determined by their extension also in the lowlands. In our opinion, the reason is state subsidy policy. Organic farmers in Slovakia can draw “The Single Area Payments” designed for all farmers (conventional and organic) and also special “Agro-environmental Payments” for land under organic farming. Moreover, when operating in the “Protected Area” they can combine agri-environmental payment with one (or more) special payments (organic farming (permanent grassland) + protection of habitats and semi-natural grasslands or organic farming + protection of habitats of birds). The amount of just an agri-environmental payment (without combination with the single area payment or special payments) is 152,69 EUR.ha<sup>-1</sup> of cropland, 671,15 EUR.ha<sup>-1</sup> of

orchards and vineyards, 376,75 EUR.ha<sup>-1</sup> of vegetables, medicinal, spices and aroma growth and 96,16 EUR.ha<sup>-1</sup> of permanent grassland (in 2007-2013 period). Payment for grasslands is lower than for other cultures. On the other hand realization of grassland is the simplest of these.

## Conclusion

Organic farming is a result of combining historical experience with the latest scientific knowledge. In general we can say that organic farming uses factors of production in a manner which do not threaten them. This type of land management system is in many ways more difficult than conventional one, but we must emphasize the need for its implementation and the benefits it brings. The theory sets basic differences from the economic and managerial point of view (Kozáková, et al., 2011). In this article we focused on this and evaluated some of this “established beliefs”. Factors labour and capital we evaluated truth statistical significance differences in selected indicators compared in Slovak organic and conventional farming. The factor land we evaluated truth comparison of basic indicators in Slovakia and 23 another European states (developed in organic farming implementation).

Our aim was to measure the differences in of organic and conventional farming on a sample of more than 1050 large farms in Slovakia. Based on the results we can conclude there are no statistically significant differences (in selected indicators) between conventional and organic farms over the whole observed period in the observed indicators. The fact that organic farms have higher number of employees was confirmed in none of the years observed as well as the equity per hectare and total assets per hectare. There is a statistically significant difference in the personal costs per hectare in year 2009 only. We can conclude, that according to methodology used we decline both hypothesis set in this article. Organic farmers in Slovakia do not have more employees and consequently higher labour costs (both per hectare) than conventional farms. Also we found no higher equity and assets need per hectare in organic farms (table 1).

**Tab. 1 Contrasts (2009-2012) – Results of t-test**

	Employees per hectare	Personal costs per hectare	Total assets per hectare	Equity per hectare
2009	no	yes	no	no
2010	no	no	no	no
2011	no	no	no	no
2012	no	no	no	no

Source: own calculation based on data from the Information Letters of the MoARD SR

\*no - there is no statistically significant difference in evaluated indicator between the conventional and organic farming,

\*yes - there is statistically significant difference in evaluated indicator between the conventional and organic farming,

From evaluation of production factor land we can conclude that we have a large farms aimed at grasslands in Slovakia. Farming on grasslands is less labour and capital intensive as on other cultures. That is the reason why there are no significant differences in the number of employees and personal cost (H1). Moreover, grasslands has not high demands on assets and equity, which means no significant differences in H2 evaluation. According mentioned we can conclude, that the primarily motivation of Slovak organic farmers is the profit. They pursue less demanding agricultural management, which is in the same time under considerable supports. In this direction, we propose to address further research to motivation of Slovak organic farmers and options of our organic farming in 2020 horizon. Because: “The strategic aim of the present vision “Europe 2020” is to transform Europe into a leading, competitive, continuously developing, knowledge-based network economy which is environment sensitive. One of the key priorities is also sustainable growth: a high rate of employment, environment-

friendly and resource – effective economy”. (Szeplédy, et al., 2012). In this regard, there is a question: Will our organic farmers be able to do business under this conditions?

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# Improving process management by identifying excessive costs

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## Abstract

Nowadays, companies must, even more than ever before, fight with continuous constantly uncertainty, if they want to survive in the fierce competition in the global market. It is very important to continuously develop and adapt management system as external conditions and strategy, which they are decided to apply. Process management is among current management methods, management theorists that are considered to be the most complete and most effective ways to manage costs. The result of such management is cost saving, which is created by effectively setting process consisting of specific activities. Process management brings to company not only a picture of the current status, but also helps to draw conclusions on the effectiveness and costs of individual processes. The aim of this article is to quantify the cost effectiveness through the model of process costs and identify problematic activities with low cost effectiveness. In examining of this issues we used basic methods as analysis, synthesis, comparison, deduction, further methods of observation and controlled interviews with workers. Model of process costs was used by quantifying the costs. This model examines the expenditure processes, the set of activities which are changing inputs into outputs. This model is built on knowing how much it cost not the outputs of the processes, but the processes themselves. Process costs are total resources for the implementation of the concrete process. According to British Standard BS 6143, this consists of the following costs:

1. compliance costs - the total cost of conversion of inputs to outputs in a certain process, which is implemented in the most effective manner,
2. costs of non-conformity - losses caused by waste of time, material and other capabilities associated with the generation of disagreement within the process.

Costs of non-conformity in the process are unnecessarily expended costs.

In connection with the model of process costs and also for quantify of costs and cost effectiveness of specific activities were used indicators of the overall process costs and cost effectiveness. The article presents the results of the analysis of process management in a selected company, where we focused on quantifying the cost effectiveness in the process of establishment data services by application of model of process costs. To monitor processes in the company uses a management information system that is set so that allows you to capture details of individual costs. We selected process related to data services, and we have identified activities that are spent highest costs. Subsequently, we determined cost effectiveness and additional calculations we determined the proportion of the costs of specific activities, on the total cost of the process. The result is a definition of the activities with the highest effectiveness and problematic activities with low effectiveness of utilization costs. Based on the results we put forward the manager, a specific actions that should be solved. In conclusion, we note that the model of process costs is able to identify the problematic

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activities in terms of utilization costs. In our opinion, the current period is very needed for companies to search the ways of reducing costs, respectively finding problem areas and here it is possible to apply the model of process costs, which can help to ensure long-term competitiveness.

### **Keywords:**

costs, cost effectiveness, globalization, model of process costs, process management

### **Introduction**

Process Management or Business Process Management, is currently unquestioned successor of Functional Classic Management, which was developed for decades. Process management is inserted between new managerial methods and initiatives such as "exceptional frontal initiative" and is enforced by management theorists as one of the most convenient, most complex and most effective process management approaches. The result of this management is costs saving, which is created by effectively setting process consisting of specific activities.

### **Literature review**

Globalization is a widely discussed topic of today's business environment and it can be seen either as an opportunity or a threat to companies. Recent years have seen rising interest in network economy. The first reason is globalization. The world has been shrunk by information technology and open economies. The second reason is that companies have to take care of costs to meet the descending price rate of the market (Kulmala, Paranko, Uusi-Rauva, 2002).

The road to Business Process Management has been a difficult one that was developed from the successes and failures of various other attempts at achieving process-based organizational efficiency. It has only been in the last several years that BPM has started to gain significant momentum in many organizations around the world (Jeston, Nelis, 2008).

Over the past few years, Business Process Management (BPM) has been advocated as evolutionary initiatives that will enable organizations become more agile through better flexibility and better reusability that lower costs and increase efficiency. BPM is mainly a management discipline and strategy which endorses the idea that we can model a business in terms of its end-to-end processes that cut across traditional organizational and system boundaries. These processes are then represented in a way computers can understand and process (Collen, 2006)

The difference between the process and functional management is in defining of responsibilities. While in functional management is given responsibility for specific sections in process management is defined responsibility for each process (Kryšpín, 2005).

Four principles of process management, which make it possible to realize the company's own development of process management:

1. determine the strategic aims and objectives,
2. defining processes and their mapping with emphasis on key processes,
3. application ownership of the process of senior management to improve the process,
4. change in the organizational structure of the company by reducing communication and corporate bureaucracy (Fiala, Ministr, 2003).

The issue of reducing costs in the current period is very actual. Management costs is classified as essential managerial activity and is an important part of management information system of the company (Kučera, Škorecová, Látečková, 2005)

A cost management system is primarily concerned with producing outputs for internal information users, using inputs and processes needed to satisfy management objectives. A cost management information system is not bound by externally imposed criteria that define inputs and processes are set by people within the company. Additionally, the focus of cost

management systems has been broadened to enable managers to better serve the needs of customers and manage the firm's business processes that are used to create customer value (Hansen, Mowen, Guan, 2007)

The constant increase of costs and a high proportion of overheads costs in the structure of the total cost is the actual problems of each production. Significant attention must therefore be paid to economic management costs and its informational support (Váryová, Košovská, Ferenczi Vaňová, 2012).

An important factor of process management is the proper creation of a process architecture. A procedural architecture is divided into four levels, namely: process groups, processes, processes on lower level, activities. It is also important to know the process categories, which are management, main and supporting processes. Management processes related to the exercise of managerial activity which promotes the provision of executive activities of the organization. Main processes deliver products and services and cover a major area of interest of the company, which is characterized in the market. Supporting processes are used to support the main processes of the company. These processes provide infrastructure and assistance to the main processes and related to the management of company (Krajčiová, 2010).

The benefits of process management can be quantified. The general benefits of process management are:

- clearly defined powers of people in processes,
- simplify and streamline of work processes,
- streamlining the current organizational structure,
- focus on key processes,
- support of information systems,
- simplify the various decision-making tasks,
- enhance the performance of people and entire processes, etc. (Kotelnikov, 2010).

Implicit in the preceding discussion are a number of fundamental principles that must be honored in order to deliver business results to customers and to satisfy the needs of the organization's other stakeholders. These principles underlie the methods of business operation and change. Understanding and living according to these principles will get managers and practitioners alike through some tough debates about managing processes. Without the principles teams can easily get lost and distracted from the intent of the journey. The 10 principles are:

- Business change must be performance driven.
- Business change must be performance driven.
- Business change decisions must be traceable to the stakeholder criteria.
- The business must be segmented along business process lines to synchronize change.
- Business processes must be managed holistically.
- Process renewal initiatives must inspire shared insight.
- Process renewal initiatives must be conducted from the outside in.
- Process renewal initiatives must be conducted in an iterative, time-boxed approach.
- Business change is all about people
- Business change is a journey, not a destination (Burlton, 2001).

## **Material and methods**

The aim of the article is to quantify the cost effectiveness through the model of process costs and identify problematic activities with low cost effectiveness. In examining the issues that we used basic methods as analysis, synthesis, comparison, deduction, methods of observation and controlled interviews with managers. In the article we deal with process management where we observe the individual processes. Issues is solved from two aspects,

aspect of theory and practical aspect. Practical part we solve in the selected company, which works in the area of provision data services. The company indicated problems in the area of management costs in the process of establishment data services for customers.

We used the model of process costs, which is not based on knowing how much services (process output) costs, but the processes themselves. The model examines the process expenditure, the set of activities changing inputs into outputs (Ciencala, 2011).

Process costs are total resources for the implementation of the concrete process. According to British Standard BS 6143, this consists of the following costs:

1. compliance costs - the total cost of conversion of inputs to outputs in a certain process, which is implemented in the most effective manner,
2. costs of non-conformity - losses caused by waste of time, material and other capabilities associated with the generation of disagreement within the process.

Costs of non-conformity in the process are unnecessarily expended costs.

In connection with the model of process costs and also for quantify of costs and cost effectiveness of specific activities were used these indicators (Ciencala, 2011):

1. Total cost for the process  $N_p$ :

$$N_p = N_{sp} + N_{np} \quad [\text{EUR}] \quad (1)$$

notes:  $N_{sp}$  – compliance costs,  
 $N_{np}$  – costs of non-conformity.

2. Cost effectiveness  $V_{efn}$ :

$$V_{efn} = \frac{N_{sp}}{N_p} \times 100 \quad [\%] \quad (2)$$

## Results

To monitor the whole process of establishment data services is used sophisticated management information system.

The whole process we closely monitored for one year while we investigated the costs of each activity in relation to the elements of the process. Under the activities we mean specific activities that must be carried out for the establishment of data services. Essential element in this process are specific orders which enter at the beginning of the process of establishment data services. The output of this process are equipped orders - establishment of data services or unrealized orders. We studied 643 orders, while equipped orders, resulted in only 76% (488 orders). The difference is represented by 155 unrealized orders or 24%, that resulted in formation of costs of non-conformity.

To each activity are calculated costs, whose effectiveness we calculated through the model of process costs. The results are shown in Table 1. Table 1 presents cost effectiveness that we calculated in relation to a specific activities that shows:

- the total cost of a particular activity,
- costs of compliance,
- costs of non-conformity,
- cost effectiveness.

**Tab. 1 Cost effectiveness**

Activities	Total cost	Compliance cost	Costs of non-	Cost effectiveness
entering of orders into the system	1 286,00 €	1 152,00 €	134,00 €	89,580%
checking the correctness of the data in order	1 929,00 €	1 728,00 €	201,00 €	89,58%
confirming the completeness and accuracy of data in order	1 932,50 €	1 440,00 €	492,50 €	74,51%
exploring possibilities to establish data service T	1 635,00 €	1 540,00 €	95,00 €	94,19%
physical establishment of data service T	4 905,00 €	4 620,00 €	285,00 €	94,19%
checking availability of establishment data service TS based on coverage maps	747,00 €	576,00 €	171,00 €	77,11%
exploring possibilities and physical establishment of data service TS	6 723,00 €	5 184,00 €	1 539,00 €	77,11%
purchasing of terminal equipment	18 096,00 €	18 096,00 €	- €	100,00%
delivering of terminal equipment	2 000,00 €	1 952,00 €	48,00 €	97,60%
sales service	14 640,00 €	14 640,00 €	- €	100,00%
$\Sigma$	53 893,50 €	50 928,00 €	2 965,50 €	94,50%

We found that the whole process of establishment data services 24% of unrealized orders are created by costs of non-conformity in the amount of 2,965.50 EUR and representing 5.50% of the total cost of process. We found that equipped orders in this process were 76% and for this reason costs of compliance were calculated in the amount of € 50,928.00 and representing 94.50% of the total cost of the process.

Costs of compliance in the process, which represents 488 equipped orders were estimated at 50928 EUR. The total cost of this process were calculated at 53 893.5 EUR, further calculation we found that the cost effectiveness of the process of establishment data services was estimated at 94.50%.

### Conclusions:

Benefit application model of process costs and determine the excessive costs is to calculate the cost effectiveness of specific activities, which can identify these activities that create costs of non-conformity. Consequently, managers can focus on improving these activities and take steps that will seek to eliminate excessive costs.

Based on calculations made by us and the application model of process costs in the selected company is clear that in the process of establishment data services were found the highest costs of activities:

- "purchasing of terminal equipment",
- "delivering of terminal equipment ",
- "sales service".

We also found that these activities have a 100% cost effectiveness, we note that they are effective. The lowest cost effectiveness was calculated in the activity "confirming the completeness and accuracy of data in order" (74.51%). Additional calculations we determined the proportion of the costs of specific activities, in relation to the total cost of the process. This situation is positive because 51% costs of the process establishment data services is created by activities with 100% cost effectiveness ("purchasing of terminal equipment", "delivering of terminal equipment" and " sales service"). Activity with the lowest cost effectiveness ("confirming the completeness and accuracy of data in order") contributes to the total cost of only 3.6%.

We recommend to managers to solve problems related to activity 'exploring possibilities and physical establishment of data service TS "whose cost effectiveness is only 77.11%, because the proportion of the total cost of the process is 12.5% for this activity. Based on the calculations in selected company, we note that the model of process costs can identify a problematic activities in terms of low rate of cost effectiveness. In our opinion, the current period is very important for companies to identify excessive costs and thus reducing costs. Because of this model of process costs can promote the achievement of long-term competitiveness.

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# Agricultural Marketing Cooperatives in the Slovak Republic. A case study

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## Abstract

Agricultural cooperatives have a long tradition in the Slovakia (SR). We distinguish the agricultural production cooperatives (APC) from agricultural marketing cooperatives (AMC). The last ones comprise of primary agricultural producers of different legal forms. There are very few studies available on agricultural cooperatives in the Central and Eastern European Countries. In the paper we analyse economic performance of the Slovak agricultural production cooperatives, members and non-members of the AMC over 2009 – 2012 in selected regions. We assume that the APC associated in the AMC benefited from the membership and had better economic performance than the non-associated ones. We used fully balanced panel of annual data of selected economic indicators (MoAaRD SR, 2012) of 109 agricultural primary production cooperatives. We constructed econometric models and estimated parameters of AMC membership impact on the APC performance expressed by selected economic indicators. We found statistically significant differences in average revenue of the AMC members and those AMC non-members, regardless of the region and AMC specialisation. The revenue per hectare increased with the size (UAA) of the APC and their partial productivity of land (value added per hectare). There were regional differences. The agricultural marketing cooperatives significantly contributed to average profit per hectare of their members only in Nitra region. The membership in the AMC however significantly increased the agricultural production cooperative average costs per hectare. In the future, besides of improving the AMC services, their members could benefit from the economy of scale by further extension of their size (UAA).

## Keywords:

agricultural marketing cooperative, agricultural production cooperative, membership, economic performance, econometric model

**JEL Classification:** Q130, C23

## Introduction

Agricultural cooperatives have a long tradition in Slovakia. The first cooperative was established in 1845 (Martuljak, 1995), in order to protect small farmers against a pressure of stronger competitors on the market. The main idea of cooperatives had been modified during the period of socialisms (Lazíková – Bandlerová et al., 2007). The agricultural cooperatives became primary production units cultivating large areas of agricultural land. During transition

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period to market economy, agricultural cooperatives had been transformed to several legal forms. After the Slovak Republic (SR) accession to the European Union (EU), many agricultural producers started to associate. These groups help their members to receive better position on the market and usually operate in a form of cooperative. In Slovakia therefore we distinguish the agricultural production cooperatives (APC) from the agricultural marketing cooperatives (AMC). The last ones comprised of primary agricultural producers of different legal forms. Since not all agricultural primary producers became the members of the marketing cooperatives, a question arise whether there are significant differences in the economic performance of members, in comparison to non-members of these agricultural marketing cooperatives. Agricultural producer cooperatives play an important role in the Slovak agriculture. In 2012 they represented 7% of agricultural farms; 26% of total number of legal entities and they cultivated 39% of agricultural land (MoARD SR, 2012a).

### **Agricultural marketing cooperative and their role in the agriculture**

Individuals in rural communities can achieve economic and social objectives as a group that they could not achieve as sole producers, workers, or consumers (Merrett, Walzer, 2004). It is a typical process of horizontal integration usually defined as a process of merger of economic units operating at the same level of production. These groups are the means by which the farmers are supposed to defend themselves from being bypassed and marginalised by liberalisation and globalisation (Vorley, 2001). They establish economic linkages between farms producing the same category of agricultural products (Malchar – Michalska, 2011). These groups are formed by their members when the marketplace fails to provide needed goods and services at affordable prices and acceptable quality (NCBA, 2005).

AMCs have several economic and social functions: improvement of the efficiency and efficacy of agri-food supply chains by exploiting economies of scale and scope as well as by reducing transaction costs (Bijman et al., 2006); providing services that support producers in their farming activities, including the marketing of the farm products, gain storage, transport (Bijman, Wollni, 2009; Ortmann, King, 2007); development of networks in order to reduce transaction costs, to facilitate knowledge transfer and exchange of resources, and be competitive (Karantininis, 2007); to strengthen bargaining power, maintain access to competitive markets and to strengthen their competitive position through product innovation and guaranteeing food safety, to improve income opportunities, to provide access to resources, to reduce costs, and manage risk (e.g. Bijman et al., 2012; NCFC, 2005); to empower people to improve their quality of life and enhance their economic opportunities through self-help (NCBA, 2005). Malchar – Michalska (2011) emphasizes that the main aim of agricultural producer groups is not the growth of amount of agricultural outputs produced in member farms, but the expectation that by strengthened cooperation among farmers they will be more active and strongly linked in a food chain and this will result in higher income.

There are lot of studies interesting in external and internal conditions under which these organizations may be more or less effective at serving their members. Bruynis and co-authors (2001) argue that member equity, limited returns, patronage refunds, democratic voting, and open membership are all considered necessary for any emerging cooperative to be successful. Adamowicz and Lemanowicz (2004) state it is necessary to promote program of cooperation within a group and to promote usage of instruments supporting creation and development of horizontal integration activities. Markelova, Meinzen – Dick, Hellin, and Dohrn (2009) indicate that without sufficient incentives in place for smallholders to organize around marketing of a particular commodity, collective marketing will not be successful. Neven et al. (2005) reveal in the Southern Africa that economic success does not automatically imply social success. A farm (AMC) may be economically successful in that its value, sales, profitability increase and in that it constantly upgrades its capacities but at the same time have little or no impact on the living

conditions of the rural poor that are involved in the project. Chirwa et al. (2005) argue that farmer organisations can encourage market access and commercial agricultural development but face many challenges, require sensitive but committed support, and are unlikely to succeed in directly helping the poor in more difficult environments; external support needs to be skilled, sensitive, consistent and patient if farm organisations are not to be another development disappointment at the start of the 21 century. Attwood and Baviskar (1987) state that the success of the cooperative sugar factories in India depends not only on a superior cane supply system, but also on their ability to generate a stable alliance among small, medium and large cane growers who are the shareholders. Bernard et al. (2006) found in Senegal and Burkina Faso that the performance is constrained by low professional management capacity and lack of access to resources. Karami and Rezaei-Moghaddam (2005) found in Iran that cooperative structure and government support factors are the most important factors explaining the performance of APCs. Barham and Chitemi (2008) suggest in Tanzania that more mature groups with strong internal institutions, functioning group activities and a good asset base of natural capital are more likely to improve their market situations.

### **The impact of collective action group membership**

There are only few studies analysing the impact of collective action groups (e.g. agricultural marketing cooperatives) on their member and comparison farmers' economic situation with the economic situation of the non-members. Some of them documented positive impact of collective action groups on the economic performance of their members (e.g. Vandeplass, Minten, Swinnen, 2013; Wollni, Zeller, 2007; Librero, Tidon, 1996; Liebrand, 2007; Bernard, et al., 2008). The higher economic performance of AMC's members than the economic performance of the non-members is one of the effects. Verhofstadt and Maertens (2014) find that cooperative membership in general has a positive impact on different farm performance indicators, but these effects are driven by specific types of cooperatives. Hellin, Lundy and Meijer (2006) conducted research in Mexico and Central America. They found that benefits of farmer organizations with regard to output markets access are more evident in vegetable sector with high transaction costs. There are far less incentives for farmers producing a commodity such as maize, to organize themselves, since transaction costs associated with market access for this commodity are relatively low. Berdegué (2001) provided research in Chile on the *empresasa sociatives campesinas* (EAC). Their main purpose is to improve the performance of their members' - farms. According to this research, members of the EAC are mainly small farmers working with the products-markets with high transaction costs. Bernard and Spielman (2009) find that poorer farmers in Ethiopia tend not to participate in rural producer organizations (RPOs) although they may indirectly benefit from them. When they do participate, they are often excluded from decision-making processes.

Most of the studies related to the impact of AMC membership on the economic performance of the agricultural producers were conducted in developing countries. There are very few studies available on agricultural cooperatives in the Central and Eastern European Countries. The AMCs and possible long term development of the agricultural sector in Poland were discussed by Valdez (2012), Adamowicz and Lemanowicz (2004) or Banaszczak (2008).

### **Agricultural Marketing Cooperatives in Slovak agriculture**

Only few AMCs have been established in Slovakia before its accession to the European Union, due to several reasons. These were lack of knowledge about the AMC's relevance, their structure, benefits and effects. The main one however, was lack of financial incentives. After the accession of Slovakia into the EU, the Slovak government decided to support the farmers associations, in order to improve their bargaining position on the markets (Bandlerová et al., 2012). There were two funding programming periods. The first one 2000-2006 started in Slovakia in 2004 (the accession of Slovakia into the EU). In this period 34 AMCs were established. Most of them were oriented on the plant production: cereals, oil seeds, potatoes,

tobacco or hops (20 AMCs). Some AMC operated in the animal production: e.g. dairy, beef meat, pig meat, sheep and poultry (Table 1). During the second programming period 2007-2013 63 AMCs were established mainly in the Western Slovakia (Yearbook, 2013). Over this period, the AMCs were supported through the Rural development program, under the measure 1.5 Producers groups. The main aim of this policy tool was to support the AMCs establishment, to adapt agricultural production to market requirements, to support marketing of agricultural products and to increase agricultural production value added. Out of 66 applications for this type of support, 63 beneficiaries received 20 139 950 EUR (Yearbook, 2013). The most of established AMCs (Table1) were oriented on the plant production (61%); dairy (24%), poultry (6, 5 %), pig meat (6, 5%) and beef meat (2%). According to the RIAFE (2013), all active 97 AMCs were established under the EU support and associated about 746 farmers of different legal forms.

**Table 1: Agricultural marketing cooperatives in the Slovak Republic**

Sector	Number of constituting agricultural producers	Number of AMC			AMC total
		2005	2010	2013	
		RDP 2004-06	RDP 2004-06	RDP 2007-13	
Cereals	243	5	12	28	40
Oilseeds and legumes	105	0	2	10	12
Potatoes	28	1	4	0	4
Tobacco	73	1	1	0	1
Hops	1	0	1	0	1
Plant production	450	7	20	38	58
Total					
Dairy	206	6	8	16	24
Beef cattle	7	0	0	1	1
Pigs	33	1	3	3	6
Sheep breeding	11	1	1	0	1
Poultry and eggs	39	0	2	5	7
Animal production	296	8	14	25	39
Total					
Total	746	15	34	63	97

Source: RIAFE, 2013, Skriniarova et. al. (2014)

The Slovak law does not prescribe a business form for the AMCs. Most of them were established as cooperatives in Slovakia. There were more than 90 % of cooperatives among the AMCs in 2012 (Bandlerová et al., 2012). There were only few AMCs established as business companies, either as limited liability companies or joint stock companies. Reasons of such a development are: the cooperative form is a traditional form of association of farmers,

the agricultural production cooperatives belong to a common form in Slovakia; and mainly the APC became the AMC members. In addition, according to the Slovak Commercial Code, minimum five constituting members are required to establish a cooperative and benefit from a financial support. The requirement of minimum of constituting members of the AMC should be considered as very sensitive. In some sectors, this requirement is too restrictive, e.g. in sheep meat or sugar sectors. Another advantage of the cooperative form is a level of required equity capital, which is the lowest for cooperative form (1250 EUR).

The AMCs in Slovakia are engaged in collective bargaining and marketing of farm products, in collecting farm products, wholesaling, retailing, selling branded consumer products (mainly fruits and vegetables), and buying inputs (e.g. seeds, fertilizers, pesticides). The AMCs in Slovakia offer services mainly related to production of their members. Social, cultural or environmental services are offered by the AMC very seldom.

## Material and Methods

In the paper we investigated effect of determinants on economic performance of the Slovak agricultural production cooperatives, which were permanently members or non-members of the AMC over 2009 – 2012 in two selected regions. We used fully balanced panel of annual data of selected economic indicators (MoAARD SR, 2012b) of agricultural primary production cooperatives. We assume that the APC associated in the AMC benefited from the membership and had better economic performance than the non-associated ones.

The membership of agricultural holdings (APC) in the agricultural marketing cooperatives (AMC) impact on the APC performance we investigated using linear econometric model (Eq. 1).

$$Y_{it} = \alpha_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + u_{it}; i = 1, \dots, N; t = 1, \dots, T; T = 4 \quad (1)$$

Where:

$Y_{it}$  dependent variable at time t;

$\alpha_0$  intercept;

$\beta_1$  estimated parameter of independent variable j;

$\beta_2$  estimated parameter of categorical variable k;

$X_{1it}$  independent explanatory variable at time t;

$X_{2it}$  categorical variable;

$u_{it}$  random error;

N = 109; the number of agricultural production cooperatives in the sample.

Following dependent variables of the agricultural producers' performance were investigated: total costs per ha; revenue per ha; profit per ha.

Primary explanatory variable of interest was categorical variable membership of the APC in the AMC (AMC): 0 non-member, 1 member.

Categorical variables: Region: 0 Nitra, 1 Zilina; Membership in Zilina (AMC ZA): 0 non-member; 1 member; Membership in Nitra (AMC NR): 0 non-member; 1 member.

Independent variables: number of farm employees; utilised agricultural area (UAA) in hectares; UAA per farm employee; gross value added per ha; gross value added per ha; Investment support per ha; Non-investment support per ha.

In order to distinguish regional differences, differences in performance of members and non-members of the AMC and differences according to other categorical variables, we modified the panel model by introducing the interactions. We expect higher significant positive effect of explanatory variables on average revenue per ha and profit per ha.

Interactions: AMC membership & UAA per ha; AMC membership & non-investment support per ha; AMC membership & gross value added per ha; AMC membership & gross value added per farm employee; AMC membership & UAA in ha; AMC membership & number of farm employees.

A method of estimation of model parameters, was selected based on panel diagnostic tests. F statistic was used to test null hypothesis that the pooled OLS model is adequate, against the fixed effects alternative. To test the null hypothesis that the pooled OLS model is adequate against the random effects alternative we applied Breusch-Pagan (1980) the Lagrange multiplier (LM) test (Greene 2003; Judge et al. 1988). Hausman (1978) statistic tested the null hypothesis that the random effects model is consistent against the fixed effects model. Due to presence of heteroscedasticity, the weighted OLS methods for estimation of parameters were selected and statistical software GRETL was used for estimation of parameters.

## **Results and Discussion**

We used fully balanced panel of annual data of selected economic indicators (MoAARD SR, 2012) of 109 agricultural primary production cooperatives. There were 67 APC from the Nitra (NR) NUTS III (The EU Nomenclature of Territorial Units for Statistics) region and 42 APC from the Zilina (ZA) NUTS III region in the sample. Out of 109 APC there were 61 permanently AMC members over the reporting period. APC in the sample cultivated 28% of UAA in Nitra NUTS III region and 25% of UAA in Zilina NUTS III region.

Small agricultural holdings with farm employees from 10 to 49 prevailed in the sample and represented 49% of Nitra subsample and 52% of Zilina subsample. According to UAA, the APC were distributed evenly, except for micro holdings (Tab. 2).

The average UAA per agricultural holding was 1686 ha. The APC acreage ranged however from 66 to 7000 ha of the UAA. On average, the APC showed negative profit over the observed period. Performance expressed by profit per ha exposed the highest variation (Tab. 3).

**Table 2: Structure of the sample**

		Agricultural holdings (APC)				
AMC		Micro	Small	Medium	Large	Total
Farm employees		up to 9	10 - 49	50 - 249	250 and more	
Nitra	Members	0	13	15	0	28
	Non-members	2	20	17	0	39
Zilina	Members	0	11	9	0	20
	Non-members	5	11	6	0	22
Total		7	55	47	0	109
UAA in ha		up to 249	250 - 999	1000 - 1999	2000 and more	
Nitra	Members	0	5	10	13	28
	Non-members	2	9	17	11	39
Zilina	Members	0	7	5	8	20
	Non-members	3	10	5	4	22
Total		5	31	37	36	109

*Source: own calculation*

### APC membership in agricultural marketing cooperatives and their performance

Average revenue per ha of the agricultural producers significantly increased over observed period. We found regional differences with significantly lower average revenue per ha of agricultural producers in Zilina region compares to Nitra region (Model 4, Tab. 4). The Members of the AMP, irrespective of region, had however significantly higher average revenue per ha compared to non-members. Further significant factors of the average revenue growth per ha were number of farm employees, investment and non-investment support per ha and value added per hectare. Average revenue per ha of the AMC members increased with acreage of the UAA they cultivated (Model 6, Tab. 4). (Model 8, Tab. 4). The impact of the UAA on average revenue in the panel was negative although insignificant (Model 4-8, Tab. 4).

The APC from Zilina region had significantly lower average total costs per ha compared to APC from Nitra region. (Model 1, Tab. 4). The members of the AMC however had significantly higher average costs per ha, regardless to their regional location Model 2, Tab. 4).

**Table 3. Summary statistics**

Statistics	UAA ha	Total costs per ha EUR	Revenue per ha EUR	Profit per ha EUR	Non-investment support per ha EUR	Investment support per ha EUR	UAA in ha per farm employee
Mean	1686.4	1260.5	1236.2	-21.286	287.45	30.086	42.235
Median	1331.5	1195.6	1162.7	4.5216	268.12	0	36.155
Min	66	297.53	82.212	-585.6	85	0	8.6364
Max	7006	6606.3	6744.3	410.91	711.71	997.05	234
Standard deviation	1186	596.71	620.77	146.02	93.913	79.481	24.399
C.V.	0.70	0.47	0.50	6.86	0.32	2.64	0.58

Notes: coefficient of variation (C.V.)

Source: own calculation

Negative significant relation between cultivated UAA and average total costs per ha of agricultural holdings in pooled panel indicates economy of scale. Similarly we found negative significant effect of value added per ha and total costs per ha in the panel. Average total costs per ha of the AMC members however, would decline by growth of their value added per ha and would increase by further extension of their UAA acreage (Model 3, Tab. 4).

Over the observed period, profit per ha had been increasing. On average the APC in sample exhibited negative profit. There was no significant difference in average profit per ha of members and non-members of the AMC. (Model 9, Tab. 4). Nevertheless, the average profit per ha was significantly higher in agricultural holding in Zilina region in comparison to APC in Nitra region (Model 10, Tab. 4). The non-members of AMC in Zilina region exhibited significantly higher average profit per ha than the AMC members in this region (Model 10, Tab. 4). Number of farm employees had significantly positive effect on average profit per ha only in agricultural holdings which were members of AMC in Zilina region (Model 12, Tab. 4). The membership in AMC had significantly positive effect on the average profit per ha of the agricultural holdings in Nitra region.

## CONCLUSIONS

We found significantly positive impact of the agricultural holdings membership in AMC on their average revenue per hectare. Members of AMC can further extend their UAA acreage and value added per hectare in order to gain higher average revenue per ha.

Average costs per ha of the AMC members were significantly higher compare to the non-members. This can be explained by more intensive production of APC, members of the AMC. Extension of the UAA would lead to cost per hectare decline and thus the APC can take advantage of economy of scale.

Agricultural cooperatives reported negative profit on average, regardless the region and their membership in AMC, with significant improving over the observed period. Investment support per hectare and number of farm employees had significantly positive impact on profit per hectare of the AMC members in Nitra region. These agricultural production cooperatives

had also significantly higher average profit per hectare compare to the non-members. In Zilina region we found reverse relation.

Lack of data on specification of AMC membership according to sectors is one of the limitations of this research. In further investigation of how the Agricultural marketing cooperative membership can influence the agricultural producer performance we will use all available regional data and will compare the various techniques of panel model estimates.

Generally, the agricultural production cooperatives, members of the agricultural marketing cooperatives did not perform significantly better than non-members. We found however, regional differences with significantly better performance of AMC members in Nitra region An explanation of generally more successful performance of the agricultural production cooperatives can be in more successful activities of AMC in Nitra region and differences in the AMC managerial skills.

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Table 4 Impact of membership in AMC on farm performance

Variable	Costs			Revenue					Profit				
	1	2	3	4	5	6	7	8	9	10	11	12	13
Const	685.97***	681.72***	697.13***	393.97***	408.22***	399.35***	395.09***	404.11***	-231.50***	-225.43***	-234.54***	-228.79***	-233.88***
Year	25.95***	34.18***	28.51***	37.75***	42.50***	37.99***	39.35***	37.55***	8.21***	7.36***	8.01***	7.72***	7.54***
Region	-359.59***	-448.56***	-354.98	-343.82***	-402.6***	-348.67***	-353.15***		19.25**	42.81***	18.53**	48.05***	19.11**
AMC	117.61***			120.83***					-5.62				
UAA in ha	-0.078***	-0.072***	-0.085***	-0.018	-0.01	-0.014	-0.015	-0.024	0.076***	0.081***	0.074***	0.078***	0.074***
Farm	4.19***	4.15***	3.86***	1.78***	1.67***	1.81***	1.82***	1.61***	-2.72***	-2.87***	-2.69***	-2.85***	-2.63***
Investment	0.432***	0.52***	0.47***	0.37***	0.44***	0.37***	0.37***	0.32***	-0.092***	-0.099***	-0.106***	-0.107***	-0.243***
Non-invest.	0.91***	1.051***	0.979***	1.51***	1.57***	1.58***	1.59***	1.55***	0.387***	0.343***	0.395***	0.344***	0.396***
Valued added	1.74***	1.76***	1.76***	1.97***	2.02***	1.99***	1.94***	2.04***	0.377**	0.395***	0.369***	0.394***	0.361***
Valued added	-0.018***	-0.02***	-0.02***	-0.012***	-0.014***	-0.013***	-0.012***	-0.013***	0.002**	0.002*	0.002**	0.002**	0.003**
AMC member			0.043***					0.048***					
AMC&Zilina		152.586***			121.18***					-32.03***		-42.39	-42.39
AMC & value						0.005***							
AMC & value							0.20***						
AMC & No. Of							0.20***				0.08	0.23**	0.23**
AMC &													0.162**
Adjusted	0.85	0.85	0.85	0.92	0.92	0.90	0.90	0.93	0.65	0.68	0.67	0.7	0.67
P-value(F)	2.2e-174	3.8e-170	1.1e-171	5.9e-230	2.9e-224	2.0e-210	7.6e-211	2.5e-238	1.80e-94	4.6e-101	8.9e-100	1.5e-106	8.0e-100

Source: own calculation

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# **An Empirical Analysis on Users' Usage Intention of Enterprise Smart Application Influencing Users' Job Performance**

**Veronica LEE<sup>1</sup>**

## **Abstract**

Enterprises face rapidly changing organizational environment and work culture, with consumption of information technology and Smart applications. As IT develops, IT paradigm has been changed in enterprises from location-centric and centralized Industrial Era to collaborative and peer-to-peer based Work 2.0. The latest key IT paradigm emerging after Work 2.0 is Smart Work. Despite enterprises' awareness of the positive correlation between business productivity and Smart Work usage, application of the Smart Work model in business environment is still in adoption staging as many organizational workers confront entry barriers such as but not limited to technical difficulties and security issues. Although many researches study on the correlation between environment's productivity and Smart Work model usage, there are relatively little analysis on the relationship between Smart Work services users' usage intention and their job performance. The research is about analysis about the relationship between Smart Work services users' usage intention and their job performance. Also it is studied on the possible positive influencing factors and entry barriers to the adoption of the Smart Work model in the organizational working environments. This empirical analysis covers Enterprise Smart Applications (ESA) among various Smart Work services, ranging from ESA services to pervasive cloud-based network services and shared drives, and examines a questionnaire survey to the ESA service users to collect their perceived usefulness for task purpose and perceived facilities of use for task purpose. Based on the questionnaire results, this study further analyses how their level of perception impacts to their usage intention of ESA and the key factors promoting individuals' efficient adoption of ESA services in organizational working environment, enhancing their actual job performances. While former studies on ESA technology acceptance model focused on users' involuntary technology acceptance and usage for PC-based Enterprise Application Program, this study investigates on users' voluntary technology acceptance, driven by personalization trend in ESA technology acceptance model based on ESA's mobility.

## **Keywords**

Enterprise Smart Application, Task Mobility, Organization Agility, Expanded TAM, Perceived Usefulness for Task Purpose

## **1. Introduction**

Enterprises face rapidly changing organizational environment and work culture, with consumption of information technology and mobile applications. As IT develops, IT paradigm has been changed in enterprises from location-centric and centralized Industrial Era to collaborative and peer-to-peer based Work 2.0. The latest key IT paradigm emerging after Work 2.0 is Smart Work. Smart Work model is ubiquitous, service-centric cloud business model, based on enhanced network service enables mobility to workers even in distributed business settings.

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Enterprises challenge to utilize Smart Work services, such as Enterprise Smart Applications (ESA) and cloud-based network services progressing ubiquitous working environment, allow the individual users to be independent from time and location enabled by Smart Work services' mobility, when users work to maximize enterprises' operational efficiency and business profits. Despite enterprises' awareness of the positive correlation between business productivity and Smart Work usage, application of the Smart Work model in business environment is still in adoption staging as many organizational workers confront entry barriers such as but not limited to technical difficulties and security issues. Although many researches study on the correlation between environment's productivity and Smart Work model usage, there are relatively little analysis on the relationship between Smart Work services users' usage intention and their job performance.

This empirical analysis covers Enterprise Smart Applications (ESA) among various Smart Work services, ranging from ESA services to pervasive cloud-based network services and shared drives, and examines a questionnaire survey to the ESA service users to collect their perceived usefulness for task purpose and perceived facilities of use for task purpose. Based on the questionnaire results, this study further analyses how their level of perception impacts to their usage intention of ESA and the key factors promoting individuals' efficient adoption of ESA services in organizational working environment, enhancing their actual job performances. While former studies on ESA technology acceptance model focused on users' involuntary technology acceptance and usage for PC-based Enterprise Application Program, this study investigates on users' voluntary technology acceptance, driven by personalization trend in ESA technology acceptance model based on ESA's mobility.

## **2. Theoretical background**

In this section, we present an overview of the widely used theories that have been applied within the context of adoption and use of smart mobile technology in order to build a foundation for our research model and introduce the concepts of *Perceived Usefulness for Task Purpose* and *Perceived Facilities of Use for Task Purpose depends on personalization*.

### **2.1. Adoption and use of information technology**

Technology acceptance model (TAM) [Davis, 1989] has been widely used to explain users' acceptance and use of mobile technology [Kim and Garrison, 2009, Kim et al., 2008, Negahban, 2012, Oi et al., 2009 and Son et al., 2012] and various mobile services including mobile internet [Chong et al., 2010, Chong et al., 2012, Kuo and Yen, 2009, Lee et al., 2012 and López-Nicolás et al., 2008], mobile games [Liu & Li, 2011], financial mobile services [Chen, 2008, Hsu et al., 2011, Jaradat and Twaissi, 2010, Kim et al., 2010, Liu et al., 2011, Luarn and Lin, 2005 and Teo et al., 2012], mobile health-care services [Lin, 2011], mobile TV [Jung, Perez-Mira, & Wiley-Patton, 2009], and mobile text alert systems [Lee, Chung, & Kim, 2013]. TAM posits that perceived usefulness (PU) and perceived Facilities of use (PEOU) are the determinants of behavioral intention to use (BI). Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" [Davis, 1989, p. 320]. Perceived Facilities of use is defined as "the degree to which a person believes that using a particular system would be free of effort" [Davis, 1989, p. 320]. Despite its widely use, TAM has some limitations in explaining acceptance and use of mobile technology [López-Nicolás et al., 2008]; which were later on addressed by other complementary theories.

The united theory of acceptance and use of technology (UTAUT) developed by Venkatesh, Morris, Davis, and Davis (2003) was used to evaluate the probability of success for new technology overviews. Moreover, in order to design interventions for users that may be less inclined to adopt and use new systems, it also supports them to understand the drivers of acceptance. UTAUT incorporated TAM, Theory of planned behavior (TPB), innovation

diffusion theory (IDT), motivation model, and social cognitive theory to develop a unified theory for technology acceptance. In addition, it tested independent variables, such as, performance expectancy, effort expectancy, social influence, facilitating conditions, to use of technology, controlling for gender, age, experience, and voluntariness of use. UTAUT also accounts for internal and external motivations. However, although the UTAUT provides a more detailed model for acceptance and use of technology, it was still has certain limitations. Therefore, Venkatesh, Thong, and Xu (2012) developed UTAUT2 and added hedonic motivation, price value, and habit to explain the model of acceptance and use of technology. UTAUT2 provides an integrated model of acceptance and use of technology, which improves TAM. UTAUT and UTAU2 provide more detailed conceptions about the relationships between external, internal motivations, and acceptance and use of mobile technology. These two models hold that social influence (symbolic value) influences perceived usefulness. They have been used in previous research to investigate acceptance of various mobile services.

## **2.2 Personalization.**

By definition, personalization can mean all of the followings: in marketing, the formation of one-on-one customer relationships in order to win the loyalty of the customers; in cognitive science, the categorization of the characteristics of individual users to distinguish from other users; in social science, the techniques by which individuals can enhance their relationships with the social network; in information science, the provision of appropriate information to individuals; in computer science, the customer-focused media based on the actions of the users.

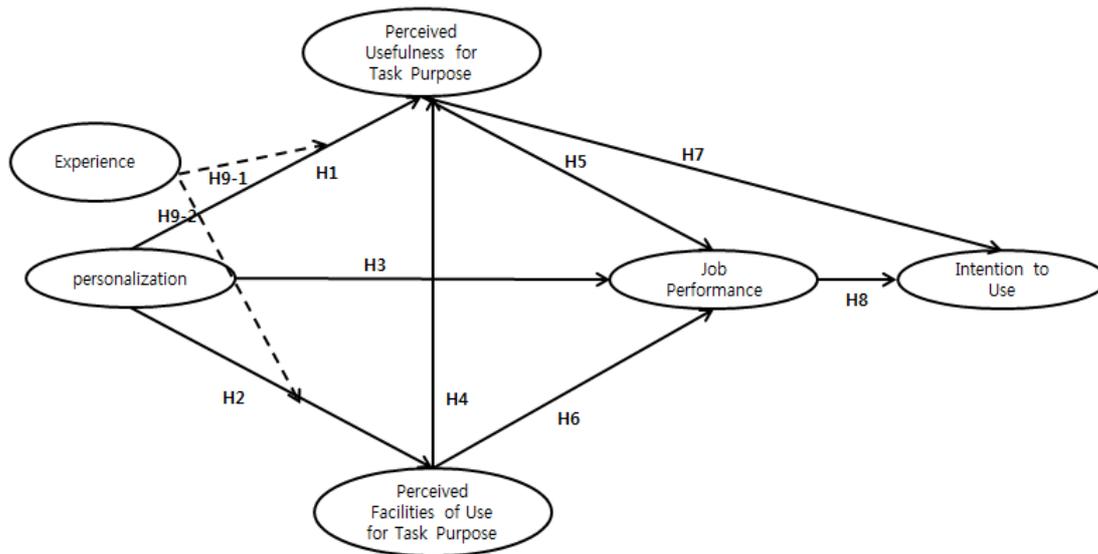
## **2.3. Functionality fit**

Theory of task–technology fit (TTF)[Goodhue & Thompson, 1995] focuses on the fit between a task's/user's needs and a specific technology/functionality. TTF argues that users adopt a technology based on the fit between their task requirements and technology characteristics and how it can improve their performance [Gebauer and Ginsburg, 2009, Goodhue, 1995 and Goodhue and Thompson, 1995]. TTF has been widely used along with other technology adoption models such as TAM and UTAUT to explain user's adoption of a technology [Dishaw and Strong, 1999, Yen et al., 2010 and Zhou et al., 2010]. By combining attitudes toward use and the fit between user's needs and a technology's functionalities through TAM and TTF respectively, we can provide a better explanation for technology adoption [Dishaw & Strong, 1999]. User's characteristics can also affect the task technology fit [Lee et al., 2007]. Therefore, the adoption of a technology is the product of both task's and technology's characteristics which consequently influence user's performance and actual utilization [Zhou et al., 2010]. This implies that a rich task technology fit will encourage user's adoption of a technology while a poor task technology fit will negatively influence users' intention to adopt a technology [Lee et al., 2007; Lin and Huang, 2008 and Zhou et al., 2010].

## **3. Research model and hypotheses**

### **3.1 Research Model**

In this study, TTF is unified with the extended TAM so as to propose a new research model (Pic.1).



ESA : Enterprise Smart Application

**Pic 1. Research Variable Model**

### 3.2 Research Hypotheses

The hypotheses are based on the model where TTF and TAM are unified, and make use of a variable of voluntary personalization. Individual tasks, experience, gender, age and work techniques are reflected in the research hypotheses listed below.

- H1 : Personalization has a positive impact towards perceived usefulness for task purpose.
  - H2 : Personalization has a positive impact towards perceived facilities for task purpose.
  - H3 : Personalization has a positive impact towards perceived job performance.
  - H4 : Perceived facilities for task purpose have a positive impact towards perceived usefulness for task purpose.
  - H5 : Perceived facilities for task purpose have a positive impact towards job performance.
  - H6 : Perceived usefulness for task purpose has a positive impact towards job performance.
  - H7 : Perceived usefulness for task purpose has a positive impact towards intention to use.
  - H8 : Job performance has a positive impact towards intention to use.
  - H9-1 : Those with experience will better improve perceived usefulness for task purpose.
  - H9-2 : Those with experience will better improve perceived facilities for task purpose.

## 4. Research Method

### 4.1 The operational definition of research variables

The measurement scales for each variable have been adopted from those of the preceding research that has been verified of its reliability and validity. The definition and related research of the variables are listed in Table 1.

A survey was conducted in order to verify the research model proposed by this study. Since the purpose of this study is to measure the intention to use ESA which has a direct impact on job performance, the participants of the survey are the office workers who actually use this in their daily job. To measure the impact ESA has on job performance as well as the intention to use it in different regions (Republic of Korea and the United States of America), an online survey was also conducted and the various participants of different job positions as well as genders were encouraged to participate in the survey through e-mails. ESA can be perceived differently by different people; hence, the application of ESA (e-mail, electronic approval system, linkage to work system, channel of free communication between employees) and the range of the system (linkage to ERP, CRM, and KMS) were exemplified before the survey so that the participants could similarly realize ESA.

### 4.2 Research method

Table1. Variable for personalization and Measurement Indicators

Variable for personalization	Concept	Previous Researches
personalization	Structural, instrumental, social, service, business and job position personalization	Fan and Deng [2008]
Perceived Usefulness for Task Purpose	The degree of confidence to believe that a personalized system to fit task purpose will improve both the use rate and the task efficiency	Davis[1989] Venkatesh and Davis[2000]
Perceived Facilities of Use for Task Purpose	The degree of confidence to believe that the use of a personalized system to fit task purpose will be convenient	Davis[1989] Venkatesh and Davis[2000]
Job Performance	Job performance dependent on a personalized system, usefulness and convenience	Taylor et al. [1995], S. Chung[2014]
Intention to Use	Intention to continuously use a personalized system	Bhattercher-jee [2001]
Experience	The length of the period of using a personalized system and an education on it, and the extent of experience on using similar applications	Thompson et al.[1994] Igbaria et al.

Additionally, smart devices have been exemplified and those who have experiences of using them for work have been chosen to take part in the survey. The responses to the survey have been collected over the month of August, 2014. From a total of 427 participants, 257 participants were considered to be an adequate pool to be the subject of this study, and their responses have been analyzed.

The measuring variables are listed in table 1. Likert scale on a scale of 5 was utilized as the measurement method.

Table 2. A summary of the demographics of the survey participants

Items		Frequency(N=257)	Ratio(%)
Gender	Male/Female	187/70	72.8/27.2
Age	20/30/40/over 50	96/120/31/10	37.4/46.6/12.1/3.9
Level of education	High school graduate/Community college graduate/University graduate/Graduate school graduate	68/63 113/13	26.5/26.4/42/5.1
Number of service years	Less than 2 years/2~5 years/5~10 years/10~15 years/over 15 years (missing)	105/85/44/10 (missing 13)	40.9/33.1/21 (5)

## 5. Research Result

Table 3. Common method bias analysis

Construct	Item	Substantive Factor Loading	T value	complex reliability	AVE
personalization	arch	0.829	22.2	0.926	0.758
	inst	0.903	72.8		
	soci	0.841	28.2		
	comm	0.906	72.1		
Perceived Facilities of Use for Task Purpose	peou1	0.843	41.1	0.942	0.730
	peou2	0.823	32.6		
	peou3	0.864	47.2		
	peou4	0.892	63.1		
	peou5	0.855	34.9		
	peou6	0.846	31.1		
Perceived Usefulness for Task Purpose	pu1	0.849	35.2	0.967	0.830
	pu2	0.921	65.0		
	pu3	0.924	79.5		
	pu4	0.924	85.6		
	pu5	0.920	68.9		
	pu6	0.926	97.0		
Job Performance	att1	0.904	66.9	0.941	0.801
	att2	0.909	59.5		
	att3	0.868	45.7		
	att4	0.897	50.9		
Intention to Use	bi1	0.922	72.2	0.970	0.865
	bi2	0.9534	100.7		
	bi3	0.9556	95.4		
	bi4	0.9366	56.1		
	bi5	0.8808	45.7		

The partial least square using SmarPLS[Ringle et al., 2005] was utilized to conduct the analysis on the research model. Prior to the analysis, SPSS version 20.0 was used and the normality of the data was investigated using Kolmogorov-Smimov and Shapiro Wilk test. The sample data of this research has been found not to follow the normal distribution. Due to the fact that this study is of a course model background and the data used for the analysis is of a non-normal distribution nature, the use of least square is appropriate for the analysis of structural equating model.

## 5.1 An analysis on the reliability and the validity of the research model variables

Table 4. Variables Correlation Coefficient

Variable	Personalization	facilities of use(easiness)	Usefulness	Job Performance	Intention to use	Experience
personalization	1					
Facilities	0.734	1				
Usefulness	0.812	0.639	1			
Job Performance	0.743	0.666	0.617	1		
Intention to use	0.751	0.682	0.626	0.727	1	
Experience	0.850	0.708	0.786	0.678	0.759	1

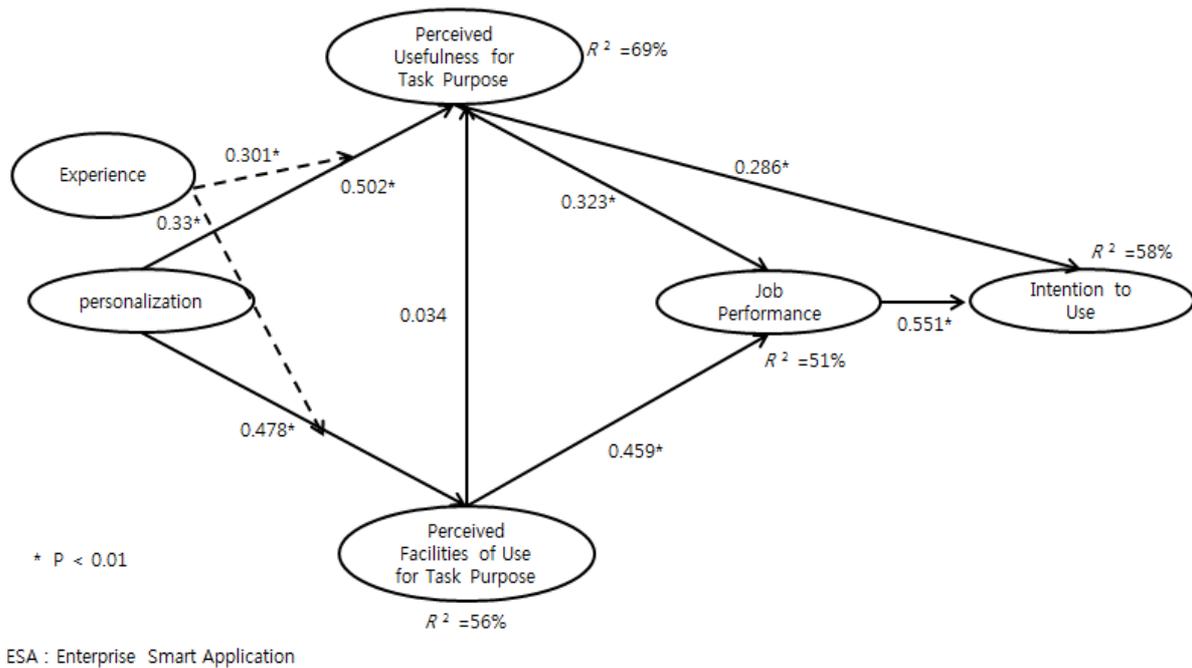
A confirmatory factor analysis was used to analyze the reliability and the validity of the research model. To achieve this, basic inner consistency of each of the variables was assessed using Cronbach's alpha. According to Nunally and Bernstein [1994], if the value of alpha is greater than or equal to 0.7, the variables are considered reliable. In this study, the alpha's are between 0.8 and 0.96 for the reliability of the variables, which proves its inner consistency. As for the convergence validity and the discriminant validity, the average variance extracted (to be called AVE here on) was utilized. It is known that an AVE value greater than 0.5 satisfies the convergence validity [Fornell and Larcker, 1981]. The discriminant validity is satisfied if the square root of AVE is greater than the correlation coefficient of other variables. Table 3 illustrates the factor discretion, reliability and AVE. Table 4. is the analysis of the correlation between the

concepts; it is evident that variables are highly correlated. This may lead to a prediction of multicollinearity in regression analysis. However, from an analysis through SPSS20.0, the standard VIF is below 10 and the tolerance limit is close to 1, which implies no multicollinearity in this case. In addition, the structural equating model can be treated under the causal relation model, and thereby improve statistical power when estimating the relationship between variables [Fornell et al., 1990].

Moreover, all AVE values are above 0.5, which satisfies the convergence validity. Furthermore, all correlation coefficients and the square root values of AVE are above 0.5, and the square root of AVE of each of the latent variables is greater than the coefficient variables, both of which satisfy the discriminant validity. Meanwhile, the  $R^2$  values of all variables exceed 10%, which is the power proposed by Falk and Miller [1992]; hence, the validity of the research model can be verified.

## 5.2 The verification of the research hypotheses

The verification of the hypotheses was measured by the size of course variable, statistical significance and dispersion value of the final subordinate variables described by leading variables. The verification of the theoretical model predetermined for this study was done by the data analysis program of SmartPLS and is illustrated as Pic 2. The intention to use, which is the final subordinate variable, has a value of 58% for  $R^2$ . That of perceived usefulness is 69%, of perceived facilities 56%, and of job position 51%. As shown in the results of the verification of the research model, the path coefficient of SmartPLS reflects the standardized regression coefficient. The results of the verification of the research hypotheses show that H3 has a regression coefficient of 0.034( $t=0.40$ ,  $p>0.01$ ) and is rejected. All other hypotheses are accepted and verified.



**Pic 2. Research Result**

## 6. Conclusion

In order to enhance the competitiveness of the rapidly changing business processes, ESA must effectively be utilized. To achieve this, the intention to use of each individual must also be improved. This study proves that this can be achieved when the individual's perceived facilities and usefulness related to work are provided. Instead of ESA customized for work, personalized ESA taking into account the user's work experience, gender and experience of using ESA must be developed. More accurate analysis can be expected when and if the elements affecting the personalized ESA are thoroughly researched.

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# Framework for Food Security Analysis at national Level

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## Abstract

The purpose of this work is to face the fresh food security function in the developing nations. It is not an easy task; on the other, it is a very important feature on people's welfare, nations' development and social stability at a national level.

The methodology applied will be the Porter's Diamond. The ensemble of resources, either physical infrastructures or capable companies or adequate regulations, to support the implementation of efficient and functional food security networks in many countries, frequently is provided without analysis of the population demand profile and resources available, normally importing other country model. Given the importance of food security to provide the correct amount of food to the different populations in a country, a framework for analyzing the competitive balance of the factors involved and the different models under consideration has been selected. Michael Porter described the Diamond in 1990 in his seminal work "The competitive advantage of Nations". It considers different national factors that interact to produce the competitive advantage, such as home demand conditions, related support industries, factor conditions, companies' strategy and rivalry and Government regulation.

With the Diamond the profile of the different factors are analyzed according to priority and importance. The resulting model allows detecting weaknesses and strengths considering the principal actors that build a food security network. Also it is possible to represent graphically the points of analysis, which allows to explore together different models of food security networks.

The food supply it is a vital factor in every country for the population survival. The fresh food production, mainly fruits and vegetables, meat and fish, needs a net work of markets, at wholesale and retail level in order to distribute that fresh food from the farms where is produced to the final consumer, mainly located in the big cities (farm-to- fork). The whole activities related to bring food and supply to the final consumers is denominated "food security".

There is another concept associated to the food security which is called "food safety". In some extend both are related, but different. The food safety concept means that the food must be "safe" for human consumption (innocuous). This simple difference (security-safety) has created some confusion in some countries. Food security guarantees the quantity of food supplied to people. Food safety guarantees the quality of food from human health perspective.

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Food security it is much more important in the poor than in the affluent countries or its regions. In countries with less than 1000 US\$ per capita, the amount of money expended on food it is around 40% of the average income. In that case, a change in agricultural costs or on food prices has tremendous influence in the whole society.

Many countries have developed a National Plan for food security in order to create markets network. This network operates as a group of engines pumping food from origin to destination. Thanks to this organization has been possible to correct many deficiencies in the population's food supply. The wholesale markets either in food origin area or in destination are not easy to establish. They need many important aspects to be evaluated before start the wholesale market design. The influence area determination; the right dimension of the premises; the type of buildings and pavilions; the protection of the market; the wholesalers transference; the users' relationships; the working rules; tariffs; timetables; gathering and distribution of the daily commercial information; connections with other markets; and a very long etcetera.

All that set of aspects varies from country to country. Not all the societies or human groups have the same choices and behaviors. The final design must be adapted to every particular country. The income level; consumption habits, feminine work outside home; industrial development; classification and grading; etc. must be taken into account in order to tailor the market to the society cultural values.

The results will be agricultural promotion and development of food distribution efficiency; income distribution among farmers and rural population; better population nourishment; food industry development; commerce and services increasing; food exports boosted; and general improvement of the national welfare for any country undertaken this economical and global activities.

**Keywords:**

Porter's diamond model; food security; wholesale and retail trade; distribution platforms; food marketing; and food safety.

**Competitive food markets**

We want to establish a framework for analyzing the development of the supply of agro-food products, at the national level in any country, according to the model of Porter's Diamond.

Currently this model is an established and used framework. There are other models, such as the one developed by Scherer (1969) to analyze the organization in any sector of the economy, and used in time for food markets analysis, called "A model of industry analysis organization." Scherer's model consists of four parts in a logical sequence that resembles a value chain, using the concept of Porter (1985).

- 1) Basic conditions. It consists on the market supply and demand analysis.
- 2) Market structure.
- 3) Market conduct.
- 4) Performance or market results.

In this model, Scherer indicates that behavior influences the structure and market demand. In turn, the structure determines the supply of that market. There is also a

progressive influence flow from paragraph 1), to 2), then to 3) Market Conduct. Finally, influences the 4), which is the performance or market results being analyzed.

The later model Porter's Diamond is based on the competitiveness factors allocation, and we will use it to analyze the food supply competitiveness of any country population. One of the main parts of this task is the model development of the wholesale markets.

The concept of Food Security is the food supply to the population. In developed countries, this supply is done, mainly, through the wholesale markets (WMs) located in large cities. Traditionally, these WMs deal with the fresh foods distribution like fruits and vegetables, meat, fish and others. In the WM premises are established businessmen and traders who supply retailers such as greengrocers, butchers, fishmongers, etc.

With new technologies and their application to commercial activities, other new forms of commerce have joined the Food Security in the retail sector. These new forms have more than three decades of existence and because of their size and business volume, combine the wholesale and retail functions. These are the major supermarket chains and hypermarkets, with its large distribution centers, and then distribute to anyone of their retail premises. Recently the e-market has emerged linked as a new purchasing model.

Its growth is constant, both, international and national level. These large retail surfaces currently have a near oligopoly in the distribution of fresh and processed foods. Even they impose their image through the called "white labels". These days both types of organizations are sharing their business in developed countries, with slight variations.

In Europe, the wholesale markets in one side, and the large retail chains are big rivals. The wholesale trade structure varies from one country to another, although the differences disappear among the more developed countries.

Wholesale markets in large cities, usually are managed by "local authorities" as public entities. In its premises are housed private wholesale companies. The large surfaces (hyper and supermarkets chains), are private entities but regulated by the local administration.

In Spain, the National Company "MERCASA" (Central Markets Supply, SA) was established in 1966, following other European experiences. In Brazil, the launch of "GEMAB-COBAL" program took place in 1973, based on MERCASA knowhow. Finally, 25 years after the opening of Eastern Europe countries, some wholesale markets are starting to be built in the Russian Federation, like Kazakjstan. In February 2013 was open a fresh food wholesale market in Shanghai China, following European experiences. Nevertheless in China exists the biggest wholesale market of small commodities in Yiwu, known as CCC (China Commodity City, at Zhejiang Province), honored at 2005 by the UN, the World Bank and Morgan Stanley.

The wholesale markets network operates like if they were a powerful group of motor-pumps pushing food from production to consumption. The money reverts to producers increasing agricultural income. The urban food supply is improved in quantity and quality. There is now a worldwide organization known by its acronym WUWM (World Union of Wholesale Markets) to develop the knowhow, which in turn is attached to the IULA (International Union of Local Authorities).

The European Union, in order to improve the quality and safety of distributed food in the countries of the Union, created the European Food Safety Agency (EFSA, European Food Safety Agency).

Following the Brussels' recommendation, each country has developed its own Food Safety Agency. In Spain, it is called AESAN (Spanish Agency for Food Safety and Nutrition) which includes the nutrition value as part of safety. Meanwhile, the FAO, more inclined to Food Security (Food Supply) has translated this concept as above, "food security".

It seems logical that FAO works with the Food Security or food supply, in order to guarantee nourishment to the poorest countries population. Moreover, rich countries, which already have enough to eat, are more interested on providing a healthy and safe food to the population. In that sense, a "safe" food means for health that it is innocuous (no danger), whole (no defects) and legal (no fraud).

### **Porter's Diamond and competitive advantage**

Michael Porter in its seminal work "The Competitive Advantage of Nations" [Porter 1998] presented an insight into the processes that created national prosperity, separating the forces underlying national competitiveness from the particular ones. Prosperity was not dependent of a country's endowment but on the capacity of its industry to innovate and upgrade [Grant 1991].

Competitive advantage is created and supported by means of localized processes happening within a nation, and local differences driving innovation contribute to the competitive success. Competitiveness can be described at national level by its productivity [Garelli 2003]. Considering that the advancing of nations is reflected in the rising standard of living of its citizens, productivity is the value of the output produced by the production factors and depends of the quality and features of products, and the efficiency of production.

Competitiveness, and the welfare associated, encompasses all industrial products including agro-food products and markets [Cartwright 1993]. Agro-food industry it is not only a key competitive sector in trade, both national and international, but a necessity for which product availability to all, food security, is a basic requirement. Therefore, a key competitive advantage for the nations described in several work [Pitts 1997] [Pitts, O'Connell, McCarthy 2001], [Kaacsony 2008], [Markus 2008], [Sterns, Thomas 2010].

Porter's Diamond is the framework envisage by Michael Porter to analyze the forces of national competitiveness, and consist of four main interrelated factors [Porter 1998], as presented in figure 1. Besides those four factors, two exogenous factors are present because the influence they have, such as Government and Change. The factors in the Diamond are the following:

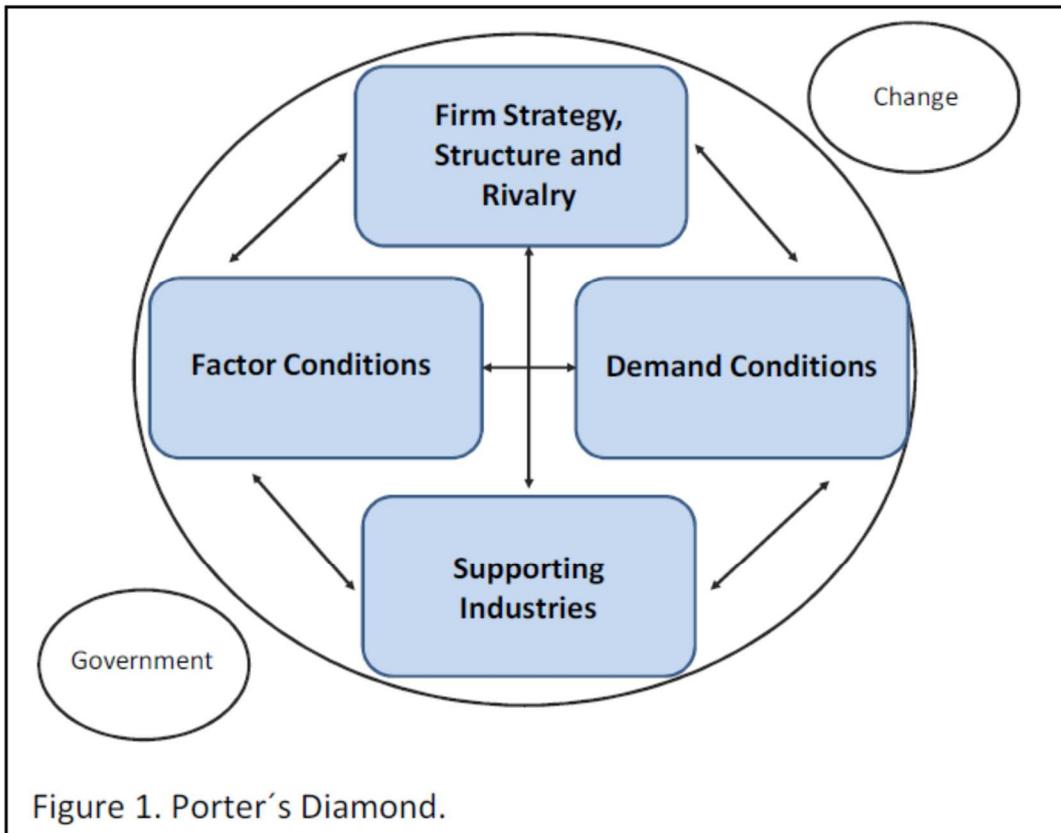
**Factor Conditions.** They are related to production factors, which are relevant for competition in relevant industries. For example; material resources (vegetables, meat and dairy animals, fish, natural resources, land, etc.), capital resources, human resources (qualifications, cost of labor, etc.), knowledge and infrastructures (roads, railways, ports, energy networks, etc.). Factors conditions limit the industry productivity and the industries that could be optimal at one given time.

**Demand Conditions.** Characterize the conditions of demand in the market for the products and services produced. Porter considers three mayor conditions: the mix

of customers' needs and wants, scope and growth rate, and signaling to the markets about demand trends.

**Supporting Industries.** Cover the presence of competitive supplying and supporting industries that will collaborate in reinforcing innovation and particular activities of the value chain.

**Firm Strategy, Structure and Rivalry.** Characterize the operation of the established country industries, which are under the national competitiveness focus. It covers size, organization, differentiation, barriers and competition, linking between companies. Porter points out that domestic rivalry and the search for competitive advantage within the country promotes the developing of advantages at global scale.



## Factors of competitiveness

The Porter's Diamond model considers the comparative competitiveness among countries. Here, we will focus in the supply or "food security" competitiveness for agro-food products.

As part of the agro-food products characteristics, competitiveness has a strong relationship with quality and price ( $Q / P$ ), for a given product or service. For "Q" we use the concept of commercial quality. While "P" is the price of the product or service, we want to measure its competitiveness.

The Q (quality), is the expected buyer's satisfaction. The P (price), is the most strong variable for agro-food products which force a person to decide a purchase. The ratio of these two variables, decide the competitiveness. If we increase the Q we are more competitive, if we reduce the price competitiveness is also increased. In that

sense, countries reducing production costs, and even increasing quality, are more competitive.

Reviewed the concept of competitiveness, we will detail each one of the attributes chosen for the four main sections that make up the Porter's Diamond model. We have selected only five attributes for each one of the four sections (see figure 2).

### **Factor Conditions.**

Production aspects that are going to provide the food and services needed to feed the country's population.

**Availability of raw products.** We are analyzing the factors of production that will shape the offer. This offer will ensure the population's nutrition.

**Farms.** The availability of the raw products will depend on the farms, their size, type of soil, type of animal breeds, individual or cooperative exploitation, type of companies' management also, etc.

**Investments.** Investments made, or going to be made, also influence the obtained production. Funding (grants, subsidies ...), infrastructure (roads, warehouses), machinery, etc, also condition the food security or supply.

**Technology.** Thanks to technological innovation, we improve quality, quantity and productivity. This ensures more competitiveness.

**Infrastructure and transport.** Here we must remember the called "marketing utilities": space, time, form and possession. About space, efficient transport; about time, good storage; about form, industrialization to transform perishable food; and finally, possession is required. Depending on who is the product owner, the product value varies. We should facilitate the buying and selling through transactions more agile and safe.

### **Demand Conditions.**

**Population's Growth.** The most important aspect is the population's growth and the increasingly need for food.

**Price elasticity.** Human preferences and need for food are related to the elasticity and prices. The more rigid is the elasticity, the more necessary is the product and the price will have less fluctuations.

**Seasonality.** Technology has reduced the seasonality of some foods. Greenhouses and forced cultivations allow crops of fresh vegetables almost the whole year.

**Form and buying habits.** The behaviour of the population varies, and sometimes varies from one country to another. Buying habits and marketing sensitivity are important aspects to be considered on the demand side.

**Quality and healthy.** Quality attributes and health aspects, like food safety, qualify demand in the Porter's model.

## Related and Supporting Industries.-

This section is the infrastructure that allows the development of competitiveness. The engine of the market economy is competition. It will not be possible if there is not a good infrastructure.

**Farmers markets (source).** The first step in the supply occurs on the producers' markets, which are attended by companies and producers.

**Supply wholesale markets.** The next step in the food distribution chain is the wholesale markets located in big cities, where people consume but not produce. These markets wholesalers sell by large quantities as opposed to convenience stores, retailers, supermarkets and hypermarkets, which sell a quantity for a person or for a family consumption.

**Agencies of Quality.** In the last two decades has taken place the creation and development of "Q management". Several international agencies such as ISO, SGS, Lloyds, TÜV, AENOR, AFNOR, BSI, etc., and other national, have created standards of commercial quality (IFS, BRC, etc). The monitoring of these regulations and the certification issued by these entities, has had a great influence on the local, national and international business development. Along with the WTO (WTO), has caused a great acceleration in commercial dynamics of companies, increasing concentration and competitiveness on the agro-food industry.

**Logistics and distribution companies.** There has been a new development due to the ICTs; creating new companies specialized in logistics.

**Supporting and complementary industries.** We have companies of packing, storage, refrigeration, frozen food, marketing, information technology, consulting, auxiliary machinery, and so long, that make more competitive the agro-food products supply.

## Companies, Structure and Rivalry.

This section recalls two sections of Scherer's model for industry analysis, when he mentions the market structure and behaviour.

**Number of buyers and sellers.** Essential for competition and is the first item of the model of perfect competition. **Product differentiation.** This aspect it is essential for enterprises just to compete in the market economy.

**Barriers to entry (legal and healthy).** They are sometimes hidden aspects as entry barriers into the business. Frequently are difficult to be discovered. They are real obstacles for a good competitiveness development. They are more abundant than they appear. Very often the country interest prevails against the international trade interest, which should be free of barriers. Healthy barriers concealed trade barriers to defend national interests against the international competition.

**Cost structure.** It is linked to technology, labour and the value of ancillary services. The selling price depends on the cost structure of the company. Recalling that the price was the dividend of the relationship Q/P, which we have

called competitiveness, the lower costs, and consequently lower prices, will increase competitiveness.

**Horizontal and vertical integration.** Porter analysis should end up with "clusters" formation. This implies an industry collective progress towards greater competitiveness. Vertical integration (from origin to destination) and horizontal integration (by the same level), is the prelude to the clusters. If there is integration spirit between firms, clusters will be easier.

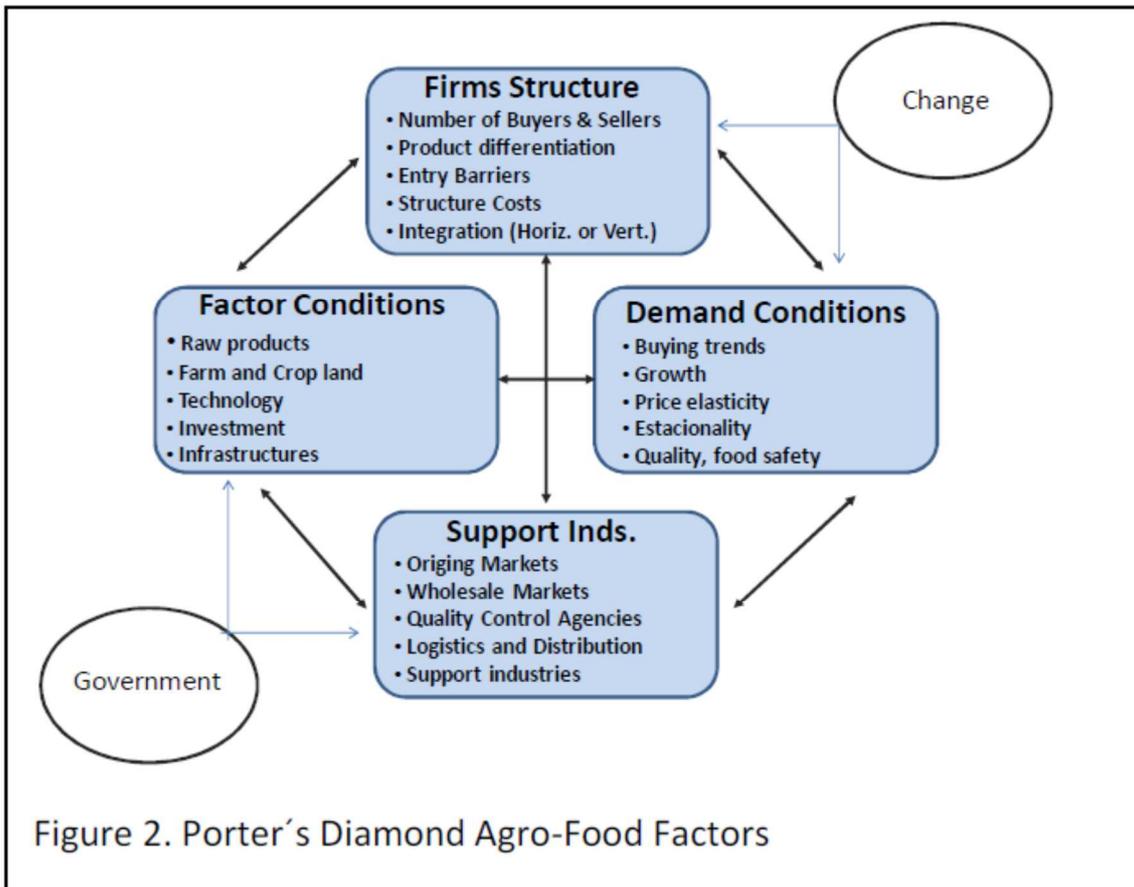


Figure 2. Porter's Diamond Agro-Food Factors

## Diamond analysis

Organizations and National Governments use the Diamond to find the extent of the home base advantages to create a competitive case for development and globalization. That is true also for the agro-food industry.

The analysis can address different scenarios of competitiveness driven by change, either time or geography. In some case, the change at national level is due to the change in time of the competitive factors. Other cases reflect the global competition between the nations and the industry.

Porter's Diamond is often analyzed following a refinement process, where first all the underlying facts are identified to be reduced afterwards by expert judgment into the competitiveness explaining factors of the Diamond. However, this method does not provide for quantitative assessment and can suffer from lack of objectiveness from the experts.

For that reason, different approaches have been followed to include quantitative methods in the process. Some are using Factor Analysis [Harkness 1983] [Markus 2008] [Bakan 2012], some others Cluster Analysis [Harzing 2014] and Structural Equation Model (SEM) [Eickelpasch, Lejpras, Stephen 2010]. Notwithstanding the merit of the approaches, the necessity of a large volume of data and the occasional veiling of the competitiveness factors makes them difficult to use unless the analyst has a good knowledge of exploratory Factor Analysis or SEM.

Some others have followed a different approach [Stone, Ranchhad 2006] using SPACE Analysis (Strategic Position and Action Evaluation) [Radder, Louw 1998]. It allows to classify and compare strategic information based in ordinal data, resulting in a reduced volume of information and clear visibility of key strategic variables.

In this work, a somehow simpler method has been used derived from SPACE. Selected the agro-food factors for the market competitiveness, they are treated as ordinal variables, and their values are found consulting a panel of experts by means of the Delphi method [Linstone, Turrof 1975] using a Likert scale of three levels (high, medium, low). The Table 1 shows the values obtained from the panel and calculated for the Diamond. The agro-food industry in Spain and the development of the competitive food market is observed in two different periods. Before 1960 (Spanish food market development) and after 1980 (Spanish food market consolidation).

The average value of each group of competitive factors is then plotted in a four values radar map, allowing the representation of the Diamond and the competitive comparison between the two periods. This graphic is shown in figure 3.

It can be noticed that the transition from period 1 (before 1960) to period 2 (after 1980) results into a significant competitive development increase in all the 4 domains represented by the factors. However, the increase it is not the same for all of them.

Diamond Components	Up to 1960			After 1980		
	Low	Medium	High	Low	Medium	High
<b>Factor Conditions</b>						
Raw Products	80,00%	20,00%	0,00%	0,00%	40,00%	60,00%
Farm and Crop Land	60,00%	20,00%	20,00%	0,00%	60,00%	40,00%
Investment	100,00%	0,00%	0,00%	0,00%	100,00%	0,00%
Technology	80,00%	20,00%	0,00%	0,00%	100,00%	0,00%
Infrastructures	80,00%	20,00%	0,00%	0,00%	20,00%	80,00%
<b>Demand Conditions</b>						
Growth	80,00%	20,00%	0,00%	0,00%	80,00%	20,00%
Price Elasticity	60,00%	40,00%	0,00%	0,00%	80,00%	20,00%
No Estacionality	60,00%	40,00%	0,00%	20,00%	80,00%	0,00%
Buying Trends	60,00%	20,00%	20,00%	20,00%	60,00%	20,00%
Quality and Food Safety	80,00%	20,00%	0,00%	0,00%	20,00%	80,00%
<b>Related and Supporting Industries</b>						
Origing Markets	80,00%	0,00%	20,00%	20,00%	60,00%	20,00%
Wholesale Markets	40,00%	60,00%	0,00%	0,00%	0,00%	100,00%
Quality Control Agencies	80,00%	20,00%	0,00%	20,00%	30,00%	50,00%
Logisitic and Distribution	100,00%	0,00%	0,00%	0,00%	20,00%	80,00%
Support Industries	100,00%	0,00%	0,00%	0,00%	80,00%	20,00%
<b>Firms Structure and Rivalry</b>						
Number of Buyers & Sellers	80,00%	20,00%	0,00%	0,00%	60,00%	40,00%
Product Differentiation	80,00%	20,00%	0,00%	0,00%	100,00%	0,00%
No Entry Barriers	40,00%	20,00%	40,00%	20,00%	80,00%	0,00%
Cost Structure	40,00%	60,00%	0,00%	20,00%	80,00%	0,00%
Integration	80,00%	20,00%	0,00%	20,00%	60,00%	20,00%

	1960	1980	Delta	
Firms Rivalry	1	2,4	1,4	Change influence
Demand Conditions	1	2,2	1,2	Change influence
Supporting Industry	1,2	2,6	1,4	Government Action
Factor Conditions	1,2	2	0,8	Government Action

Table 1. Delphi panel results

Table 1. Delphi panel results

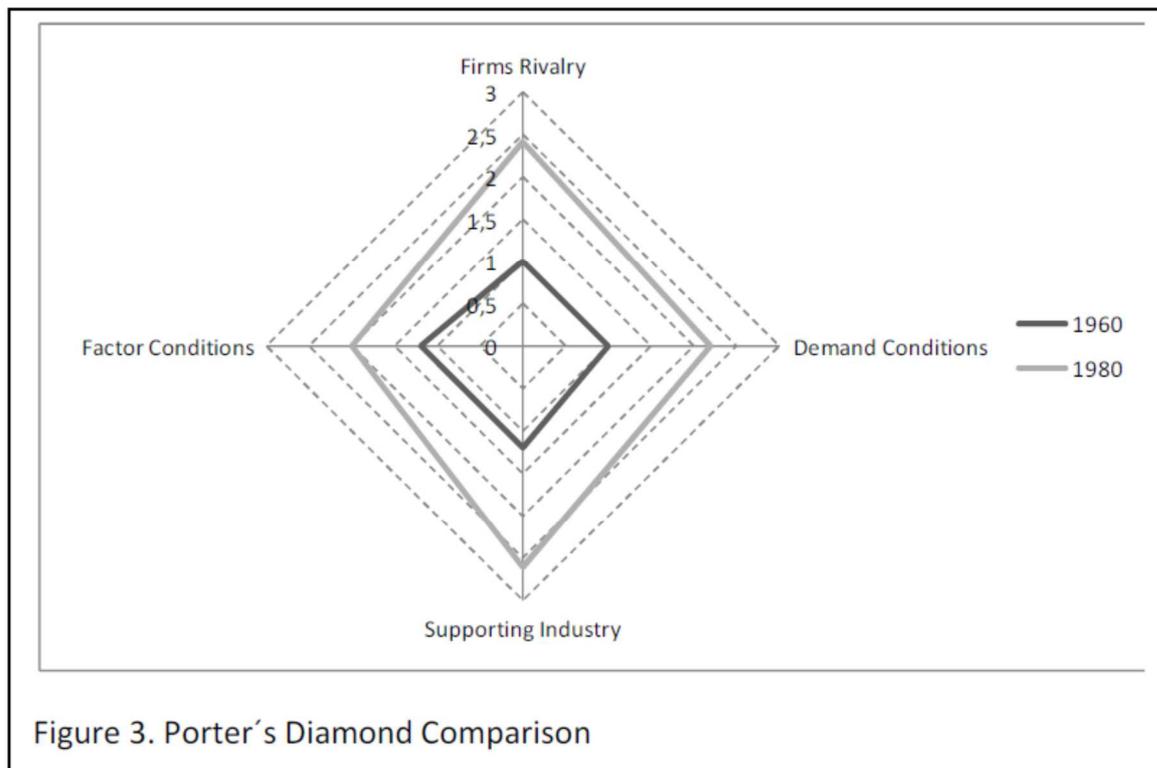


Figure 3. Porter's Diamond Comparison

The largest increases are in Supporting Industry and Firms Rivalry. Both are "Market Making" factors. Government strategic development of Wholesale food market networks like

MERCASA and modern Food City Markets, together with Agencies for regulation and control of food safety are driving the bases for food commercialization. In the other side, the food industry and supporting industry growth and specialization have been driven by change due to the opening of the markets, and favorable conditions caused by the change in the conditions for commercialization.

In the other side the lowest increase, correspond to Factor Conditions. The mayor changes have been by Government investment in a strong motorway national network and the national and EU support programs to farmers.

## Conclusions

This study considers the change in time of the competitiveness of the food security function at national level, in Spain. The food security function is supported today by the Spanish Market System and Distribution Network, as a result of the development caused by related government policies and the impact of Spain joining the European Union (EU) in the mid 80's. Two periods have been considered, before 1960 when the market system was in its primitive form (local markets, small suppliers, insufficient quality), and after 1980 when all the transformations had taken place.

Change is paramount as can be seen in the Porter's Diamond. The largest changes correspond to Firms Rivalry and Supporting Industry, the least to Factor Conditions. The Demand Conditions have expanded as result of the new possibilities open by the markets and the new welfare of the population. As mentioned before the related government policies and EU agriculture and infrastructures support, and the market opening measures, are behind these changes.

Those events behind the changes in the Porter's Diamond are some the following:

- Political changes that favored the opening of national borders, which resulted in food markets development, and opening.

- Agro-food industry development both internally and externally.

- Modernization of the production and distribution organizations reaching out from local to national level, and increasing cooperation between them.

- More dynamic offer and demand of agro-food products in quantity and quality, together with the global development of the country.

The usefulness of Porter's Diamond to research and study the agro-food market system development (food security, food safety) in this case is clear. Now, it remains to evaluate its use into more complex markets to analyze the change drivers.

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# Profile of visitors to the Moravian Karst PLA as a basis for solving visitors' impacts on nature protection

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## Abstract

The article presents habits and activities of visitors to the Moravian Karst PLA in relation to potential and actual impacts of recreation on protected areas and ecosystems. Methodology of the work is based on a standard questionnaire survey, conducted in the summer and autumn of 2013. The objectives of the survey were to find recreational activities, habits and preferences of visitors to PLA Moravian Karst in relation to nature and landscape protection and secondary also regional development. The length of stay in the summer and autumn survey differs significantly. In autumn there are the most frequent one day trips, and if tourists stay for several days, then usually only for a weekend. While in summer they are here for a longer period of time. Visitor survey shows that most tourists do not feel limited by conservation measures.

## Keywords:

Outdoor recreation, tourism, nature protection, visitor impact, management of protected areas, ecosystem services

## Introduction

The increasing demands of tourists burden negatively the territory beyond its potential and can lead to negative impacts on nature protection. Specific natural environment of karst areas reacts sensitively to the activity of socio-economic sphere. Given that in karst landscapes there are unique karst shapes unique vegetation and many other unique features, manifesting a need for maintaining at least the damaged area. On the other hand, the development of human society and the related tourism and recreation, is manifested by penetration into the karst landscape.

Therefore, it is necessary to regulate the negative impacts of tourism on nature protection, which are caused by recreational activities. Manifestations of intense traffic and recreational activities can be divided into several groups (Schneider, Lorencová 2014):

1. visible (observable)
  - a. soil erosion due to intense trampling (including cycling, riding (horses) and driving motor vehicles)
    - i. Official (marked) trails
    - ii. uncontrolled ("wild", "black") trails
  - b. fireplaces
  - c. litter
  - d. faeces
  - e. acts of vandalism
    - i. damaged living and non-living components of the ecosystem
    - ii. damaged recreation infrastructure
  - f. unkept furniture and recreational infrastructure

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- g. imported alien species
- h. bringing non-native ecosystem elements and compounds (typically rock climbing, geocaching)
  - i. chemical substances – such as magnesium
  - ii. objects - for example, geocache, staples
- 2. normally unobservable (identified by monitoring or survey)
  - a. vacant niche in ecosystems
    - i. disturbance of e.g. birds during nesting, absence of other animal species
    - ii. missing plant species, probably also fungi
  - b. change of the behaviour of animals in response to disturbance and stress

Monitoring socio-environmental data and mapping sociological environment in protected areas is one of the prerequisites of responsible governance, management and environmental management of these areas. In addition to basic information sources it presents a number of additional features such as the prevention and elimination of overt and covert conflicts or might become a non-violent means of raising environmental awareness and education on the principles of sustainable development (Görner, Cihar, 2010).

The above list of tourist pollution places requirements on the measures to control these impacts in the field. On the other hand, these measures can also be specified more efficiently by analysing the preferences, habits and the prediction of the development of the visitors' recreational activities. The synthesis of this aspect with the analysis of direct impacts on ecosystems when planning traffic management in specially protected areas isn't fully appreciated. Yet it helps to better define the aspect of a long-term period and weights of recreational impacts possibly also the need for acute solutions of the modern phenomena. This thesis is therefore focused on the interaction of nature protection and tourist traffic. The article defines the Moravian Karst visitors' profile, which includes not only their age, education, as well as their reasons for visiting, further activities, which they really engaged in during the (length) of their stay, etc. It detects even the habits of visitors to the area. It is a necessary pursuit of sustainable tourism development, where the needs of the present tourists and host regions are met, all of course with regard to the protection and evaluation of opportunities for the future (Stefanova, 2012).

Impacts of recreation are also dependent on where and when the visitor is present. There are methods used to deploy visitors. There was an improvement in technology and that increased the ability for the scientists to measure and monitors the use of the area by their visitors (D'Antonio et al., 2010; Hallo et al., 2012; Wolf et al. 2012). The most suitable is GPS locator that visitors carry; it provides the possibility to see where visitors are traveling, the use of specific routes and the amount of time spent in certain places. These data can be combined with other sources of information, such as a survey of visitor preferences and identifying the impacts of recreation, determining the real cover, special flora and fauna.

Literature also identifies two relationships between the effects of nature and landscape protection and land use. It is assumed that there is a linear relationship between increasing land use and increasing social and biophysical impacts on the given area (Manning, Lime, 1996). But there is also a non-linear relationship, which states that the initial use of "destruction" of the area has a greater impact than its further use. This relationship was empirically supported by a research that dealt with, trampling of soil and vegetation cover (Hammit, Cole, 1998; Leung, Marion, 1996). However, it is rather based on the length of exploitation than its intensity.

Experts also hold different views that result from the application of different criteria for evaluating the importance of recreation and its impact. This reflects the lack of attention and lack of exploration in recreation ecology. Impacts may be considered significant if they form a substantial loss of ecological integrity and must be perceived by people as being uncomfortable and be a reflection of inappropriate behaviour. According to Cole and Landres (1996) the

impacts that are most significant in terms of perception, are often quite different from the effects that are important in terms of ecology (Cole, Landers, 1996).

The specific effects of intense traffic and recreational activities on the natural environment, large especially protected territories are dealt with by for example Barančok (e.g. 2006, 2013). Among other things, he deals with detailed monitoring of development of erosion on hiking trails, changes in land cover and last but not least, the effect of slopes on plant communities.

Studying the effects of outdoor recreational activities on the environment and their effective management is what recreation ecology deals with. It's a relatively new scientific discipline that has emerged over the last fifty years. During this time, the understanding has improved of how recreation and managerial factors affect the ecological conditions and processes. Current trends indicate an increased public interest in environmentally friendly recreation and thanks to the appreciation of natural areas it continues to grow. Recreation ecology has emerged primarily in response to the needs of managers involved in the use of land for maintaining the conditions of natural resources and growing demands for outdoor recreational opportunities. Hammit and Cole (2000) describe recreation ecology as the study of the impact of outdoor recreation and environmentally friendly recreation and natural or semi-natural environment (Monz et al., 2010).

## **Materials and methods**

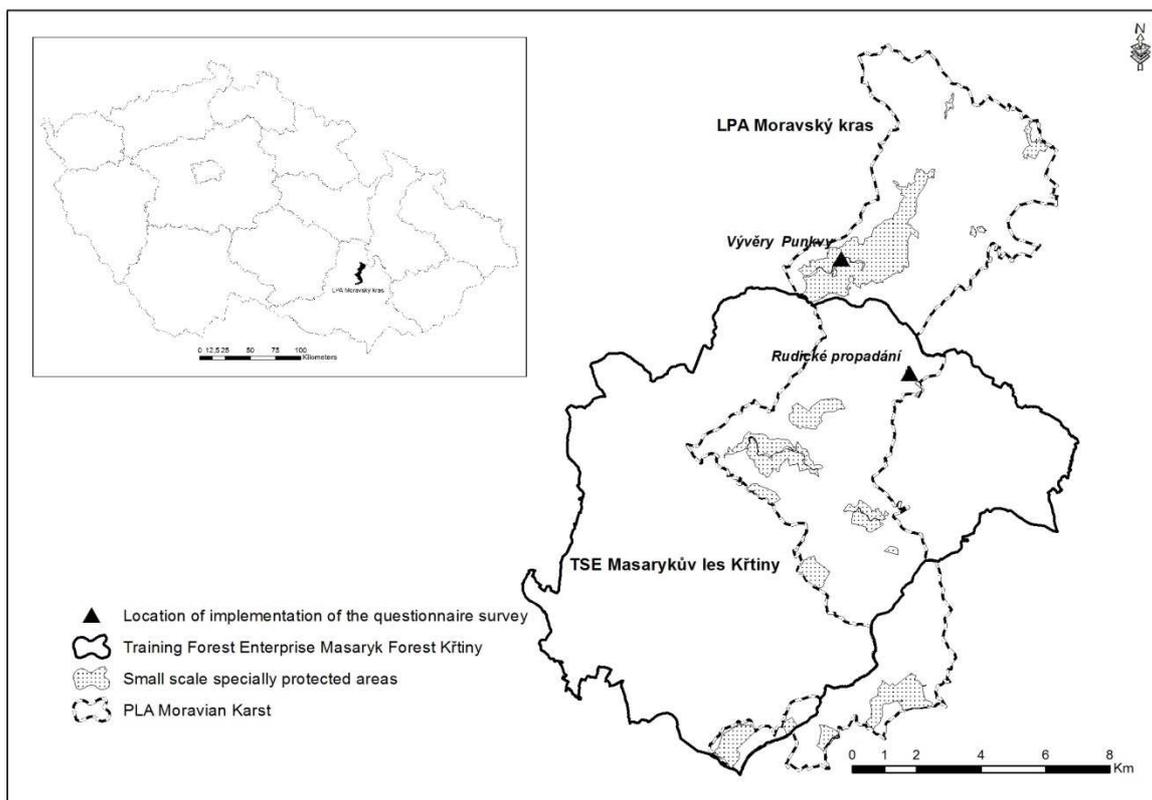
Visitor surveys were conducted during two periods - the main (summer) season and the secondary (autumn). The surveys were conducted in the National Nature Reserve Vývěry Punkvy and National Natural Landmark Rudické propadání based on a preliminary survey of attendance intensity. On the other expert-specified locations, intensively used by tourist, an evaluation was made of the visible impact of recreational activities.

## **The area of interest**

Moravian Karst is located in the South Moravian Region in the north-east of Brno among the municipalities Sloup, Blansko and Jedovnice. It is a part of Dražanská vrchovina in the southeast part of the Česká vysočina and is composed of limestone in an area of 92 km<sup>2</sup>. Moravian Karst was declared a protected landscape area in 1956. There are four national nature reserves, two national natural landmarks and 11 nature reserves located in the Moravian Karst. There are not only karst phenomena, but also plant and animal communities, bound to the limestone bedrock (Schneider, Lorencová 2014).

An important economic and conservation aspect in the territory of the Protected Landscape Area Moravian Karst is the Training Forest Enterprise Masaryk Forest (TFE MF) in Křtiny of Mendel University in Brno. It plays a significant part in the management of small specially protected areas as well as building, maintaining and developing recreational furniture and infrastructure. It takes care of unique phenomenon such as of Lesnický Slavín, representing a set of memorials of important personalities and customized water springs and wells. It maintains a set of aesthetic glades and is the main keeper of the forest road network, intensively used by holidaymakers.

Finally, it is important to note that Protected Landscape Area Moravian Karst represents a natural recreational area for citizens of the city of Brno, the Moravian metropolis, with nearly 400 thousand residents (Schneider, Lorencová 2014).



**Pic. 1: PLA Moravian Karst - position in the Czech Republic, the relative position of TFE MF Křtiny to small-scale specially protected areas and location of implementation of the questionnaire survey (Schneider, Lorencová 2014)**

### The methodology

The target group of the survey were visitors to Protected Landscape Area Moravian Karst. The survey was conducted in two terms. The first was in the summer holiday season in the period from 11<sup>th</sup> to 31<sup>st</sup> August 2013 (147 respondents). The second survey was carried out from 5<sup>th</sup> to 28<sup>th</sup> October 2013 (128 respondents). A questionnaire survey was conducted anonymously. The survey was conducted in the same day and time span. Therefore, the number of respondents in the autumn is about 10% lower.

The objectives of the survey were to find recreational activities, habits and preferences of visitors to PLA Moravian Karst in relation to nature and landscape protection and secondary also regional development.

Questions can therefore be divided into three groups:

- 1) Questions of a general nature - age, sex, education, regional origin
- 2) General inquiries in relation to regional development (and indirectly also to nature and landscape protection) - accommodation, length of stay, transportation, preferred destinations and activities, impulse for the visit, orientation in the terrain...
- 3) Questions with a direct connection to nature and landscape protection - limitations in terms of nature protection, the opinion of the cable car from Punčevní jeskyně to the Macocha Abyss, evaluation of recreational infrastructure and furniture (Schneider, Lorencová 2014).

## The Results

In the first phase of the research areas were identified with a high concentration of traffic in the PLA Moravian Karst and places burdened with high attendance. The table 1 shows that heavily visited territories are mainly linked to the caves surroundings, which is equipped with sufficient tourist infrastructure and furniture and does not raise the visitors' needs to move and be active outside these treated areas.

**Tab. 1 Areas with a high concentration of visitors in the PLA Moravian Karst, concerned small-scale specially protected area (SSPA) determining the character of the location and visible manifestations of recreational burden (Source: Mazalová, 2014)**

Number	Description	Concerned SSPA	Character of the location /site. Visible influence
1	Punkevní caves with its surroundings	NNR Vývěry Punkvy	Adjusted built area, tourist centre, asphalt road, near limestone rocks and other karst phenomena, natural deciduous forests with the occurrence of protected species of plants and animals. No significant visual impacts.
2	Section from Skalní mlýn to Kateřinská jeskyně (cave)	NNR Vývěry Punkvy	Asphalt road, near limestone rocks and other karst phenomena, natural deciduous forests with the occurrence of protected species of plants and animals. No significant visual impacts.
3	Macocha Abyss, the trail to Dolní můstek (Lower Bridge)	NNR Vývěry Punkvy	Adjusted built area, the tourist centre, asphalt road, near limestone rocks and other karst phenomena, natural deciduous forests with the occurrence of protected species of plants and animals. Occasionally non-native spruce monocultures. To a limited extent, trample, minimum of trash and excrements.
4	trail from Punkevní jeskyně (caves) to the castle ruins Blansek	NNR Vývěry Punkvy	Hiking trail. Deciduous forests with the presence of specially protected species of plants and animals. Occasionally non-native spruce monocultures. To a limited extent, trample, minimum of trash and excrements, fireplace(s).
5	trail between Macocha and Punkevní jeskyně (caves)	NNR Vývěry Punkvy	Reinforced concrete paved walkway with railings. Mixed near-natural vegetation. No significant visual impacts.
6	surroundings Sloupsko-šošůvské jeskyně (caves)	NR Sloupsko-šošůvské jeskyně	Adjusted built area, the tourist centre, asphalt road, on the outskirts of the village. Near limestone rocks and other karst phenomena, natural deciduous forests with the presence of specially protected species of plants and animals. No significant visual impacts.
7	surroundings of the cave Balcarka	NR Balcarkova skála - Vintoky	Adjusted built area, the tourist centre, asphalt road, on the outskirts of the village. Near limestone rocks and other karst phenomena, maintained rocky steppes. No significant visual impacts.

8	trail between the windmill in Rudice and Rudické propadání subsidence	NPR Rudické propadání	Hiking trail. Deciduous forests with the presence of specially protected species of plants and animals. Occasionally non-native spruce monocultures. To a limited extent, trample, minimum of trash and excrements.
9	trail through the valley of Josefský potok (creek), around Býčí skála (rock)	NNR Býčí skála	Comfortable unpaved hiking trail. Natural and near-natural deciduous mixed forests with the presence of specially protected species of plants and animals. Occasionally unregulated trodden paths.

**Tab. 1 Areas with a high concentration of visitors in the PLA Moravian Karst, concerned small-scale specially protected area (SSPA) determining the character of the location and visible manifestations of recreational burden – continuance (Source: Mazalová, 2014)**

Number	Description	Concerned SSPA	Character of the location /site. Visible influence
10	Trail through the valley of Říčka and surroundings of the cave Pekárna	NR Údolí Říčky	Comfortable unpaved hiking trail. Natural and near-natural deciduous mixed forests with the presence of specially protected species of plants and animals. Occasionally unregulated trodden paths.
11	NNR trail Hádecká planinka	NNR Hádecká planinka	Natural warm temperate oak and close to nature mixed stands. Comfortable hiking trails. Numerous unregulated trodden paths.
12	Creek sink Stará and Nová Rasovna, castle ruins Holštejn	NR Bílá voda	Natural and near-natural deciduous mixed forests with the presence of specially protected species of flora and fauna, karst phenomena. Locally unregulated trodden paths, fireplace.
13	surroundings of the K. H. Macha monument in Josefské údolí ( valley)	NNR Býčí skála	Landscaped surroundings of the monument, natural and near-natural deciduous mixed forests with the presence of specially protected species of plants and animals. Sporadic trampling.
14	NNR Hádecká planinka (plain)	NNR Hádecká planinka	Natural warm temperate oak and near-natural mixed forests, steppe communities with particularly protected species of plants and animals. Comfortable hiking trails. Numerous unregulated trodden paths.
15	NNR Býčí skála	NNR Býčí skála	Landscaped surroundings (hay /mowed meadows, camping, Speleological station), just off the road. Locally trampling, occasionally excrement.
16	NNR Vývěry Punkvy, surroundings of the cableway	NNR Vývěry Punkvy	Landscaped setting surrounded by natural deciduous forests. Locally trampling, occasionally excrement and garbage.
17	Suchý žleb - cave Koňská jáma	NNR Vývěry Punkvy	The hiking trails of various kinds (hard and soft). Deciduous and mixed close to nature forests. Locally trampling.

18	Pustý and Suchý žleb	NNR Vývěry Punkvy	The hiking trails of various kinds (hard and soft). Deciduous and mixed close to nature forests. Locally trampling.
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The questionnaire survey at locations Vývěry Punky and Rudické propadání brought the following results:

The ratio between men and women interviewed in both surveys was almost balanced. In both surveys there was a predominant percentage of women (52 and 54%). Age structure of respondents in both surveys was very similar. In both cases respondents from 26-35 years and 36-45 years prevailed. Another part of questionnaire was pointed to the nationality of the respondents. In the summer season, the number of foreign visitors is higher than in the autumn. As well as their diversity is higher in the summer. The largest representation in both surveys have the visitors from Slovakia. The residence (region) of the Czech respondents was investigated, from which regions they came to the area in question. These were 73% responses in summer and 87% of respondents' answers in the autumn survey. In the autumn survey, the proportion of visitors mainly from South Moravian region and neighbouring regions grew. In the summer, on the contrary, visitors from more distant regions were more numerous.

In determining the reasons for their visit the survey participants reported most frequently attractive countryside and interest in the caves.

The transport which was most frequently used was the car. In the autumn survey there were more visitors who arrived by bicycle, which can be caused by an increase in tourists from the nearer neighbourhood (Brno, Blansko).

In terms of the length of the visits during the summer survey, the respondents stayed in the Moravian Karst mostly for one day (41%) and also weekly stays (32%). In the autumn survey, there was an increase of visitors for two to three days (weekends). But autumn trips were mainly (51%) of a one-day character.

As for the activities that visitors engaged in during their stay, hiking prevailed, often associated with visiting historical and cultural sites, as mentioned above. In the autumn survey, hiking increases by seven percent. There are more tourists who stay for only one day, so due to limited time spent there, there is a smaller diversity of activities that could be done in the area. Although in the second survey the use of bicycles as a means of transport to the area increased, except for these visitors, the number of respondents engaged/involved in cycling wasn't higher than in the summer (Schneider, Lorencová 2014).

When asked whether the visitors were limited in their recreational activities by any conservation measures during the summer survey, eighty percent of visitors said they were not. In the autumn survey, ninety-three percent of visitors were not even aware of a restriction. As for answers 'yes', the respondents had to express how exactly they perceived any possible limitation.

Comments from visitors to restrictive measures could be summed up in these few categories:

- Visitors perceive as limitations the inability to visit the caves which are, in order to protect nature, not accessible to the general public (26% and 55%)
- Visitors would like to move beyond the marked trails either on foot or by bicycle (21% and 27%)
- Automobile restrictions, visitors were bothered by not being able to get everywhere by a car (11% and 18%)
- Limitations on collecting berries, which is not permitted throughout the territory (5%)
- So called limits of visitors due to which they could not visit a cave open to the public (37%)

The infrastructure was evaluated as adequate by a majority of visitors. Nine per cent in both investigations perceives it as unnecessary. As the third option there was an answer "I lack ...", in which the respondents were to specifically express what they lack. Tourists once

again expressed that they lack the possibility of moving beyond marked trails, as well as their better, clearer labelling. In the summer survey visitors lacked more parking places and automobile limitations were mentioned again.

In the summer survey the visitors' wish to walk off the trail the largest share and a certain representation (in absolute numbers, there were only two answers) had a requirement for parking spaces. In the autumn survey, visitors expressed themselves more to off-trail travel, better marked trails and automotive limitations (Schneider, Lorencová 2014).

Absolute numbers and percentages of responses to selected questions are presented in Tab. 2a and 2b

**Tab. 2a - Recreational activities of visitors to PLA Moravian Karst in the summer and autumn – Reasons for visiting, Visited caves**

Reasons for visiting	Respondents' answers in %		Visited caves	Respondents' answers in %	
	Summer	Autumn		Summer	Autumn
Attractive countryside	32	34	Punkevní caves	26	26
Interest in the caves	22	24	Cave Balcarka	5	4
Good food and drink	2	1	Kateřinská cave	10	9
Cultural and historical monuments	11	8	Sloupsko-šošůvské jeskyně Caves	15	11
Regional products	4	1	Cave Výpustek	3	1
Peace and quiet	8	8	Abyss Macocha from the Bridge	32	40
Sport activities	13	14	Publicly inaccessible cave	1	0
Clean air	8	8	I haven't been to any	8	9
Other work activities	1	2			
Picking forest berries /herbs	1	0			

**Tab. 2b - Recreational activities of visitors to PLA Moravian Karst in the summer and autumn – Activities for the period of stay, Duration of Stay**

Activities for the period of stay	Respondents' answers in %		Duration of stay	Respondents' answers in %	
	Summer	Autumn		Summer	Autumn
Hiking	66	73	1 day	41	51
Cycling	20	16	Weekend	24	39
climbing a wall	6	3	Week	32	10
Geocaching	1	2	more than a week	3	1
horse tourism	3	1			
Speleology	2	0			
none of these activities	2	3			

## **Conclusions:**

We carried out two surveys, which were to indicate the general characteristics of visitors and compare how the structure of traffic at different times changes (or does not change). From the results it can be stated that

- surveys show the expected trend where tourists tend to travel more in the summer and their holidays are longer. The proportion of "non-resident" visitors is higher in summer season
- in the autumn it is mainly the residents of Brno and surroundings who visit PLA Moravian Karst and Brno. Their stay is predominantly one-day, one-week stays are exceptional
- seasonality also affects the type of accommodation - in the summer there is a significant proportion of accommodation in camps, which decreases in the autumn
- in the autumn the use of bicycles as a means of transport increases at the expense of cars
- the autumn survey also shows a significant increase in the proportion of visits unrelated to any major tourist attractions. Visiting caves remains the same.
- primarily general indicators are not dependent on the seasonality, age, gender and education, further means of transport, preference souvenirs or diets. Unchanged, however, remains also the assessment of visitor infrastructure.

As shown in the individual results, from this factor some differences in the behaviour and tourists' preferences are derived compared to the autumn season. For example, the number of foreign tourists in the autumn months falls and with them the interest in regional products. The survey also shows that, despite the seasonality there are invariant factors in the visitors' preferences that are not affected by the change of seasons, or they are very little. Most of the tourists visit the Moravian Karst mainly because of the caves.

The investigation itself and a number of studies suggest that the capacity of the landscape and the nature of the Moravian Karst is sufficient to absorb the burden of long-term recreational traffic intensity. Little attention, however, still paid to the short-term recreational activities of the inhabitants of the municipalities in whose territories the PLA is located. Their influence is constant over time, but the intensity may increase depending on the expansion of residential development and population growth. In addition to the common forms of soft short holiday there can be expected an increase in the number of off-road motorcycles and ATVs, whose impact needs to be monitored and controlled.

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# Professional project management as a prerequisite for effective management of regional projects

Pavel MACHAL

## Abstract

Project management or systematic management which takes into account both internal and external influences, is a relatively young field, but it forms the basis for successful and efficient running of a project. Project management methods are very important and have successfully and effectively been used by many international and national companies especially in the field of regional development. In this age of globalization, efforts to effectively and consistently manage, lead and coordinate the various processes in a company, plays an increasingly important role in the integrity and homogeneity of management principles. This effort corresponds to the implementation and application of the principles of project management (project management - PM), whose standards (baselines) provide the desired uniform approach and procedures in the management process.

An effort was made in the Czech Republic in the 1990s to implement the principles and knowledge of project management methods. However, when it became necessary for the collaboration and cooperation, especially with international IT companies or banking with foreign partners, it became important to provide sufficient motivation for the development and dissemination of training courses to train prospective workers issue them with certificates in this field. Its important role included the possibility of obtaining European projects, whose conditions for realization depended on the guarantee of quality and experienced project team. We can therefore assume that these facts increased or contributed to the significant interest in project management as a discipline.

There are two possible ways to be educated in the field of project management in the Czech Republic. The first option is to attend a project management course run by project management professionals in both theory and practical experience to obtain an International certificate (IPMA, PMI, PRINCE 2) at the end of the course. The second option, are courses run by Universities as part of their curriculum to bring the awareness of project management to their students.

It is not imaginable to develop cities and regions without the projects and all these projects must be managed by professionally competent and experienced project managers. The purpose of this paper is to suggest the minimum requirements for the position of professional managers to ensure effective management of regional projects. Finally, from the obtained results, the paper will outline the necessary techniques and tools that a project manager must perfectly know in order to fulfil the objectives of the project and thus contribute to the achievement of the anticipated benefits. Comparative analysis methods will be used to compare the following international standards IPMA, PMI and PRINCE 2 and come out with recommendations for their use in the management of regional projects.

## Key words

Project management, regional development, standards, IPMA, PMI, PRINCE 2

## **Introduction**

As stated in the document of the Ministry for Regional Development of the CZ - A new regional policy (2002, p.20), the concept of regional development can introduce a wide range of projects and activities whose general objective is to improve the social and economic level of regions, cities and municipalities. That the regions had the same chances and opportunities and that their demographic, economic and natural potential was fully exploited, the state must create equal opportunities for people of all regions must therefore to some extent to take measures at the national, regional and international level which will mitigate regional differences.

To illustrate further we can include other definitions of regional policy. Goodall, B. (Dictionary of Human Geography, London, Penguin Group, 1987) states that regional policy as part of government policy affecting the deployment of the main economic resources and activities throughout the national territory or in its parts, includes measures conducive to the growth of economic activity in the territory with high unemployment and little hope of a natural economic growth and on the other side measures to control economic activities in areas with excessive growth. Vanhove N., Klaassen, L.H. ( Regional Policy : A European Approach . Aldershot: Gower, 1983) writes that regional policy represents all public interventions to improve the geographic distribution of economic activities or attempts to rectify certain spatial consequences of a free market economy in terms of achieving two interdependent objectives: economic growth and improve the social distribution of economic effects.

Considerably pragmatic approach to the regional policy formulated by Taylor and Wren (Regional Policy, 1997), according to which regional policy can be defined on the basis of the quantity and distribution of expenditures between different types of regional policy instruments. The objectives of the strategic documents of the public and state administration can be effectively meet assuming that there are targets formulated and projects adopted.

In today's era of globalization, efforts to effectively and consistently manage, lead and coordinate the various processes in the society, consistency and homogeneity plays an increasingly important role in the principles of management. This effort corresponds with the implementation and application of the principles of project management (project management - PM), whose standards (baselines) ensure the desired uniform approach and procedures in process control +46 (HAROLD, K, 2009).

There was an effort to implement the principles and knowledge of project management methods already in the 90s in the Czech Republic. However, the need for collaboration and cooperation, especially in the international IT companies or in banking sector with foreign partners was a demand to provide sufficient motivation for the development and dissemination of trainings, courses and certification process for workers in this field.

The possibility of obtaining education in the Czech Republic in the field of PM is feasible in two ways. The first option is participation in the certified course under the guidance of the teacher, who will prepare candidates for certification according to IPMA standards (International Project Management Association), or PMI (Project Management Institute), or PRINCE 2 (Project In Controlled environments). It is therefore to gain experience and theoretical knowledge with help of commercial products. The second on, which would certainly increase awareness of PM and at the same time would made it a regular practice, the compulsory teaching of PM at universities or secondary schools.

## **Potentials and weaknesses in project management in the Czech Republic**

The weaknesses of the project management in the Czech Republic certainly is its misunderstood and expert commentary. Especially on academia, but also in public administration, the word "project" is repeatedly used for activities that are far from project

management and its ideas have nothing in common. In order to design a project to meet the needs of so-called. three imperative (Fig. 1), e.g. cohesion of time, costs and a goal (Svozilová, A., 2007).

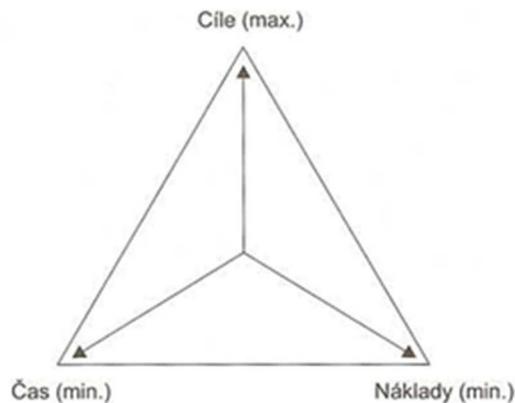


Fig. 1 – Three imperatives. Dolezal (2009)

The issue of insight into a project management in the private sector was already addressed by many authors. For example. Vořechová (2005) in her study of the project management and its perception of the company revealed the following. The question whether "Most companies does not use project management strategically" implies that only a little over half of respondents (55% of 108 respondents) confirmed that project management is incorporated into the company strategy. However, if we consider the lack of understanding of project management as a whole, with a share of fifty-five percent we can be satisfied. The fact that project management is not used strategically by majority of companies it is demonstrated by weak penetration of project management as a culture at all hierarchical levels in companies."

One of the objectives of education and extending at least basic knowledge of project management is the accurate definition of concepts and their proper use and application in practice. The only way to achieve this goal is the systematic teaching with defined competencies which students should achieve after completing the course

### **Project Management in the Czech education system**

The quality of teachings of project management, its conception, organization and professional content is still not anchored, established or publicly recommended. According to information available there are three public schools and one university that are accredited with bachelor's and master's degree program. Faculty of Regional Development and International Studies, Mendel University in Brno, opened a Master's degree in project management in regional development.

The question of expansion support and obtaining of a general concept of project management is its introduction in high schools. Clearly there is no obligation to teach project management in the educational framework programs for vocational schools.

### **The importance of project management in regional development**

The development of cities and regions can not be imagined without the projects. Projects must be managed professionally by competent and experienced project managers. The project manager is interacting within the social environment, leading a certain team of people who share a common activity in the implementation of a specific project. Its outputs may have

material nature or immaterial products. It is therefore good to understand his position in terms of both technical and especially social sciences and psychology in particular. The project manager shall know, in addition to techniques and methods in project management and methods influencing behavior of both his and the project team, to know and to control a variety of related competencies. By analysis and comparison of the techniques used in an individual standards aforementioned may be recommended that the project manager - to be dominated in the technics and project management methodologies that will ensure to him and the entire project team effective achievement of project objectives. The author presents four fundamental techniques that the project manager should use in project management.

### **SWOT analysis**

The SWOT analysis is a proven technology in project management particularly in the area of risk management, but also in analyzing the "strength" of the project team. It is a universal analytical technique focused on the evaluation of internal and external factors affecting the success of the project. The author of the SWOT analysis is Albert Humphrey of Stanford University, who developed it in the sixties of the 20th century. SWOT is an acronym of the initial letters of the English names of various factors:

- Strengths
- Weaknesses
- Opportunities
- Threats

The authors of Project risk management (Korecký, Trkavský) using SWOT analysis to identify the threats and opportunities of the project recommended the following:

1. If possible, take advantage of current SWOT analysis of the company, or process it with regard to the areas of strengths and weaknesses of the project.
2. Select and specify the internal strengths and weaknesses of the project.
3. Find more specific internal strengths and weaknesses of the project.
4. Select and specify external opportunities and threats of the company, which are relevant to the project and determine which of them are potential threats and opportunities for the project, the result is first group of threats and opportunities of the project.
5. Search for more opportunities and threats outside the company or within a company environment, which are external to the project, resulting in a further group of threats and opportunities of the project.
6. Use of types of strategies for inner squares of SWOT table for better understanding of found threats and opportunities and also for strategies proposal for their solution.

SWOT ANALYSIS MATRIX	Present	Future
Positive	Strengths	Opportunities
Negative	Weaknesses	Threats

Fig.n. 2 - Interpretation of fields in SWOT matrix analysis (source author)

The SWOT analysis method is relatively simple, but it is an effective way to identify the particular risks that cannot be learned from current data and documents. However, it must be abided by a principle that it is necessary to go back to SWOT during all phases of the project life cycle and update the SWOT analysis accordingly.

### The logical framework matrix

Creating a Logical Framework matrix is set in the initial phase of the project and serves as a guide for setting project goals, project outline of major deliverables and activities. It is a technique by which project managers are able to clearly and briefly describe the project to the extent of A4. Techniques of logical framework matrix serves as a basic tool for decisions of competent persons of the project.

Defining the project using the methodology of Logical Framework matrix is the basis for project management. The logical framework matrix is suitable for the identification and analysis of problems on one side and definition of objectives and determination of specific activities to address these issues on the other side.

Applying the methodology of logical framework matrix is important not only in the preparatory phase of the project, but it is also a key tool for its implementation and evaluation. It forms the basis for the preparation of activities and development of the monitoring system. Logical framework matrix is used in the evaluation for its simplicity, brevity, clarity and uniformity especially for the description of all projects. It facilitates the work of evaluators and allows them objective comparison and assessment of each project.

The logic of this technique is dual. First, the vertical relationship expresses a logical relationship between key activities, outputs, the project goals and its aims and secondly horizontal relationship, which has for all lines except the first one the same meaning.

<b>CONTRIBUTION</b>	Objectively verifiable indicators	The method of verification (sources of information)	<i>DO NOT FILL</i>
<b>GOAL</b>	Objectively verifiable indicators	The method of verification (sources of information)	Assumptions for which C actually contribute and in accordance with P
<b>OUTPUTS</b>	Objectively verifiable indicators	The method of verification (sources of information)	Assumptions for which V in fact lead to C
<b>KEY ACTIVITIES</b>	Resources (money, people ..)	Timeframe activities	Assumptions for which KD in fact lead to V
			Any pre-conditions

Fig. n.3 How to read the Logical Framework Matrix (Source: DOLEŽAL, MÁCHAL., Lacko, 2012)

Thus:

If we are implementing Activity, we achieve the planned Outputs, if we have achieved this, we have reached Goals of the project and when it was achieved this Goal, the project contributed to its achievement.

### Work Breakdown Structure

When defining the project goals we provide, inter alia, the so-called decomposition of outputs and main activities of the project into smaller parts. This activity is usually called a project structuring, which creates a hierarchical structure of the project, or the Work Breakdown Structure (WBS). This work therefore represents the decomposition of the project into manageable activities so as to obtain the maximum likelihood of meeting customer requirements for products and processes. For elements of this structure are often used terms such as "activity", "task" and "work package". The result is known as work structuring (WBS). It is the central tool for ensuring succession and communication in the project. It represents a conceptual structure for all integrated planning and work control. The term structuring means decomposition of the individual outputs of the project, decomposition the main subjects of supplies into smaller parts in order to facilitate subsequent project activities (planning, implementation, and finalization). In the context of defining the activities particular staff should be included in the project management who will be responsible for various activities (work packages). The task activity definition is:

- To ensure that all required actions have been identified and logically linked,
- To improve the accuracy of time estimates, resources and costs,
- To define models for performance measurement and work management,
- To allow a clear definition of responsibilities.

Techniques for creating a hierarchical structure of a project may be:

- Patterns - structures of earlier projects,
- Decomposition.

The structures of previous projects can be reused. Although each project is unique, many projects may have the same or similar life cycles, and therefore the same or similar items of deliveries in each stages of implementation.

During the decomposition it is possible to represent each level of the hierarchical structure of the work with focus on:

- project outputs
- functional areas
- components or parts of the product,
- project phase,
- responsibility, etc.

However it is not clear how detailed a hierarchical structure of the work should be. Hierarchical structure is recommended to be up to four levels, otherwise it is necessary to consider to establish subprojects. The project structuring is assumption to commence planning for all three project parameters - quality, time, and costs for individual activity.

Verification of the accuracy of the decomposition can be done by answering the following questions:

- Are the items at the lowest level necessary and sufficient for completion of the parent item in the structure work? If not, sub-elements must be adjusted - added, deleted and redefined.
- Is each item completely and clearly defined? If not, must be revised, expanded
- Can be each item properly planned, budgeted, and allocated to specific resource, which assumes responsibility for satisfactory completion? If not, it needs to be revised.

In preparing WBS is necessary to include such tasks, which are not specified as supplied items, but need to be implemented to achieve the outcomes (e.g. coordination activities).

WBS can be still edited in the context of time planning and scheduling costs.

Specification of work defines and describes the content of the activities, targets, outcomes, responsibilities, dates and deadlines, resources, and cost estimates (in Eng. SOW - statement of Works). It represents the part of the contract, in which states exactly what will be delivered and when. For internal projects may be contained in an internal note. However, it should always include specific, measurable and achievable goal.

## Risk management

Risks and opportunities in the project is the uncertain cases or situations with possible negative impact on the overall success of the project, partial results provided by the project or by events that may cause unforeseen damage. They occur in all projects, regardless of their size and complexity, in segments of the industry, construction, financial investment, and in the education segment, services or social policy. Managing risks and opportunities in the project is one of the key factors that distinguishes systematic approach to the process as opposed to the intuitive approach. The risk management process and opportunities is present in all phases of the project.

Generally, the risks and opportunities that are associated with the acyclic processes (non-recurring) and with their management, compared with cyclic (repeated) processes, are always higher. The risk that damage will occur, associated with delayed product deployment on the market or placing infrastructural element into activity with excessive budgetary costs, projected onto their prices, poor quality and class that was not the intention, there is complex, complicated, mediated and deferred.

The projects have distinct specifics in terms of management and opportunities as well as business processes. The project outputs is a product, individual, mostly unique work created by order on the basis of an individual, an individual-based complex documentation. The work itself is not usually the end product it is intended to produce "goods" such as products, services, socio-political programs, etc.. Projects product is not to sell or "over the counter" nor in the form of "net sales" nor "consignment stores" nor "commodity market". Usually, the term "risk" refers the value of probable losses in monetary terms. Part of the management activities, whether general or particular, project management is called Risk Management. Its purpose is to identify in advance potential sources of loss and subsequently, through active work with the risk, reduce the likelihood of their occurrence and their severity to an acceptable value. In the event that, despite all the measures taken, the damage occurs, it is necessary to prepare in advance a set of corrective measures.

The risk assessment project can be done in two groups of methods:

Qualitative - qualitative methods using a verbal value to determine the probability of loss.  
Quantitatively - quantitative methods using a numeric value to determine the probability of a loss.

Among the recommended methods of risk analysis in the project management belongs RIPRAN method (Risk PProject Analysis). Method RIPRAN as stated by DOLEŽAL, MÁČHAL., Lacko (2012) is a method for experienced project managers. This method consists of four basic steps:

- Project hazard identification
- Quantification of project risks
- Responses to project risks
- Overall assessment of project risks

Risk and opportunity management is part of the general activities and the project management specifically. Its purpose is to identify in advance potential sources of damages (loss) and subsequently, through active work with risk, reduce risk likelihood and severity of their impact on the interests of monitored group to an acceptable level through preventive measures. If then the realization of the risks actually occurs, it should be prepared in advance a set of corrective measures that would reduce the actual damage.

## Conclusion

Systematic and comprehensive company management or state institutions are an essential element of an effective and sustainable operation. Managers' personality and their knowledge of and ability to use, the application of project management is essential to create an environment that would become standard practice and specific connection element. The society-wide and widespread use of project management in organizations will go a long way. However, it should start with the youngest age groups, which are just pupils in secondary schools. They should get the basic concept of the existence of project management, its principles, methods, and they should realize that its part are competence in the field of soft skills, which is quite universal, important and vital component in the education of every person. Universities should then take over the role in which a student will understand more deeply how project management works, how and when to use specific methods and can use their knowledge gained in high school and enriched by practical work and by team work in practice. To obtain a specific teaching model that could raise a competitive student and applicable to the labor market should serve survey compares the employer on the one side, managers of secondary schools and on the other side and students who once find themselves as potential employees.

Project management will always be an appropriate model for leadership, not only large companies. Its moral principles copying behavior, effective management and systematization are widely applicable and useful in all fields and areas of business and all types of public institutions. Now depending on the amount of sufficient qualified staff who are able to teach project management correctly and will share their experience and knowledge with future generations.

Regional development is inherent without implemented projects and so-called soft or hard (investment). For project managers and their teams in charge of the implementation of the project depends not only meeting the objectives of the project, but also the benefits for the region.

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# State Administration Efficiency in the Field of Trade Licensing – case of Slovakia

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## Abstract

State administration, a part of public administration system, is often considered inefficient and inflexible, while mainly performance indicators, personal and financial aspects of performance are appearing to be problematic. Because currently there is a social and political pressure on efficiency and effectiveness in public administration, the assessment of efficiency within subsystems of public administration represents very actual topic. The objective of the paper is to present the assessment of state administration efficiency in the field of trade licensing in Slovakia within the years 2009 – 2012. The state administration in this field in Slovakia is provided by Trade Licensing Offices– departments of District Offices within 49 territorial districts. The study employs a non-parametric Data Envelopment Analysis to measure relative efficiency of the offices and distance function approach to measure Malmquist productivity index which is decomposed into technical efficiency change, scale efficiency change, and technical change. The results show that total productivity was growing yearly in average by 2.3%. Within the examined period it increased by 7.14%. The growth was driven mainly by positive technical change (8.26% growth), what indicates improvement of the best practice offices performance (technological change). Decreasing technical efficiency corresponds to declining share of efficient Trade Licensing Offices within the examined time period. Total decrease in technical efficiency is 1.06% and fall in efficient offices share is 21.6%, what indicates that the lag of inefficient offices behind efficient ones is increasing. The average measure of scale efficiency increased within the time period 2009-2012 by 1.68%, what may be a result of a better set up of the size of the offices. Regression analysis indicates that there is statistically significant relationship between the office size measured by number of employees and the scale efficiency. This factor explains 25% of scale efficiency variability. The statistically significant difference in scale efficiency was found between Trade Licensing Offices in the seat of regions (8) and the other Trade Licensing Offices (41). In the paper we present also results of super-efficiency estimation, what enables to rank all Trade Licensing Offices into an unambiguous performance order and project target inputs/outputs values for inefficient offices to catch-up best practice offices.

## Keywords:

state administration, Trade Licensing Offices, total productivity change, technical efficiency change, technical change, scale efficiency change

## Introduction

Managing a successful business requires a good public management and public services not only in set up of business idea but also for the entire business activities. (Edwards, 2007) Demands for public services productivity improvement led to the various models of efficiency and effectiveness tracking. (Rabin et al., 2006) The concept of the public administration efficiency assessment represents an ambitious research area aimed at the

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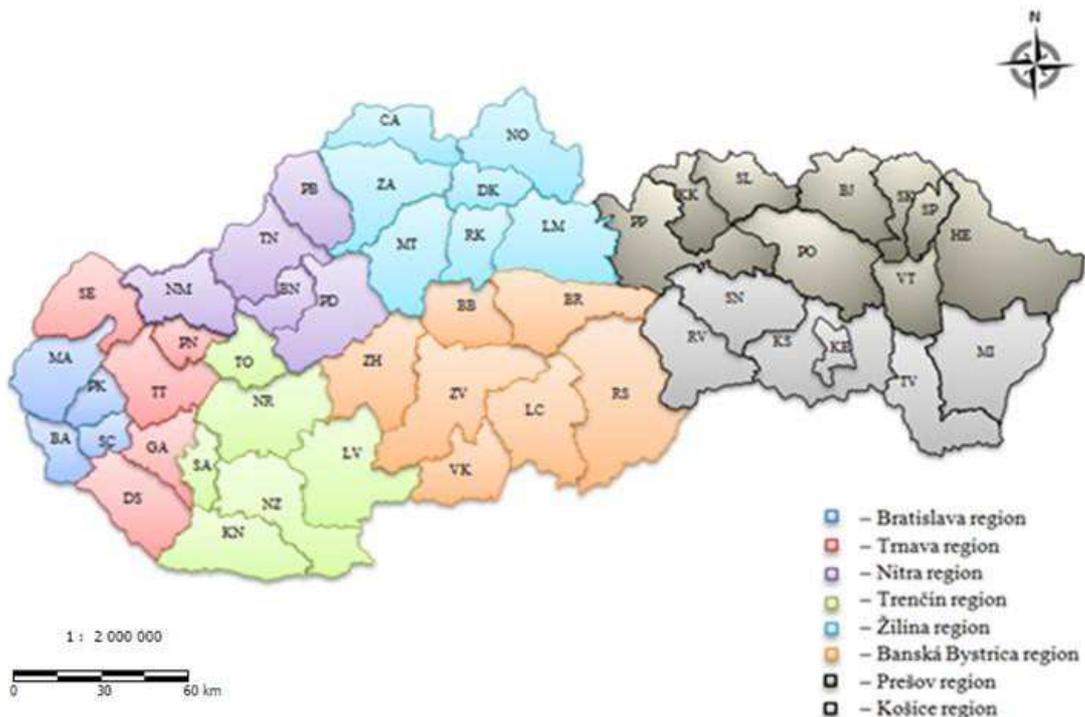
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provision of new assessment knowledge within the framework of individual aspects of public administrative performance. The results of the researches also represent a relevant source enabling identification of the potential necessary for the possible future improvement of the public administrative activities assessed. The presented paper focuses on the assessment of efficiency of the public administrative performance of state administration authorities in the field of trade licensing in the Slovak Republic. In terms of public administration, efficiency may be considered to be one of the key values not only from the perspective of the investment of resources in relation to the results achieved but also from the perspective of meeting the needs of the recipients of relevant public services. In terms of the trade licensing in the Slovak Republic, public administrative activities are administratively provided by Trade Licensing Offices, which are set up at the District Offices (Trade Licensing departments). These are administratively dimensioned to the Trade Licensing Offices in the seats of regions (8) and to other Trade Licensing Offices (41) having different competences. Legislative platform is proposed by the Act No. 455/1991 Coll. on trade licensing, as amended. The role of the Trade Licensing Offices is to provide public services in accordance with the letter of the abovementioned Act, while the public services represent services related to the tradesman registration, modification or termination of trade authorization; to provide consultancy; to issue administrative acts; and last but not least, to carry out the trade inspection of compliance with the provisions of the Trade Licensing Act and the relevant special regulations.

**Fig.1: Administrative division of the Slovak Republic – territorial units of the Trade Licensing Offices**



**Source: own processing according to the Geodesy, Cartography and Cadastre Authority of Slovak Republic, 2014**

In Europe, public administration currently faces challenges resulting from the lingering economic recession and debt crisis. One of them is the need to ensure public administrative performance as effective and efficient as possible, while having only limited resources. On the other hand, the current state administration in Slovakia is being created in terms of approved governmental ESO reform (Effective, Reliable and Open state administration). This

reform of state administration shall lead to more simple and complex approach of citizens toward necessary administration as well as required public sources consolidation and decrease overstaffing in public authorities. That is also challenge with an impact on trade licensing state administration. Motivation of this paper is to offers a view on the current state of the state administration efficiency in the field of trade licensing in the Slovak Republic. Trade Licensing Offices of the Slovak Republic consist of Trade Licensing Registration Sections and the Trade Licensing Inspection Sections. At the same time, they carry out the tasks of the Points of Single Contact (PSCs), created on the basis of a requirement of the European Union in all of the Member States with aim to facilitate the free movement of services in the EU internal market. Thus results of the analysis of the Trade Licensing Offices efficiency offer a view on the work of the PSCs in the Slovak Republic. The view through the state administration efficiency can be the first step within the implementation of the EU recommendation for the years 2014 – 2015, take action to introduce measures to improve business environment including for SMEs (European Commission, 2014a). Especially SMEs play an important role in European Union economy therefore an efficient state administration is a fundamental criterion to the business environment improvement (European Commission, 2014b).

## Methods and material

The concept of the research is based on the assessment of the performance (outputs) of the Trade Licensing Registration Sections and the Trade Licensing Inspection Sections in relation to the used resources necessary to ensure the performance of the public services in this field (inputs). Our starting point is represented by the assumptions that the performance of each of the Trade Licensing Offices (hereinafter referred to as TLO) can be expressed as a function of the resources used:

$$Y_j = f(X_j), j=1, \dots, n \quad (1)$$

where  $Y_j$  is the indicator representing outputs and  $X_j$  relevant inputs in TLO  $j$ . If  $Y_j < f(x_j)$ , i.e. output of the observed TLO unit is smaller than the best attainable one, than it is said that TLO  $j$  is inefficient. Efficiency assessment is based on the productivity indicator expressed as the ratio of output to input. In our work we assume several outputs and several inputs. In such a case productivity of an observed TLO can be expressed as a ratio of weighted sum of outputs to a weighted sum of inputs:

$$Productivity = \frac{u_1 y_{1o} + u_2 y_{2o} + \dots + u_s y_{so}}{v_1 x_{1o} + v_2 x_{2o} + \dots + v_m x_{mo}} = \frac{\sum_{r=1}^s u_r y_{ro}}{\sum_{i=1}^m v_i x_{io}} \quad (2)$$

where  $u_r$  are unknown weights of outputs  $y_r$  and  $v_i$  are unknown weights of inputs  $x_i$ , which can be calculated by means of mathematical programming. Productivity of any observed unit expressed relative to a maximal productivity in a sample of units is known as technical efficiency (TE):

$$TE = \frac{\frac{\sum_{r=1}^s u_r y_{ro}}{\sum_{i=1}^m v_i x_{io}}}{\max_j \left( \frac{\sum_{r=1}^s u_r y_{rj}}{\sum_{i=1}^m v_i x_{ij}} \right)}, j = 1, 2, \dots, n \quad (3)$$

where

$y_{ro}$  is r-th output of an observed TLO

$y_{rj}$  is r-th output of j-th TLO

$x_{io}$  is i-th input of an observed TLO

$x_{ij}$  is i-th input of j-th TLO

$u_r$  is weight of r-th output

$v_i$  is weight of i-th input

If  $TE = 1$ , then a TLO is technically efficient. If  $TE < 1$ , then the TLO is inefficient and in comparison with efficient units could produce the same output from the lower level of inputs. TE scores less than one are usually interpreted as coefficients of reduction of input use.

For the estimation of technical efficiency we employ a non-parametric approach known as Data Envelopment Analysis (DEA). Two DEA input oriented models are applied, both for constant return to scale (CRS) (Charnes et al., 1978), as well as for variable returns to scale (VRS) (Banker et al., 1984) assumption.

**Tab. 1 DEA models for technical efficiency estimation**

Model DEA-CRS	Model DEA-VRS
$TE CRS = \theta^* = \min \theta$	$TE VRS = \theta^* = \min \theta$
subject to	subject to
$\sum_j^n y_{rj} \lambda_j \geq y_{ro} \quad r = 1, 2, \dots, s$ $-\theta x_{io} + \sum_j^n x_{ij} \lambda_j \leq 0 \quad i = 1, 2, \dots, m$ $\lambda_j \geq 0$	$\sum_j^n y_{rj} \lambda_j \geq y_{ro} \quad r = 1, 2, \dots, s$ $-\theta x_{io} + \sum_j^n x_{ij} \lambda_j \leq 0 \quad i = 1, 2, \dots, m$ $\lambda_j \geq 0$ $\sum_j^n \lambda_j = 1$
(4)	(5)
$\theta$	technical efficiency score
$\lambda_j$	intensity variable of j-th TLO

The constant returns to scale DEA model is applied when it is assumed that TLOs in the sample are operating at optimal scale. In real life TLOs as public administration units are not in mutual competition and therefore we can assume that they do not operate at optimal scale. Then variable returns to scale DEA model is more appropriate. It provides TE score, which indicates deviation from the best practice performance due to managerial inefficiency. Ratio of both CRS and VRS technical efficiency scores expresses the scale efficiency measure:

$$SE = \frac{TE|CRS}{TE|VRS} \quad (6)$$

$SE = 1$  indicates that a TLO is scale efficient, i.e. it operates in the area of most productive scale size.  $SE < 1$  indicates scale inefficiency, i.e. a TLO is operating under increasing or decreasing returns to scale.

For the purpose of ranking of TLOs we additionally apply **Andersen and Petersen (1993)** super-efficiency DEA model, which provides TE scores enabling unambiguous ranking not only inefficient NLOs with  $TE < 1$ , but also all efficient NLOs with  $TE = 1$ . Andersen and Petersen's (1993) super-efficiency DEA model is identical to the standard models (4) and (5), except that the unit under evaluation is excluded from the reference set, what is solved with an extra constraint  $\lambda_o = 0$ .

For the analysis of the NLO's performance development in time we employ a non-parametric distance function approach to measure Malmquist total productivity index, which we further decompose into technical efficiency change and technical change.

We apply output oriented Malmquist index as the geometric mean of two Malmquist indexes for two adjacent periods  $t$  and  $t+1$ , using reference technology  $S^t$ , as well as technology  $S^{t+1}$  (Färe, Grosskopf, Lindgren and Roos, 1989, 1994).

$$M_o(x^t, y^t, x^{t+1}, y^{t+1}) = \left[ \frac{D_o^t(x^{t+1}, y^{t+1})}{D_o^t(x^t, y^t)} \frac{D_o^{t+1}(x^{t+1}, y^{t+1})}{D_o^{t+1}(x^t, y^t)} \right]^{\frac{1}{2}} \quad (7) \text{ With}$$

regard to character of employed distance functions Malmquist index  $M_o(x^t, y^t, x^{t+1}, y^{t+1}) \gtrless 1$ , according as productivity change between two periods  $t$  and  $t+1$  can be positive, zero or negative.

According Färe, Grosskopf, Lindgren and Roos (1989, 1994) Malmquist index (7) can be decomposed to technical efficiency change (TECH) and technical (technological) change (TCH). Following Färe et al. (1989, 1994) an equivalent way of writing this index is:

$$\begin{aligned} M_o(x^t, y^t, x^{t+1}, y^{t+1}) &= \frac{D_o^{t+1}(x^{t+1}, y^{t+1})}{D_o^t(x^t, y^t)} \left[ \frac{D_o^t(x^{t+1}, y^{t+1})}{D_o^{t+1}(x^{t+1}, y^{t+1})} \frac{D_o^t(x^t, y^t)}{D_o^{t+1}(x^t, y^t)} \right]^{\frac{1}{2}} \\ &= \text{TECH}(x^t, y^t, x^{t+1}, y^{t+1}) \cdot \text{TCH}(x^t, y^t, x^{t+1}, y^{t+1}) \end{aligned} \quad (8)$$

where  $\text{TECH} > 1$  indicates improvement in technical efficiency and  $\text{TECH} < 1$  deterioration in technical efficiency.  $\text{TCH} > 1$  indicates technical progress (evidence of innovation) and  $\text{TCH} < 1$  technical regress. Both components equal unity are associated with no change. Likewise Malmquist index of total factor productivity change equal unity means stagnation, index greater than unity indicates growth and index less than unity means deterioration of productivity.

Malmquist index in (7) a (8) is based on the assumption that technology exhibits constant returns to scale (CRS). If the assumption on returns to scale is relaxed to allow variable returns to scale (VRS), then component of TECH in (8), following Färe, Grosskopf, Lovell (1994), can be further decomposed to scale efficiency change (SECH) and pure efficiency change (PECH):

$$\begin{aligned} \text{TECH}(x^t, y^t, x^{t+1}, y^{t+1}) &= \left[ \frac{D_o^t(x^t, y^t | \text{VRS})}{D_o^t(x^t, y^t | \text{CRS})} \frac{D_o^{t+1}(x^{t+1}, y^{t+1} | \text{CRS})}{D_o^{t+1}(x^{t+1}, y^{t+1} | \text{VRS})} \right] \left[ \frac{D_o^{t+1}(x^{t+1}, y^{t+1} | \text{VRS})}{D_o^t(x^t, y^t | \text{VRS})} \right] \\ &= \text{SECH}(x^t, y^t, x^{t+1}, y^{t+1}) \cdot \text{PECH}(x^t, y^t, x^{t+1}, y^{t+1}) \end{aligned} \quad (9)$$

Estimation of distance function values for components calculation needs to apply 4 DEA output oriented models for each decision making unit, list of which is presented in Table 2.

**Tab. 2 DEA models for distance functions estimation**

<p>Model 1  <math>[D_o^t(x^t, y^t   \text{CRS})]^{-1} = \max_{\varphi, \lambda} \varphi</math>                      subject to  <math>\varphi y_j^t - Y^t \lambda \leq 0</math>  <math>X^t \lambda \leq x_j^t</math>  <math>\lambda \geq 0</math></p> <p style="text-align: right;">(10)</p>	<p>Model 2  <math>[D_o^t(x^t, y^t   \text{VRS})]^{-1} = \max_{\varphi, \lambda} \varphi</math>                      subject to  <math>\varphi y_j^t - Y^t \lambda \leq 0</math>  <math>X^t \lambda \leq x_j^t</math>  <math>\lambda \geq 0</math>  <math>1' \lambda = 1</math></p> <p style="text-align: right;">(11)</p>
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Model 3  
 $[D_0^{t+1}(x^{t+1}, y^{t+1} | CRS)]^{-1} = \max_{\varphi, \lambda} \varphi$

Model 4  
 $[D_0^{t+1}(x^{t+1}, y^{t+1} | VRS)]^{-1} = \max_{\varphi, \lambda} \varphi$

subject to

$$\begin{aligned} \varphi y_j^{t+1} - Y^{t+1} \lambda &\leq 0 \\ X^{t+1} \lambda &\leq x_j^{t+1} \\ \lambda &\geq 0 \end{aligned} \quad (12)$$

subject to

$$\begin{aligned} \varphi y_j^{t+1} - Y^{t+1} \lambda &\leq 0 \\ X^{t+1} \lambda &\leq x_j^{t+1} \\ \lambda &\geq 0 \\ 1' \lambda &= 1 \end{aligned} \quad (13)$$

Notation:

$y_j^t$  is  $S \times 1$  vector of outputs of j-th DMU in period t

$x_j^t$  is  $M \times 1$  vector of inputs of j-th DMU in period t

$Y^t$  is  $S \times N$  matrix of S outputs and N DMUs in a period t

$X^t$  is  $M \times N$  matrix of M inputs and N DMUs in a period t

$\lambda$  is  $N \times 1$  vector of intensity variables

$\varphi$  is scalar, output oriented measure of efficiency

The material of the paper consists of collected data primarily kept within the reporting of the Trade Licensing Offices' activity in the years 2009 to 2013. It mainly consists of the output data. The input data were obtained on the basis of the Act No. 211/2000 Coll. on free access to information, as amended. Output performance indicators were processed for the Trade Licensing Registration Sections, PSCs and the Trade Licensing Inspection Sections individually. Analyzed period: years 2009, 2010, 2011, 2012.

Studied input indicators:

- number of employees of the Trade Licensing Offices
- wage costs of the Trade Licensing Offices
- material costs of the Trade Licensing Offices

Considering the internal processes of the Trade Licensing Offices and the dynamically changing structure of state administration, in some cases, certain Trade Licensing Offices were not able to provide the required data (a problem occurred only in the indicators of wage and material costs). Since these are relatively standardized data, they were subsequently estimated with a regression analysis. Mathematically estimated data accounted for 1.8% of all of the data comprised in the two given indicators.

Studied output indicators:

Studied output indicators – Trade Licensing Registration Section:

- *administrative decisions issued by the Section during the studied period*
  - *administrative decision on cancellation of authorization ex officio*
  - *administrative decision on suspension of authorization ex officio*
  - *administrative decision on stay of proceeding*
  - *administrative decision on termination of proceeding ex officio*
  - *administrative decision on non-formation of trade authorization*
- *other actions of the Trade Licensing Registration Section*
  - *certificate of trade authorization*
  - *notice of suspension*
  - *termination of authorization based on tradesman's notification*
  - *modification by means of a merger*

- *modification by means of a take-over*
- *other modification carried out without a decision*
- *extract from the Trade Register*

Studied indicators – PSC (Point of Single Contact)

- *PSC services*

- *actions of the PSC service for the TD*
- *actions of the PSC service for the HIC*
- *actions of the PSC service for the BR*

Studied indicators – Trade Licensing Inspection Section

- *finest imposed in ticket fines proceedings during the studied period*

- *administrative decisions issued by the Trade Inspection Section*

- *decision on imposition of fines*
- *interlocutory revision*
- *decision on termination of proceeding*

- *other acts of the Trade Inspection Section*

- *summons to the hearing on the record of inspection*
- *notice of initiation of administrative proceeding*
- *letter of formal notice*
- *addendum to the record of inspection*

## **Results**

Table 3 presents estimated measures of three efficiency indicators for the years 2009, 2010, 2011 and 2012. Presented are average values of technical efficiency under constant return to scale (TE-CRS-I), technical efficiency under variable returns to scale (TE- CRS-I), and scale efficiency (SE-I) for all Trade Licensing Offices. As we employed input oriented DEA models, letter I in all abbreviations indicates that orientation. Following inputs and outputs were used in the models:

*Inputs:*

- *number of employees of the Trade Licensing Offices*
- *material costs of the Trade Licensing Offices*

*Outputs:*

- *number of administrative decisions issued in the Trade Licensing Registration Section (\*aggregated with other acts of the TRS.)*
- *number of actions performed in the Trade Licensing Registration Section (\*aggregated with decisions of the TRS.)*
- *number of actions of the Points of Single Contacts service*
- *number of inspection actions carried out by the Trade Licensing Inspection Section*
- *number of other acts carried out in the Trade Licensing Inspection Section*
- *number of imposed ticket fines*
- *number of issued administrative decisions on fines*

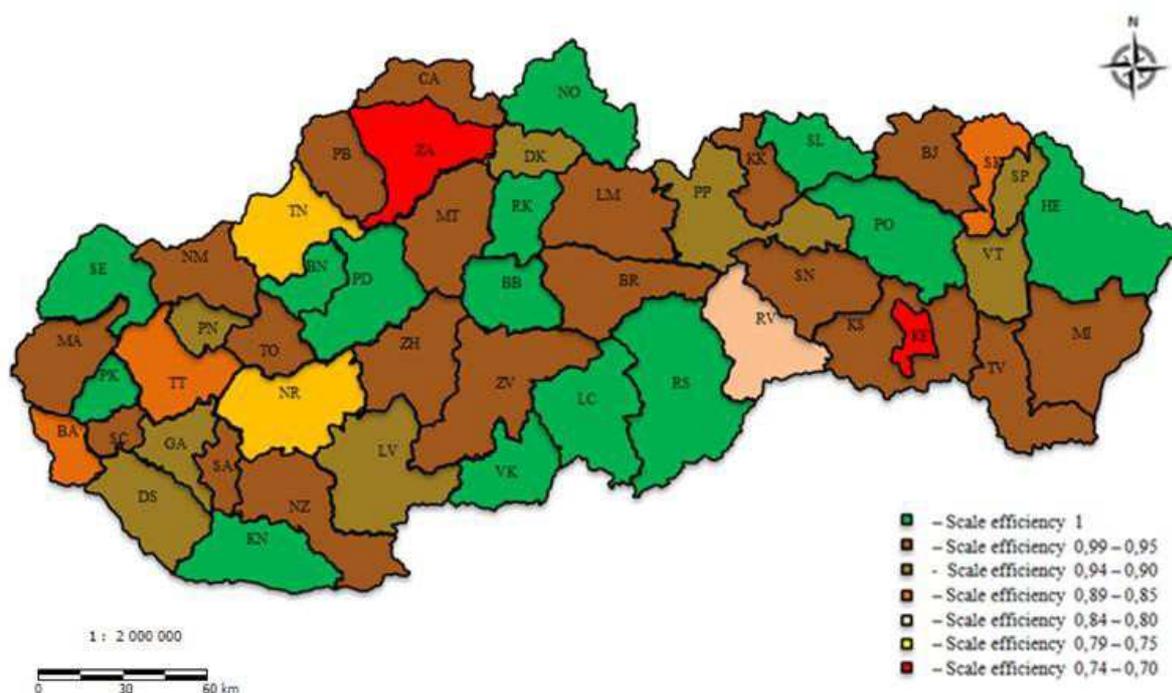
**Tab. 3: Technical efficiency measures 2009 - 2012**

2009			2010			2011			2012		
TE-CRS-I	TE-VRS-I	SE-I	TE-CRS-I	TE-VRS-I	SE-I	TE-CRS-I	TE-VRS-I	SE-I	TE-CRS-I	TE-VRS-I	SE-I
<b>Average</b>											
0.892	0.951	0.938	0.871	0.927	0.940	0.840	0.922	0.911	0.885	0.928	0.954
<b>Percentage of efficient Trade Licensing Offices</b>											
37%	59%	37%	39%	53%	39%	29%	43%	29%	29%	43%	29%

**Source: own processing, 2014**

In the period of first three years technical efficiency under constant return to scale (TE-CRS-I) is decreasing what indicates that the lag of inefficient offices behind the efficient ones is growing. That process stopped in year 2012 where the average efficiency score is comparable to year 2010. Similar development we can identify also in terms of technical efficiency under variable return to scale (TE-VRS-I). As the TE-VRS is considered as an indicator of managerial (in)efficiency, we can interpret the development as the deterioration of managerial skills to keep offices efficient. It is probably caused by the fact that some offices are not designed in accordance to inputs/outputs scale, what is expressed by average values of scale efficiency. But its development does not fully correspond to the development of the previous two indicators. Share of efficient TLOs in Table 3 shows decreasing number efficient offices according to all efficiency indicators after year 2010.

In Figure 2 we show spatial picture of scale efficiency within all TLOs in Slovakia. Green regions are those where offices' set up is closest to the 'most productive size. Since they are distributed randomly, there is no reason to assume that there is some significant regional factor helping to improve TLO's performance.



**Fig. 2 Scale Efficiency of Trade Licensing Offices - (2012)**  
**Source: own processing, 2014**

## Measuring Dynamic Change of Performance

The Table 4 we present indicators of the dynamic development in performance of Trade Licensing Offices for the period 2010-2012. They are represented by the Malmquist index of total productivity change, which is decomposed to technical efficiency change and technical change. Technical efficiency change is further decomposed to pure efficiency change and scale efficiency change.

**Tab.4: Average dynamic change indicators**

Year	Total productivity change	Technical efficiency change	Technical change	Pure efficiency change	Scale efficiency change
<b>2010/2009</b>	1.007	0.972	1.036	0.972	1.001
<b>2011/2010</b>	1.025	0.954	1.074	0.993	0.961
<b>2012/2011</b>	1.038	1.067	0.973	1.010	1.057
<b>Geom. mean</b>	1.023	0.997	1.027	0.991	1.005
<b>2012/2010</b>	1.071	0.989	1.082	0.975	1.017

**Source: own processing, 2014**

Time analysis of TLOs' performance shows that their total productivity was growing within whole examined period. Average year-to-year growth was 2.3%. Cumulative growth for the period was 7.1%. The efficient Trade Licensing Offices' productivity, indicated by technical change index, was growing yearly by 2.7%. Cumulative growth is 8.2%. Two out of three technical efficiency year-to-year change components are less than one and indicate that the gap between efficient TLOs and inefficient ones was in average increasing. Within the period 2010-2012 it increased by 1.06%.

Average pure efficiency change indices for 2010/2009 and 2011/2010 are less than one and indicate that managerial component of efficiency was deteriorating. Some improvement is seen in year 2012/2011. But cumulative deterioration in managerial efficiency for the whole period is 2.52%.

Positive changes are seen in scale efficiency. Within the whole period it increased by 1.7% and it may indicate that TLOs' scale is slightly approaching to the most productive size.

### Model of Super-Efficiency

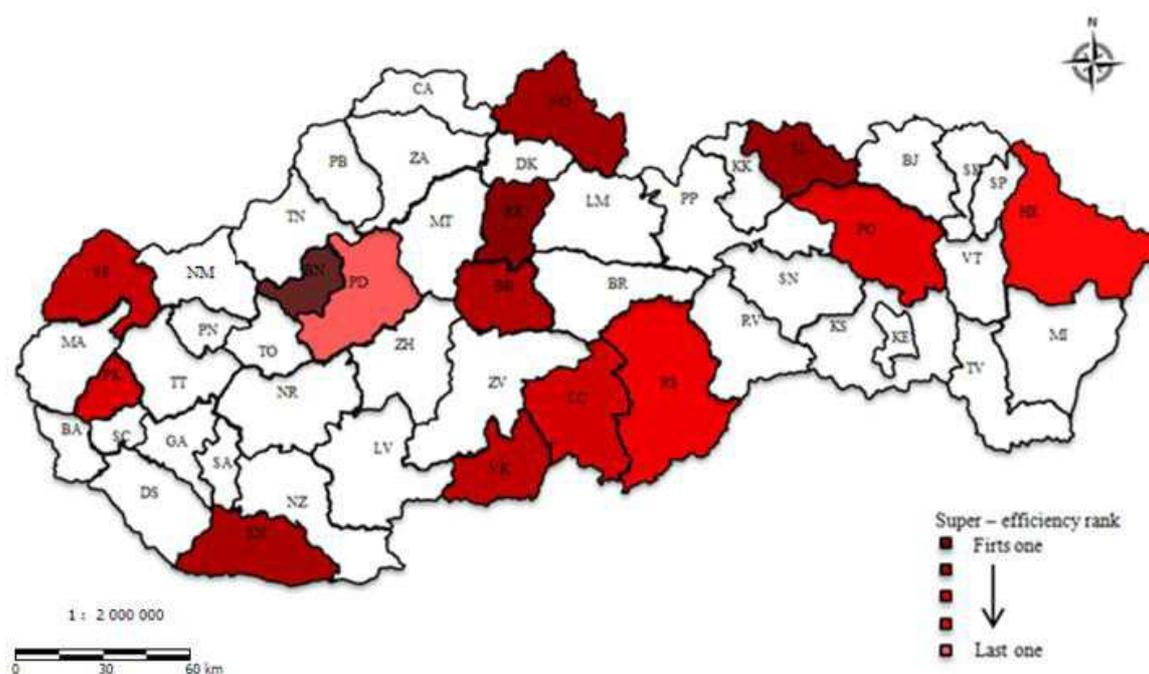
In the following section we present super-efficiency measures estimated by **Andersen and Petersen (1993)** DEA model which enables one to distinguish between the efficient TLOs and put them in an unambiguous order.

Table 6 presents all efficient Trade Licensing Offices in each year of the examined period. Two letter codes in the table represent Trade Licensing Offices in respective regions (see Fig.3). Spatial distribution and rank of efficient offices is shown in Figure 3.

**Tab.6:Trade Licensing Offices rank according to super-efficiency measures, 2009 - 2012**

SUPER-EFFICIENCY	2009	2010	2011	2012
1	PN	PD	GA	BN
2	RK	GA	ZH	RK
3	BA	RK	BN	SL
4	VK	PK	MT	NO
5	BR	SA	PN	KN
6	PK	SL	LC	BB
7	GA	MA	KN	VK
8	HE	HE	RK	SE
9	PD	LM	NZ	LC
10	PB	TT	PD	PK
11	TV	TO	PO	PO
12	DS	BR	BJ	RS
13	KK	VK	TO	HE
14	MT	BJ	DS	PD
15	KN	NO		
16	DK	KN		
17	NO	SE		
18	SL	BA		
19		PO		

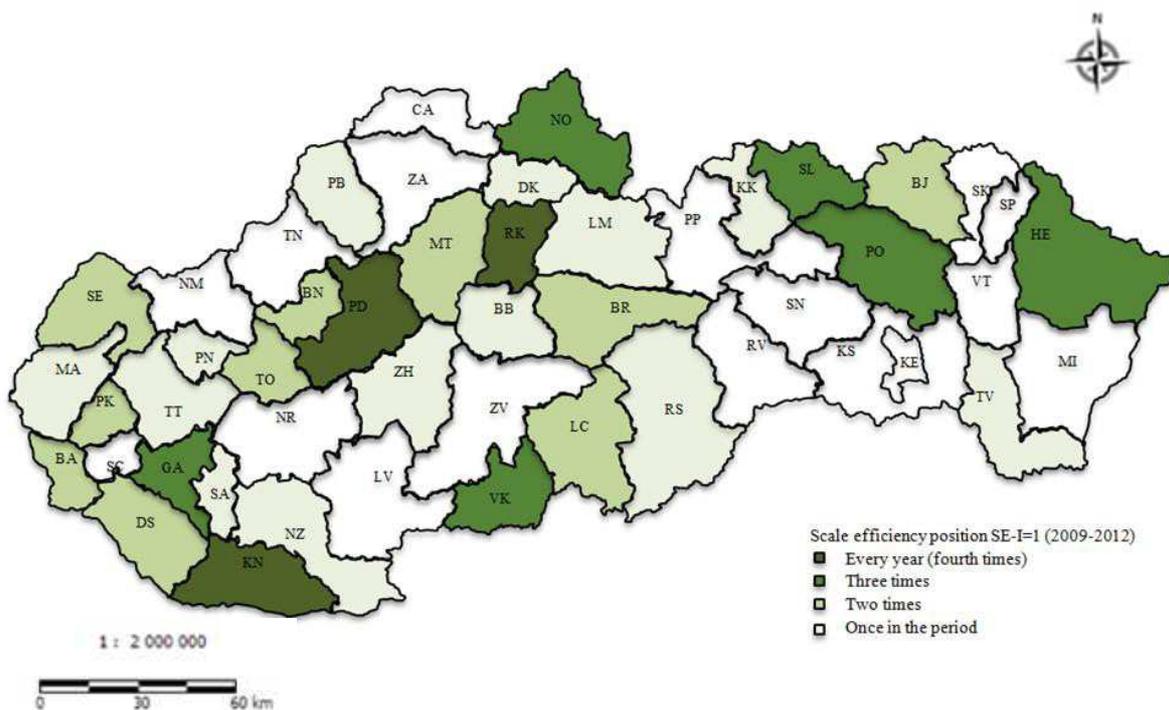
Source: own processing, 2014



**Fig. 3: Trade Licensing Offices - Super-Efficiency Rank (2012)**

Source: own processing, 2014

In Figure 4 we show frequency of occurrence of efficient Trade Licensing Offices in the group of efficient offices within the examined period. In the map efficient units are coloured in dependence on the occurrence frequency. These offices may subsequently be benchmarks for the inefficient Trade Licensing Offices during an implementation of best practices across all administrative units.



**Fig.. 4: Trade Licensing Offices – Efficient Units (2009 – 2012)**  
**Source: own processing, 2014**

Scale efficiency, interpreted above, is an important indicator of the rational scale of used inputs/outputs. In the following section we present results of a detailed analysis of the dependence of scale efficiency scores ( $y$ ) on the size of the TLOs expressed in the number of employees ( $x$ ). Regression model constructed for results of the year 2012 suggests that the size of TLOs ( $P$ -value = 0.000221) explains 25% of variability of SE scores. Negative parameter of the independent variable in the regression function:

$$SE = 0,997 - 0,005x \quad (14)$$

indicates that decreasing the number of employees leads to improvement of scale efficiency, what may be explained that NLOs are in average in the range of decreasing returns to scale. The regression model constructed for the relationship of scale efficiency ( $y$ ) of the Trade Licensing Offices and the number of entrepreneurs/tradesmen ( $x$ ) registered in the relevant Trade Licensing Offices (2012) indicates that 13% of scale efficiency variability can be explained by the variability of the number of entrepreneurs/tradesmen ( $P$ -value=0,00977). Negative parameter of the independent variable in the regression function:

$$SE = 0,974 - 1,582x \quad (15)$$

can be interpreted as in the previous case.

Additional testing was run to learn, weather there is a difference between efficiency scores of Trade Licensing Offices in the seat of regions (8) and the other Trade Licensing Offices (41). Statistically significant difference was found in scores of scale efficiency, where TLOs in the seat of regions exhibit lower efficiency.

## Conclusion

Public administration represents a complex structure of public institutions and administrative relations. Efficiency can be included among the fundamental demands on the public administration system, while it can be evaluated not only at the level of the public administration as a whole but also at the level of specific sub-systems of the public administration. This paper focuses on the assessment of the efficiency of state administration

authorities in the field of the trade licensing in the Slovak Republic. State administration in the field of trade licensing significantly contributes to the formation of the business environment, the level of operativeness of entrepreneurs/tradesmen and the dynamics of the business activities. In the study we employed a non-parametric Data Envelopment Analysis approach to measure relative efficiency of the offices and distance function approach to measure Malmquist productivity index which is decomposed into technical efficiency change, scale efficiency change, and technical change. The results of the analysis lead to the following conclusions: In 2012 average technical efficiency of Trade Licensing Offices with respect to returns to scale scale factor was: TE-CRS-I = 0.911 and 29% of the Trade Licensing Offices were efficient, TE-VRS-I = 0.928 and 43% of the offices were efficient, SE-I = 0.954 with the total number of 29% of the efficient Trade Licensing Offices. The total productivity of the Trade Licensing Offices grew in average by 2.3% yearly during the examined period. Within the examined period it increased by 7.14%. The growth was driven mainly by positive technical change (8.26% growth), what indicates improvement of the best practice offices performance (technological change). The average year-to-year productivity growth of the efficient Trade Licensing Offices was 2.7%. However, the technical efficiency of the inefficient Trade Licensing Offices decreased, an increase was recorded only between years 2011/2012 by 6.7%. Total decrease in technical efficiency is 1.06% and fall in efficient offices share is 21.6%, what indicates that the lag of inefficient offices behind efficient ones is increasing. The average measure of scale efficiency increased within the time period 2009-2012 by 1.68%, what may be a result of a better set up of the size of the offices. Regression analysis indicates that there is statistically significant relationship between the office size measured by number of employees, number of entrepreneurs registered at office and the scale efficiency. First factor explains 25%, second factor explains 13% of scale efficiency variability. Negative parameter of the independent variable in the regression functions may indicate that NLOs are in average in the range of decreasing returns to scale. The assessment of super-efficiency measures enabled to distinguish between the efficient TLOs and put them in an unambiguous order. This result can serve as a benchmark in the process of performance improvement and innovation of a management style in the field of Trade Licensing in Slovakia.

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# The Product Policy Perception by the Specific Segment “Singles” in the Czech Republic

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## Abstract

The article deals with consumer behavior of specific target group “Singles” in the Czech Republic with emphasis on product policy and brand importance. The aim of the article is to assess the significance and market potential of this segment, as well as create a description of this segment by proposing adequate marketing approaches. Paper determinates the theoretical concept of segmentation in the introductory section. Then in the context of orientation analysis the available foreign and domestic secondary information regarding the issues of “singles” have been analysed. The major part of paper is devoted to primary marketing research. For purpose of collecting data, the method of questioning (combination of off-line and on-line approach) was chosen with the use of social networks. The questionnaire was given to 390 respondents living in the Czech Republic. The data were analysed by Statistical Package for the Social Sciences software. The sub-segments of the target group have been formed, and characterized on the basis of cluster analysis (data processed in analytical program SPSS). This paper describes only a partial output of the primary marketing research with focus on the brand and product policy importance for the defined segment. Generally, it can be said that this segment buys first of all food, then clothing and fashion accessories, dry goods, books and magazines. In the financial services sector, the typical demand is for financial products such as current account, pension insurance, building savings and life insurance. There are also remarkable findings in the area of tourism. This segment goes on holidays 2-3 times a year, prefers foreign destinations and the willingness to pay for the holidays is not too significant (approximately 500 euros). The brand is essential especially in connection with product categories such as electronics, cosmetics and food products. Finally, paper tries to determine suitable marketing recommendations in the area of product policy, which could be put into practice.

## Keywords:

brand, cluster analysis, marketing mix, marketing potential, marketing research, primary and secondary information, product policy, segmentation, singles

## Introduction

There are some fundamental changes in the population lifestyle thanks to globalization and societal events. Today it is not important to start a family, young people prefer studying and then career building. There is also an increasing trend of independent living and increased divorce rate in Europe. These facts could also be the impulse of the new marketing tendency formation in the Czech Republic - marketing of “Singles”. The lifestyle of singles in developed foreign countries has been evident for many years. This issue has been analysed very sporadically from the scientific and practical point of view in the Czech Republic. The target group of singles can be considered as a growing and significant marketing potential in the future. However, the comprehensive typology of Czech singles that reflects marketing

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approaches has not been published yet. The available studies related to singles' description reflect especially the sociological and psychological aspects. At the same time, this segment cannot be regarded as a uniform group of consumers, it is also necessary to identify, map and describe the various sub-groups (sub-segments) properly.

Typology of "Singles" has not been well defined yet and foreign research outputs differ in certain aspects. Some researchers define "singles" as persons without partners, others include partners, or sometimes singles are also understood as persons with partners and children. Only a few authors are interested in this scientific issue in the Czech professional marketing literature. There are only a limited number of available research studies that haven't been based on advanced sophisticated statistical methods and it must be also stated that the size of the respondents' sample is insufficient in the previous marketing surveys. The article deals with consumer behavior of specific target group "Singles" in the Czech Republic with emphasis on product policy and brand importance. The aim of the article is to assess the significance and market potential of this segment, as well as create a complete description of this segment by proposing adequate marketing approaches with emphasis on product strategy.

### **The importance of segmentation approach in marketing**

An undifferentiated/mass marketing or total market approach assumes that all customers have similar needs and wants and can be served by a single marketing mix. Nowadays companies cannot connect with all customers in large, broad, or diverse markets. But they can divide such markets into groups of consumers or segments with distinct needs and wants. A company then needs to identify which market segments it can serve effectively. (Kotler and Keller, 2012, p. 235) Target market (segment) is a group of people for which a business creates and maintains a marketing mix specifically designed to satisfy the needs of group members. (Pride and Ferrell, 2010, p. 161)

The central elements of an efficient marketing strategy include the division of consumer markets into meaningful and distinct customer groups: segmentation – selection of particular customer groups to serve: targeting and the placement of the product or service offerings in the minds of consumer targets: positioning. This process is called STP and segmentation is the first and crucial phase. (Levens, 2012, p. 130) There are a number of reasons why organizations undertake segmentation for instance meeting consumer needs more precisely, increasing profits, segment leadership, retaining customers and focusing marketing communications. (Drummond and Ensor, 2005)

### **The segmentation process and its assumptions**

Very few products or services can satisfy all customers in a market. Not all customers want or are prepared to pay for the same things. Therefore to implement the marketing concept and successfully satisfy customer needs, different product and service offerings must be made to the diverse customer groups that typically comprise a market. The technique that is used by marketers to get to grips with the diverse nature of markets is called market segmentation. (Jobber, 2010, p. 260) Market segmentation is the process of splitting customers, or potential customers, within a market into different groups, or segments, within which customers share a similar level of interest in the same, or comparable, set of needs satisfied by a distinct marketing proposition. (McDonald, 2012, p. 14) The failure of numerous companies around the world to grasp this fundamental principle of market segmentation is one of the main reasons why, according to Christensen et al. (2005), less than 10 % of new products succeed, meaning over 90 % of new products fail.

The segmentation process involves establishing criteria by which groups of consumers with similar needs can be identified. These criteria have to identify consumer groups that have some typical characteristics. The consumers in segment must be homogenous and heterogeneous within segment. The segment has to be large enough, accessible and measurable. Effective programs can be formulated for attracting and serving the segments.

It means that segment should be actionable. (Drummond and Ensor 2005; Kotler and Keller 2012, p. 253)

Segmentation is a creative process and can be conducted using a range of different variables. It is necessary to take into account the type of the market when the segmentation variables are selected. In the case of consumer markets segmentation variables can be divided into three main categories: profile, behavioural, psychographic variables (Drummond and Ensor 2005) However, there is not one way or one aspect of segmentation. According to Kotler et al. (2007) the main segmentation variables for individual customers and households include geographic, demographic, psychographic, and behavioral variables. Another approach based on Kotler's et al. concept (2007) creates a different level of segmentation variables in the form of four categories - general and objective, psychographic and general, specific and objective and the last specific and psychographic. Kumar (2008) generalizes Kotler's approach into two basic segmentation variables groups - identification variables (Who are they?) and response variables (What do they want?) Bártová et al. (2002) describes the segmentation variables as variables of market features (causal and variables for use), descriptive variables (traditional and psychographic) and variables of responses to marketing stimuli. In the book by Schiffman and Kanuk (2004) is said that sellers usually segment markets by combination of several segmentation variables. Hybrid segmentation allows companies more abundant and more precisely defined consumer segments. This includes in particular psychographic-demographic variables and geodemography.

Developments in IT are increasing the opportunities for businesses to capture and manage data about customers in business-to-business marketing and consumers in consumer marketing. This use of technology has led to more complex segmentation studies, with resulting segmentation schemes using more variables. (Dibb and Simkin, 2004) Řezánková (2007) mentioned that in terms of primary data interpretation cluster analysis is very suitable for the segmentation use. Basic methods of cluster analysis allow either groups (clusters) identification of similar categories of one variable based on the categories of the second variable, or discovering the links between the two categories of variables (two-dimensional clustering). In both cases, it is usually hierarchical clustering. The software program SPSS has three different procedures that can be used to cluster data: hierarchical cluster analysis, k-means cluster, and two-step cluster.

### **Singles as the specific market segment**

Singles live a unique lifestyle. Often well educated and earning good salaries they only have themselves as financial burdens. They also enjoy more free time (which they fill with a variety of selfbased activities) and often have only themselves to satisfy. Singles tend to lead a very active lifestyle.

According to Vysekalová et al. (2011, p. 262) singles are said to be people who have not married or their marriage was canceled, single people around 30 years old, but often all individuals who do not live in pairs, also widowed seniors or lonely middle-aged people. In a qualitative study of single people conducted in 2003 one particular finding stood out: a significant number of the interviewees (economically independent and without a partner) revealed their involvement in various other forms of regular or even long-term relationships. The existence of relationships that are not longterm or reproduction-oriented is not a result of any deliberate strategy but is rather a consequence of the complex changes in mentality and behaviour that occurred in the 1990s. These shifts, for example, relating to professional commitment and career satisfaction, tend to be understood as the explicit result of labour-market pressures on individual actors, but research has shown that, even at the level of individual actors, alternative approaches to partner relationships and reproduction are much more the result of people adopting and internalising post-1989 cultural templates. (Tomášek, 2006, p. 81)

The segment singles is not clearly defined in the Czech Republic or abroad. According to international research outputs, the content of the singles category changes over time. The

most commonly used criteria for the purpose of typology were developed by Staples and Stein. The Staples' criterion is the degree of the relationship openness: Free floating unattached, Open-coupled relationship, Close-couple relationship, Singles in one household, Accomodationalist (Vysekalová, 2011, p. 263). The typology according to Stein takes into account voluntary and permanence of the state singles: Voluntary temporary singles, Stable Voluntary, Involuntary temporary, Involuntary stable singles (Stein, 1981). There are more and more people living without a steady partner in the Czech Republic. It is estimated that people at age of 45 years and less without steady partner represent one third of Czech population. In terms of the Czech Republic, the typology, which was based on sociological research of Masaryk University in Brno can be used. This typology identifies three groups of singles: a) still unmarried (including their single mothers and fathers with children), b) divorced, the separated, widowed, c) exclusion from the marriage (different sexual orientation, priests, religious and medical reasons and so on). (Vysekalová et al., 2011, p. 263)

Young single adults comprise most of the single market, although there are singles over the age forty-five. Most marketers direct their appeals to a singles market who are typically in the beginning stages of their working lives after completing some form of job training, college or career training. Many members of the singles market have left their parents' homes are likely to spend their income on rent, home furnishings, automobiles, clothing, accessories, and travel and entertainment. Singles are interested in joining health clubs and participating in sports activities and are targets for products related to health club and sport activities. This target market has few financial burdens and are particularly influenced by fashion opinion leaders. Many purchases of goods and services are related to the mating time. The increasing size, affluence and complexity of the singles market creates new opportunities and challenges for markets. (Michman, Mazze and Greco, 2003, p. 113)

There is considerable evidence that singles have different preferences and shopping behaviors. Unlike the average consumer population, singles are typically astute in what they are looking for, more food savvy, less price-sensitive, and more conscious of their personal tastes. They can afford to indulge more on themselves and tend to do so with specialty, high - priced goods. Singles may be less likely to stock-up on items when they shop and are often less likely to purchase large-sized items or high-impulse items (Lewandowski 2004). According to Donthu and Gilliland (2002) singles tend to identify more closely with brand names. The lifestyle depicted by the brand may be a reflection of their own. By choosing a certain set of brands they may be assuring themselves of their lifestyle. When it comes to choosing a store brand or a national brand, singles do not consider the store brand as important and are more likely to purchase their favorite national brand regardless of the price.

## **Marketing research**

The marketing research was realized for the purpose of practical evaluation of examined issue. The secondary and primary data were analysed. The major part of paper is devoted to primary marketing research.

## **Defining the research problem and hypothesis**

The main research problem represented the inappropriate respecting of the fundamental demographic trends development by providers of products and services in the Czech Republic and the related neglect of significant market potential of the segment singles. The objective of this research was to describe the consumer behavior of the specific segment singles in the area of their products and services consumption and requirements.

The following four working hypotheses were defined for the purpose of marketing research.

- **H1:** More than 30 % of respondents invest their savings in the travelling.
- **H2:** Brand of clothing and fashion accessories is important for most respondents.
- **H3:** Less than 20 % of respondents consider the product offer for singles as adequate.
- **H4:** The segment singles cannot be seen as a uniform group of customers – there is an essential presumption of heterogeneity according to the terms of brand importance.

### **Marketing research methodology**

In terms of the orientation analysis secondary data were used that are supplementary to the data obtained within primary research. The basic secondary data were obtained mainly from Czech Statistical Office, domestic and foreign professional literature and available papers and studies. Due to the type of requested information and examined topic, the personal interview as the primary research method was chosen. The analysis was based on the number of 390 respondents, most of them from the bigger cities in the Czech Republic. As a technique of selecting a sample of respondents was used semi-representative technique of choice (non-exhaustive survey), which consists of selecting respondents based on the assumption (judgment) that these respondents meet certain requirements. The choice of respondents was also restricted to people who have their own income, household and they manage their own resources from the economic point of view. There was no limitation regarding the age, marital status, the level of incomes and education, gender, place of living. The survey was distributed in the summer of 2014.

We questioned consumers about their past behaviour within the topic of products consumption and brand importance. For the purpose of the research, combination of online (96.2 %) and offline (3.8 %) data collection was chosen. The internet penetration among people up to 45 years in the Czech Republic is 92% (Netmonitor, 2014). The number is even bigger in big cities (where singles live the most), therefore we used dominantly online primary data source. Questionnaire technique as one of the quantitative method was used. Answers were collected within online panel by self-administered internet-mediated questionnaires. Unfortunately answers have consisted of respondents which were not the typical singles by our definition. We used controlling questions about household they live in and about their income. Then respondents living with parents and students were eliminated from the sample. Therefore we continued to collect data with pay-per-click advertising on the social network Facebook to bring the sample close to the singles segment as we defined it before. Offline data were collected by snowball sampling which is non-probability procedure in which subsequent respondents are obtained from information by initial respondents (Saunders, Lewis and Thornhill 2009, p. 240). Since it is hard to find the single respondents in population, this is considerably suitable technique.

MS EXCEL was used to evaluate the overall research. Working hypotheses were evaluated with descriptive statistics (absolute and relative frequency of responses). Then Cluster analysis was used to classify objects into relatively similar groups based on known variables (Malhotra and Birks, 2007). These clusters then showed high homogeneity within each group and the heterogeneity between all groups. (Hancock and Mueller, 2010). In this case, the main objective was to highlight the internal structure within the segment of singles and divide it into subgroups based on the preferences of the individual brand preferences of particular product categories.

## **Marketing research sample characteristics**

The structure of the sample is 41.5 % male and 58.5 % female, dominated by unmarried people. The largest group of respondents, as expected, represents people at the age of 26 – 25 years. In the area of education, the largest group represents the respondents with secondary education diploma. Their share amounted to 46.7 % of total sample of respondents. The respondents with higher education were the second largest group (42.8 %). The largest income group is in the category up to 15 000 Czech crowns (41.3 %), 33.1 % respondents belong to the income category 15 001 – 25 000 Czech crowns. Only 4.9 % respondents have incomes more than 45 000 Czech crowns.

Respondents prefer individual living in flats (50.5 %). 25.6 respondents live in flats but they share living and related costs with someone else. Only 9.7 % respondents stated that they prioritize individual living in a family house. The aim of the survey was to reach respondents, mainly in large cities in the Czech Republic. 31 % of respondents were interviewed in Prague, 9.5 % of respondents in Brno, 6.2 % of respondents in Ostrava and 53.3 % of respondents in other locations in the Czech Republic. It can be assumed a certain correlation between the size of the city and location of the target segment singles. The bigger the city, it is easier to find a larger number of singles.

## **Marketing approach to target group singles in the area of product policy according to marketing research findings**

Segment singles buys mostly product categories such as food (77.4 %), travelling (32.8 %), clothing and fashion accessories (32.1 %), dry goods (24.4 %), electronics (19.2 %) and books and magazines (19 %). *The hypothesis No. 1 has been confirmed because 32.1 % of respondents invest money in the travelling.*

Then we wanted to learn more about the brand importance in their purchasing decision process. It is clear that the brand is currently very important for young people because it creates their social status. As expected, the respondents make purchasing decisions according to the brand especially in electronics (mobile phones, tablets, etc.). This product category was chosen by 53.8 % of the respondents. Furthermore, the brand is also essential for them in the area of food products (39.5 %), cosmetic products (36.4 %) and home appliances (31 %). *The hypothesis No. 2 has not been confirmed because the brand is important especially in the area of electronics.*

The research was also focused on the financial services industry and provided services in the field of tourism. It can be said that 76.2 % of respondents go on vacation. They prefer foreign destinations. The higher demand is more typical for learning trips (35.4 %) than stay tours (26.6 %). The most common frequency of trips is 2 - 3 times a year (36.9 %). Respondents' willingness to invest money in their holidays is relatively low, most often chosen option was up to 10 000 CZK (56.2 %), then 10 000 - 20 000 CZK (30 %). In financial services, we aimed to learn only the information about the use of financial products. As expected, the current account is the most frequently used financial product (91.8 %), followed by pension insurance (52.1 %), building savings (43.8 %), life insurance (42.3 %) and non-life insurance (35.6 %). Short-term credit and sophisticated investment products are not demanded by the target segment. Overall, the segment singles rather tends to savings than to credit products. They demand for financial products to minimize losses (life and non-life insurance and accident insurance). This observed fact is mainly due to higher public awareness in the area of financial literacy in the Czech Republic, as well as changing customer access to debt. The caution, rationality and responsibility dominate increasingly in their behavior. The creation of financial reserves and minimizing financial liabilities are used to ensure a certain standard of living in future.

Generally, there is a significant market niche because the offer is untargeted or nonexistent in the Czech market. Only 16.7 % of respondents think that products offer for singles is sufficient and well targeted. On the other hand, 83.3 % of respondents represent the latent demand, because they would expect better adaptation of the products according to

their requirements. *The hypothesis No. 3 has been confirmed because less than 20 % of respondents are satisfied with product offer regarding their consumer needs.*

### Cluster analysis

Silhouette coefficient, which is a measure of both cohesion and separation, was at the level of 0.6. Based on the work of Kaufman and Rousseeuw (2005) it can be considered as reasonable or strong evidence of cluster structure. Ratio of sizes of largest cluster (26.9 %) to smallest cluster (12.1 %) was 2.23. Five clusters were identified by two-step cluster analysis based on four inputs (categorical variables) which were all drawn from answers of respondents about how important is brand in given product categories. The input variables cosmetics and home appliances were not used because of its redundant respectively insufficient influence on clusters cohesion and separation. Categories included were services, clothing, food and electronics as the table No. 1 shows.

**Tab. 1 Cluster model features' importance**

Cluster		1	2	3	4	5	
Size	n=390	61	47	87	105	90	
Size	%	15,6	12,1	22,3	26,9	23,1	
Input	Predictor importance	Answer	%	Answer	%	Answer	%
Services	1	No	100	Yes	100	No	100
Clothing	0,92	No	100	No	87	Yes	100
Food	0,67	No	100	No	53	Yes	100
Electronics	0,37	No	100	Yes	51	Yes	100

The *first cluster* consists of singles who do not consider brand as an important factor in any of the product categories. The *second cluster* consists of respondents, for which is brand important in the field of services in all cases. Furthermore, in most cases it is not important in clothing and in approximately half of the cases in food and electronics categories. The *third cluster* consists of singles who do not consider brand as an important in services but on the other hand important in clothing. In food category in most cases the brand is not important while in electronics the situation is more or less the same as in cluster two. The *fourth cluster* consists of respondents who perceive brand as important factor in food and not important in services and clothing. In the category of electronic its structure copies attributes of cluster two and three. Lastly, in the *fifth cluster* there are singles who consider brand as an important factor in category of electronics but not so in services, clothing and food. Similarly as cluster one, the percentages are at the highest possible level. Therefore these clusters could be considered as extreme ones with highest internal homogeneity and minimum external heterogeneity. *No. 4 has been confirmed because there is an essential presumption of heterogeneity among sub-segments according to the terms of brand importance.*

In the last step all cases were assigned to particular cluster membership and relevant statistical tests were conducted (Chi-Square and Kruskal-Wallis test) to compare relations between this membership and other surveyed variables. As we can see from the table No. 2 only the education has statistically significant relation to the cluster membership ( $p\text{-value } 0,035 < 0,050$ ). Therefore, perceived brand importance in product categories differs among the clusters and also differs by education level of the respondents. From closer examination of the residuals in cross tables, the university graduates were more than expected represented in cluster four and less in clusters one

and two. In contrast high school graduates were more represented in cluster two and less in cluster four. These results underline the complexity of the segment of singles. One would presume that for example income would also play an important role in differences among clusters classification. As well, the perception of importance of brand could be influenced by other hidden variables, for which it is possible to investigate further.

**Tab. 2 Cluster membership in relation to other respondents characteristics**

	Gender	Status	Type of household	Age	Education	Income	City
<b>Pearson Chi-Square</b>	2,203	6,206	1,467	2,502	8,589	4,202	3,295
<b>p-value</b>	0,698	0,184	0,690	0,776	0,035	0,379	0,193

## Conclusions:

The aim of this article was to assess the significance and market potential of this segment, as well as create a description of this segment by proposing adequate marketing approaches with emphasis on product policy and brand importance. The research outputs of the Czech Statistical Office indicate that the number of singles is going to be increased in the future. Therefore, it is highly desirable to analyze in detail and get to know the segment singles and understand their lifestyle and consumer behavior with the aim of creating their typology. The available consumer studies show that companies do not create suitable marketing programmes according to singles requirements. At present, it is possible to buy a limited number of foreign products that can be used by singles but there is a huge market niche especially in the services market in the Czech Republic. Because of the limited research in this area, many producers are forced to guess about the consumer habits of singles and about what products and services they want. Some of these preconceptions might include that for example young singles seldom cook and rely heavily on takeout or delivery, that they just buy a few items at the supermarket and prefer small package, that they shop in little shops and have little store loyalty, that they prefer natural, organic, specialty gourmet and ethnic items, that they are very interested in brands and that they do not watch TV commercials and use social networks a lot and so on.

The analysis of the single for the purpose of this paper was based on the number of 390 respondents included in primary marketing research. This research helped identify any unique purchasing preferences for this growing population segment and examine some common preconceptions. The choice of respondents was also restricted to people who have their own income, household and they manage their own resources from the economic point of view. There was no limitation regarding the age, marital status, the level of incomes and education, gender, place of living. The survey was distributed in the summer of 2014. Generally, it can be said that this segment buys first of all food, then clothing and fashion accessories, dry goods, books and magazines. In the financial services sector, the typical demand is for financial products such as current account, pension insurance, building savings and life insurance. There are also remarkable findings in the area of tourism. This segment goes on holidays 2-3 times a year, prefers foreign destinations and the willingness to pay for the holidays is not too significant (approximately 500 euros). The brand is essential especially in connection with product categories such as electronics, cosmetics and food products. There is a significant market niche because the offer is untargeted or non-existent in the Czech market. More than 80 % of respondents think that products offer for singles is insufficient and poorly targeted. The application of cluster analysis showed internal structure within data and revealed five clusters. Analysis subdivided segment of the singles based on the four input variables from answers about how important is brand in

given product categories. Subsequently, education has been pointed out as an independent variable with which is cluster membership related.

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# Regional diversification of innovation activity of food industry in Poland

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## Abstract

The main objective of the paper was an attempt at diagnosing the state of regional diversification of food industry innovation performance in Poland. The research material used in the analysis was unpublished secondary information from the Community Innovation Survey (CIS) from the years 2006-2008 and 2008-2010 regarding food product manufacturers. The researched phenomenon was described using a non-model method of aggregation of variables which allows to present a complex phenomenon using so called synthetic variable. The analysis of food industry innovation activity level in Poland conducted from the regional perspective allows for a statement that the level is diversified and variable in time. In some voivodships an improvement in the state of innovation activities of food producers can be seen. But in other voivodships innovation activity of food industry weakened considerably. It may be noted that in both investigated periods the same voivodeship was the leader according to state of innovativeness of food producers.

## Key words:

innovation activity, regional diversification, food industry, Poland

## Introduction

The concept of region comes from Latin and means a land. In scientific cognition the concept of region appears in many branches and disciplines (among others in economic and legal sciences, humanities, social and earth sciences) but has no single general definition, which may be used by all sciences (Styk, 2000). A popular trend of considerations on the crux of a region is a realistic approach which is a compromise between a positivist approach, treating a region as a category which is only a product of researcher's imagination, and a dialectical approach which treats a region as a part of a higher system, itself being composed of smaller subsystems (Krawczyk, 2010, p. 223-224). A region has some determined, logical and cohesive social and spatial structure. Genesis of economic spatial analysis dates back to the 19<sup>th</sup> century, while the comparative studies on spatial structure are an important cognitive factor of the surrounding reality (Pawlik, 2013, p. 1-2). Exposing regional aspects of economic activity is one of the directions of economic sciences development. Such mezo-economic perspective has been reflected in increasingly more numerous multifaceted comparisons and analyses. Its growing importance results from progressive economic and political regionalisation (Grzybowska, 2013, p.53), whereas regions become more and more active subjects in shaping the EU domestic policy including innovation policy (Nagyova, Picha, Skorepa, Vilhanova, 2013). At the same time, a region is a source and place of socio-economic activities realisation by various entities, moreover it is an important receiver of this activity. A demand for commodities and services increasing on a regional and supraregional scale in conditions of market economy contributes to the growth of efficiency and innovation performance of operating economic entities. It caused increased rates of their development,

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which in result provides a basis for initiating processes of socio-economic regional development (Krawczyk-Sokołowska, 2013, p. 5). In this way geographical proximity of regional stakeholders becomes a key factor and translates into economic, organisational, social and cultural proximity of economic subjects and their partners (Adamik, Matejun, 2010, p. 13).

## Data and methods

The main objective of the paper was an attempt at diagnosing the state of regional diversification of food industry innovation performance in Poland. Studies on food industry innovation performance were conducted by regions. In Poland regions are usually identified with voivodships created in result of administrative reform introduced on 1 January 1999 (NUTS2 classification). The research material used in the analysis was unpublished secondary information from the Community Innovation Survey (CIS) from the years 2006-2008 and 2008-2010. This material was obtained from Central Statistical Office (CSO). The analysis of regional innovation activity was conducted for aggregated Section 10 of Polish Classification of Activities (PKD) – Manufacture of food products (excluding Section 10.89 “Manufacture of other food products n.e.c” and group 10.9 “Manufacture of prepared animal feeds”).

The researched phenomenon was described using a non-model method of aggregation of variables which allows to present a complex phenomenon using so called synthetic variable. Diagnostic variables which provided a basis for conducted analysis form three groups:

1. technological innovations (in the percent of total innovative enterprises):  $X_1$  - enterprises which introduced new products,  $X_2$  - enterprises which introduced new processes concerning methods of product manufacturing,  $X_3$  - enterprises which introduced products new to the market,  $X_4$  - enterprises which developed new products mainly independently or in a group,  $X_5$  - enterprises which developed new processes mainly independently or in a group;
2. non-technological innovations (in the percent of total innovative enterprises):  $X_6$  - enterprises which introduced organizational innovations as knowledge management system,  $X_7$  - enterprises which introduced organizational innovations as a change in work organization,  $X_8$  - enterprises which introduced organizational innovations as relationships with other firms,  $X_9$  - enterprises which introduced marketing innovations as changes in the appearance, form or shape of products,  $X_{10}$  - enterprises which introduced marketing innovations as new methods of sales or distribution channels (in the percent of total innovative enterprises);
3. expenditures on innovation activities conducted by food companies (in the percent of total innovative enterprises unless stated otherwise):  $X_{11}$  - expenditure on fixed assets (in the percent of innovation activity expenditure),  $X_{12}$  - own funds (in the percent of innovation activity expenditure),  $X_{13}$  - enterprises which made outlays on R&D conducted in the unit,  $X_{14}$  - enterprises which made outlays on R&D works acquired from external sources,  $X_{15}$  - enterprises which made outlays on machinery and technical equipment, means of transport, tools, appliances and facilities,  $X_{16}$  - enterprises which made outlays on software,  $X_{17}$  - enterprises which mad outlays on purchase of ready technologies as documentation or licenses,  $X_{18}$  - enterprises which made expenditure on personnel training,  $X_{19}$ - enterprises which made expenditure on marketing.

The variables form a matrix:

$$[x_{ij}] = \begin{bmatrix} x_{11} & x_{12} & \dots & x_{1,k} \\ x_{21} & x_{22} & \dots & x_{2,k} \\ \dots & \dots & \dots & \dots \\ x_{19,1} & x_{19,2} & \dots & x_{19,k} \end{bmatrix}$$

Where:

$X_{ij}$  – value of the  $j$ -th variable in the  $i$ -the spatial object.

For the diagnostic variables selected for the analysis, value of variation coefficient  $V(X_j)$  should fulfil the following conditions:

$$V(X_j) > 0,1$$

where:

$$V(X_j) = \frac{S(X_j)}{\bar{x}_j} \quad (j=1, 2, \dots, s \quad i \quad \bar{x}_j \neq 0),$$

$$S(X_j) = \sqrt{\frac{1}{n} \sum_{i=1}^n (x_{ij} - \bar{x}_j)^2} \quad (j=1, 2, \dots, s),$$

$$\bar{x}_j = \frac{1}{n} \sum_{i=1}^n x_{ij} \quad (j=1, 2, \dots, s).$$

$S(X_j)$  – standard deviation of  $X_j$  variable,

$\bar{x}_j$  - arithmetic mean of  $X_j$  variable.

Diagnostic variables are usually diversified regarding measures, which makes impossible their direct comparison. Zero unitarization method (Kukuła, 2000, p. 79) was applied to make them comparable:

$$z_{ij} = \begin{cases} \frac{x_{ij} - \min_i x_{ij}}{\max_i x_{ij} - \min_i x_{ij}}, \text{ when } X_j \in S \\ \frac{\max_i x_{ij} - x_{ij}}{\max_i x_{ij} - \min_i x_{ij}}, \text{ when } X_j \in D \end{cases}$$

Where:

$z_{ij}$  – standardized values of features, such that:  $z_{ij} \in [0,1]$ ,

$S$  – a set of stimulants;

$D$  – a set of destimulants

Standardized variables were aggregated and the value of  $Q_i$  synthetic variable was computed by means of additive function of:

$$Q_i = \sum_{j=1}^s \omega_j z_{ij} \quad (i=1, 2, \dots, n)$$

Where:

$$\omega_j = \frac{V(X_j)}{\sum_j V(X_j)}$$

$\omega_j$  – weight the  $j$ -th diagnostic variable.

Application of the method discussed above allowed to make hierarchization of objects according to  $Q_i$  values. Within the ordered set,  $k$  groups may be identified (Kukuła, 1996,

p. 27) by adding subsequently to  $\min_i Q_i$  the values  $\frac{1}{k}(\max_i Q_i - \min_i Q_i)$ . When  $k = 4$ :

Group I:

$$Q_i \in \left( 0,25 \left( \min_i Q_i + 3 \max_i Q_i \right), \max_i Q_i \right],$$

Group II:

$$Q_i \in \left( 0,25 \left( 2 \min_i Q_i + 2 \max_i Q_i \right), 0,25 \left( \min_i Q_i + 3 \max_i Q_i \right) \right],$$

Group III:

$$Q_i \in (0,25(3 \min_i Q_i + \max_i Q_i), 0,25(2 \min_i Q_i + 2 \max_i Q_i) ],$$

Group IV:

$$Q_i \in [\min_i Q_i, 0,25(3 \min_i Q_i + \max_i Q_i)].$$

Rankings and grouping of voivodships were established on the basis of the analysis according to food industry innovation activity indicator.

## Food industry in Poland

Food industry is treated as a leading link of the agri-food sector, i.e. agri-business. According to Polish Classification of Activities (PKD), it is classified to one of industry branches present in Poland (Grzelak, 2011, p. 88). Food industry is the area of activity whose objective is satisfying the population needs. It is characterized by a considerable diversification and regarded as one of the most common kinds of economic activity.

In Poland food sector is among the most important and fastest developing areas of the economy. Its share in the value of sales for the whole industry reaches almost 24% and is on average 15% higher than in so called EU-15 countries. Among these countries the share of food industry higher than in Poland is registered in Denmark (28%) and Greece (27%) (Sektor spożywczy...).

Over the last years, crucial changes may be observed in Polish food companies. These have been not only structural or ownership changes, but also involving many other aspects of the activity, concerning the technologies, equipment, production processes or product range. The reason for modernisation activities was in the first place a necessity to adjust the firms to operating in constantly changing market economy, moreover including Poland in the European Union structures.

Subjective structure of food industry is considerably diversified. It is similar to the structure of this industry in some European Union countries (e.g. In Spain, Germany or France). In Polish food industry no monopoly systems exist, whereas oligopolies occur only in some branches, such as tobacco, sugar, oils or distillery branch. The basis of each sector is formed of a group of leaders composed of large and medium-sized enterprises, which regarding the structure of resources and mode of activity do not differ from similar businesses in other European Union countries (Urban, Szczepaniak, Mroczek, 2010).

Relatively big labour consumption of some kinds of food production, their links with the local market and a large range of products cause that also micro, small and medium-sized enterprises are important components of the subjective structure of food industry.

A comparison of development trends of food industry and its domestic environment in 2004-2010 proved favourable for the industry. During that period food production was developing at a slightly faster rate (4%) than GDP growth, almost twice faster than increase in marketable agricultural production (2.5% per year), 2.4 times faster than growth in consumption of food, beverages and tobacco products (1.7%) and slightly slower than the rate of industrial production in Poland (5.6%) (Wigier, 2012).

## Innovation performance as characteristic of food enterprises

The concept of innovation is associated with changes which should lead to positive both economic and social results. Effects of introducing innovations can be observed through the market where they are offered by their creators and then accepted by customers. Innovations affect both a producer and consumer. For consumer these are most frequently advantages resulting from new product added value. For a producer innovations are an element of his development strategy and a source of income, but they also incur costs, cause apprehension and risk (Adamowicz, 2008, p. 224). The necessity for innovations is determined by the situation on the market. In the integration and globalisation process the market becomes increasingly more competitive and open. On the part of enterprises it causes a greater demand for innovations as a tool of gaining market advantage (Cyrek, Cyrek, 2007, p. 13).

Enterprise innovation performance may be defined as skills and motivation for activities aiming at seeking and commercial application of research results, new inventions, ideas or conceptions (Świtalski, 2004, p. 89). Such procedure is supposed to strengthen the enterprise position among competitors, increase the state of the art level or help the realization of some other ambitions. Innovative may be called the enterprise, which is able to create, absorb and sell new products and one which shows the ability for on-going adjustment to changes occurring in its environment. Innovation performance should be the highest creative power, included in the management system of an enterprise to make it function in market economy (Kowalczyk, 2008, p. 249).

Among many factors influencing enterprises' innovation performance, one may identify internal and external ones. The internal factors comprise the dimension and scale of the enterprise activities, its market position, used marketing strategies, management strategies, the state of financial and human resources, the enterprise management, but also its climate and innovation culture (Adamowicz, 2008, p. 226).

The external factors determining enterprises innovation performance include among others market competition, upward market trends, infrastructure, technical and technological progress, the state policy, education and training system, market and outside market links with partners who are sources of information and technologies (Szopik-Depczyńska, 2009, p. 96).

Innovation activity is observed among economic subjects of all branches, both those classified to high technology branches but also these offering products of medium or low technology, classified to so-called "traditional" economy. Pressure applied by the market to introducing innovations may be perceived also in food manufacturing companies which are classified to traditional branches (Łącka, 2011, p. 290). Despite many barriers, innovation performance of these enterprises is very important in fast developing economy. The necessity to meet the consumer expectations by Polish food manufacturers and opening the economy to external competition requires diminishing previous delays. It creates a widely understood innovation compulsion. The compulsion accelerates modernization of production potential, favours marketing development and in result increases enterprises' competitiveness (Szczepaniak, 2006).

However, delays in the area of Polish food companies' innovation performance as compared with other European Union countries are strongly visible. Among the EU countries Poland placed on the last but one position concerning the percentage of innovative firms of food branch. A lower indicator characterises only food industry in Latvia (no research is conducted in Greece). Considering the kinds of innovations introduced by Polish food product manufacturers, non-technological innovations have a big share. At the same time, the percentage of innovative enterprises introducing both technological and non-technological innovations in Poland is one of the lowest among the European Union countries (Matysik-Pejas, Żmija, 2014, p. 226).

The main obstacles which domestic food companies face in introducing innovation activities is the lack of funds and high costs of introducing innovations. Many firms operating in this branch have far too little possibility to finance innovations, therefore they often choose solutions which require lower funding but encourage customers to purchase a product (marketing innovations).

The highest expenditures which food companies incur on implementing innovations are still connected with purchasing machinery and technical equipment, and outlays on buildings, constructions and land. It is due to the necessity to adjust the enterprises to the European Union quality standards in food production and the necessity to eliminate the technological gap between Polish and West European enterprises.

Food companies rarely cooperate with other entities while developing innovations, but a higher percentage of firms collaborates with the entities from their own environment in the area of process than product innovations. Still, definitely the highest number of innovations is developed by enterprises independently. If food companies decide for cooperation in developing innovations, their main partners are most frequently suppliers, institutional customers and enterprises from the same capital group. The cooperation to a small extent

involves research and development units (JBR) and consulting firms, commercial laboratories or private R&D institutions. A lack of collaboration between enterprises and subjects from their environment or its small area is characteristic for low technology branches (Wziętek-Kubiak, 2010).

The enterprise may succeed in the process of introducing innovations if it creates conditions appropriate for innovation activity and its activeness in this respect. Food producers may succeed when the process of introducing innovations is inspired by the needs of consumers: functional food products, food minus category (products with decreased amount of salt, sugar, fat and other ingredients), food plus category (products enriched with vitamins, minerals, fiber), niche products for a special kind of consumers (diabetes, lactose intolerance, gluten-free products), products connected with slow food (Horska, 2012, p. 400-401). But it is also necessary to remember that changes in food system with comparison to high tech industries happen rather slowly. There are many reasons of this situation, e.g.: traditional consumers, maturity of food industry, difficulties in improving biological products (Matysik-Pejas, Krasnodębski, Szafrąska, 2012, p. 209-210).

## Results

All diagnostic variables on the basis of which the analysis was made were classified to stimulants. They also fulfill the assumed criterion of variables selection for the description of a complex phenomenon  $V(X_j) > 0.1$ . Application of a non-model aggregation method allowed for a hierarchization and grouping of regions (voivodships) of Poland according to obtained values of synthetic measure  $Q_i$  (Food Industry Regional Innovation Activity Indicator).

Conducted analysis revealed that regarding food industry innovation performance, Opolskie voivodship was the leader in both investigated periods. In comparison with the previous period, in the 2008-2010 period, seven voivodships improved their ranking position regarding the Food Industry Regional Innovation Activity Indicator, whereas eight worsened it. The level of food industry innovation activity improved most in the Mazowieckie voivodship, which advanced from the 13<sup>th</sup> to the 4<sup>th</sup> position (by 9 positions) and Dolnośląskie which from the 16<sup>th</sup> position moved up by 8 positions. Increase in food industry innovation activity level was noted also in the Wielkopolskie voivodship, which from the 8<sup>th</sup> position moved to the 2<sup>nd</sup> place. The greatest decline in food industry innovation activity between the studied periods may be observed in the Pomorskie and Warmińsko-mazurskie voivodships. Each fell in the ranking by 10 positions, whereas Warmińsko-mazurskie voivodship placed on the last position in the 2008-2010 period, replacing Dolnośląskie voivodship.

**Tab. 1 Values of Food Industry Regional Innovation Activity Indicator and ranking of voivodships in the periods 2006-2008 and 2008-2010**

Voivodships	2006-2008		2008-2010		Change of ranking position
	value of $Q_i$	position in ranking	value of $Q_i$	position in ranking	
Dolnośląskie	2.097	16	4.423	8	8
Kujawsko-pomorskie	5.118	2	5.193	5	-3
Lubelskie	4.478	9	3.542	14	-5
Lubuskie	4.469	10	3.930	12	-2
Łódzkie	3.882	14	4.113	11	3
Małopolskie	4.811	5	5.765	3	2
Mazowieckie	4.406	13	5.301	4	9
Opolskie	6.020	1	6.001	1	0
Podkarpackie	3.021	15	4.201	10	5
Podlaskie	4.435	12	4.990	6	6

Pomorskie	4.946	3	3.775	13	-10
Śląskie	4.834	4	4.776	7	-3
Świętokrzyskie	4.437	11	3.478	15	-4
Warmińsko-mazurskie	4.615	6	3.468	16	-10
Wielkopolskie	4.507	8	5.867	2	6
Zachodniopomorskie	4.519	7	4.397	9	-2

Source: Own studies on the basis on unpublished COS data

Following the methodological assumptions, voivodships ordered according to obtained value of synthetic measure were divided into four groups comprising:

Group I – voivodships with high value of Food Industry Regional Innovation Activity Indicator, Group II voivodships with medium value of Food Industry Regional Innovation Activity Indicator,

Group III – voivodships with low value of Food Industry Regional Innovation Activity Indicator, Group IV – voivodships with very low value of Food Industry Regional Innovation Activity Indicator.

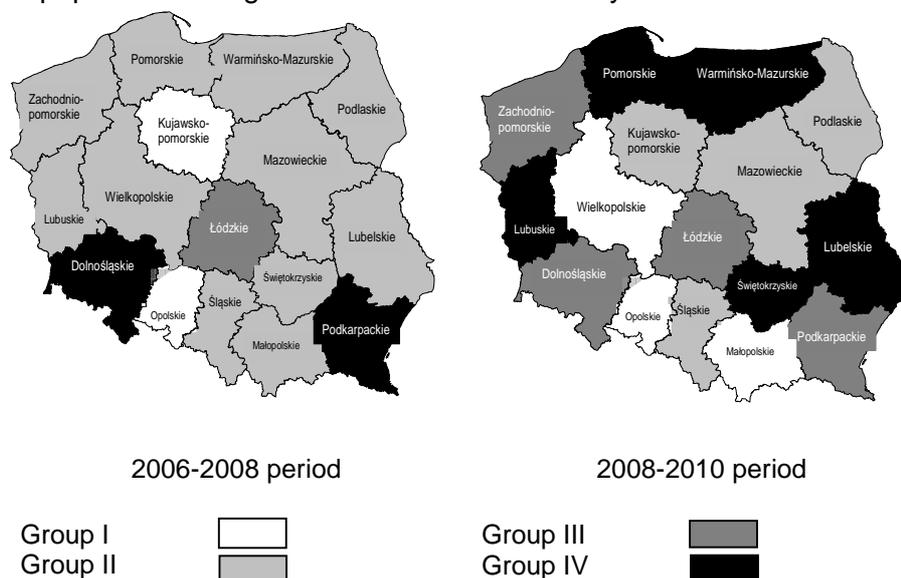
During the 2006-2008 period Opolskie and Kujawsko-pomorskie voivodships were classified to group I characterised by a high value of computed measure. The voivodships forming this group were clearly distinguished against the other voivodships regarding technological innovations introduced by food companies. It concerned in the first place mean percentage of innovative enterprises which introduced new products (almost 96%) and those which developed new products independently or jointly with other enterprises in the capital group to which they belong (over 90%). Also non-technological innovations introduced by food companies affected the ranking position of these voivodships. Among these innovations attention should be paid to the percentage of innovative firms introducing marketing innovations as changes in the appearance, form or shape of products (56%) and firms introducing marketing innovations as new methods of sales or distribution channels (38%). In food companies localised in voivodships in group I, higher than in the other groups was the average share of own funds in the expenditure incurred on innovation activities (over 86%) and also the percentage of innovative enterprises which made outlays on modernisation of machinery (c.a. 77%) and on marketing involved in introducing new products (c.a. 33%).

Group II with medium value of Food Industry Regional Innovation Activity Indicator in the 2006-2008 period was formed by eleven voivodships (Pomorskie, Śląskie, Małopolskie, Warmińsko-Mazurskie, Zachodniopomorskie, Wielkopolskie, Lubelskie, Lubuskie, Świętokrzyskie, Podlaskie and Mazowieckie). In this group maximum values, in comparison with the other groups, were reached by mean values characterizing technological innovations regarding the percentage of innovative food enterprises introducing new processes in the area of product manufacturing methods (67%) and products new to the market (39%). Concerning the factors connected with non-technological innovations it may be noticed that the mean percentage of enterprises introducing organisational innovations either in the form of changed knowledge management systems (46%), changes in work organisation (47%) or links with other firms (32%) was higher in group II than in the other groups.

Only one – Łódzkie voivodship was classified to group III with low value of Food Industry Regional Innovation Activity Indicator. Values of enterprise innovation activity variables for food companies in this voivodship in most cases were lower than the corresponding means for all voivodships. Only in the area of introduced technological innovations, this voivodship stood out from the other owing to the percentage of food companies which developed new processes on their own or in a capital group to which they belonged. On the other hand, none of the factors characterizing non-technological innovations introduced by food companies in this voivodship exceeded mean values obtained for all analysed regions. However, the food enterprises localized in this voivodship registered the highest percentage of expenditures on fixed assets in the outlays on food industry innovation activity, as well as the percentage of

firms which incurred expenditure on software and personnel training connected with introducing innovations.

In group IV, composed of Podkarpackie and Dolnośląskie voivodships, values of a definite majority of food industry innovation activity factors were lower than average values obtained for the whole population of regions and these were usually minimum values.



**Fig. 1 Regional diversification of food industry innovation activity in 2006-2008 and 2008-2010**

Source: Own studies on the basis on unpublished COS data

In the period 2008-2010 Opolskie voivodship was again classified to group I. It was joined by Wielkopolskie and Małopolskie vovodships. Group I gained advantage over the other ones in case of a majority of considered variables. Among the factors connected with technological innovations the group was distinguished by a mean percentage of innovative food companies which introduced new processes and methods of product manufacturing (c.a. 61%) and products new to the market (50%), as well as mean percentage of the companies which developed new products independently or jointly with other companies in the capital group to which they belonged (c.a. 66%). Also in case of non-technological innovations this group was characterized by higher means obtained for individual variables. Remarkable is also mean percentage of enterprises which introduced organizational innovations in the form of change of work organization (c.a. 58%) and marketing innovations as changes in the appearance and shape of products (81%), and a new way of sales or distribution channels of their products (43%). Among variables associated with the expenditures on innovation activity, in group I a maximum mean value characterized 5 out of 9 analysed factors. These comprised mean percentage of food companies which incurred expenditures on R&D works conducted in the firm (39%) and acquired from the outside (19%). Moreover, higher than in the other groups was mean percentage of enterprises which incurred expenditures on software (36%), purchase of ready technology as documentation and licenses (18%) and on marketing connected with introducing innovations (c.a. 38%).

Group II was composed of four voivodships, of which three, i.e. Mazowieckie, Podlaskie and Śląskie returned to this group. They were joined by Kujawsko-pomorskie voivodship, previously classified to group I. Also this group was characterized by the variables whose mean values for food enterprises reached higher level than in the other groups. Among them were the factors connected with technological innovations (mean percentage of innovative enterprises which introduced new products to the market (c.a.58%) and with non-technological innovations (mean percentage of enterprises which introduced organizational innovations: knowledge management systems – c.a. 50% and links with other firms – c.a. 26%). Higher than in the other groups was also mean share of expenditures on fixed assets in the outlays

on innovation activity (91.5%) and the share food enterprises own funds in funding this activity (c.a. 85%). This group differed from the rest also by mean percentage of innovative enterprises which incurred expenditures on personnel training associated with introducing innovations (c.a.50%).

Group III with low value of Food Industry Regional Innovation Activity Indicator in the period 2008-2010 comprised Dolnośląskie, Zachodniopomorskie and Podkarpackie voivodships which joined Łódzkie. None of the discussed food industry innovation factors in this group obtained a value which would be higher than in the other groups. On the other hand, it should be stated that in this group several variables reached the lowest mean values among all groups. This applies to such factors as mean percentage of innovative companies which introduced new products (c.a.48%) and new processes concerning food manufacturing methods (c.a.49%). Also lower than in the other groups was mean percentage of enterprises which introduced organizational innovations in the form of knowledge management systems (31%). Among the factors connected with the expenditures on innovation activity a low percentage was noted for the enterprises which made outlays on R&D works conducted in the firm (8.7%) and on personnel training connected with introducing innovations (43%).

Group IV with very low value of Food Industry Regional Innovation Activity Indicator was composed of five voivodships which in the preceding period belonged to group II. Some variables characterizing the level of food enterprises innovation performance in this group reached the lowest mean values among those obtained for all groups. However, there were also those whose mean values were the highest. It applies to the percentage of innovative enterprises which independently or in a capital group developed new processes (45%) and incurred expenditures on modernization of machinery connected with introduced innovations (72%).

## **Conclusions:**

Over more than ten years Polish food industry has undergone significant changes concerning its restructuring and modernisation and was included in the processes of internationalisation and globalisation of the economy. Owing to the changes the gap between Polish enterprises and their competitors from the developed European Union countries has been closed. It allowed domestic producers to enter European food markets and achieve success. The main agents of Polish food product competitiveness are lower prices and high quality, but often also traditional way of product manufacturing. However, in further perspective in order to keep their market position, food companies will have to seek factors of competitive advantage. In this area key importance has been ascribed to innovation performance. It is increasingly more desired characteristic of economic entities which allows them to operate in the environment saturated with competition. Comparison of innovation performance of Polish food manufacturers and their competitors from the EU countries has been so far advantageous for the latter ones. It may be noticed that despite innovation activities undertaken to introduce technological and non-technological innovations, its intensity remains insufficient, while in this respect Polish food industry occupies one of the last positions among the EU countries.

The analysis of food industry innovation activity level in Poland conducted from the regional perspective allows for a statement that the level is diversified and variable in time. In each of the periods subjected to the analysis due to the availability and comparability of the data, identified were four groups of regions (voivodships) which reveal different level of the intensity of innovation activities undertaken by food industry. In the 2006-2008 period, the group of leaders according to the value of synthetic Food Industry Regional Innovation Activity Indicator comprised two voivodships, i.e. Opolskie and Kujawsko-pomorskie. However, during the same period the most numerous was group II with medium value of this indicator, composed of eleven voivodships. In the subsequent analysed period, i.e. 2008-2010 position of a majority of voivodships changed in result of a change in food industry innovation activity. In the first group Opolskie voivodship maintained its position, which evidences that food industry localized in its area maintained a high scale of pro-innovation orientation. Beside this one, two more voivodships, which in the preceding period belonged to the group with medium value of

the indicator, were classified to the group with the high level of Food Industry Regional Innovation Activity Indicator. Therefore in their case an improvement in the state of innovation activities conducted by the food manufacturing economic entities localized in their area may be seen. However, during this analysed period the most numerous was group IV, characterized by a low value of computed indicator. It comprised five voivodships in the preceding period classified to group II, which shows that food industry innovation activity in these voivodships weakened considerably.

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# Interconnections of Regional Disparities between Innovation and Agricultural Productivity and Development within Slovak Regions

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## Abstract

Tendency of increasing innovation performance is often discussed topic not only in Europe but also in the global context. In 2014, Regional Innovation Scoreboard that comparatively assessed innovation performance of 190 regions within the European Union, Switzerland and Norway was published. By evaluating the Summary Innovation Index, which is composed of 25 indicators, Slovakia turns out to be categorized as the Moderate Innovator with positive regional innovation performance growth. Despite awareness of the importance of supporting research and scientific areas, the Ministry of Education, Science, Research and Sport of the Slovak Republic in the last annual report on the state of research and development in Slovakia in 2012 concluded, that Slovakia utilizes its research and development potential insufficiently and in comparison with other EU countries, spending on research and development (R&D), with the value 0.68 percent of GDP, belongs to the lowest ones. Worldwide growth in demand for food and feed is one of the most important reasons why it is necessary to focus on innovation and thus spending on the R&D in agriculture. Investments in agricultural R&D will lead to productivity growth of agriculture in different regions of Slovakia, ensuring an increasing level of regional development of Slovak regions. Growth in agricultural productivity will also cause the reduction of pressure on natural resources and the environment.

The main objective of this paper is to evaluate and assess the level of regional disparities while taking into consideration innovation performance, agricultural productivity and chosen socio-economic indicators of regional development and to demonstrate, whether there exists some correlation between the trend of these regional disparities within the Slovak regions.

The research of the paper begins with the collection of relevant data, mainly from regional statistical database RegDat and the official Statistical Office of the Slovak Republic and its archived agricultural and food publications, publications on the state of R&D. The data availability caused that the article summarizes and evaluates 5 year period - from 2008 to 2012. All of the analyses are focused on NUTS III classification of the Slovak Republic, namely on Bratislava Region, Trnava Region, Trenčín Region, Nitra Region, Žilina Region, Banská Bystrica Region, Prešov Region and Košice Region.

The first part of the paper focuses on the time-spatial analysis of selected indicators of innovation performance of agriculture, particularly spending on R&D, and socio-economic indicators of the level of regional development, namely Total Gross Agricultural Production per 1 ha-1, Taxes and Fees per 1 ha-1, Number of Employees per 100 ha-1, in all regions of Slovakia.

Secondly, the Coefficient of Variation and Gini Index are applied to evaluate the level of regional disparities within the selected indicators. Subsequently, the method of chain indices reflecting the trend in examined regional disparities is used.

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In the third part of the paper, we want to demonstrate existence of correlation between the trend of regional disparities of selected indicators of innovation performance, particularly spending on R&D, and the development trend of regional disparities of mentioned socio-economic indicators of regional development and productivity within the Slovak regions in the agricultural sector.

Conclusion of the paper summarizes the results obtained in this research with the accentuation of the importance of reducing regional disparities, the use of innovation and new scientific techniques and methods funding, applied in the agricultural sector, resulting into an increased productivity and the entire socio-economic level of regional development.

### **Keywords:**

Innovation, R&D, regional disparities, agricultural sector

### **Introduction**

The Slovak Republic is considered as the agricultural country from both, the historical point of view and also the traditions. However, following Huttmanová and Kiseľáková (2010), the current situation, specifically its unprofitability, ineffectiveness and thus unattractiveness, was signed under the decline of this sector. Competition in the pan-European agricultural market is very high and businesses operating in these difficult conditions must constantly improve operational efficiency by increasing productivity, investing in new technologies and application of innovative methods and processes. Scoones and Thompson (2009) stated that agriculture is one of the industries when a system approach to innovation has been least applied. They mentioned that there are institutional barriers and this distance between research and practice means, that in many countries, farmers' knowledge, as a possible source of innovation, has been taken into consideration insufficiently.

Also Fáziková and Melichová (2014) concluded in their case study of the Nitra Region, that the sector of agriculture is still undergoing economic transformation, and its transition towards knowledge economy has been rather spontaneous than systematic. Despite the productivity growth achieved through technology innovations, Slovak agriculture is less competitive in comparison with developed European agriculture. They also stated that unsystematic and fragmented approach to innovation in most segments of the value chain (research, production, processing and sales) is manifested in the declining competitiveness of agricultural enterprises and the industry as a whole.

According to the Regional Innovation Scoreboard published in 2014, Slovakia turns out to be categorized as the Moderate Innovator with positive regional innovation performance growth. Despite awareness of the importance of supporting research and scientific areas, the Ministry of Education, Science, Research and Sport of the Slovak Republic in the last annual report on the state of research and development in Slovakia in 2012 concluded, that Slovakia utilizes its research and development potential insufficiently and in comparison with other EU countries, spending on research and development (R&D), with the value 0.68 percent of GDP, belongs to the lowest ones.

Increasing competitiveness and economic prosperity of the agricultural sector in Slovakia can be achieved by exploiting the potential of its individual regions. Gajdoš (2008) deals with the regional disparities and he claims that rapid increase of regional disparities in their potentials, living conditions and development availabilities has become one of the most characteristic accompanying phenomena of social and economic transformation in Slovakia. Disparities in the SR are deepening in the sense that the problems more significantly move to less developed regions, where they are concentrated. The accession of the SR to the EU highlighted its unfavorable regional situation among regions in Slovakia, as well as between the regions of Slovakia and the regions of the EU.

There exist many methods and indicators that can be used for assessment of the regional disparities and in this way, it is possible to compare the level of regional development. Malatinec and Hanáčková (2012) evaluate influences between the innovation of the agricultural business entities and the level of regional development. Their regression model shows statistically significant relationship between the economic result of the farms and product and marketing innovation. Matlovič and Matlovičová (2011) deal with the regional disparities at NUTS III level of the SR using methods Coefficient of variation and Gini Index on chosen indicators - unemployment rate, average monthly wage, monthly net income per capita, monthly net expenditure per capita, GDP creation per capita, organization focused on generating profits per 1000 inhabitants, tradesmen per 1000 population, gross birth-rate, the collection of taxes in the regions and the share of foreign investments.

## **Data and Methods**

The whole agricultural sector in the Slovak Republic is clearly underdeveloped when we compare the level of regional development with the member states of the western EU. This paper is focused on the evaluation and comparison of the level of regional development in the Slovak agricultural sector and the level of regional disparities within the Slovak regions.

The paper wants to demonstrate whether there exists correlation between the trend of regional disparities in innovation performance and trend of regional disparities in agricultural productivity and chosen socio-economic indicators of regional development within the Slovak regions.

### **Data**

The research of the paper begins with the collection of relevant data, mainly from regional statistical database RegDat and the official Statistical Office of the Slovak Republic and its archived agricultural and food publications, publications on the state of R&D. The data availability caused that the article summarizes and evaluates 5 year period from 2008 to 2012. The data availability caused that the current situation of the research is the year 2012. All of the analyses are focused on NUTS III classification of the Slovak Republic, namely on Bratislava Region, Trnava Region, Trenčín Region, Nitra Region, Žilina Region, Banská Bystrica Region, Prešov Region and Košice Region.

### **Methods**

The first part of the paper focuses on the time-spatial analysis of selected indicators of innovation performance of agriculture, particularly spending on R&D, and socio-economic indicators of the level of regional development, namely Total Gross Agricultural Production per 1 ha<sup>-1</sup>, Taxes and Fees per 1 ha<sup>-1</sup>, Number of Employees per 100 ha<sup>-1</sup>, in all regions of Slovakia. Total Gross Agricultural Production is calculated as the sum of sales outside the company, internal turnover and the stock levels difference of finished goods and animals within the year. This indicator consists of Crop Production and Animal Production. In this way, we can see the composition of the Total Gross Agricultural Production within the Slovak regions. The second indicator used in this paper, Taxes and Fees per 1 ha, shows how much of the funds concrete Slovak region contributes into the common budget in the form of taxes and fees per 1 hectare of agricultural land. The last of evaluated indicator, Number of Employees per 100 hectares, assesses the situation of regional employment in the agricultural sector, concretely per 100 hectares. By taking into the consideration these 3 factors, we try to evaluate and compare the level at which Slovak regions contribute to the regional development in agricultural sector.

Secondly, the Coefficient of Variation and Gini Index are applied to evaluate the level of regional disparities within the selected indicators. Coefficient of variation is very frequently used method for measuring the regional disparities. Matlovič and Matlovičová (2011) claim that it represents a relative measure of dispersion derived from standard deviation (the ratio of the standard deviation and the mean). Coefficient of variation is calculated as:

$$CV = \left( \frac{\sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n}}}{\bar{x}} \right),$$

where  $n$  is the number of observational units,  $x_i$  is the value of the variable  $x$  measured in observational unit  $i$  and  $\bar{x}$  is the arithmetic mean of the variable  $x$ .

According to Michálek (2012), Gini index is based on a comparison of all of the relative mutual variances between each observation. Gini coefficient is closely related to the Lorenz curve, which is used for graphical representation of spatial phenomenon. It is calculated as:

$$Gini = \frac{1}{2n^2\bar{x}} \sum_i \sum_j |x_i - x_j|; 0 \leq Gini \leq 1,$$

where  $n$  is the number of observational units,  $x_i$  is the value of the variable  $x$  measured in observational unit  $i$ ,  $x_j$  is the value of the variable  $x$  measured in observational unit  $j$ , and  $\bar{x}$  is the arithmetic mean of the variable  $x$ .

The Gini index (theoretically) varies between 0-1. The closer is Gini coefficient to 1, the greater the differentiation. Low values of the Gini coefficient indicate that countervailing tendencies prevail. Subsequently, the method of chain indices reflecting the trend in examined regional disparities is applied.

In the third part of the paper, we want to demonstrate whether there exists correlation relationship between the trend of regional disparities of selected indicators of innovation performance, particularly spending on R&D, and the development trend of regional disparities of mentioned socio-economic indicators of regional development and productivity within the Slovak regions in the agricultural sector.

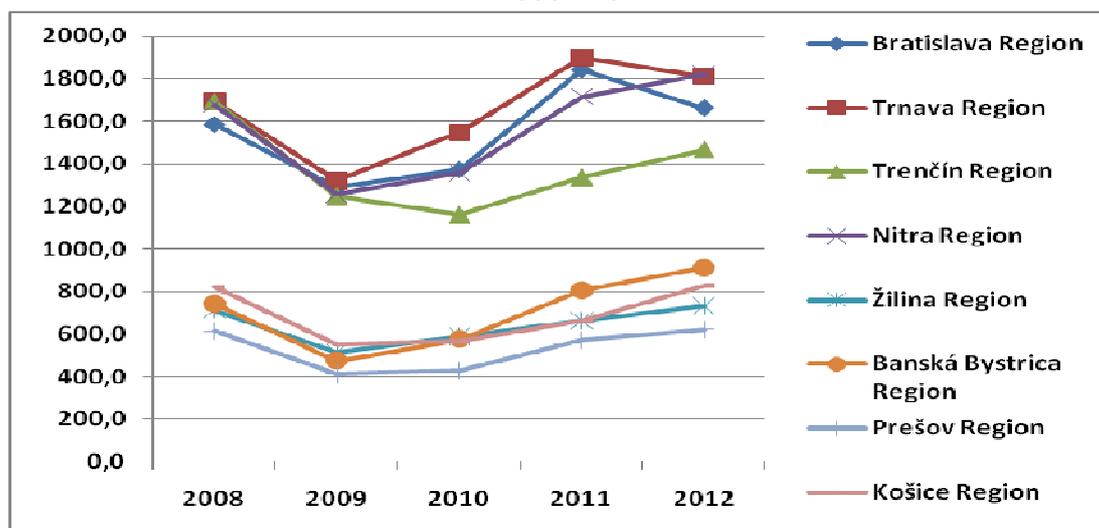
## Results and Discussion

The following part will evaluate and summarize the results of the research.

### Time – Spatial Analysis

Firstly, we have a closer look on the indicator – Total Gross Agriculture Production per 1 ha measured in Euros in the examined period from 2008 till 2012. At the beginning, Trnava Region achieved the highest value, but in 2012 Nitra Region overtook this position.

**Graph 1 Total Gross Agricultural Production (EUR) per 1 ha within Slovak Regions in 2008 - 2012**



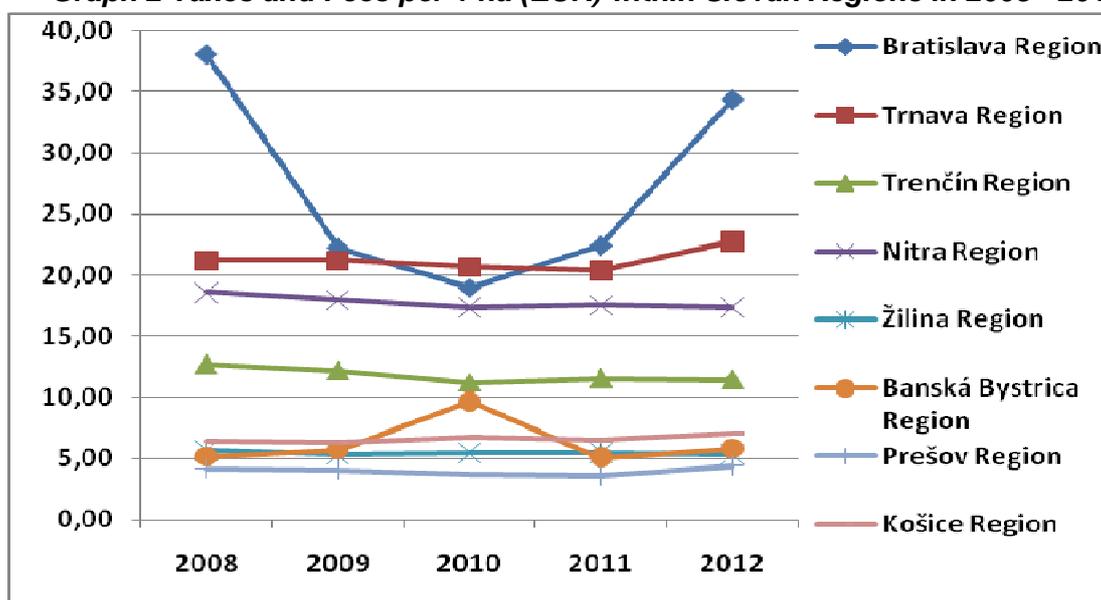
This situation occurred mainly because of Trnava Region Crop Production reduction and because of increasing Crop Production in Nitra Region. On the other hand, in Prešov Region,

Total Gross Agricultural Production per 1 ha of agricultural land had achieved the worst values during the whole examined period.

As we can see in the Graph 1, the declining tendency of all Slovak regions is clearly visible in the period 2008 – 2009. This negative trend was affected by the world economic crisis, when all sectors of the national economy stated economic turndown. The situation changed in 2010, when in all Slovak regions, Total Gross Agriculture Production has started to rise. Another important fact that can be concluded is significant disparity between western regions and regions of central and eastern Slovakia.

From the Graph 2, we can see that most of the regions had stated quite stable payments in a form of taxes and fees per 1 ha in Euros. Only in Bratislava Region this indicator had been changed significantly. Till 2010, it had decreased to half of the value measured in 2008. In 2012, Bratislava region contributed the most to the state budget in the form of taxes and fees per 1 hectare. On the other hand, Prešov Region had achieved the lowest value of this indicator within all of Slovak regions in the period 2008 – 2012.

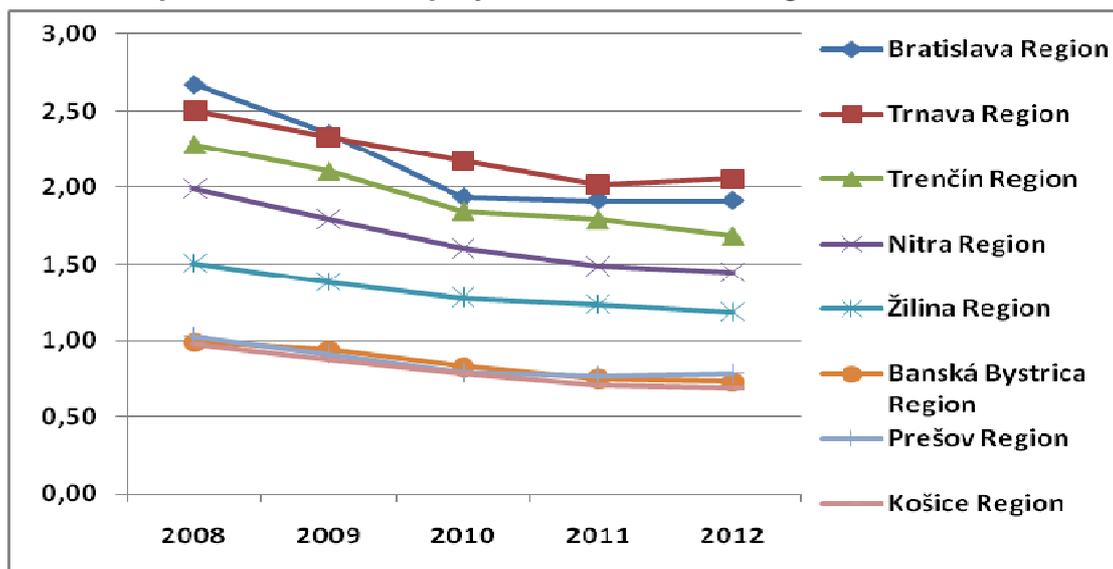
**Graph 2 Taxes and Fees per 1 ha (EUR) within Slovak Regions in 2008 - 2012**



The total amount of Taxes and Fees collected within Slovakia to the common budget represents more than 27.6 million EUR in 2012. Nitra Region had the major share in this total amount with the sum about 8 million Euros, what represents 29.28 percent and Trnava Region with the amount more than 6.5 million Euros, what represents 23.78 percent.

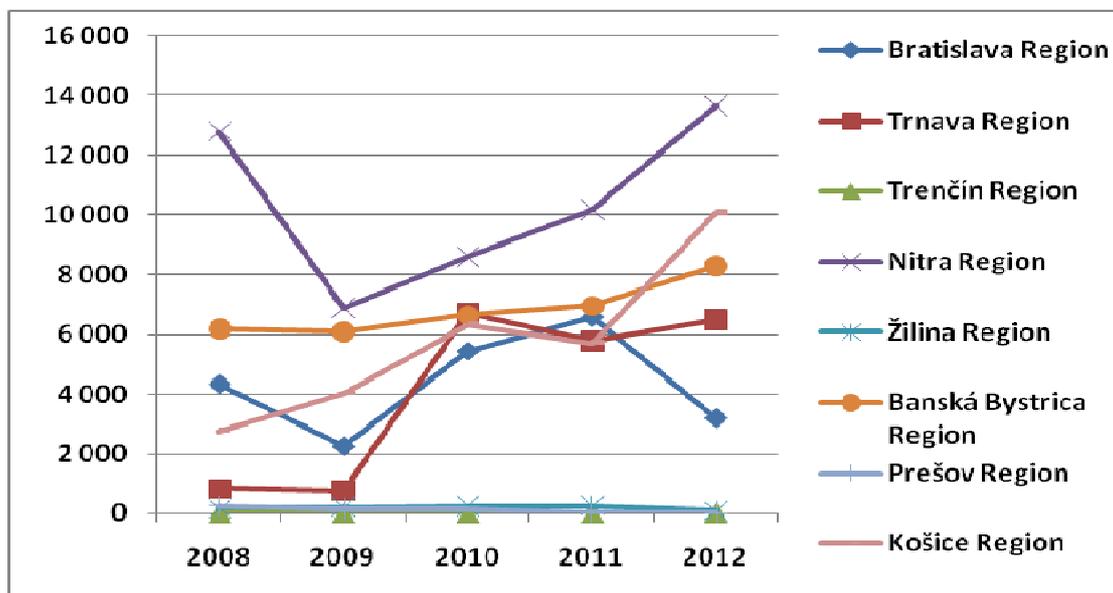
The last indicator that help us to compare and evaluate the level at which Slovak regions contribute on the regional development in agriculture sector is the Number of Employees per 100 hectares of agricultural land. Graph 3 shows us the declining tendency of this indicator in all Slovak regions in the period 2008 – 2012. This trend is also caused by the substituting the human resources for machineries. The most people per 100 hectares are employed in Trnava Region (2.05) and Bratislava Region (1.91) in 2012. The lowest employment in agriculture sector was in Banská Bystrica Region, Košice Region and Prešov Region.

**Graph 3 Number of Employees within Slovak Regions in 2008 - 2012**



The one and only examined indicator by which we want to describe the innovation performance in agriculture sector is Spending on R&D. Nitra Region accounts for most of the total government expenditure on R&D in agriculture sector with the sum of 13 667 000 Euros in 2012. This is because of the fact that Nitra Region is the region with the realiest agrarian character with the significantly largest acreage of agricultural land and because the existence of scientific and research institutions, particularly Slovak University of Agriculture in Nitra. On the other hand, the minimum or none Spending on R&D go to Trenčín Region, Žilina Region and Prešov Region.

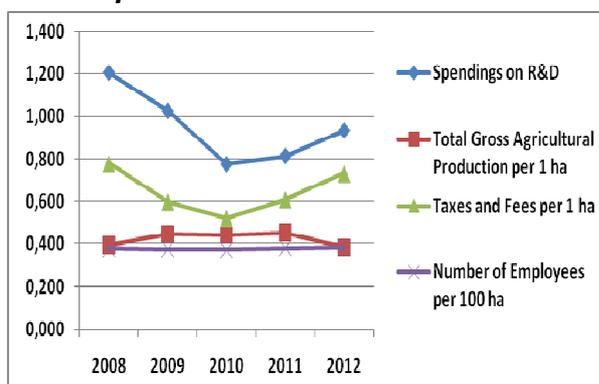
**Graph 4 Spending on R&D in agriculture (1000 EUR) within Slovak Regions in 2008 - 2012**



### Analysis of Regional Disparities

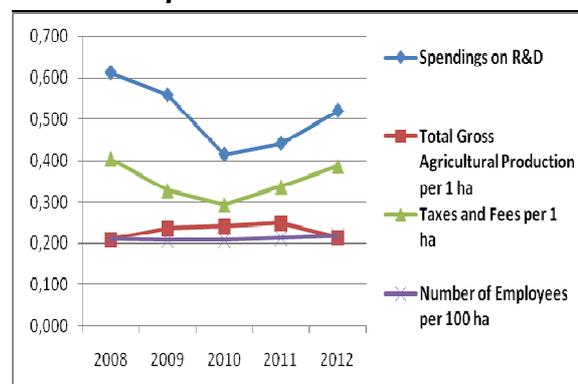
The Coefficient of Variation and Gini Index are two methods in this article used to analyze regional disparities of selected indicators of regional development and innovation performance.

**Graph 5 Coefficient of Variation**



CV	2008	2009	2010	2011	2012
<b>Spendings on R&amp;D</b>	1,206	1,026	0,776	0,815	0,935
<b>TGAP per 1 ha</b>	0,397	0,449	0,445	0,453	0,386
<b>Taxes and Fees per 1 ha</b>	0,781	0,598	0,521	0,610	0,733
<b>Number of Employees per 100 ha</b>	0,380	0,377	0,373	0,382	0,387

**Graph 6 Gini Index**



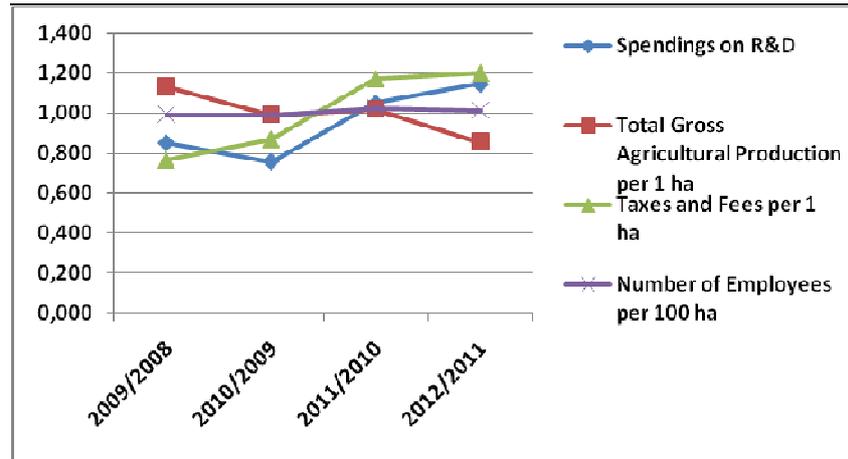
Gini Index	2008	2009	2010	2011	2012
<b>Spendings on R&amp;D</b>	0,612	0,558	0,415	0,441	0,520
<b>TGAP per 1 ha</b>	0,210	0,236	0,242	0,249	0,214
<b>Taxes and Fees per 1 ha</b>	0,405	0,328	0,294	0,337	0,387
<b>Number of Employees per 100 ha</b>	0,212	0,210	0,209	0,213	0,218

The results of the analysis of regional disparities measured by both methods, Coefficient of Variation and Gini Index, are almost identical. From the Graph 5 and Graph 6 we can see the development of regional differences of selected indicators in the examined period 2008 – 2012. Regional disparities are mostly visible in Spending on R&D and Taxes and Fees per 1 ha. These 2 indicators have reached quite similar development during the whole period. Comparing the current situation (2012) with the beginning of the period (2008) we can say that regional disparities have declined. When speaking about Total Gross Agricultural Production per 1 ha and Number of Employees per 100 ha, it can be concluded that regional disparities haven't changed or have changed just a little.

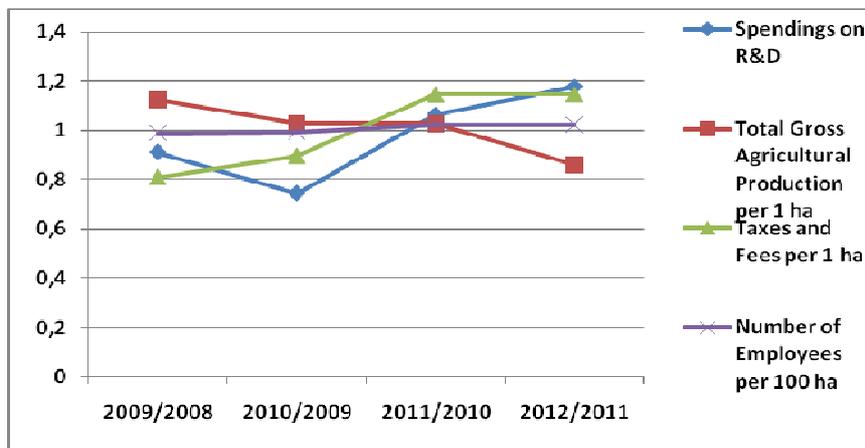
### Correlation Analysis of Regional Disparities' Trends

The final analysis of this paper shows the trend of selected indicators' regional disparities within Slovak regions in the examined period 2008 – 2012. To reflect the development trend of regional disparities, chain indices that compare the annual increase or decrease were used. There are no significant differences between the trends expressed by Coefficient of Variation and Gini Index. From the Graph 7 and Graph 8, we can see that in the first 2 years, regional disparities of Spending on R&D in agriculture and Taxes and Fees per 1 hectare of agricultural land had declined. After 2010, opposite trend has occurred. On the other hand, regional disparity of Total Gross of Agricultural Production per 1 ha firstly increased but in the last annual period, it decreased almost on the same value as in 2008.

**Graph 7 Trend of Regional Disparities by Coefficient of Variation**



**Graph 8 Trend of Regional Disparities by Gini Index**



The highest value of Correlation Coefficient in the trend of regional disparities was achieved between Spending on R&D in agriculture and Taxes and Fees per 1 ha of agricultural land.

## Conclusions

The first part of the paper evaluated selected indicators of regional development and productivity, as well as the indicator of innovation performance; particularly Spending on R&D. Total Gross Agricultural Productivity per 1 hectare had been negatively affected by the world economic crisis, when all sectors of the national economy stated economic downturn. After 2010, this indicator started to rise and in the last year Nitra Region reached the highest agricultural productivity per 1 ha of agricultural land. Comparing the level at which Slovak regions contribute to the common national budget, in the form of Taxes and Fees collected per 1 hectare of agricultural land, we can conclude that Bratislava Region, Trnava Region and Nitra Region maintained the highest positions. The development trend in the case of regional employment calculated per 100 hectares of the total agricultural land is the same in all Slovak regions. The declining tendency of this indicator is not only the case of the Slovak Republic but it is the worldwide status since the labor force is substituted by machineries. In this way, not only agricultural businesses and farms want to increase productivity.

It is important to conclude that in all of selected socio-economic indicators that describe the level of regional development in agriculture are significant and visible differences between the western part of Slovakia and its central and eastern regions.

The indicator Spending on R&D in agriculture was chosen to represent innovation performance of the Slovakia. It is not surprising that significantly highest sums of the national expenditures on agricultural R&D are invested in Nitra Region. This is because of the fact that Nitra Region is the region with the realest agrarian character with significantly the largest

acreage of agricultural land and because of the existence of scientific and research institutions, particularly Slovak University of Agriculture in Nitra.

The highest regional disparities within Slovak regions were reached in the case of Spending on R&D and Taxes and Fees per 1 hectare. Apart from this fact, these two indicators had stated the overall decrease in comparison to the beginning of the examined period.

Analysis of the trend of regional disparities in the case of selected indicators shows its development in comparison to the previous year. The highest correlation in these trends was measured between Spending on R&D in agriculture and Taxes and Fees per 1 hectare of agricultural land. However, because of the small amount of observations (lack of the data), it is not appropriate to say that Correlation Analysis is able to conclude such a result.

The initiatives that will lower the level of regional disparities within Slovak regions should be much more visible. The government should focus on the financial incentives in the region of central and eastern Slovakia and try to support domestic agricultural business entities and farmers.

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# Business Start-up Motivation of Indian Entrepreneurs in Bangkok, Thailand

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Nirundon TAPACHAI<sup>1</sup>

Nuttapon PUNPUGDEE<sup>1</sup>

## Abstract

This paper aimed to identify the motivational factor of Indian entrepreneurs which motivate them to make a decision to start a business of small and medium enterprises in Bangkok, Thailand. Twenty one motivational factors which were emerged out of the analysis are entrepreneur, work, skill, individual, economic, social and wealth related factor of motivation which has compared among/ between different personal factors of Indian entrepreneurs. The model tested based on descriptive research used constructed questionnaires as the instrument to survey which was conducted 342 Indian entrepreneurs who are currently running their businesses in Bangkok area. It could be concluded that gender, age, religion & community, educational background, family background, previous occupation have significant difference in entrepreneurs motivation towards business start-up., while marital status, prior income and initial investment have no significant difference in entrepreneurs motivations toward business start-up motivation of Indian entrepreneurs in Bangkok, Thailand.

## Keywords:

Business Start-ups, Entrepreneurship Motivation, Immigrant Entrepreneurship

## Introduction

Thailand has extended into a global and regional migration in south-Asia. Migration is a phenomenon that has to multi-faceted impact on societies, cultures and also significant impact on Thailand's development, growth and stability. Although migration labor force are contributing a significant share in Thailand economy. A number of economic development in Thailand have motivated international migration much of manufacturing sector in financed by Foreign Direct Investment. The Board of Investment (BIO) has a strategy to attract migration through providing tax incentives.

The Indian Diaspora in Thailand has emerged as an important factor in further strengthening the bilateral economic relations The Indian Diaspora, total population of Indians in Thailand located at 150,000, which is 0.07 per cent of total Thai population. In this, the number of persons of Indian origin (PIOs) is 60,000, while there are 90,000 non-resident Indians (NRIs), (Ministry of Overseas Indian Affairs, Government of India) Almost all major states of India and has made significant contribution to activities in various fields in Thailand especially gems and jewellery, textiles and real estate business. There are a large number of Indian professionals working with Thai private companies and with other agencies in information technology and other professionals fields such as in various international and UN organizations, multinational companies, banks and financial institutions), (Indian embassy, Thailand) Historically, the Indian migration to Thailand has largely been voluntary and in search of economic opportunities. The Indian population is largely concentrated in cities, mainly in Bangkok, Chiang Mai and Chiang Rai. Among Indian groups, Sikhs are the most prosperous community in Thailand. They are engaged primarily in the textile sector, while the Tamil Muslims and the Bohras are engaged in trading in precious stones and high-value technology goods respectively. There are many Indians in the service sector in Bangkok, especially those who belong to Gorakhpur in Uttar Pradesh. However, the number of Indians working in information technology and other high-skilled jobs is increasing significantly.

Thai-India economic and commercial relations have rapidly expanded with bilateral trade increasing from US\$1.05 billion in 2001 to US\$4.7 billion in 2007 and next target to increase the trade between two countries from its 2010 figure of \$ 6.7 billion to its double in 2014. (BIO). Thailand and India are recognizing

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different method to the scope of economic cooperation and cooperating in various multilateral for a like India's dialogue partnership with ASEAN, the ASEAN regional forum (ARF), and the East Asia Summit, India is a member of the Asia Cooperation Dialogue (ACD) initiated by Thailand in 2002 and of the Mekong-Ganga Cooperation (MGC), the sub-regional grouping BIMSTEC involving Bangladesh, India, Nepal, Bhutan, Sri Lanka, Thailand and Myanmar, and trilateral transport linkages with Thailand, Myanmar and India. a group of six countries. Indian and Thailand agreed to increase the cultural interaction, connectivity and enhancement of trade and economic through the bilateral and regional frameworks viz. ASEAN- India, BIMSTEC and MGC

This Study proposed to gain insight into the factors which motivate Indian entrepreneurs to start business in Bangkok, Thailand. However, the development of entrepreneurship is an important phenomenon in contemporary economics. Entrepreneurship is strongly linked to small and medium sized enterprises (SMEs), which are the main developing force of the developed market economics. SMEs are usually representing the majority of all the enterprises and accordingly they are main driving force of entrepreneurship development and economy. This research will provide valuable Information to both academic and business practitioners

in terms of business start-ups motives and driving factors in developing country such as Thailand. They will gain a deeper understanding of the reasons why Indian immigrants in Thailand chose self-employment. The immigration department can use the results to determine whether the skilled migrants who are venturing into entrepreneurship are doing so because of lack of skilled jobs in the labor market or for other motivational reasons. The outcome of the study will be significant in confirming whether or not the theories of immigrant entrepreneurship that have been tested in other countries can be applies to Thailand society as well. It will also provide empirical results as to the factors motivating entrepreneurship among Indian immigrants in Bangkok.

Business start up motivation of Indian entrepreneur's in Bangkok province, Thailand have not been clearly addressed in the literature on business start-ups and international business arena. However, the business opportunities for Indian entrepreneurs prove to be a valuable topic of investigation.

### **Objective**

The objective of this study is:

1. To examine business start up motivation of Indian entrepreneurs in Bangkok, Thailand
2. To compare motivational factor between/among Indian entrepreneurs in terms of age, gender, marital status, religion and community, educational qualification, family background, previous occupation, prior income and initial investment.

### **Literature Review:**

The literature review first presents the topic of entrepreneurship, and also looks at the literature on motivations for entrepreneurship, looking at both empirical research and theories developed under the topic of entrepreneurship.

There are several literatures on relate to entrepreneurship. Thus, Schumpeter (1949) defined Entrepreneur as the person who able to create new idea into successful innovative ventures. Yet, Garter (1985) perceives it as the creation of new businesses, while Kirzner (1979) defines it as people who are looking out for new opportunities. Later, under Chicago tradition, Knight saw entrepreneurs as people who were willing to take risks, and bear uncertainty to get a reward (Deakins, 1999). In recent years, theories have focused on the financial sphere of entrepreneurial activities. Kirzner saw entrepreneurs as people aware of opportunities that can generate profit (De Vries, 2007). With the evolution of business administration since the seventeenth century, scholars have not been able to reach an agreement on the definition of entrepreneurship (Wartman, 1987). Bygrave and Hofer (1991) stated that entrepreneurs were people who recognized opportunities and created new business organizations Personality and motivation have an influence on the likelihood of using entrepreneurial opportunity (Shane, 2003). People with certain characteristics of these traits tend to act differently in similar situations. Successful entrepreneurs have: the ability to take risks; a knowledge of the market; an innovative nature; marketing skills; business management skills; and the ability to co-operate (Shane, 2003). Theories that are applied to the study of entrepreneurship are McClelland's (1961) "theory of the need to achieve" and Rotter's (1966) "Locus of control theory". According to McClelland's theory, individuals with a high need to achieve are those who like to solve their own problems, set targets and meet those targets, and it is these who are going to be successful entrepreneurs. The theory states that individual who have a strong need to achieve become entrepreneurs and succeed better than others, Immigrants are

thought to have a high need of achievement after migrating to a new country, and are more likely to become entrepreneurs, according to this theory (Maritz, 2004).

An individual's locus of control can be internal or external. Internal control refers to control over one's own life (Ratter (1996). where the results of one's actions are dependent on the characteristics of the individual's behavior. External control refers to the thinking process that focuses on the actions of other people, luck, fate or chance. Generally, Entrepreneurs have internal control expectations whereby they are willing to learn and motivate themselves instead of blaming others for their results. Immigrants who have migrated to a new country show the characteristics of internal control necessary for entrepreneurship (Maritz, 2004).

Robichaud, McGraw and Roger (2001) have studied North American entrepreneurs and have grouped motivational factors into four categories.

1. Extrinsic rewards- motivation is for economic reasons
2. Independence/autonomy
3. Intrinsic rewards- motivation is for self-fulfillment and growth and
4. Family security

Wang, Walker and Redmond (2006) did a study on motivations of small business owners in Western Australia, and put 17 motivational factors into four groups.

1. Personal development motivations
2. Financial motivations
3. Motivations related to work and family, and
4. Flexible lifestyle motivations

The most significant motivating factors which is available in the empirical research. Motivating factors which is most frequently visible in the literature regarding motivation for entrepreneurship. They are need for achievement; desire for independence; wealth creation/money; risk taking; self efficacy; passion; assistance from government; political and social stability; labor market; opportunity; work-related factors; family related factors. Factors like need of achievement, desire for independence and wealth creation/money, are straightforward, but for other factors like family-related motivators and work-related, the differences between the various studies are pointed out.

## Conceptual Framework

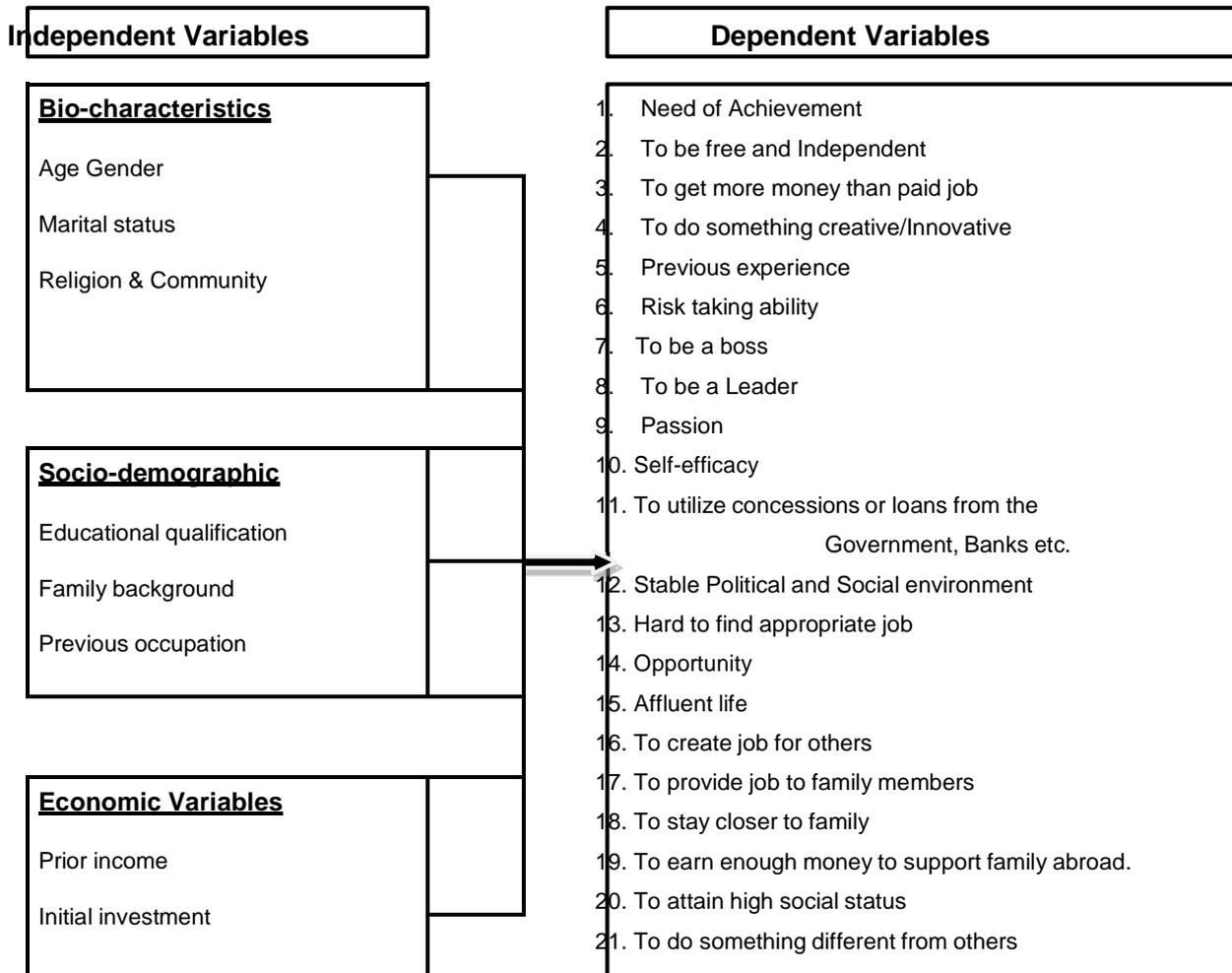


Figure 1 Model for the Study of Entrepreneurial Motivation

### Hypothesis:

Entrepreneurs with different personal factors have different motivation toward business start-up

### Methodology:

#### Population and sampling

The target population for this study was Indian entrepreneurs who are currently running their businesses in Bangkok area. The primary data used in this research was conducted from sample group who are business owners or executives making decisions on business start-ups internationally.

Total number of enterprise operating in Bangkok is approximately 800 (source: got data from business executives at the time of initial interview). So in this case Researcher used sampling method. The Researcher took 300 samples out of the target population on the basis of knowledge of the research problem with using convenient sampling method. Expected rate of response was 75% in that case, the researcher distributed 400 questionnaires to maintain the reliability of the research while the response rate was 85.5% or 342 sets of completed questionnaires were returned.

#### Data collection Methods

Primary data used constructed questionnaires as the instrument to survey contacted with Indian association in Bangkok province which is located in Phurat, Phra Nakhon, Sukhumvit, silom and Patunam and distributed among the Indian business owners or executives are making decisions on business start-ups

internationally. The questionnaire was attached with cover letter outlining the research purpose is distributed to business owners and executives through personal (face to face) survey.

As an initial step, a number of characteristics delineated as entrepreneurial motives were listed from the literature available and this research has taken twenty one motivational factors which is fourteen have taken from literature and added seven factors which was developed on the basis of exploratory research. In exploratory research, total ten Indian entrepreneurs interviewed by the Researcher including business owners and executives to recognize their motivational factor to develop the conceptual framework for this research. The questionnaire composed of two parts including:

### **Part 1 Personal Information**

Consists of questions asking about the personal information including: age, gender, marital status, religion and community, educational qualification, family background (father's occupation, mother's occupation, spouse occupation), previous occupation, prior income, initial investment, working experience, types of business, age of business and number of employees.

### **Part 2 Motivational Factor**

Consist of questions asking respondents marking agreement level of motivational factors; need of achievement, to be free and independent, to get more money than paid job, to do something creative/innovative, previous experience, risk-taking ability, to be a boss, to be a leader, passion, self-efficacy, to utilize concessions or loans from the government, Banks etc., stable political and social environment, hard to find appropriate job, opportunity, affluent life, to create job for others, to provide job to family members, to stay closer to family, to earn enough money to support family abroad, to attain high social status, to do something different from others. A Likert scale, which was used closed-ended questions in survey research because of the ease on counting the frequency of each response. The respondent was given a list of predetermined responses from which to choose their answer.

### **Data Analysis**

The research data analyzed by the Researcher using descriptive statistics (frequency, percentage and mean) to describe the personal factor of entrepreneurs, for testing hypothesis is used one-way analysis of variance (ANOVA), F-test, t-test and weighted average mean, standard deviation was used to compare means between data variables at significant level at 0.05. The Researcher used exploratory factor analysis to identify interrelationship (correlation) among variables by defining a set of variables which are highly correlated known as factors and reduced the number of dependent variables to emerge into group variables. The Researcher was tested hypothesis involving issues as which are grouped together on a factor.

### **Result and Discussion**

The Researcher analyzed data variables after collected a total 342 sets of questionnaire while the response rate was 85.5% out of 400 sets of questionnaire was distributed by hand. The results of study in this research have included four parts as follows:

1. The personal factor of Indian entrepreneurs.
  2. Level of Motivation toward business start up of Indian entrepreneurs.
  3. Data reduction
  4. Hypothesis testing (comparison of entrepreneurs motivation toward business start up classified by personal factor of Indian entrepreneurs)
- 1. The personal factor of Indian entrepreneurs.**

This part focused on personal factor of Indian entrepreneurs and their frequency distribution of including gender, age, marital status and religion and community, educational background, family background (father's occupation, mothers occupation and spouse occupation) and previous occupation, prior income and initial investment of the respondents shown in table 1.

If we split the respondents into comparing groups based on data variables, we can see that the majority of respondents are males in the groups, shows that there are 204 respondents or 59.6% of total 342 respondents in Indian entrepreneurs group are males, 138 respondents amounting 40.4% are females. In age group of Indian entrepreneurs frequency distribution shows the number of respondents in the range 20-30 years old is 18 respondents, amounting 5.3% of the total respondents, range 31-40 years old with 166 respondents, or 48.5% of total respondents, range 41-50 years old with 94 respondents, or 27.5% of total

respondents, and more than 50 years old with 64 respondents which are 18.7% of total respondents. The frequency distribution by religion and community of Indian entrepreneurs with 342 respondents amounting 50% of total 171 respondent are belong to Hinduism, 9 respondents amounting 2.6% of total belong to Christianity, 19 respondent amounting 5.6% belong to Islam, 5 respondents amounting 1.5% of total belong to Buddhism, and 134 respondents amounting 39.2% of total belong to Sikhism and 4 respondent amounting 1.2% of total belong to others.

The frequency distribution by Educational qualification of respondents shows in table 2, the majority is in Bachelor Degree with 162 respondents, amounting to 47% of total 342 respondents. There are 63 respondents who hold Higher Diploma/Association, occupying 18%, and 102

respondents that hold Master Degree, amounting to 30 % of total 342 respondents and 3 respondents that hold Doctoral Degree, amounting to 9% of total 342 respondents and next 12 respondents who hold Other Degree, amounting 4% of total 342 respondents. The frequency distribution of Father's occupation of the respondents of Indian entrepreneur,. First 98 respondents' whose father is employee, amounting to 28.7% of total 342 respondents, 192 respondents' whose father is entrepreneurs, amounting to 56% of total 342 respondents, and 34 respondents whose father is retired and 18 respondents whose father is belong from others category amounting to 5% of total 342 respondents.

**Table 1 Personal factor of Indian entrepreneurs (n= 342)**

Personal Factors	Frequency	Percent (%)	Personal Factors	Frequency	Percent (%)
<b>Gender</b>			<b>Educational Qualification</b>		
Male	204	59.6	Higher Diploma	63	18.4
Female	138	40.4	Bachelor Degree	162	47.4
<b>Age</b>			Master Degree	102	29.8
20-30 Years	18	5.3	Doctoral Degree	3	.9
31-40 Years	166	48.5	Other	12	3.5
41-50 Years	94	27.5	<b>Previous Occupation</b>		
More than 50 Years	64	18.7	Unemployed	48	14.0
<b>Marital Status</b>			Employee	200	58.5
Single	48	14.0	Entrepreneur	59	17.3
Married	294	86.0	Other	8	2.3
<b>Religion &amp; Community</b>			Missing	27	7.9
Hinduism	171	50.0	<b>Family Background</b>		
Christianity	9	2.6	<b>Fathers Occupation</b>		
Islam	19	5.6	Employee	98	28.7
Buddhism	5	1.5	Entrepreneur	192	56.1
Sikhism	134	39.2	Retired	34	9.9
Other	4	1.2	Other	18	5.3
<b>Prior Income</b>			<b>Mother's Occupation</b>		
Up to 100000	35	10.2	Unemployed	21	6.1
100001-400000	160	46.8	Employee	55	16.1
400001-700000	12	3.5	Entrepreneur	49	14.3
Above 700000	7	2.0	Retired	10	2.9
Missing	128	37.4	House Wife	206	60.2
<b>Initial Investment</b>			Other	1	.3
Up to 500,000	103	30.1	<b>Spouse Occupation</b>		
500,001-1,000,000	86	25.1	Unemployed	8	2.3
1,000,001-1,500,000	66	19.3	Employee	74	21.6
1,500,001-2,000,000	9	2.6	Entrepreneur	114	33.3
Above 2,000,000	5	1.5	House wife	105	30.7
Missing	73	21.3	Other	41	12.0

## 2. Level of entrepreneur motivation toward business start-up

Table 2 reveals the level of motivation towards the business start-ups through twenty one motivational factors included entrepreneur related factors (to provide job to family members, to stay closer to family, stable political and social environment, to utilize concession or loans from the Govt. and Banks etc., to create job for others and hard to find appropriate job), work related factors (passion, self efficacy, to be a leader and to be a boss), skill related factors ( risk taking ability, previous experience and to do something creative and innovative), individual related factors ( to be free and independent and need of achievement), economic related factors (opportunity, to earn enough money to support my family abroad), social related factors ( to attain high social status and to do different from others), and the last wealth related factors (to get more money than paid job and affluent life).

The average score of questions for each dimension are calculated in order to measure the tendency of Indian entrepreneur's motivation regarding to the mean score, overall of motivation for 21 motivational factors toward business start is presented high level of motivation at 3.80. For each motivational factor like need of achievement, To be free and independent, To get more money than paid job, To be own boss, passion, affluent life is considered high level of motivation at 4.25, 4.40, 4.44, 4.39, 4.44, 4.33 and To do something creative/innovative, previous experience, To be a leader, Self efficacy, Opportunity, To create job for others, To stay closer to my family, To do something different from other, To attain high social status, To earn enough money to support my family abroad is considered high level of motivation at 3.84, 3.56, 3.63, 4.14, 3.62, 3.48, 3.46, 4.04, 3.90, 3.51 and risk taking ability, To provide job to family members, stable political and social environment, Hard to find appropriate job, To utilize concession or loans from the Govt., Banks etc considered Low level of motivation at 3.36, 3.06, 3.26, 3.40, and 3.23 respectively. Indian entrepreneurs tend to think that they will beneficial from making decision of business start-ups in Bangkok.

**Table 2 Mean, Standard deviation, and Motivational factors of Indian entrepreneurs towards business start-up.**

(n= 342)

Motivational Factors	X	S.D	Level of Motivation
<b>Entrepreneurial</b>			
To provide job to family members	3.40	.74	Moderate
To stay closer to family	3.46	.80	High
Stable political and social environment	3.26	.75	Moderate
To utilize concession or loans from the Govt., Banks etc	3.06	.52	Moderate
To create job for others	3.48	.76	High
Hard to find appropriate job	3.23	.81	Moderate
<b>Work</b>			
Passion	4.44	.59	Very High
Self efficacy	4.14	.84	High
To be a leader	3.63	.92	High
To be a boss	4.39	.60	Very High
<b>Skill</b>			
Risk taking ability	3.36	.82	Moderate
Previous experience	3.56	.77	High
To do something creative/innovative	3.84	.84	High
<b>Individual</b>			
To be free and independent	4.40	.57	Very High
Need of achievement	4.25	.50	Very High
<b>Economic</b>			
Opportunity	3.62	.87	High
To earn enough money to support my family abroad	3.51	1.15	High
<b>Social</b>			
To attain high social status	3.90	.76	High
To do something different from others	4.04	.77	High
<b>Wealth</b>			
Affluent life	4.33	.64	Very High
To get more money than paid job	4.44	.71	Very High
<b>Overall</b>	<b>3.80</b>	<b>.75</b>	<b>High</b>

### 3. Data Reduction

The data collected was subject to exploratory factor analysis, Normalized varimax rotations were computed, the statistics output shows several very important parts of the output: The Kaiser- Meyer-olkin measure of sampling adequacy and Bartlett's test of sphericity. The KMO statistic (1974) recommends accepting values greater than 0.5 as acceptable (values below this should lead to either collect more data or rethink which variables to include). Furthermore, values between 0.5 and 0.7 are mediocre, values between 0.7 and 0.8 are good, values between 0.8 and 0.9 are great and values above 0.9 are superb. For these data the value is given 0.74 in table 3, which falls into the range of being good: so, we should be confident that factor analysis is appropriate for these data which is shown in table 3

**Table 3 KMO and Bartlett's Test**

KMO and Bartlett's Test			
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.746	
Bartlett's Test of Sphericity	Approx. Chi-Square	2.211E3	
	df	210	
	Sig.	.000	

Bartlett's measure tests the null hypothesis that the original correlation matrix is an identity matrix. For factor analysis to work we need some relationships between variables and if the R- matrix were an identity matrix then all correlation coefficients would be zero. Therefore, we want this test to be significant (i.e. have significance value less than 0.05). A significant test tell us that the R-matrix is not an identity matrix; therefore, there are some relationships between the variables we hope to include in the analysis For these data, Bartlett's test is highly significant (.000), and therefore the Researcher concluded that the factor analysis is appropriate.

The minimum factor loading observed was 0.306 and the maximum loading was seen to be 0.830. The seven factors that emerged out of the analysis are Entrepreneur, work, skill, individual, economic, social and wealth related factor, their respective items with the numbers and their corresponding factor loadings are given in table 4

**Table 4 Factors and the Corresponding Items with Factor Loadings**

Dimensions (Motivation)	Item No.	Items	Factor Loadings
Entrepreneur	17	To provide job to family members	.770
	18	To stay closer to my family	.758
	12	stable political and social environment	.686
	11	To utilize concession or loans from the Govt., Banks etc	.566
	16	To create job for others	.569
	13	Hard to find appropriate job	.532
Work	9	Passion	.818
	10	Self efficacy	.629
	8	To be a leader	.689
	7	To be a boss	.577
Skill	6	risk taking ability	.700
	5	previous experience	.649
	13	To do something creative/innovative	.455
Individual	2	To be free and independent	.802
	1	need of achievement	.761
Economic	14	Opportunity	.722
	19	To earn enough money to support my family abroad	.717
Social	20	To attain high social status	.830
	21	To do something different from other	.785
Wealth	3	To get more money than paid job	.530
	15	affluent life	.730

#### 4. Comparison of entrepreneur's motivation toward business starts up classified by personal factor of Indian entrepreneurs and hypothesis testing.

Table 5 reveals that the hypothesis of this study aimed to investigate whether there was a significant difference in entrepreneur's motivation toward business start-up among/between different group of personal factors. The results showed that there was a significant difference in entrepreneur's motivation towards business start-up among six personal factors including gender, age, religion and community and educational background, family background and previous occupation at a level of significance of 0.05. However, there was no significant difference in entrepreneur's motivations toward business start-up in aspect of marital status, prior income and initial investment at significant level of 0.05.

An independent-samples t-test was conducted to examine whether there was a significant difference between male and female entrepreneurs to their motivation toward business start up. Table 5 also presents the results of mean difference in expressing motivation based on gender aspect. The results revealed that there is all dimensions entrepreneur, skill, individual, economic, social, and wealth related factor are statistically significant except work related factor, The entrepreneurs related factor is statistically significant difference in perceiving motivation for male and females [ $t(340)=3.529, p=.000$ ]. For this statistically significant result, it was reported that male entrepreneurs ( $M=3.39, SD=.54$ ) significantly perceived higher level of motivation in entrepreneur related factor than female entrepreneurs ( $M= 3.20, SD = .40$ ). Work related factor, reported that female entrepreneurs ( $M=4.20, SD= .56$ ) significantly perceived higher level of motivation rather than the male entrepreneurs ( $M=4.11, SD= .51$ ).

An independent-samples F-test was conducted to examine whether there was a significant difference between different age group of entrepreneurs to their motivation toward business start up. Table 5 presents the results of mean difference in expressing motivation based on age aspect. The results revealed that the dimension in work, individual, economic and wealth related factor are statistically significant and difference in perceiving motivation for 20-30years old, 31-40years old, 41-50years old and more than 50years old [ $F(338)=2.608, p=.051$ ], [ $F(338)=7.484, p=.000$ ], [ $F(338)=4.653, p=.003$ ]. [ $F(338) =6.761, p=.000$ ]] For this statistically significant result, it was reported that age of 20-30years old entrepreneurs ( $M=4.43, SD=.45$ ) significantly perceived higher level of motivation in work related factor than the other age group of entrepreneurs. age of 31-49 years old entrepreneurs ( $M=4.43, SD=.44$ ) significantly perceived higher level of motivation in individual related factor and as shown in the result..

**Table 5** Comparison of entrepreneur's motivation toward business starts up classified by personal factor of Indian entrepreneurs

Dimensions	Entrepreneur				Work				Skill				Individual				Economic				Social				wealth				
	Mean	SD	F	Sig.	Mean	SD	F	Sig.	Mean	SD	F	Sig.	Mean	SD	F	Sig.	Mean	SD	F	Sig.	Mean	SD	F	Sig.	Mean	SD	F	Sig.	
<b>Gender</b>																													
Male	3.39	.54	3.529	.000	4.11	.51	-1.462	.145	3.75	.56	6.565	.000	4.30	.42	3.399	.001	3.81	.79	7.069	.000	4.08	.63	3.726	.000	4.43	.47	2.237	.026	
Female	3.20	.40			4.20	.56			3.33	.60			4.22	.47			3.20	.78			3.80	.71			4.31	.60			
<b>Age</b>																													
20-30	3.33	.71	1.959	.119	4.43	.45	2.608	.051	3.79	.61	1.286	.278	4.22	.59	7.484	.000	3.69	.87	4.653	.003	4.05	.76	2.478	.061	4.13	.68	6.761	.000	
31-40	3.37	.54			4.14	.54			3.60	.66			4.43	.44			3.67	.87			3.99	.66			4.42	.49			
41-50	3.21	.41			4.16	.53			3.50	.61			4.28	.45			3.57	.78			4.04	.67			4.51	.46			
> 50	3.30	.35			4.04	.84			3.58	.42			4.14	.32			3.22	.73			3.76	.68			4.17	.60			
<b>Marital Status</b>																													
Single	3.24	.49	-1.102	.271	4.42	.50	1.360	.175	3.61	.62	.392	.695	4.26	.49	-	1.112	.267	3.48	.76	-0.664	.507	3.89	.55	.791	.430	4.30	.59	-1.176	.241
Married	3.32	.49			4.13	.53			3.58	.61			4.33	.44			3.57	.85			3.97	.69			4.39	.52			
<b>Religion and Community</b>																													
Hinduism	3.39	.58	4.314	.001	4.16	.52	2.780	.018	3.66	.67	1.806	.111	4.38	.48	2.382	.038	4.06	.55	53.880	.000	4.09	.60	4.211	.001	4.47	.46	3.466	.005	
Christianity	3.04	.49			4.44	.50			3.81	.18			4.56	.39			3.72	.71			4.00	.50			4.28	.62			
Islam	2.96	.33			3.99	.50			3.51	.49			4.32	.34			3.87	.97			3.97	.72			4.34	.53			
Buddhism	2.96	.42			3.55	.72			3.20	.51			4.00	.00			3.30	1.30			3.20	.91			3.90	.102			
Sikhism	3.31	.35			4.17	.53			3.60	.56			4.27	.43			2.88	.64			3.82	.73			4.32	.57			
Other	3.17	.19			3.75	.29			3.67	.38			4.00	.00			3.50	.00			4.50	.00			3.75	.29			
<b>Educational Qualification</b>																													
Higher Diploma	3.28	.52	1.433	.223	3.95	.47	3.334	.011	3.43	.57	3.264	.012	4.21	.36	1.904	.109	3.19	.85	4.965	.001	3.73	.78	2.734	.029	4.40	.50	1.291	.273	
Bachelor Degree	3.28	.40			4.15	.53			3.56	.58			4.35	.43			3.59	.82			3.99	.61			4.35	.50			
Master Degree	3.40	.53			4.25	.54			3.69	.65			4.35	.51			3.72	.78			4.06	.69			4.47	.56			
Doctoral Degree	3.00	.00			4.17	.14			3.11	.38			4.17	.29			3.17	.29			4.33	.58			4.33	.58			
Under Board	3.42	1.02			4.25	.64			3.92	.82			4.54	.62			3.92	1.06			4.04	.78			4.17	.81			
<b>Previous occupation</b>																													
Unemployed	3.13	.48	4.809	.001	4.03	.55	2.286	.060	3.15	.69	9.837	.000	4.22	.40	2.497	.043	3.57	.95	4.968	.001	3.78	.76	2.319	.057	4.39	.43	5.645	.000	
Employee	3.33	.55			4.14	.51			3.72	.56			4.37	.46			3.70	.83			4.03	.64			4.40	.52			
Entrepreneur	3.40	.30			4.17	.52			3.53	.53			4.38	.45			3.35	.73			3.98	.76			4.52	.47			
other	2.85	.50			4.03	.49			3.71	.28			4.06	.50			3.25	.80			3.50	.46			3.63	.52			
Missing	3.47	.27			4.40	.62			3.44	.70			4.26	.37			3.09	.64			3.94	.66			4.26	.70			

Table 5 (Continued)

Dimensions	Entrepreneur				Work				Skill				Individual				Economic				Social				wealth			
	Mean	SD	F	Sig.	Mean	SD	F	Sig.	Mean	SD	F	Sig.	Mean	SD	F	Sig.	Mean	SD	F	Sig.	Mean	SD	F	Sig.	Mean	SD	F	Sig.
<b>Prior Income</b>																												
Up to 100,000	3.34	.60	2.928	.035	4.22	.56	2.928	.652	3.72	.66	1.191	.314	4.30	.50	1.888	.133	3.77	.89	0.685	.562	3.96	.68	0.929	.428	4.27	.62	1.616	.187
100,001-400,000	3.30	.53			4.13	.51			3.69	.55			4.40	.46			3.67	.83			4.04	.66			4.42	.52		
400,001-700,000	3.76	.59			4.21	.55			4.00	.60			4.21	.26			3.96	.62			4.04	.58			4.29	.40		
Above 700,000	3.12	.77			4.00	.29			3.81	.38			4.07	.53			3.50	.65			3.64	.80			4.07	.45		
Missing	3.03	.79			3.33	.71			3.24	.55			4.02	.67			3.44	.72			3.03	.98			4.06	.42		
<b>Initial Investment</b>																												
Up to 500,000	3.16	.47	6.092	.000	4.09	.53	0.771	.545	3.44	.56	5.800	.000	4.35	.41	0.390	.816	3.83	.79	5.584	.000	3.97	.69	0.268	.899	4.44	.53	0.677	.608
500,001-1,000,000	3.47	.49			4.16	.51			3.83	.58			4.31	.49			3.67	.87			4.05	.68			4.44	.49		
1,000,001-1,500,000	3.43	.49			4.22	.53			3.55	.67			4.36	.50			3.24	.79			4.05	.67			4.42	.44		
Above 1,500,001	3.56	.66			4.10	.43			3.87	.63			4.32	.37			3.54	.85			4.11	.54			4.34	.58		
Missing	3.37	.64			4.06	.38			3.33	.72			4.20	.27			3.80	.57			4.10	.74			4.50	.50		
<b>Father's Occupation</b>																												
Employee	3.25	.48	18.039	.000	4.10	.48	1.043	.374	3.65	.57	8.797	.000	4.28	.45	4.262	.006	3.89	.67	50.327	.000	4.07	.58	8.428	.000	4.33	.56	4.171	.006
Entrepreneur	3.27	.37			4.17	.54			3.47	.58			4.30	.44			3.18	.77			3.84	.72			4.35	.53		
Retired	3.87	.81			4.24	.60			4.02	.76			4.54	.43			4.53	.44			4.41	.57			4.66	.47		
Other	3.18	.36			4.01	.53			3.63	.47			4.50	.49			4.06	.48			3.94	.51			4.53	.44		
<b>Mother's Occupation</b>																												
Unemployed	3.11	.35	4.451	.002	4.37	.46	1.959	.100	3.54	.50	3.242	.013	4.31	.43	1.680	.154	4.12	.67	8.790	.000	4.02	.72	2.795	.026	4.57	.40	0.855	.491
Employee	3.23	.47			4.18	.52			3.74	.59			4.28	.50			3.76	.77			3.95	.69			4.43	.53		
Entrepreneur	3.26	.35			4.15	.55			3.33	.61			4.34	.48			3.03	.72			3.78	.65			4.36	.48		
Retired	2.92	.69			3.83	.51			3.60	.70			4.00	.33			3.50	.97			3.50	.65			4.40	.52		
House Wife	3.39	.52			4.13	.53			3.61	.61			4.36	.43			3.58	.83			4.04	.66			4.36	.56		
<b>Spouse Occupation</b>																												
Unemployed	3.02	.29	6.514	.000	4.28	.41	1.671	.156	3.58	.35	9.994	.000	4.38	.23	3.706	.006	4.00	.60	11.020	.000	4.19	.46	2.342	.055	4.31	.26	1.569	.182
Employee	3.29	.46			4.19	.52			3.74	.52			4.38	.44			3.72	.79			4.03	.64			4.36	.51		
Entrepreneur	3.20	.40			4.13	.56			3.31	.61			4.28	.46			3.19	.76			3.85	.74			4.37	.56		
House Wife	3.50	.58			4.07	.52			3.76	.58			4.42	.42			3.85	.86			4.08	.67			4.48	.49		
Other	3.26	.49			4.29	.48			3.63	.65			4.13	.50			3.50	.75			3.85	.56			4.26	.64		

## Conclusion

The study identified the dependent variables which includes need of achievement, desire to be free and independent, can get more money than paid job, do something creative/innovative, ability to use my past experience, risk taking ability, want to be my own boss, want to be a leader, passion, want to prove I can do it, to utilize the concessions or loans from the Government, Banks etc., stable political and social environment, hard to find appropriate job, found an opportunity to serve the market, needed affluent life, to create job for other, to provide job to family members, to stay closer to my family, to support my family abroad, attain high social status, to do something different from others. The dependent variables are gender, age, marital status, religion and community, educational qualification, family background (Father's occupation, Mother's occupation and Spouse occupation), previous occupation, prior income and initial investment.

To acquire the required information, data was collected from the questionnaires. A total of 400 sets of questionnaire were distributed by hand, while the response rate was 85.5% or 342 sets of completed questionnaires were returned. The collected data is analyzed by using the statistical tools included, percentage, and arithmetic mean, standard deviation, sample t-test, one-way analysis of variance (ANOVA), F-test.

Most of the respondents were males. Most of the respondents were aged between 31- 40years old, and the smallest group consisted of respondents who were 50 years old or above, the highest proportion of respondents had bachelor's degrees, diploma degrees, and master's degrees. The majority of respondents reported they were belong to Hinduism religion and Sikh respectively, The most of respondents father's occupation is entrepreneurs, mother's occupation is house wife and spouse occupation is entrepreneur and house wife respectively. The respondents who were running their own business in Bangkok more than 6 years were considered as the largest group, followed by the respondents who had work experience of up to 5 years, 6-10 years and respectively. Entrepreneurs who had highest range of early previous income 100,000-400,000 baht yearly and the majority of group did not respond about the previous income due to feeling unsecured, while the most of respondents who are engaged in service business, manufacturing business, food business respectively.

The hypothesis of this study aimed to investigate whether there was a significant difference in entrepreneur's motivation toward business start-up among/between different group of personal factors. The results showed that there was a significant difference in entrepreneur's motivation towards business start-up among six personal factors including gender, age, religion and community and educational background, family background and previous occupation at a level of significance of 0.05. However, there was no significant difference in entrepreneur's motivations toward business start-up in aspect of marital status, prior income and initial investment at significant level of 0.05.

## Research implications

This research highlights the factors which motivated Indian entrepreneurs to make a decision to start a business in Bangkok area. The findings of this research will be useful for policymakers in their decision making. A clear understanding of immigrant entrepreneurial motivation can be translated into efficient distribution of funding and grants As an example of the positive application of this sort of research, policymakers can try to ensure more immigrant entrepreneurs are 'visible' as role models and are shown in advertisements and the like, so that other potential immigrant entrepreneurs can view them as role models.

This study shows that skilled migrants can become motivated to pursue entrepreneurship because of previous occupation of Indian entrepreneurs are significantly effect on motivation toward business start up as well as religion and community also have significant impact on Immigrants who are looking for opportunity in the market. And also because many feel that they can earn more money in self employment. The Immigration Department can use the findings of this research to promote entrepreneurship as a positive alternative for skilled migrants. Thailand future prosperity depends on how it uses its limited skilled labor force. If skilled migrants find themselves underemployed in the labor force or migrants feel that they can increase their income

through self-employment, then entrepreneurship should be encouraged. It will be a more viable option for the individual and for the Thailand economy.

This research will provide valuable Information to both academic and business practitioners in terms of business start-ups motives and driving factors in developing country such as Thailand. They will gain a deeper understanding of the reasons why Indian immigrants in Thailand chose self-employment. The immigration department can use the results to determine whether the skilled migrants who are venturing into entrepreneurship are doing so because of what motivational factor motivate them.

### **Limitations of the Study**

It is appropriate to address the difficulties and limitations that occur in the undertaking of the research.

This study was limited to motivation of only those entrepreneurs who are running their businesses in Bangkok province which are located in Phahurat, Sukhumvit, silom and Patunam. There were more entrepreneurs of other province, such as Chiangmai, Phuket and Pattaya etc. As this study was conducted with only 342 entrepreneurs from Bangkok are located in Phahurat, Sukhimvit, silom and Patunam., the findings may not be applied broadly to all entrepreneurs from Thailand may be other than the Bangkok area. But most of Indian population residing or running their businesses in Bangkok province.

First, limitation is due the difficulty to access respondents. Since respondents are entrepreneurs, business owners, executive or decision-makers, it is not easy and simple to approach, contact, and get information due to their time constraints and work load even they are willing to answer.

Second, limitation occurs when some respondents are not willing to give information about initial investment or information relating to financial issues due to a concern of confidentiality.

### **Recommendations for Further Studies**

This research is conducted only Indian entrepreneurs who are currently running their businesses in Bangkok area. Moreover there are numerous theories referring to factors motivating entrepreneurs to make a decision to start a business while study focused only three sets of factors: Bio-characteristics which are composed of age, gender, marital status and religion & community and Socio-Demographic which are composed of educational background, family background and previous occupation and Economic Variables which are composed of prior income and initial investment. Although the researcher used descriptive research using structured questionnaire to collect data. Moreover, this research stated on only motivational factors on entrepreneurs business start-ups but not on determinants of start-ups success or obstacles in setting up a business internationally. Consequently, recommendations for further research as follows:

- A study to explore more motivational factors (dependent variables) rather than those found in the research that affect business start-ups likewise need of achievement, to be free and independent, to get more money than paid job, to do something creative/innovative, previous experience, risk-taking ability, to be a boss, to be a leader, passion, self-efficacy, to utilize concessions or loans from the government, Banks etc., stable political and social environment, hard to find appropriate job, opportunity, affluent life, to crate job for others, to provide job to family members, to stay closer to family, to earn enough money to support family abroad, to attain high social status, to do something different from other.
- A study to focus only male or only female entrepreneurs besides both.
- A study that uses more in quantitative and qualitative techniques
- A study that uses more effective collecting data instruments that can improve response rate.
- Similar entrepreneurs based studies could be carried out in other countries and ethnic group.

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# Perceived Embeddedness by Shoppers at Farmers' Markets in the Czech Republic

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## Abstract:

This paper addresses some of the key aspects of the perceived embeddedness in alternative food networks, making a direct link between theory and empirical research. To more fully understand the concept of embeddedness and its role in food chain and regional development, perceived embeddedness benefits of shopper at farmers markets were investigated. Through the empirical research conducted on shoppers at all 11 farmers market in Brno, Czech Republic, it was found that the shoppers' satisfaction was not only influenced by tangible aspects, such as the product experience attributes and the comparative price convenience, but that satisfaction is also influenced by the complementary impact of an intangible factors of perception of social, spatial and natural embeddedness. By the shopping at the farmers market consumers demonstrate preference not only for fresh and tasty food, but also their willingness to support local production and community.

## Key words:

Embeddedness perception, ethical consumption, alternative food chains, farmers markets, regional development

## Introduction

Growing globalization and integration of agro-food systems have led to significant changes in food production and consumption patterns and its social contexts. O'Hara and Stagl (2001) define four fundamental characteristics of the development of these global network structures: industrialization and concentration; dependence on symbols particularly money; reliance on expert systems; and spatial and temporal independence. While in the traditional systems of food production and consumption took place within a given location-specific set of biophysical and cultural constraints, in integrated systems are becoming spatially and culturally independent. Growing interest in the quality of food including ethical concerns about environmental and social effect of food production systems reflects increasing awareness of consumers about human dependence on the natural systems. A popularity and growing number of alternative food markets and local producer/consumer networks can be regarded as an effort to return the focus back to the context specific ecological and social factors that global markets tend to externalize.

Reasoning in this paper starts from the premise that individual food consumption decisions can have a wide variety of social welfare consequences, including not only effects on the health, environment, productivity, labor conditions, farm and industry structure, but also regional community development. The conscious (ethically minded) consumers feel accountable towards the society and the environment, and they seek to express their values and preferences through their shopping habits. Thus ethical consumption can be seen as a tool to social change and transition to sustainable global and regional economies. However within globalized agro-food networks consumers face growing uncertainty with respect to food quality characteristics. The links of trust and direct relations between consumers and producers have vanished, which complicates attempts to match food choices with preferences. Beck's (1992) social theory predicts that in situations of increasing distrust, alternative

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movements will emerge as consumers get organized to overcome their sense of unreliability and insecurity. In response to the evidence, that the conventional food system is no longer meeting the goals and values of many consumers, there has been a development and growth of alternative food networks (AFN) also in the Czech Republic. AFN reconnects farmers and consumers, and contributes to resilience and sustainability of food systems.

According to Lamine (2005) local food systems are developed to provide consumers with both access to fresher food and knowledge about where and how their food was produced. The growth of localized food systems are seen to bring life to rural areas, increasing the connection between those who produce the food and those who consume it. Marsden et al. (2000) stress that farmers also benefit from local food systems with direct marketing that allows for an improved economy and at the same time it ensures, if wanted a higher contribution to the community. So when assessing potentials of local food systems questions raises about the real efficiency of AFN, and the relationship between talk and action.

In order to perceive added value from a local food, consumers should recognize a problem with local food production and become involved with the local community welfare issue. Thus the management of information from agriculture and the food industry requires that the target population be identified and their specificities are well understood and taken into account so as to make information meaningful, useful and effective. If consumers do not see the relevance of embeddedness attributes upon which the product is positioned, then the local product will not satisfy relevant need. Thus the current debate about development of alternative food networks needs the consumer behavioral perspective as one of the points of departure.

Future success, either from an agro-food industry, public policy or research point of view, depends on a better understanding of the motives, perceptions, attitudes and behavior of consumers at the alternative food networks. The goal of this paper is to define and discuss some of the key aspects of the perceived embeddedness in alternative food networks. To better understand the concept of embeddedness and its role in food chain and regional development, the perceived embeddedness of shoppers was investigated at farmers market in Brno, Czech Republic, making a direct link between theory and practice.

## **Theoretical background, material and methods**

The evaluation of food quality plays a major role for consumers in determining food purchases. The quality characteristics of food that may enter the utility function of the consumer can be grouped into (1) *experience (intrinsic) attributes* such as freshness, taste, visual appeal, package, etc., and (2) *credence (extrinsic) attributes* related to nutritional value, places and methods of production, use of certain substances, environmental impact and, in a broad sense, the level of safety and local community effects associated with the product. Within the globalized agro-food system, consumers' food choices are increasingly influenced by credence cues, which are difficult or, in some cases, impossible to detect, both before and after the purchase. Several studies (Miškolci 2011, Moser et al. 2011, Grunnert 2005, Deliza and MacFie 1996) confirm that in many post-industrial societies credence food characteristics, such as the health aspects, origin or environmental aspects, are becoming increasingly important to consumers. As consumption provides no information, in order to match food choice with preferences, the consumer is reliant on third-party or external information to identify the existence of the attribute in the product. Quality signals, such as product information and labels, help transform credence characteristics into search attributes, thereby enabling buyers to better communicate preferences via markets. From this perspective, Rabinowicz (1999) describes labels primarily as a tool of direct consumer information that may help reduce information asymmetry. While some studies consider labelling to be the least costly and least restrictive method of information asymmetry solution in cases where credence attributes are involved (Henson and Caswell 1999, Caswell and Mojduszka 1996), other studies (see for example Blandford and Fulponi 1999), indicated that labelling can be costly, in particular, when independent certification and traceability are required in order to guarantee product content and performance as expected by the market. Moreover Magat and Viscusi (1992) argue that

information policy such as labeling generally is not very effective, and there are some circumstances, such as when people do not read, understand or do not care about the information on the label, in which it may not be effective at all. Bray et al. (2010) highlights for example the problem of so called “green washing”, when the high number of companies exploit the concept of environmental friendly, without any care of the environment, leading to the lack of confidence to ethical products and finally the sense of guilt to support these exploited groups. Yet almost all authors agree that consumer’s education, communication, and the lack of trust are significant concepts for the shortcoming of ethical consumption. Farmers’ markets, food cooperatives, and other direct marketing schemes are part of this trend to regain a degree of reliability and trust.

From these perspectives, short supply chains seek to redefine the producer-consumer relation by giving clear signals as to the credence characteristics of the food product. Notable here are the additional identifiers which link price with quality criteria and the construction of food quality, based on consumer own experience and knowledge. Marsden (2000) indicates, that the common characteristics is the emphasis upon the type of relationship between the producer and the consumer in these supply chains, and the role of this relationship in constructing value and meaning, rather than solely the type of product itself. The successful translation of this information allows products to be differentiated from more anonymous commodities and potentially to command a premium price if the encoded or embedded information provided to consumers is considered valuable. Thus new sources of value added that can be captured locally, and so stimulate rural economic regeneration.

Despite of growing number of important research studies of shoppers’ perceived embeddedness at farmers markets (Cassia et al. 2014, Spilkova et al. 2013, Spilkova and Perlin 2013, Chen 2013, Feagan and Morris 2009), Chen and Scott (2014) identified a lack of consistency in market embeddedness conceptualization and measurement of perceived embeddedness. They define perceived embeddedness as a latent multidimensional construct reflected in the spatial, social and natural dimensions. Thus for the purpose of investigating the shopping motivation and perceived benefits at the farmers markets, the following categorization of perceived embeddedness can be used (see also in Feagan and Morris 2009):

1. *Perceived spatial embeddedness* - refers to shoppers’ perceived connection between them and local food including buying: fresh, tasty and healthy local food, supporting local production, supporting local community.
2. *Perceived natural embeddedness* - shoppers perceived connections between them and nature, including positive impacts on agro-biodiversity and reduction in the use of agrochemicals for organic production: education about agricultural production, environmentally more sensitive production.
3. *Perceived social embeddedness* - shoppers’ perceived social interaction between actors at farmers markets: buying directly from farmers (knowing and talking with farmers), participation in local cultural events, recovering of public spaces.

Though empirical analysis conducted on shoppers at 11 farmers’ markets (FM), this study analyzes consumer perceived embeddedness at farmers’ markets in Brno, Czech Republic. The draft survey was pre-tested with 40 shoppers at two farmers’ markets in Brno, who were asked to complete the draft questionnaire and discuss the items in the questionnaire for comprehension, logic, and relevance. On the basis of their comments, the items for perceived embeddedness measurement were refined. As a result of this measurement development process, final version of the perceived embeddedness measure was divided into 2 categories: perceived individual benefits and perceived community benefits of shopping at FM. Perceived individual benefits measure contained 8 items: 4 items assessing the perceived spatial embeddedness, 3 items assessing the perceived natural embeddedness, and 2 items assessing the perceived social embeddedness; and perceived community benefits contained

5 items: 2 items assessing the perceived spatial embeddedness, 2 items assessing the perceived natural embeddedness, and 1 item assessing the perceived social embeddedness. Each respondent was asked to indicate perceived benefits in above mentioned categories. From total number of indicated benefits in each category, the weights for each item and category was calculated. Here it is worth pointing out that the hierarchical structure of the perceived embeddedness items implies that the weightings obtained for each sub-category should always add up to one (i.e.:  $W_{\text{spatial}}+W_{\text{natural}}+W_{\text{social}}=1$ , etc.).

## Results and discussion

Primary data was collected by Taušová (2014) through the use of a survey questionnaire administered through a personal interview of 458 customers at farmers markets in Brno, in South Moravia region, Czech Republic. The survey was conducted in the period August–November 2013. The survey sample of farmers' market shoppers provided by this research reflects those that shop in all 11 farmers' market places in Brno (Bystrc, Kotlářská Street, Královo pole, Líšeň, Medlánky, Moravany, Římské náměstí, Slatina, Starý Lískovec, Zelný trh, Židenice). Data collection took place at the venue of farmers' markets. Quota sampling of respondents was conducted during a particular day in market so as to best represent the core set of buyers in the market. The demographic profile of survey sample farmers' market shoppers indicates that they are more likely to be female (65 % of total sample) at the age level 31 – 50 years, they are mostly urban dwellers (87 % of the total sample stated Brno as a place of residence). Respondents indicated that farmers' markets are only a complementary option for food purchasing, and the average expenditure 5 106 CZK/month for food. Mean of maximum willingness to spend for food in FM is 780 CZK. This represents in average up to 10 – 15 % of total food expenditure stated by respondents.

The construct of perceived embeddedness of FM shoppers was measured by the stated benefits in two categories: (1) perceived individual benefits and weight of each attribute from stated individual benefits ( $w_i$ ), (2) perceived community benefits and weight of each attribute from stated individual benefits ( $w_c$ ). Consequently the total weights for each attribute ( $w_i$ ) were calculated from the total number of perceived benefits indicated by respondents. The results - the share of respondents that perceived certain embeddedness category and issue, and partial and total weight of each embeddedness attribute are shown in Table 1 and Table 2.

### Perceived individual benefits analysis

Results of embeddedness analysis indicate that 96 % from the total number of respondents perceive individual spatial embeddedness benefits. This represents the weight of 0,78 from the perceived individual benefits of FM and 0,45 from the total stated benefits. As the most important spatial embeddedness benefits in this category were indicated access to fresh food (78 % of respondents,  $w_i = 0,3$ ;  $w_i = 0,17$ ) and possibility to buy products directly from farmers (69 % of total sample).

Natural embeddedness individual benefits of FM are perceived by 35 % of respondents (partial weight from perceived individual benefits 0,17; and total perceived benefits weight 0,09), where the most important factor is to gain access to healthy food (stated by 30 % of respondents). Perception of social embeddedness benefits such as participation in local cultural events and exceptional social experience was indicated by 15 % of respondents.

**Tab1: Perceived individual benefits of shoppers at farmers market**

<b>Perceived individual benefits</b>	<b>Share of respondents</b>	<b>Perceived individual benefits weight (<math>w_i</math>)</b>	<b>Total perceived benefits weight (<math>w_t</math>)</b>
<b>Perceived spatial embeddedness</b>	<b>96,30%</b>	<b>0,777</b>	<b>0,4410</b>
Access to fresh food	77,78%	0,292	0,1656
Access to tasty food	57,08%	0,215	0,1215
Trust - buy directly from farmers	68,85%	0,257	0,1466
Others - specific products	3,49%	0,013	0,0073
<b>Perceived natural embeddedness</b>	<b>35,08%</b>	<b>0,167</b>	<b>0,0923</b>
Access to healthy food	29,63%	0,116	0,0631
Information - more information about process of production	13,73%	0,051	0,0292
<b>Perceived social embeddedness</b>	<b>15,25%</b>	<b>0,056</b>	<b>0,0325</b>
Participation in local cultural events	13,29%	0,049	0,0283
Others - social experience	1,96%	0,007	0,0042

*Perceived community benefits analysis*

Results of perceived community benefits analysis of shoppers at farmers markets show that again the most of respondents (94 %) perceive spatial embeddedness benefits in this category, when the support production of local farmers was considered as the most important perceived community benefit of shopping at farmers markets ( $w_c = 0,46$ ;  $w_t = 0,20$ ). Almost half of respondents (46 %) also indicated perception of natural embeddedness community benefits, namely in form of increasing knowledge about process and seasonality of local agricultural production (38 % of respondents). Perceived social embeddedness community benefits in form of local community support indicated 21 % of respondents.

**Tab 2: Perceived community benefits of shoppers at farmers markets**

<b>Perceived community benefits</b>	<b>Share of respondents</b>	<b>Community perceived benefits weight (<math>w_c</math>)</b>	<b>Total perceived benefits weight (<math>w_t</math>)</b>
<b>Perceived spatial embeddedness</b>	<b>93,68%</b>	<b>0,613</b>	<b>0,2663</b>
Support of production of local farmers	93,03%	0,456	0,1981
Recovering of public spaces	32,03%	0,157	0,0682
<b>Perceived natural embeddedness</b>	<b>46,41%</b>	<b>0,284</b>	<b>0,1234</b>
Increasing knowledge about process and seasonality of local agricultural production	38,13%	0,187	0,0812
Support of environmental-friendly production	19,83%	0,097	0,0422
<b>Perceived social embeddedness</b>	<b>20,92%</b>	<b>0,103</b>	<b>0,0445</b>
Local community support	20,92%	0,103	0,0445

The main theoretical implication of these findings is to support the discussion about more comprehensive conceptual definition (Chen 2013, Feagan and Morris 2009) that views perceived embeddedness as a multi-dimension construct consisting of three dimensions: social, spatial, and natural embeddedness. Obtained results support the hypothesis, that demand for foods is increasingly being influenced by complex group credence attributes, which are difficult or, in some cases, impossible to detect. Consumer preferences for embeddedness issues of food production can be expressed via their food purchases at the farmers markets. Based on the obtained results, the following preference ordering of perceived embeddedness benefits of shopping at farmers markets can be derived:

1. Support of production of local farmers
2. Access to fresh food
3. Trust - buy directly from farmers
4. Access to tasty food
5. Increasing knowledge about process and seasonality of local agricultural production
6. Recovering of public spaces
7. Access to healthy food
8. Local community support
9. Support of environmental-friendly production
10. Information - more information about process of production
11. Participation in local cultural events
12. Others - specific products
13. Others - social experience

## **Conclusions**

Farmers' markets have a long tradition in the Czech Republic. Growing popularity of this form of Alternative Food Networks during the last 5 years can be explained as a response to the lack of consumer confidence for the current globalized systems agro-food production, and also as part of an ongoing process of multifunctional transformation of European rural areas, which includes the restoration of relations between urban and rural areas. From this point of view, farmers' markets can contribute to economic growth in rural areas, health and social capital of the community. However in order to fully exploit the potential FMs for the sustainable development of the regions, it is necessary to take into account the specifics of regional production systems and networks along with the views and demands of customers. The failure to acknowledge consumers as active partners in the emergence of AFNs is often paralleled by the limited analysis of the social relations of consumption.

Farmers' markets should not be only seen as a place to buy "fresh food directly from the source" but also as a means to express consumer values associated with embeddedness of food production, the 'replacement' of food within its social, cultural, economic, geographical, and environmental contexts.

Through the empirical research conducted on 458 shoppers at all 11 farmers market in Brno, Czech Republic, it was confirmed, that the shoppers' satisfaction and perceived benefits of shopping at the FMs are derived also from an intangible factors of perception of social, spatial and natural embeddedness. By the shopping at the farmers market consumers demonstrate preferences not only for fresh and tasty food, but also their willingness to support local production and community. According to the preference ordering of perceived embeddedness benefits, the most important motive for shopping at farmers market is local farmers' production support. Although sales from farmers' markets make up a relatively small percentage of total food sales in the Czech Republic, the increasing numbers and popularity of AFNs generally and their social and economic benefits indicate a need to address their potential. The findings in this study might offer useful insights for several actors of regional development, including public policy makers, public organizations, farmers' markets organizers and traditional retailers.

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# Innovation as a key factor in sustainable rural and agricultural development<sup>2</sup>

Danka MORAVČÍKOVÁ<sup>3</sup>

Izabela ADAMIČKOVÁ<sup>4</sup>

## Abstract

The paper is concerned with the distinctive issues (challenges, opportunities, needs and problems) of implementing innovations in rural and agricultural development, in order to describe and analyze the general context as well as the specificities of the situation in Slovakia. The paper is based on a document analysis and is divided in several thematic sections. The conceptual framework, basic characteristics and key questions addressed in the first section relate to the role of innovation and knowledge that is required to support the future prosperity of rural areas and agriculture based on the principles of the new paradigm of their development. The changes in strategic orientations that have resulted in the reformed Common Agricultural Policy (CAP) and new rural development policy of the EU are characterized, particularly in terms of the shift from the modernisation paradigm to a sustainability perspective. Secondly, the specificities of rural areas and agricultural sector in relation to the transfer of innovations are discussed emphasizing the systemic, cross-sectoral and territorial aspects of innovation processes. Next parts of the paper are aimed at presenting the performance and types of innovation in modernising rural economy and agriculture, and at describing the general principles of innovation policy. The fifth section of the paper is dedicated to explaining the important role of different actors in promoting innovations in contemporary rural and agricultural development. Finally, the authors interpret the policy measures, indicators and key information about the innovation performance in the EU.

## Keywords:

Transfer of innovation, sustainable rural development, rural and agricultural innovation, SMEs, innovation performance

## Introduction

Sustainable rural and agricultural development is increasingly related to the capacities of global, national, regional and local economies to change and to innovate. For rural areas and agricultural sector, innovations are widely regarded as one of the most important factors of their increased competitiveness, and promotion of innovation is a central feature and main priority in the Europe 2020 strategy. Innovation is not restricted to new practices or behaviours or new products only, it is also about improving and upgrading the existing ways of “doing something” or about new processes and thus about “doing old things in a new way”. The innovative approach to sustainable development of rural areas and agriculture is an interactive process involving multiple stakeholders and different source of knowledge and information. The economic structure of rural areas and agrarian structure is mainly made up of SMEs; therefore, the external input and public investment may be needed.

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Agricultural development is determined by innovations that represent a basic source of productivity, economic growth and competitiveness, and generally play an irreplaceable role in creating jobs, poverty reduction, global food security, environmental sustainability and driving the socio-economic development. According to The Innovation Policy Platform<sup>5</sup> "innovation in the agricultural sector involves the development of healthier, safer and more nutritious food for human and animal consumption, new breeding techniques, and fuel for industrial use. Agricultural innovation has the potential to increase the productivity and adaptability of crops, diversify the variety of agricultural crops, enhance the nutritional value of food, feed increasing farm animal populations, and provide fuel for a growing range of industrial uses without depleting available land, water and biodiversity resources."

It is a process through which agrarian companies improve their production and management practices. A key challenge is to support (Knickel et al., 2009):

- improvement in the processing, marketing and value added capacity of agriculture;
- exploration of new opportunities in new rural and environmental services and non-food production.

From the societal point of view, following issues are mostly emphasized:

- resilience of production systems,
- provision of rural amenities,
- enhanced environmental protection,
- occupational safety,
- hygiene and animal welfare.

Innovation is a fundamental challenge for the European agriculture, involving not only technical or technological approaches, but also strategy, marketing, organisation and design. In fact, innovation by farmers, for example, results from their different forms of thinking and doing things, as well as recombining existing knowledge in an innovative way. Innovation is about solving problems and taking advantage of opportunities, and is characterised by a combination of technical, economic, organisational and external drivers. Innovation takes place when the network involved in the production changes how they do things, which suggests innovation entails the patterns of interactions between people, tools and resources. Moreover, a learning process is also associated to innovation processes, as changes which result in improvements in social or economic organisation, also increases the available knowledge. (Klerkx, Gildemacher, 2012) Making rural areas more attractive requires promoting sustainable growth, creating new job opportunities as well as facilitating the access to information and communication technologies (ICTs).

There are several important challenges of designing the rural and agricultural innovation system for the twenty-first century that are different in comparison to the previous period (e.g. in terms of changed position of the public sector and the new structure of actors, such as private research institutions, advisory services, as well as civic organisations).

### **Changes in developmental paradigms and policies**

Several European Union policies have an impact on rural areas<sup>6</sup>:

- *Common Agricultural policy (CAP)* and *Rural Development Policy (RDP)* in general;
- the LEADER initiative;
- *Regional policy* and *Cohesion Policy*, whose objectives are to reduce development disparities between regions;

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<sup>5</sup> Available at: <https://innovationpolicyplatform.org/content/agriculture?topic-filters=11399>

<sup>6</sup> Rural Europe: Definitions, Issues and Policies (2007)

- sectoral policies (for transport, the promotion of communications technologies, the environment, etc.) - these policies are not specifically applicable to rural areas, but broadly affect them.

The competencies and responsibilities for sustainable rural development are given to different administrative levels. National authorities are responsible for coordination, the development of strategies and policies and the settings of the framework conditions for sustainable development. While regions of the European countries (e.g. districts, cantons, statistical or self-governing regions etc.) are responsible for territorial planning, strategic programming and implementation, the municipalities are in charge of local development and spatial planning.

Contemporary RDP has to evolve beyond the traditional model with exclusive focus on agriculture. It comprises more strategies with spatial context, that prioritize the investments over subsidies, and that encourage a multi-stakeholder approach and policy framework. There is a visible shift from an agricultural-based development to a more integrative rural and regionally based development. According to Høst (2013) the new rural paradigm is used to describe a rather diverse mix of initiatives in rural development. From single businesses build around new products and service innovations, to heavy institutionalized and bureaucratic development strategies at state and also above state level. The new rural paradigm is a new term stemming from an OECD conference and following publication (Tab. 1). It co-exists with other and often contradictory paradigms. For some the new rural approach is a supplement, for others it is seen as a rebellion against a large-scale agriculture and big business biased development agenda.

**Tab.1 New and old approach to rural policy**

Old approach		New approach
<b>Objectives</b>	Equalisation, farm income, farm competitiveness	Competitiveness of rural areas, valorisation of local assets, exploitation of unused resources
<b>Key target sector</b>	Agriculture	Various sectors of rural economies (e.g. rural tourism, manufacturing, ICT industry, etc.)
<b>Main tools</b>	Subsidies	Investments
<b>Key actors</b>	National governments, farmers	All levels of government (supra-national, national, regional, and local), various local stakeholders (public, private, NGOs)

Source: OECD (2006). *The New Rural Paradigm: Policies and Governance*

It is widely declared and believed that the future prosperity of rural areas will be driven by enterprise, innovation and new technologies, tailored to markets and applied to new and old industries. (OECD, 2006) The economic crisis that erupted in 2008 has resulted in the long-term discussion (OECD conferences in 2009, 2010, 2012) about the best approaches to future rural development. Two overlapping categories of premises were identified – four areas of opportunity (tourism, forestry, renewable energy and local foods), and four areas of vulnerabilities (demographic change, climate change, declining fiscal resources and single industry towns) – as well as the necessity to innovate and modernise the rural economy. Contemporary RDP should work in a coordinated and complementary manner with other elements of the CAP, as well as with other EU funds. In this context, RDP retains the long-term strategic objectives of contributing to the competitiveness of agriculture, the sustainable management of natural resources and climate action and the balanced territorial development

of rural areas. In line with the *Europe 2020* strategy, these broad objectives of rural development support for 2014-2020 are given more detailed expression through the following six EU-wide priorities (Rural Development in the EU 2012): (i) fostering knowledge transfer and innovation in agriculture, forestry and rural areas; (ii) enhancing competitiveness of all types of agriculture and enhancing farm viability; (iii) promoting food chain organization and risk management in agriculture; (iv) restoring, preserving and enhancing ecosystems dependent on agriculture and forestry; (v) promoting resource efficiency and supporting the shift towards a low-carbon and climate-resilient economy in the agriculture, food and forestry sectors; (vi) promoting social inclusion, poverty reduction and economic development in rural areas.

The initiative ARC 2020 (Agricultural and Rural Convention)<sup>7</sup>, in its campaigning related to the future CAP, has called for:

- a paradigm shift in agriculture and food systems from the unsustainable, resource-intensive model to sustainable farming and diversified pattern of regional and local production and processing of food;
- a social, economic and environmental renaissance of rural areas, linked effectively to place-based territorial development and with a particular focus on the great outlying regions which have been losing population and which need stronger and more diversified economies in order to thrive. (Dower, 2013: 1-2)

One of the main experts and representatives of this initiative formulated the key challenges and priorities for rural development in the EU in the programme period 2014-2020: “Rural development must have a strong place among the effective instruments supporting territorial development. It is vitally important, because of the contribution which rural areas can make to Europe's long-term prosperity, and the need to address gross social and economic disparities. It must be focused upon the specific character and needs over each rural area. It must embrace a wide scope of social, economic and environmental action. It must be effectively linked to regional and urban development. It must be based on partnership between the public, private and civil sectors, and within each of those sectors. It should fall within a broader framework of rural policy. If these requirements are met, the rural regions of Europe may indeed be able to make the full contribution to achieving the *EU 2020* goals of smart, inclusive and sustainable growth.” (Dower, 2013: 14)

### **Socio-economic specificities of rural areas**

Rural areas represent a very heterogeneous space, both at the international level and within the country. The heterogeneity is determined by local, regional and national specificities and differences. Rural areas play large economic role, they also contribute to the quality of societal life, and most rural people are employed in service sectors – e.g. tourism, health care, public administration, education, finance etc. They are not always disadvantaged in comparison to the urban areas, especially from an entrepreneurship perspective. Rural areas and regions have to be trade-open and competitive, even if they will not grow in the same way that urban ones. Entrepreneurship is seen as a driving force for modernising both rural and urban economies. In rural areas, new firms may be particularly important because they are the mechanism for introducing new sectors and products. Rural settings present a unique space for SMEs, since the local and/or regional labour force is generally too small to supply large companies. (OECD, 2012)

A large number of studies (mostly from the US) point to lower population density, consumer income and educational level, and also to different socio-cultural values, as the main differences faced by rural SMEs. Smallbone (2009) emphasizes three main aspects that need to be taken into account when encouraging the rural entrepreneurship:

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<sup>7</sup> It is an alliance of 180 European, national or regional NGOs representing over 2 million people.

1. Characteristics of the business environment: the small size of local markets, characteristics of rural labour markets, the availability of business premise, transport and communication infrastructure, access to information, advisory and business services , access to finance and the institutional environment.
2. Characteristics of rural population: the development of an enterprise culture, nature and extend of social capital and the role of in-migration.
3. Aspects of the existing economic structure: size composition, sectoral mix, and innovation and growth performance of rural enterprise.

He also highlighted two main policy priorities and considered institutional development as a crucial issue for their implementation. On the demand side, a need to develop potential sources of entrepreneurship particularly in marginal rural areas, targeting young people, immigrants, and existing entrepreneurs who can act as animators and models. On the supply side, he refers to the need to develop the infrastructure to support entrepreneurship (emphasizing education and training) and the physical and social infrastructure as well as the measures focused on overcoming barriers to innovation and enterprise development.

### **Rural and agricultural innovations and innovation policy**

Innovation is generally understood as the successful production, assimilation and exploitation of novelty in the economic and social spheres. Innovation can take different forms – e.g. working in new ways, developing new products and services or adapting proven approaches to new circumstances. The typical innovation is based on the investment in scientific research realized at universities or research institutions and on the number of patents. It is often associated only with high-tech products and research and development activities mostly carried in urban areas. Most of rural settings and agricultural firms (especially SMEs) lack this possibility. When speaking about the rural development, the innovation plays a key role and it must follow the principles of sustainable development, together with the territorial division and the stakeholders' networks that lead to successful socio-economic development. Innovation in a rural space can be linked with traditional activities (agriculture, farming and/or tourism) and combined with new or improved technologies. According to the methodological framework of the survey of the European Commission on the role of public support in the commercialisation of innovations (European Commission 2014) new or significantly improved services, goods, marketing strategies, organisational structures and processes are considered as the general types of innovations. The cross-national analysis on innovation processes in agriculture and rural development realized within the FP6 project IN-SIGHT (Knickel at al, 2009: 28) points out following innovations:

***Tab. 2 Major innovations in direct marketing in agriculture, environmental technologies and new rural services***

	<b>Direct marketing in agriculture</b>	<b>Environmental technologies</b>	<b>New rural services</b>
<b>Main innovations</b>	<ul style="list-style-type: none"> <li>• Consumer/community-supported agriculture (CSA)</li> <li>• Solidarity consumer groups</li> <li>• Selling via internet</li> <li>• Farmers' collective shops</li> <li>• Collective sale to local communities</li> <li>• Selling to individuals in groups</li> </ul>	<ul style="list-style-type: none"> <li>• Production of biofuels</li> <li>• Wood-based heating plants</li> <li>• Biogas from agriculture</li> </ul>	<ul style="list-style-type: none"> <li>• Social services</li> <li>• Health care</li> <li>• Green care farms</li> <li>• Social care farms</li> <li>• Rural tourism</li> <li>• New links with other products and services (care + organic farming + region branding)</li> <li>• New ways of organizing the service system</li> </ul>

There are also several approaches aiming to encourage innovation in rural areas (Alpine Convention, 2011: 11):

- clustering of enterprises working in a specific field and on a given territory;
- creation and fostering of networks of enterprises to exchange experience and learn from each other;
- promotion of cooperation between enterprises and research and development institutes;
- facilitated creation of specific university branches and specialized training institutes, with sufficient autonomy to define their own programmes and the capacity to develop partnerships with businesses and populations;
- provision of the necessary hard and soft infrastructures to enable enterprises to innovate and be competitive (e.g. broadband access, venture capital).

The innovation policy deals with a wide scope of different agrarian economic models and rural structures. Therefore, it is not emphasized in RDP. "Innovation policy refers to a set of policy actions that promote innovative activity in order to reach societal goals. While innovative activity refers to the creation, adaptation and adoption of new and improved products, processes and services." (OECD, 2012: 9) Rural and agricultural innovations are rather young policy issues, they have become an important objective of national and regional development policies. The European agriculture and rural development face new challenges, including climate change, impacts of financial and economic crisis as well as energy crisis. Therefore, rural and agricultural innovations are typical by co-existence of different paradigms and they can react to the current model of agriculture and rural development, such as multifunctional a sustainable orientation, development of knowledge-based rural economy, management of ecosystems, and quality of life. The above mentioned project IN-SIGHT (Knickel et al, 2009: 153) developed the theoretical model of innovation which shows and explains how rural innovation can contribute to the new tasks of agriculture and rural development:

**Tab.3 Innovation strategies**

Reinventing traditions	Radical creativity	Scaling-down	Cooperation
<ul style="list-style-type: none"> <li>• The value of traditional agriculture</li> <li>• Embeddedness</li> <li>• Traditional food</li> <li>• Local energy</li> <li>• Living countryside</li> <li>• Public goods</li> </ul>	<ul style="list-style-type: none"> <li>• Designing new models of economy: bio, eco, creative, lifestyle, regional, local</li> <li>• Radical transdisciplinarity</li> <li>• Mixing culture, arts, IT and RD</li> </ul>	<ul style="list-style-type: none"> <li>• Shrinking of markets</li> <li>• Anti-Globalisation</li> <li>• Revisiting the growth model of innovation</li> <li>• Re-territorialisation</li> <li>• Re-localisation</li> <li>• Principle of reduction</li> </ul>	<ul style="list-style-type: none"> <li>• Cognitive</li> <li>• Transdisciplinary</li> <li>• Sectoral</li> <li>• Territorial</li> <li>• Innovation platforms, forums, alliances, communities, networks</li> </ul>

### Actors of rural and agricultural innovation

Rural and agricultural innovation includes a wide range of different actors, such as administrations (national, regional, local), researchers, private businesses, farmers and farmers' unions, non-farmers, associations, advisors, NGOs, consumers, inhabitants etc. They link the knowledge and innovation, guide, support, create, transfer or adopt innovation, and advise and inform public and farmers about innovations. The actors have different interests and objectives and belong both to the public and private sector. While most of the research

activities still remain quite often outside of farms and are carried out by mostly public funded research institutions and projects, it seems extremely important to develop effective and efficient methods that would lead to innovation driven research that would benefit the real growth of agriculture and rural development. Compared to science driven research, innovation driven research is much more practical in terms of empowering potential innovators themselves, farmers and small business owners. Although innovation is related to business and scientific activities, other actors like governments and civil society should also actively play an important role in facilitating and advocating the process.

The working group Innovation and Technology transfer (I&TT)<sup>8</sup> summarized by Loeffler-Höptner-Chiran (2013) has identified the needs and barriers to I&TT in the EUSDR countries<sup>9</sup> in several categories:

**Tab. 4 Needs and barriers to I&TT**

<b>Actors' characteristics</b>	<b>Technology developers: universities &amp; R&amp;D organizations</b>	
	<b>Needs</b>	<b>Barriers</b>
	<ul style="list-style-type: none"> <li>• long term strategy for collaboration with companies</li> </ul>	<ul style="list-style-type: none"> <li>• lack of contacts with companies</li> <li>• academic approach limits the information transfer to business</li> </ul>
	<b>Technology recipients: companies</b>	
	<b>Needs</b>	<b>Barriers</b>
<ul style="list-style-type: none"> <li>• internationalization of SMEs</li> </ul>	<ul style="list-style-type: none"> <li>• SMEs underestimate the potential of innovation</li> <li>• companies are afraid to participate in R&amp;D projects</li> <li>• low exploitation through SMEs</li> <li>• (not enough) equipment</li> </ul>	
<b>Relationship characteristics (between technology developer and recipient)</b>	<b>Direct relationship</b>	
	<b>Needs</b>	<b>Barriers</b>
	<ul style="list-style-type: none"> <li>• incentives for contacts with SMEs/university</li> <li>• broaden the TT to non-high-tech companies</li> <li>• mentality shift to applied research, incentives for contact with SMEs</li> <li>• brokerage events (Business, innovation-technologies)</li> <li>• need for more Public-Private-Partnership</li> <li>• need &amp; exchange of best practices, focus on good practices from others</li> <li>• trust "what how with whom"</li> <li>• handbook on basic topics</li> <li>• motivational structures/incentives + promotion systems</li> </ul>	<ul style="list-style-type: none"> <li>• lack of common links between university-research-innovation-business environment, of joint responsibilities and of community cohesion</li> <li>• (no) trust in collaboration</li> <li>• (no) common methodology/data basis</li> <li>• different language (Business vs. academic)</li> <li>• lack of language and understanding</li> <li>• large multi-national companies are less interested in acquiring new technologies if the Return on Investment is not quick enough</li> <li>• pressure of big companies on research transfer to market</li> <li>• separation between R&amp;D entities and private companies</li> </ul>
	<b>Indirect relationship (via intermediary)</b>	
	<b>Needs</b>	<b>Barriers</b>
<ul style="list-style-type: none"> <li>• labelling of TT &amp; innovation centres</li> <li>• wishes for central structures</li> <li>• access to finance for support structures</li> </ul>	<ul style="list-style-type: none"> <li>• lack of central point of dissemination &amp; contact for R&amp;D facilities</li> </ul>	

<sup>8</sup> One of the authors (Danka Moravcikova) is a member of this working group.

<sup>9</sup> EU Strategy for the Danube Region.

		<ul style="list-style-type: none"> <li>no national business centres network committed to innovative activities</li> <li>limited knowledge about the TTOs activities</li> </ul>
Know-how technology	<b>Needs</b>	<b>Barriers</b>
	<ul style="list-style-type: none"> <li>smart energy grids, C-mobility, H2 Technology, Energy storage</li> <li>cross cutting technologies (IT mechatronics to agriculture)</li> <li>design sector</li> </ul>	<ul style="list-style-type: none"> <li>destroyed agricultural sector</li> <li>projects are not fitting to market needs</li> </ul>
Framework conditions	<b>Political framework</b>	
	<b>Needs</b>	<b>Barriers</b>
	<ul style="list-style-type: none"> <li>standards</li> <li>specific approaches for different levels (service, process, organization level)</li> <li>what/who/how</li> <li>tools to identify the industry needs (vertical &amp; horizontal)</li> <li>better implementation of smart specialization</li> <li>focus on specific sectors (wood, agriculture...)</li> <li>measurement of innovation (company, city, national level), common evaluation of competitiveness/innovation</li> <li>need for priorities and resources (people, skills)</li> <li>government policy and strategy, instruments</li> <li>more flexible structure of communication with EU</li> <li>need for smart research</li> </ul>	<ul style="list-style-type: none"> <li>bad communication of authorities</li> <li>lack of clear rules and practices</li> </ul>
	<b>Legal framework</b>	
	<b>Needs</b>	<b>Barriers</b>
<ul style="list-style-type: none"> <li>Intellectual Property EU harmonization</li> <li>Intellectual Property Management standards</li> <li>clustering issues: regulation</li> <li>specific rules for the new product to enter on the market</li> </ul>	<ul style="list-style-type: none"> <li>Private-Public Partnerships: unclear/non favourable regulations</li> <li>lack of standards</li> <li>legislation: lack of facilities for innovation oriented companies or technology companies</li> </ul>	

Source: Priority area 8 of the EU strategy of the Danube region (EUSDR); 2nd Annual meeting in Bucharest, October 2013 (working paper)

Efficient innovation systems are reflected in the appropriate institutional arrangement and based on cooperation and partnership among different groups of public and private actors, regional innovation platforms and business clusters.

## Innovation performance in the EU

As it was mentioned before, the economic basis of rural economy and agriculture are SMEs. In general, innovation is important for SMEs and SMEs are essential for innovation. Empirical studies show that innovative SMEs grow faster and create more jobs than non-innovative SMEs. However, policy measures do not only focus on SMEs. The share of innovative SMEs increases gradually with the size of the companies. Policy measures should recognize that large firms are essential for the innovation system. The recent trend of concentrating resources on SMEs ignores the natural ecology of industry. An often neglected target group is the medium-sized firm above the SME threshold. This category probably has the greatest potential

for increasing spending on research and development. The contribution of innovative SMEs is also key for large firms: many of the smaller firms are acquired at some stage by large ones, which use them as a source of radical innovations that the more closed and stratified context of large firms does not facilitate. At the same time, access to the funding, manufacturing and distribution capacities of a large firm allows in many cases to leverage the innovative performance of small firms.

The Flash Eurobarometer 394, *The role of public support in the commercialisation of innovations*<sup>10</sup>, was conducted at the request of the Directorate-General for Enterprise and Industry in the 28 EU Member States as well as in Switzerland and the United States. It was designed to benchmark innovation activities in a range of areas, as well as explore barriers to commercialisation, and the role of public funding in innovation. The survey<sup>11</sup> covered the following areas:

- profiles of companies that develop innovations, including the most common areas where innovations have occurred since January 2011;
- the impact of innovations on turnover;
- actors involved in the development of ideas for innovation;
- types of public support received for innovation activities and its importance for innovation;
- barriers to commercialisation of both innovative and non-innovative goods or services;
- the role innovation plays in public procurement.

Here are some of the most interesting facts and data:

- Around three in ten companies have introduced innovations in each of the areas asked about since January 2011. Companies are most likely to have introduced new or significantly improved services (38%) or goods (37%). One third have introduced new or significantly improved marketing strategies (33%), while 30% have introduced new or improved organisational structures and 29% new or improved processes. Overall two thirds of companies (66%) have introduced at least one innovation in one of these areas since January 2011.
- Just over one in five companies have carried out research and development activities since January 2011 – either in-house or via subcontractors. In contrast, fewer than one in ten have applied for one or more patents or trademarks (7%). Almost half of companies (48%) say that they do not have any innovation to commercialize, while a third (33%) have innovations and also commercialise them.
- Companies were asked about the role of various actors in developing ideas for the company's innovations since 2011. More than three quarters of companies say management (87%) and employees (78%) contributed to the development of ideas for innovations. Just over half (54%) say other companies contributed to the development of ideas for innovations, while 45% say individual consumers contributed. One in five (20%) say the same for public sector organisations, while 17% say universities or research organisations made a contribution.
- Most companies say they have not received public financial support for R&D or other innovation activities since January 2011 (91%). Fewer than one in twenty (4%) have received local or regional government assistance, 3% received national government assistance and 3% assistance from the EU.
- Just over one third of the companies that have introduced new or significantly improved goods or services since January 2011 have collaborated with partner companies or

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<sup>10</sup> The document is available at: <[http://ec.europa.eu/public\\_opinion/flash/fl\\_394\\_en.pdf](http://ec.europa.eu/public_opinion/flash/fl_394_en.pdf)>.

<sup>11</sup> The survey was carried out by TNS Political & Social network in the 28 Member States of the European Union between 22 January and 11 February 2014. Some 11.206 respondents from different social and demographic groups were interviewed via telephone (landline and mobile phone) in their mother tongue on behalf of the European Commission, DG Enterprise and Industry.

external consultants to market, distribute or promote innovative goods or services (35%). One third has collaborated with client companies or individual consumers (33%). Collaboration with competitors (12%) or public sector organisations (9%) to market, distribute or promote innovative goods or services is less common.

- Companies that have developed innovative goods or services since January 2011 were asked what kinds of financial or non-financial support they had received from government or administration to commercialise their innovations. Just over one in twenty have received support in training staff how to promote innovative goods or services (6%), while 4% had assistance meeting regulations or standards. Support in market testing, prototype development, marketing plan development or selling in export markets was received only by 2% of companies. Just 1% received support in applying for or managing intellectual property rights.
- Companies who have developed innovative goods or services since January 2011 were asked what barriers they had encountered when trying to commercialise them. More than two thirds (68%) say a lack of financial resources has been a problem, while 64% mention a market dominated by established competitors and 62% the cost or complexity of meeting regulations or standards.
- Almost three quarters of companies that have introduced innovative goods or services say other companies are important for the sale of these goods or services in 2013 (73%). At least six out of ten say individual consumers are important (63%), while one third (33%) say public sector companies are important for the sale of their innovative goods or services.

The European Commission recognizes the vital role innovation plays in Europe's ability to compete in the global economy, and is involved in guiding and implementing policies and programmes that support the development of innovation. The importance of innovation is highlighted by the Europe 2020 flagship initiative *Innovation Union*, with the key goal of helping Europe to increase investment in research and development, and to better translate research results into improved goods or services.

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# The issue of global citizenship and the ways of its implementation into the educational process at the universities in the preparation of future economists

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## Abstract

Global citizenship represents a relatively new forming concept which is connected mainly with the growing importance of global and development education issue. The essence of global education, as the new approach in the educational process, is to show especially to the young citizens how the world works and also the number of problems that trouble it today. Thanks to the increasing globalization these problems are becoming world wide and thus often affect each of us in a certain degree and certain intensity. Global education should also help people be oriented in these issues and perhaps be able to create own attitudes to them. In this respect global citizenship is acquiring a strong position as one of the fundamental pillars of global education. Just global citizenship should show people the citizenship from the different, new perspective. It should provide new information and knowledge to people about the modern world, about the problems that are being expanded over it, that the world is diversified and each diversity has its own place and importance. It should also bring every person to the understanding that he or she is also a part of global entity and so everyone should accept its place and role in it. Further to this knowledge and to the feeling of belonging to the world community people need to be educated. Therefore, the education for global citizenship should form an integral part of the educational process at all its levels in the contemporary society. Global citizenship does not represent a legally defined term, but the feeling, approach or attitude to the world and the form of choice and belief in change. Therefore, through the education for global citizenship particularly young people, as the future of planet, should be led to the feeling of belonging and to the feeling of global citizen. They should be also led to act as active global citizens, who also bear an adequate responsibility for their action. Beside the current interconnectedness and interdependency of the world the issue of global citizenship and education for global citizenship does not pass any area no more. Therefore, it cannot be missing in the educational process of future economists, and thus in the study programs with economic focus. The graduates of these specializations will operate on the new global market after their graduation in a big extent. For this purpose they must be prepared adequately. They must be necessarily acquainted with global problems, learn how the global market works and how it should work to make a better, fairer and more sustainable place from the world. They have to learn how to accept these facts, act according to them and even bear responsibility for their acting. However, it is important to find the right space for this new approach in the education. At the same time it is very important to choose appropriate methods for its implementation, that will give a sufficient information, knowledge and practical skills about the issue of global citizenship for students and so they will have the opportunity to choose the attitude of global citizen.

Based on the analysis of the importance of global citizenship and exploration of the current state of society in our issue and on the basis of synthesis of the gained knowledge we will try to define the importance of this phenomenon in the education of future economic experts. Through this we will try to point out the necessity of the implementation of global citizenship dimension into the educational process for these students. At the same time we will try to find and specify the appropriate methods for the implementation of this educational

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approach into the existing subjects in the education of future economists. The result of this paper will be finding that the global dimension of education for citizenship and the education for global responsibility cannot be missing in the education of future economists today.

### **Key words:**

Global citizenship, global citizen, global education, globalization, global responsibility, economic focus, global economy.

### **Introduction**

The world is globalizing and its interconnectedness increasingly enables to hint on inequalities, or even on the chasmal differences between the developed and developing countries. With the progressing development these differences have been increasing, but most of the population does not have any information about it. But the world is interconnected and what happens in one of its parts often affects the rest of it today. Therefore, it is very important that individual citizens will be globally educated, and so that they will be able to see the problems that increasingly grow in the world and also their causes and consequences.

Global education as a new approach in the educational process, is acquiring an increasing importance also in the area of more thorough compliance of social, human, economic and environmental rights at the national, but also international level. That is why it acquires the status of essential part of education today. At the same time it involves many different components. Education for democratic citizenship and its global dimension belongs to the most important one. This issue has already been implemented into the educational process in many countries before the intensive actions developed through the various international organizations.<sup>2</sup> However, the necessary global dimension is still largely missing there.

### **New approach in the education**

In Slovakia mainly the primary and secondary schools have been dealing with the issue of global education for several years. Significant advancement started at the beginning of 2012 with adoption of the National Strategy for Global Education<sup>3</sup>, which beside the defining of global education also highlights the importance of global citizenship. However, an effective approach to this issue in the education still mostly absent. Situation is unsatisfactory especially at the universities. The problem is clearly connected with the economic focused schools that educate future economic experts, so the citizens, who should actively operate on the new global market in future.

The documents about global education and global citizenship education acquire still more crucial importance in current globalizing societies, accompanied by various crises and global problems. Because „all citizens need knowledge and skills to understand, participate in and interact critically with our global society as empowered global citizens“ ([Silva et al., 2012, p. 67](#)). Just the global citizenship should lead to the greater justice, sustainability, equity and human rights for all (Silva et al. 2012, Appendix 1). Because, if individuals should be able to think or act globally they must feel that they are directly involved on the acting, and therefore, they must feel that they are global citizens.

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<sup>2</sup> The most important are: United Nations and its Millenium development goals (see United Nations Development Programme), Council of Europe and the Maastricht global education declaration was adopted (see [Silva et al., 2012, Appendix 1](#)) and European Union with Declaration on developing education and active global citizenship (see European Parliament).

<sup>3</sup> National Strategy for Global Education (2012).

## **From national to global**

Until recently the concept of citizenship was understood exclusively nationally. At the beginning of the 21st century view onto the individual problems gradually moved and the global dimension has started getting to the front. This change has started also because of the intensive development of global learning and global education issues and other concepts arising from them (also the concept of global citizenship). The concept of “global” acquires a new meaning, and it is just because of the massive deepening of globalization and its growing impact on individual societies. (Hartmeyer, 2008).

Global dimension is a form of new insights onto the world mostly from lower national dimensions. The importance of this dimension can be clearly understood from the following argument: „the global dimension connects the local, national and global in a way that people are aware of how their actions have implications for others across the globe“ (McGough – Hunt, 2012, p. 1-2).

The essence of global dimension is especially the examining of the facts that unite us with the rest of the world. Through the education it allows students to penetrate into the complex of global issues and explore the links between their own lives and the people, places or issues around the world. It helps students to develop their ability to imagine different forms of their future, as well as the tasks that may play themselves in a newly forming equitable and sustainable world (Qualifications and Curriculum Authority, 2007a). It can help to equip especially younger generation with abilities and skills of the 21st century, which are largely required for life in the contemporary world.

Global dimension should help people to raise the level of respect for others, as well as their sense of responsibility, respect for diversity, empathy and fairness. At the same time young people are able to achieve new approach in a thinking and begin to be critically engage in the complex of problems, that run over the national boundaries (such as environmental problems, armed conflicts and poverty).

## **Forming of global view on the institute of citizenship**

In the area of insight to the institute of citizenship the advance in its understanding started in the 20th century, with the fixing of European citizenship as the type of supranational citizenship. Despite of its specificity and appreciable limitedness, this kind of belonging represented big breakthrough in the view on civic institute.

At the beginning of the 21st century due to the deepening globalization of the world another change in the move from national to global came and it brought requirement for modification of the concept of citizenship.

Global issues are intensively getting into the school curricula. The need for more intensive development of global outlook has been developing and deepening, because students at the primary and secondary schools but also at the universities should acquire a sense of global citizen, along with the skills to live and work in any part of the world (Bourn, 2014). Also for that reason this phenomenon should be implemented onto economic faculties, which future graduates will largely operate on the new global market, and thus in economic field and its global dimension.

## Global citizenship and the need for democratic citizenship education

Although, we cannot find the concept of global citizenship in our conditions very often and people are rarely able to imagine what can be understood under this phenomenon, in various international organizations and number of developed countries, where the global education already represents common practice, global citizenship represents one of its fundamental pillars.

Today the ideal of cosmopolitanism is based on a new vision of global justice, which should be basis for a real human unity and creation of an area for cooperation between people, nations and civilizations. It is about sharing of common humanity. The moral ideal of cosmopolitanism should overcome national boundaries mainly through the universal human solidarity (Chmelár, 2006).

Being a global citizen means some internal feeling and self-identification with a certain system of moral values. Global citizenship represents mainly a kind of idea that mankind constitutes one big community, which should be based on the understanding, solidarity, cooperation and mutual help. As global citizens we should be able to adopt a joint responsibility for the development and running of this community.

Process of global education represents one of the most effective efforts and realized approaches how to implement global dimension into the educational process, today. The interconnection of various parts of the world reaches a marvellous intensity and primarily for this reason it is necessary to educate individual citizens. The primary responsibility of individual countries and their relevant institutions becomes to ensure the education for global and national citizenship. It should be ensured especially for the students, because mainly young generation should be oriented in the contemporary world which is full of quick, often unexpected changes. They should be able to understand the functioning of the world from global perspective sufficiently (Suchožová, 2013).

Every area of society life has its own specific meaning. Economic area belongs between the most important one in the national but also transnational and global sense. Beside the cultural and social dimension the globalization processes can be observed especially in the economic sphere (in its positive and also negative manifestations). Therefore, the requirement for new type of education should not pass by the schools with economic focus. Global economy, business and other economic areas are also increasingly globally interconnecting and it is needful to put an adequate importance to the education of the future graduates of economic faculties so that they will be able to react to the new and continually changing conditions. There is also still more frequented free movement of persons, goods, services and capital in the world. Therefore, it is necessary to inform future economists about the economic rights, freedoms but also the responsibilities which they have in global economic space. The most important tool for the forming of full-valued – socialized – citizens is the education for citizenship (see Sřahel, 2012) and today also for its global dimension.

Many European and global strategies have agreed that it is necessary to support formal and also informal form of education for citizenship today. All the more it is necessary in the education of future economic experts. Young, economically focused people must learn to orient in the new coherences, problems and dynamic changes, which are brought by the modern globalized society and global market, so that they could become responsible citizens also in global dimension.

Not only the passing of knowledge is important in this education. The most important is learning for being an active global citizen. Therefore, the *Handbook of global citizenship defines* „global citizenship, respectively cosmopolitanism, as the process of acquiring responsibility for our environment, people around us and society, which we are part of“ (Kronegger – Mrak – Suša, 2010, p. 4). Current society is also engulfed by consumerism and

economism and therefore, the students of economic faculties must learn to realize decisions and at the same time to bear a sufficient responsibility for them in a global scale.

Economic faculties must ensure the implementation of global dimension into the civic education. Just the education for citizenship (in this case for global citizenship) „can be seen as a countertraction to the atomizing tendencies of the market society with dominant influence of consumerism and economism“ (St'ahel, 2012, p. 89). Therefore, especially students should be motivated for global responsibility and should fully realise that they are able to influence the world positively with their active participation on the political life, responsible shopping, responsible approach to the environment and mutual tolerance in todays globally interconnected society (Suchožová, 2013). But for this purpose it is necessary to develop critical thinking and ability for cooperation.

### **The importance of global dimension in the education for citizenship of current society**

It is not important what school and focus it is, because this issue has a global reach, and it affects everything. Therefore, it is desirable that each country establish a comprehensive approach to this area. Its increasing role also results from the societal and international changes. The world is connecting and countries must adapt to the new conditions especially in the area of creation and promotion of new educational activities aimed to the global dimension and global citizenship education. Because from new situation in the international environment often result new realities for the people as citizens, for which they need to be prepared.

The concept of global citizenship and education for it does not belong to the frequented one, and nor in Slovakia we do not have a lot of possibilities to encounter with it. However in many developed countries it is an issue which already operates efficiently, has its own system and theoretical platform. Many theorists and experts are trying to define this phenomenon despite the fact that it is quite problematic and seemingly antirealistic phenomenon. For example, R. Israel writes, that „a global citizen is someone who identifies with being part of an emerging world community and whose actions contribute to building this community's values and practices“ (Israel, 2013). But it is important who uses this concept. Understanding, definition as well as the deepness and emphasis on this issue, depend on it in a large extent. Therefore, there are a lot of perspectives and opinions about what the global citizenship is. „These range from the idea that everyone is a citizen of the globe to the standpoint that in a legal sense there is no such thing as a Global Citizen“ (Young – Commins, 2002, p. 1).

In the institutions that are specifically dealing with this concept, the deeper idea is dominant. This idea goes beyond the classical idea that all of us are the citizens of the world to the understanding that we all have responsibility not only for one another, but also for planet as a whole. Thus, the global citizenship is primarily about understanding of the need to remove injustice and inequality in the world, and also about the fact that people want and they have possibility to act for this purpose. Global citizenship is primarily „a way of thinking and behaving. It is an outlook on life, a belief that we can make a difference“ (Young – Commins, 2002, p. 1).

Global citizenship and the education for it can be defined as a gaining of knowledge, skills and understanding of concepts and institutions, which are necessary for become informed, active and responsible citizen (DFID, 2005).

The concept of civil responsibility more clearly and intensively exceeds national boundaries today and the education for global citizenship should help people to understand the importance and impact of a global responsible acting and help especially young citizens to

initiate in the functioning of global society and strengthen their orientation, awareness, democratic values, prepare globally responsible citizens, develop personal and social responsibility in new global environment, support global education and diversity, but also reinforce their civic role and social responsibility in a higher education so that these citizens could be a positive contribution not only for the local and national but also for global society, in which they will actively operate after the graduation.

Education for global citizenship should provide the knowledge, skills and approaches to it, so that the students will be able to understand their rights and responsibilities, which they have as global citizens. The educators have a unique opportunity and a clear responsibility to help prepare their students to be responsible citizens of the future. Because the fate of the planet Earth and all its life forms lie in their hands (Bourn, 2006).

However, in this education it is necessary that the students would understand the essence of global citizenship, at first and in particular the difference with national citizenship. Because while the national citizenship is necessarily linked with birth as well as with specific country the global citizenship is not. It is a sort of voluntary link with the term, which represents “ways of thinking and living within multiple cross-cutting communities –cities, regions, states, nations, and international collectives...” (Schattle, 2007, p. 9).

As the global citizenship is mainly understood as the possibility of choice and a way of thinking, people can make a choice in whether or how to practice it (Green, 2012). But, if they should be able to realize this choice it is necessary to educate them, and provide the necessary information, so they could adopt a positive approach to the citizenship.

Education for citizenship should represent a part of educational processes in the individual modern societies and it should help students understand such topics as international organizations and their role in world politics, whether in protection of human and civil rights and in solving of various mainly international problems. It should also help students to think about the impact of their own activities and customs onto the issues like environmental crisis or world poverty. However, one of the fundamental parts of any education for citizenship is to prepare students so that they would be able to deal with the whole complex of global problems, perceive them and eventually adopt an attitude to them.

Citizenship education should currently includes mainly the issue of:

- areas connected with social justice;
- human and civil rights and freedoms in the range from local to global;
- global dependency and support for young people to refuse injustice, inequality and discrimination;
- help for young people to develop their critical skills and thinking about a wide range of political, social, ethical, environmental and moral issues and examining opinions or thoughts other than just those that are oriented on themselves (Qualifications and Curriculum Authority, 2007b);
- strategies for encompassment with the local, national and global conflicts;
- impact and consequences of individual and collective actions on society, including volunteer activities;
- policy and practice for sustainable development and their impact on the environment;
- economy in relation to citizenship and to decisions about the cumulation and allocation of public money;
- changing nature of home country, including the diversity of ideas, religions, cultures, identities, traditions, perspectives and shared values;
- impact of migration and integration on the identities, groups and communities;
- relationship between the country and transnational groupings and with the global society;

- challenges surrounding global community (McGough – Hunt, 2012).

It can be stated that the education for citizenship and its global dimension should provide information and necessary knowledge of individual issues for students, that exist in the contemporary world and that are thanks to globalization not enough far for anyone. At the same time it should help them to arouse their interest. Thanks to these information, knowledge and acquired skills individuals should be able to take their own attitudes and they should be prepared in the way, so that they would be able to operate actively in this environment, in future. Therefore, it is not possible to avoid universities with economic focus in this issue.

### **The place of global citizenship education at the universities with economic focus**

On the present, we can notice the attendance of various global issues, but also contexts with global citizenship in curricula of many subjects, even at the universities with economic focus. However, the issue which should build an integral part of them is not sufficiently developed yet, although the space for implementation of these topics is located in almost every subject. We can make some several conclusions about the most important ones, which should create the basis of global knowledge for future econom

ists:

- For example, at most of universities with economic focus the subject of European integration processes is being taught. This subject includes especially European issues and therefore, also the view on European citizenship. But also the topics about interconnectedness of the world, global sphere in human life and citizenship have a wide space in it.
- Also the subjects about globalization and its accompanying processes belong among the important and actual ones at most of economic schools. Global citizenship should constitute one of the fundamental topics in these subjects.
- International Relations is also dealing with the issue of global citizenship and with learning for an active participation in global society. Actually, we can say that it belongs to the general basis of university education and it can be added into the group of subjects, which provide a suitable space for the implementation of global perspective to the citizenship of human, as well as for the informing of young people about the global issues and problems as a whole.
- In a certain extent we can find a space for the implementation of global dimension of citizenship also into subjects like Theory of Policy or Political Science, which contain also the issue of citizenship as a whole. Subjects like Ecophilosophy and Environmental Policy, represent very good and appropriate space for providing of knowledge and necessary information about the global issues connected mainly with the environment. This is necessarily linked to the economic activities, therefore, these subjects create also an important part of educational process at the economic schools.
- Appropriate space can be found also in curricula of basic (not only) economical subjects focused on marketing, management and economic policy. They dispose with content where the global dimension can be implemented sufficiently. Through these types of subjects future economic experts can be prepared for their role in global market as the responsible active global citizens.
- On the other hand subjects like international management, international marketing and financial markets necessarily contain the global dimension in their basis and they should acquaint students with the phenomenon of international markets and their real functioning. These knowledge are necessary in the education of future economic experts and therefore, they should represent some important pillars that follow the education for global citizenship.

We can say that not only the global education, but also the field of global citizenship has its place in many subjects and belongs among the important cross-cutting issues of many disciplines. Maybe creation of a new separate subject – Global education would be beneficial for this issue, because this type of subject is still missing in the educational process at the economic schools in Slovakia. Such a course would cover not only education for global citizenship, but also many other important global areas and knowledge, which should form the basis of education of every young educated person of the world. All the more, the education of future graduates of economic specializations, who should actively participate in global economy.

However as most of experts noticed, global citizenship should not be constituted as a separate subject. It should create only a sort of moral base, which should be implemented across the whole educational system. It should involve everyone, from students to teachers, parents, government as well as the wider society, who should participate on the education. At the same time, this education should be implemented into the individual existing curricula, which will highlight the global aspects of individual issues and will put the emphasis on the social justice, diversity, importance of sustainable development, etc. (Young – Commins, 2002).

### **Appropriate methods for the implementation of global citizenship education into the educational process**

Global citizenship represents a very important article in the education of today's young citizens and future economic experts. Phenomenon of global citizenship still represents something new, unknown and unclear. It is very problematic not only for its formal fixing but also because of its understanding and the view on it. It is also hard to talk about the legal fixing and defining of this concept. Citizenship is a legal relation and affiliation of a man to some concrete state and it is always territorially limited. So how could some person be a citizen of the world?

However the world is becoming more connected and the concept of global citizenship is rising more during recent years. It is happening especially in developed countries, where the potential for empowerment of people is more effective. Therefore, various associations and today also the schools try to educate young people about the fact, that they are not only citizens of some country, but they are also part of some global entity, which borders cannot be even imagined, but in which they can also actively and positively operate. Thus, while the global citizenship represents only a kind of internal attitude and feeling of a man today it has becoming more important, especially in the education of new generation. The main effort is to operate positively and make a more sustainable place from the Earth. For this purpose it is primarily necessary to instil students the sense of belonging to some global entity, and social responsibility which results from it.

It is also very important to find the best way how to implement this new approach into the educational process. According to our research realized also beside the solving of research project – KEGA no. 006SPU-4/2012: *Implementation of Global Development education into education process at faculties of economics* (Svitačová, 2011) at the Faculty of Economics and Management, Slovak University of Agriculture and according to knowledge and skills received at summer school focused on global citizenship education (Summer School: Global Citizenship Education in a post-2015 context, 2014) we can formulate several conclusions:

- The best way how to spread global citizenship issues is to implement its main topics and other connected global issues to the existing subjects of citizenship education. Likewise, it is important to implement these issues into the main subjects, which were mentioned before. These are mainly the subjects of globalization, international

relations, theory of policy or more specialized environmental policy, ecophilosophy, environmentalism, management, marketing, financial markets, economic policy and their international dimensions. All of these subjects have a very wide space for the implementation of global citizenship issues in their core.

- We mostly incline to opinion that the majority of contents of courses, which are being taught at economic specializations include reference to the topics to which global citizenship education pays attention. These knowledge result also from two national discussible workshops (see more in FEM SUA, 2012; FEM SUA, 2013a; FEM SUA, 2013b), which were realized in recent two years as an output of the mentioned project KEGA. The main objective was to find the most appropriate methods for the implementation of global development education at the Slovak economic faculties, which is closely connected with our topic.
- Another approach can represent the idea which was mentioned before – creation of new subject which should be concerned only to the global issues – for example, subject of global education, development education or global development education. But inspite of the fact that it sounds like a best way, it is strongly problematic. Mainly for the fact that the universities in Slovakia are missing experts on global issues who would guarantee these subjects.
- Most of necessary subjects are attended in current educational process. Needful is just to implement or strengthen the status of citizen there and also its global dimension within their rights and responsibilities.

After the finding of appropriate subjects for the implementation of global citizenship education another very important task is arising – to find the appropriate methods, which should be used in concrete education.

- According to the knowledge and information from summer school we consider that the most appropriate are forms of informal education also combined with formal education. It is very important to give students and mainly future economic experts important knowledge and information about the issues of global citizenship, that they will understand its meaning. Then, there should be created a wide space for informal part of education realized mainly throught the various workshops. It means to let students work with the information that they received in formal way. According to the taken topic they should create their own views and attitudes to these issues. This way is appropriate for getting own skills with global citizenship issues (to know the facts, feel emotions, find inspiration, create own opinion and connection with their own life and find the opportunity for action and change). Students should receive the main knowledge throught the getting of experience, throught the games and thinking actively about the real topics. In global citizenship also the non-formal education has an important place in everyday life (but this form is not a topic of this paper).
- Using of socio-educational methods, techniques and didactic instruments in this new educational approach depends on soundness and creativity of the teacher. For example, the project teaching, cooperative learning, various didactic games, situational and inscenational method, case studies, heuristic and research method, fieldworks, excursions and participation on a specific events and activities, are considered to be appropriate. Typical instruments that are used in global citizenship education are various discussion techniques, simulation games, games with roles, critical reading of the text and integration methods, which allows to see the issues from several perspectives.
- We can talk also about some other possibilities of the implementation of global citizenship issues into the educational process, which were discussed at the mentioned workshops. It can be stated that most of the issues can be implemented through the cross-section of global issues in the education at faculties of economics. We can notice that these issues intersect across the various educational areas. Or through the accentuation of global dimension in several subjects that are integrated in the current

study programs. Then we can say that the lectures of experts from a various foundations and associations, which deal with the global and development issues, and other educational activities, could be beneficial. It would be beneficial to mediate real experience of members of these associations to students, and so encourage the interest on problems, that worry people in different parts of the world.

- Very important is supporting of cooperation between universities and these organizations. But, at the same time, we consider that any selected form of implementation of global citizenship issues at the economic faculties should be complemented about some other forms of education, for example, training, seminars, workshops, etc., that will be led by the experts of such foundations and associations. Due to the fact, that global citizenship issues already have an immovable place at many foreign faculties, and some students graduated or have the possibility to graduate a study stay at them, they can educate themselves also in this area.
- The possibility of speaking to foreign students and involving them into the global citizenship education as the lecturers, or as the participants of discussions, workshops, etc. was discussed. This would be a good way to learn more about the life in various parts of the world. For example, foreign students from developing countries can provide an interesting information and practical experience relating to areas from which they come, to other students of faculty. This may also be one of the forms, how to motivate students of economic faculties to engage in volunteer activities.
- Implementation of global citizenship issues into the educational process at economic faculties requires also the open mind of academic teachers to global problems, as well as to new resources, which can be used here. Academic teachers should be aware of the importance of these topics and they should want to and also be able to implement them into the curricula of their subjects. This new form of education puts new demands on academic teachers, who should be able to reflect new requirements adequately and for this purpose they should be prepared.

### **Summary:**

Global citizenship represents one of the main areas in the contemporary world, to which young people have to be educated. This education should inform about various global issues that trouble the world today and that their global nature affects almost every country of the world. People will meet these problems more often in a real life. Therefore, especially young people, as a generation which must learn to adopt an attitude to these problems, should be led to the feeling that they represent a real part of the world community.

In regard to the increasing individualism in society the issue of global citizenship is acute all the more. One of the main negative expressions of this phenomenon is the growing deficit of social responsibility. However „the uniqueness of human is given by the exceptionality of his responsibility. A man has responsibility not only for what he has created, but also for that what was given to him, for the life on Earth“ (Špirko, 2011, p. 16). Connectivity with the global problems and global relations is still escaping to the people and especially students (also of the economic specializations). It is mainly because the current educational system is not able to prepare them adequately. This is a significant problem because, for example, the future graduates of economic specializations have to be prepared to fulfill their tasks in the global economy and to bear an adequate extent of social responsibility for them. Therefore, it is necessary to solve this problem comprehensively, through the targeted education of people and promotion of education for global citizenship.

It is necessary to create a world of global citizens. We live in diversified society and global citizenship provides the tools for effective confrontation with ignorance and intolerance, which exist in it and go oppose disagreements and stereotypical views. The world is globalized and full of rapid changes and the basis of global citizenship is flexibility and adaptability as well as the positive vision of future. Global citizenship shows that each individual has the power to

change things and everyone has the possibility of choice as to which direction will set out his behavior (Young – Commins, 2002).

Global citizenship education has a multidimensional nature and it has an importance for each area of society and each specialization, not excluding the economical ones. Its aim is to vindicate the sense of belonging to the world community. So the students should be informed adequately about the global challenges, problems and risks of the world. They should create new kind of social ideal, which gives a missing sense of social and human responsibility for them and their action. This action should be directed to the benefit of global entity, not just of themselves or their local and national communities.

This education has to be primarily realized at all levels of schools. Not excluding universities with economic focus. There are a lot of challenges and implications for this purpose. Firstly, there is a need for critical education where also the conditions for national educational policy have to be positive. Values and principles connected with responsible life in the contemporary world are important. There is a need to make people thinking. The best way is through the implementation of global citizenship education into the educational process with using the number of methods, which will impressed students and make them keep questioning and finding answers.

In this paper we tried to find and present the most important subjects which should contain the global dimension of citizenship today and also the most appropriate methods, through which the education for global citizenship should be realized. There is still a long way for satisfactory solving of this problem at the Slovak economic schools. But inspite of the problematical nature of global citizenship and many negative and dubitative views on it, its importance is still rising and it affects also our society. It cogently influences economical area with all its consequences and so the requirements for educating of responsible and economical active global citizens slowly and gradually create the appropriate space and implement various methods into the educational process also in Slovakia.

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# Driving growth and employment through business clusters- in the case of Slovakia

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## Abstract

Industry business clusters are regarded as geographic concentration of companies which are interconnected through a buyer-supplier chain. Business Cluster analysis provides a clear picture of the regional and national economy by indicating the industry clusters that are growing in importance, emerging and declining. Inevitably analysis of industry business clusters is a starting point in constructing economic development strategies. Moreover, Economic development strategies implemented for industry clusters will have additional effect on regional/national growth in comparison to ones intended for individual industries. This study measured the performance of industry clusters of Bratislava region, Western region, Central region and Eastern region of Slovak republic. The primary objective of this study was to assess regional competitiveness in attracting and retaining industry clusters.

## Key words:

Employment, Business Clusters, Economic Development, Growth

## Introduction:

Globalisation has gradually shifted the basis of industrial competitiveness from static price competition towards the ability to innovate and create knowledge (Malmberg and Maskell 2001). This has happened both within firms and at the national level, where rapid technological change is pressuring countries to adapt quickly. Cluster development has become an increasingly attractive way for policymakers to respond to this challenge, as seen from the growing literature on cluster development (Tilman Altenburg and Meyer-Stamer 1999, England's Regional Development Agencies 2004, Enright 1998, 2000, European Commission 2003, are "geographical concentrations of interconnected companies, specialised suppliers, service providers and associated institutions (e.g. universities; standard agencies; and trade associations) in a particular field, linked by commonalities and complementarities."

Firms in a cluster are both competing and cooperating. A cluster provides a potential platform for innovation and collective action, which are main ingredients, among other things, to boost national competitiveness.

The cluster approach has attracted the attention of those designing policies for economic development, and many countries have sought ways to implement it successfully. Nevertheless, formulation and implementation of cluster policy is by no means a clear-cut process, since there is no uniform model or formula to develop clusters that is valid everywhere and at any point in time (Nauwelaers 2001). Given that every cluster is unique, imitating a cluster policy that has proven to be effective elsewhere is hardly a plausible tactic. Evidence from cluster development in various countries shows that a cluster policy implemented successfully in one country might not be suitable in another country or context. Hence, this study examines the process and dynamics of cluster development from a holistic perspective.

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It investigates several clusters in Slovak Republic, in both technology-driven and natural resource based.

The primary objective of this study is to assess;

- If cluster increases local competitiveness by increasing employment, can policy makers, by interlinking clusters achieve an even better effect at the state level.

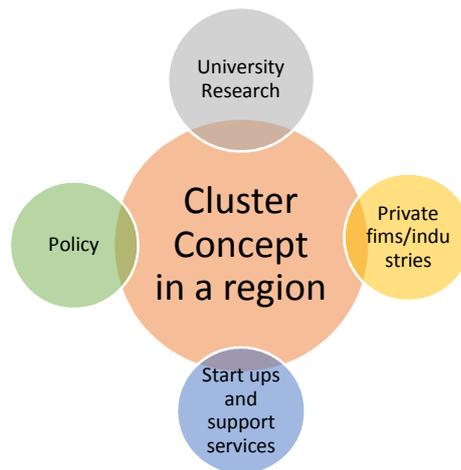
Three partial goals are formulated in relation to the main objective of the study.

- Analyse industry business clusters within Slovak republic and the structure of existing clusters in four major geographic regions.
- Analyse economic performance in major geographic regions and contribution of industrial business clusters towards local economic development.
- Did current cluster/industry policy made any impact on clusters and its performance?

## **Cluster Concept**

According to Wolfe and Gertler (2004) the cluster concept has been applied in two different ways in the cluster literature: analytical and political. Firstly, as a functionally defined group of firms and supporting institutions that produce and market goods and services from a group of related industries that are concentrated in a specific geographical localisation. This approach takes the point of departure in a cluster definition that is very similar to Porter's that was cited in the beginning of this chapter (Porter, 1998). The main purpose of this approach is to explain analytically the mechanisms of cluster development. These identified mechanisms could and should provide guidance to local and regional policy-makers in preparing their cluster promotion and support strategies (Wolfe and Gertler, 2004).

Secondly, in the political approach the cluster concept is used as a policy tool – as “an overarching framework to guide policy-makers in the design of initiatives to promote cluster development” (Wolfe and Gertler 2004, p. 1072). In this second approach there are often more applied practitioners that ideally should start from the results of the analytical approach when drafting policy guidelines. According to Wolfe and Gertler this is unfortunately done in a rather limited way. The practitioners very often limit their interpretation of the analytical cluster studies to the elaboration of lists of the ‘critical factors’ for cluster development that were derived from individual studies of the most successful cases. These lists used by policymakers may be counter-effective as they very often do not take the region- and industry specific factors into account, e.g. regional specialisation tradition, institutional context.



## Clusters and Economic Development

The concept of clusters is a modern description of the long observed phenomenon of geographical concentration of economic activities, which is widely believed to be an important factor for economic development. (Marshall 1890) described already in the 19th century the advantages of agglomeration of economic activities in terms of availability of a qualified workforce and specialisation. Similarly, (Schumpeter 1939) referred to the “swarming” or clustering of industry. The concept of clusters is very broad and comprises different perspectives and aspects covered by other concepts that have been around for a long time. It builds upon traditional location and agglomeration theory and integrated other concepts, such as the concept of “industrial districts”, growth poles (“poles de croissance”), new industrial spaces, systems of production, innovative milieux, national or regional innovation systems, learning or creative regions, to name a few.

## Industry Cluster Analysis

The economic development tools utilized in the study are Location Quotient, Economic Base Model, and Shift-Share Analysis. These tools complement each other and together they can furnish necessary information to local economic development agencies in developing policies for business retention and attraction. Location quotient identifies strength and weakness in a local economy with respect to industry clusters. Export-oriented industry clusters, which are considered to be the drivers of local economy, are identified using the economic base model. Finally, the shift-share analysis measure performance of local economy with respect to the national trends. Industry clusters identified in this paper are adopted from a study conducted at Centre for Strategy and Competitiveness, CSC Stockholm School of Economics April 2011. The following Cluster were indentified.

<b>Bratislava Region</b>	<b>Central Region</b>
Automotive	Automotive
Oil and Gas	Building equipment and services
Telecom	Metal Manufacturing
<b>Western Region</b>	<b>Eastern Region</b>

Heavy machinery	Apparel
Lighting and electrical equipment	Building equipment and services
Automotive	Metal manufacturing
Building equipment and services	
Footwear	
Metal manufacturing	

Source: [www.clusterobservatory.eu/](http://www.clusterobservatory.eu/)

## Location Quotient

The location quotient (LQ) is defined as the ratio of industry cluster's share of the local economy and the share of the nation, or the state, or the region. This study compares the local economy which is divided into four major geographical areas such as Bratislava region, Western region, Central region and Eastern region. Industry cluster employment is the most widely used variable in LQ analysis, even though it can be estimated using other variables, such as sales and income. LQ identifies dominant clusters in a given region. It can identify export-oriented clusters, which drive the local economy by bringing money into the region, rather than just circulating it.

LQ is calculated as follows:

$$LQ = \frac{E_i/E}{N_i/N}$$

where  $E_i$  represents regional employment in a given industry cluster  $i$ ,  $E$  represents total regional employment,  $N_i$  represents national employment in a given industry cluster  $i$ ,  $N$  represents total national employment.

The LQ analysis indicates that ICT industry as star clusters in the Bratislava region. However the ICT industry cluster, one of the driving forces of the local economy, is transforming from being a star to a mature cluster. Another prominent clusters for the local economy are the tourism and Automotive industry cluster which is becoming less concentrated and shifting towards a star cluster in the future. Cluster that is emerging and have a potential to be a future star cluster is the Heavy equipment manufacturing cluster.

The Electronic industry cluster in transforming to be a emerging cluster from a current transforming cluster.

The LQ analysis indicates that the Heavy equipment manufacturing and Electrical equipment manufacturing as the star clusters in the Western region. These dominant clusters are becoming more concentrated. The Electronics cluster, one of the driving forces of the western region economy, is transforming from being a star to a mature cluster. Further, there is a tendency that Electrical equipment cluster will follow the above pattern in future. The apparel cluster is moving from being an emerging cluster to a star cluster. Another clusters that is emerging and have a potential to be a future star cluster is: tourism industry. Industry clusters such as: ICT and Metal industries are less concentrated in the region as compared to the nation, and are becoming less concentrated over a period of time. Automotive industry is moving from being a mature cluster to a transforming cluster.

Central region LQ analysis indicates that there are no prominent star cluster industries in central region. However the metal industry cluster, is transforming from being a star to a mature cluster. Heavy equipment manufacturing cluster is prominent for the region and gained maturity in the region compared to the nation. Automotive industry cluster is an emerging in

the region and moving towards a future star cluster. Both apparel and electrical equipment manufacturing clusters are also emerging with high concentration and potential to move towards a star cluster. The ICT cluster is shifting to be an emerging cluster from a current transforming cluster.

Eastern Slovak region's cluster performance with respect to the nation. The LQ analysis of regional industry clusters with respect to the nation indicates that the Metal industry accounts for a major share of local economic contribution in eastern region appearing to be the largest industry in the region. Star clusters currently not representing in the region however with low concentration the tourism cluster may slowly approach star cluster in future. Eastern Slovak region consists of several emerging clusters some of them been newly presented in the area namely Automotive, ICT, Electrical equipments and electronics. Apparel industry cluster is mature cluster in the region appearing one of the largest industries, while heavy equipment manufacturing is identified as a pure transforming industry cluster. Shift-share analysis presented in the later part of the research provides further information regarding the increasing and decreasing concentration of clusters.

### **Economic Base Analysis**

The main purpose of the economic base analysis is to classify regional clusters into export and import industry categories. The analysis provides information on where a county was and where it is currently with regard to employment concentration. The economic base analysis is used to identify sectors of the local economy that serve other regions (export industries/clusters). These sectors are the backbone of local economy. The economic base theory assumes that the industry structure of local economy is made of up of two sectors:

1. *Basic Sector*, which produces and distributes goods and services for export outside the region, thus bringing wealth to the local economy. Examples of basic sector include firms in the manufacturing and energy clusters, which produce goods that are consumed within region as well as outside the region.

2. *Non-Basic Sector* whose goods and services are consumed primarily within the local area. Examples of non-basic sector include industries such as, retail trade, construction, transportation, and utilities. These firms mainly serve the local population. The study compares county industry cluster employment to that of the state and the nation. It is important to relate the local economy to other regions because the economic activity in the local area usually depends on other regions, as well as on the state and the nation. There are several direct and indirect industry classification techniques that determine whether an industry cluster is export-oriented or not. Even though direct methods have more precision, they are not commonly used because of their intensive time, labour and financial requirements (Galambos and Schreiber 1978). Dinc (2002) proposed four different methods for classifying industry clusters into basic and non-basic sectors:

A LQ equal to 1.2, indicates that the local employment is sufficient to meet the local demand and all good services are utilized locally and nothing is exported, therefore, these industries are also considered to be non-basic in nature; and 3. Finally, industries with LQ greater than 1.2 indicates that some of the goods and services are exported to other regions, which in turn indicates that some of the employment in that industry is basic in nature. Base employment in industry  $i$  in region  $r$  is calculated as follows:

$$BE_{ir} = \left(1 - \frac{1}{LQ_i}\right) * E_{ir}$$

Where  $LQ_i$  represents location of industry  $i$  and  $E_{ir}$  represents employment of industry  $i$  in region  $r$ . Once the base employment is calculated, it can be used to estimate the *Base Multiplier*, which is the ratio of the total employment in year  $t$  to the base employment in that year. The base multiplier is calculated as follows:

$$BM = \frac{E_r^t}{BE_r^t}$$

Where  $BE_r^t$  represents base employment of a given industry in region  $r$  and time  $t$ .  $E_r^t$  represents a given industry's total employment in region  $r$  and time  $t$ . The multiplier will provide an insight on local employment (non-base employment) based on a given change in the base employment. For example, a base multiplier value of 3.5 indicates that for every one base job created there will be additional 2.5 non-basic jobs. Base multipliers are powerful tools in analyzing and forecasting regional economic activity.

### Economics Base Analysis Results

Cluster	Bratislava Region				Western Region				Central Region				Eastern Region			
	00 8	00 9	11 0	11 1	00 8	00 9	11 0	11 1	00 8	00 9	11 0	11 1	00 8	00 9	11 0	11 1
Automotive Industry	00. 54	00. 57	00. 58	00. 53	11. 99	22. 45	33. 24	44. 33	-	-	-	-	-	-	-	-
Tourism Industry	00. 67	00. 74	00. 61	00. 60	-	-	-	-	-	-	-	-	-	-	-	-
Electronic Industry	-	1.0 7	-	-	01. 55	11. 70	11. 46	11. 51	-	-	-	-	-	-	-	-
ICT Industry	00. 86	00. 91	00. 78	00. 80	-	-	-	-	-	-	-	-	-	-	-	-
Metal Manufacturing Industry	-	-	-	-	-	-	-	-	11. 21	11. 36	11. 24	11. 24	11. 04	11. 06	11. 05	11. 05
Heavy Machinery Industry	-	-	-	-	33. 42	22. 33	22. 75	22. 32	11. 02	11. 09	11. 05	11. 13	-	-	-	-
Apparel Industry	-	-	-	-	-	14. 39	77. 16	33. 89	-	-	-	-	11. 07	11. 11	11. 36	11. 35
Electrical Equipment Industry	-	-	-	-	10. 56	10. 50	10. 52	10. 50	-	-	-	-	-	-	-	-

Source: Own calculations/ Euro stat

### Shift-Share Analysis

Shift-share analysis is an additional economic development tool, which complements LQ and economic base analysis. The shift-share method provides valuable detail about the uniqueness of local growth and competitiveness of local industries. This method begins with a baseline value for expected output growth and is termed as the national growth component. The second component, termed as the industrial mix component, adds or subtracts a GDP/Employment change value that accounts for the country's unique industrial mix. The third component, is termed as competitive share, adds or subtracts a GDP/Employment change value reflecting the competitiveness of local firms within their own particular industrial sector. The advantages of using this technique are: (1) it is simple and straight forward calculations, and can be readily understood; and (2) the ability to measure the gains and losses of each market in comparison with the total market.

There are three components involved in performing shift-share analysis, they are:

- I. National Growth
- II. Industry Mix
- III. Competitive Share component

*National Growth Component* (NG): This component explains how much of the regional industry's growth is explained by the overall condition of the national economy. It measures the regional economic change that would have occurred if the regions had grown at the same rate as a reference area (Dinc 2002). The NG is calculated as follows:

$$NG = E_i^t \left( \frac{N^{t+1}}{N^t} - 1 \right)$$

where  $E_i^t$  indicates regional employment in a given industry  $i$  at the beginning of a period  $t$ ,  $N^t$  represents total national employment at the beginning of a period  $t$ , and  $N^{t+1}$  represents total national employment at the end of the period  $t+1$ .

*Industry Mix Component* (IM): This component determines the quantity of growth that can be attributed to the region's mix of industries. It determines the share of regional industry growth that is explained by the growth of that industry nationally. The IM is calculated as follows:

$$IM = E_i^t \left( \frac{E_i^{t+1}}{E_i^t} - \frac{N^{t+1}}{N^t} \right)$$

where  $E_i^t$  indicates regional employment in a given industry  $i$  at the beginning of a period  $t$ ,  $E_i^{t+1}$  indicates regional employment in a given industry  $i$  at the end of the period  $t+1$ ,  $N_i^t$  represents national employment in a given industry  $i$  at the beginning of a period  $t$ , and  $N_i^{t+1}$  represents national employment in a given industry  $i$  at the end of the period  $t+1$

For our analysis purpose, we also calculate expected change, which is a sum of national growth and industry mix component, which is basically the job growth that one would expect if the region follows national trend. The total economic change, which indicates a region's actual growth or decline, is determined by summing up the three components.

$$EC = NG + IM ; \quad TEC = NG + IM + CS ;$$

For example, if an industry is growing in a region, we would generally assume that the region favours that industry, however, shift-share analysis may reveal that the industry is growing at a faster rate nationally, indicating that the local factors have less influence on regional industry growth. This is especially the case with Apparel cluster in Bratislava region. Between 2009 and 2011, Apparel cluster gained 1702 jobs, which is mainly because of nation trend which accounted 1118. The region was not performing as good as the nation.

#### Bratislava Region

Year	Auto	Tourism	Electronic	ICT	Metal	Heavy	Apparel	Equipment
<b>Competitive Effect</b>	14246.87	1215.09	1418.12	34162.81	238.97	2176.91	584.03	1163.97
<b>Expected Change</b>	12537.74	1210.39	1243.53	32882.83	245.14	2244.74	1118.44	1024.17
<b>Job Gain/Loss</b>	26784.61	2425.47	2661.65	67045.63	484.11	4421.65	1702.47	2188.14

Source: Own calculations/ Euro stat

## Western Region

Year	Auto	Tourism	Electronic	ICT	Metal	Heavy	Apparel	Equipment
<b>Competitive Effect</b>	22389.87	787.09	10468.12	6301.81	2763.97	16458.91	7749.03	16481.97
<b>Expected Change</b>	23453.21	748.60	11431.44	6221.14	2608.06	15852.50	7385.35	16375.03
<b>Job Gain/Loss</b>	45843.08	1535.69	21899.56	12522.94	5372.03	32311.41	15134.38	32857.00

Source: Own calculations/ Euro stat

Table presents the results of shift-share analysis of industry clusters in the Western Slovak region as compared to the nation. The Western region when compared to nation has a comparative advantage for industry clusters such as: Tourism, ICT, Metal manufacturing, Heavy machinery manufacturing, Apparel and Electrical equipment.

The region, however, has a comparative disadvantage for Automotive and Electronics cluster. Even though the region did not lose employment in respective sectors the region achieved less job opportunities in Automotive and Electronics clusters compared to the nation. Although the shift-share analysis determines a region's comparative advantage/disadvantage with respect to a given industry cluster, it does not specify the factors responsible for the actual growth or decline. A study conducted by Harvard Business school (2012) indicated that availability of labour market, skilled technicians, High levels of R&D, and sufficient supplier depth are the most significant factors affecting the location of the Automotive cluster.

## Central Region

Year	Auto	Tourism	Electronic	ICT	Metal	Heavy	Apparel	Equipment
<b>Competitive Effect</b>	11836.87	340.09	2801.12	6421.81	7695.97	13014.91	4169.03	5455.97
<b>Expected Change</b>	12113.93	647.50	2409.06	7040.25	7497.99	13518.24	4041.58	5604.03
<b>Job Gain/Loss</b>	23950.81	987.59	5210.18	13462.05	15193.96	26533.15	8210.61	11060.00

Source: Own calculations/ Euro stat

Table presents the results of shift-share analysis of industry clusters in the Central region as compared to the nation. The Central Slovak region has a comparative advantage for Automotive, metal industry and heavy equipment manufacturing cluster. These industry clusters are performing relatively well in the region as compared to the nation. For example, Electronic cluster is gained jobs in the region much ahead of national gains.

## Eastern Region

Year	Auto	Tourism	Electronic	ICT	Metal	Heavy	Apparel	Equipment
<b>Competitive Effect</b>	8416.87	692.09	3187.12	7327.81	12751.97	5578.91	6936.03	4767.97
<b>Expected Change</b>	8738.12	424.35	2770.66	8027.72	13078.13	5582.20	6873.61	4841.06
<b>Job Gain/Loss</b>	17155.00	1116.44	5957.78	15355.52	25830.10	11161.11	13809.64	9609.03

Source: Own calculations/ Euro stat

Table presents the results of shift-share analysis of industry clusters in the Eastern region as compared to the nation. The Eastern Slovak region has a comparative advantage of marking Metal, Heavy equipment, Apparel and Automotive. The Metal cluster seems to be a booming industry in the eastern region creating highest number of job gains in the region where as Automotive industry takes the second place in chosen clusters job gains. Further Apparel, Electrical equipment manufacturing and ICT sector contributing effectively towards local job gains.

## Conclusion

Recent years time, national and local economic development planners as well as research economists have been using industry cluster analysis to understand regional cluster structure and to design and develop strategies for cluster growth. The primary objective of this study was to assess the Slovak Republic's regional competitiveness in attracting and retaining industry clusters. Specifically, the study utilizes different regional economic tools to analyze the industry cluster structure and composition. The economic development tools may not give a comprehensible picture of the regional economy, because the results are sensitive to the time period chosen. However, they provide necessary tools for assessing the present economic condition of the region. The location quotient model is helpful in quantifying the degree of concentration of a particular cluster in a region relative to the nation or the state. It reveals the most specialized clusters in the region as well as the ones that are emerging or transforming. The economic base model identifies the export-oriented clusters in the region.

This model measures the economic impact of export-oriented clusters on the local economy. The shift-share analysis on the other hand, differentiates the national and industrial contributions from local or regional contributions with regard to cluster growth. It identifies the clusters that are mainly influenced by local factors as compared to external factors. It measures a region's comparative advantage for industry clusters. The study analyzed 8 industry clusters in 4 regions. The study did not discuss the results of country cluster analysis in depth; however, the results are reported in tables and graphs format. Interpretation of country cluster analysis results is similar to that of the regional cluster analysis.

When compared to the nation, Bratislava region was found to be specialized in ICT cluster. The main reason for the increasing concentration of ICT cluster is the national trend + regional trend. Several jobs were gained as a result of local conditions (see Shift-Share results). Conversely, Metal, Apparel and Electric equipment manufacturing was declining because of local economic conditions as compared to the national trend. Bratislava been the capital city with several ICT and presence of other multinational companies less favours heavy manufacturing industries. There are no major export oriented cluster in Bratislava region. Two of the eight clusters are favoured by local economic conditions indicating that their growth in the region is better compared to nation. Namely, ICT cluster and Automotive cluster. The

region has two *emerging* clusters, of which Heavy equipment and Apparel product manufacturing hoping will make contribution to local economic growth in the near future.

When compared to the nation western region has found to be specialized in Automotive, Electrical equipment manufacturing, Electronics and Heavy machinery. The region seems to be one of the best region in attracting additional cluster members. (shift-share analysis results) According to Sario.sk Kia Motors Zilina, VW Trnava and PSA Trnava are the major members of Automobile cluster. However, tourism industry did not show any comparative advantage compared to the nation. Compared to the nation, region's clusters promote export oriented firms. Export oriented clusters were found in Automotive, Electronic, Heavy machinery, Apparel and Electrical equipment industries. Job multiplication in these industries were the highest accounting less unemployment rates in the region compared to other regions. Electronic, Apparel, Heavy equipment, Electrical equipment clusters were star clusters where as Metal and ICT industry been emerging clusters. Automotive Industry, heavy equipment, Electronics and Electrical equipment are the prominent clusters in the region. This conclusion is based on the fact that:

1. These clusters are export-oriented in nature (basic clusters)
2. They are favoured by local factors as indicated in shift-share analysis
3. Their location quotient is approaching the threshold values.
4. These are clusters with large employment.

Both central and Eastern regions follow somewhat similar patterns with Heavy equipment, Metal, Apparel and Automotive industries been prominent industries. In Central region with high base multipliers Heavy equipment and Metal industries are export oriented and in eastern region Apparel and Metal manufacturing industries are creating jobs in the local economy. The emerging factor of Automobile cluster is visible in Central and Eastern regions hoping it will dramatically shift towards a star cluster and continue to benefit local economic development in respective regions. Apparel industry cluster is matured in Eastern region with job multiplication seems to improve consistently. According to sario.sk US steal Kosice and Spinea Presov are major contributors in the Eastern region.

Over the past few decades, state and local economic development planners as well as research economists have been using industry cluster analysis to understand regional cluster structure and to design and develop strategies for cluster growth. The primary objective of this study was to assess the regional competitiveness in attracting and retaining industry clusters. Specifically, the study utilizes different regional economic tools to analyze the industry cluster structure and composition. The economic development tools may not give a comprehensible picture of the regional economy, because the results are sensitive to the time period chosen. However, they provide necessary tools for assessing the present economic condition of the region. The location quotient model is helpful in quantifying the degree of concentration of a particular cluster in a region relative to the nation or the state. It reveals the most specialized clusters in the region as well as the ones that are emerging or transforming.

The research concludes that despite the theoretical underpinnings and recommendations of international agencies including European commission, there are no signs of cluster policy development reported in Slovakia up to date. There has been attempt to create Cluster initiative which has not gone beyond paper pack. Although the priority to support SME development has yielded benefits to regional economic growth.

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# Rural reforms and agricultural productivity growth in Uzbekistan<sup>1</sup>

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## Abstract

This paper describes the development of agricultural reforms in Uzbekistan implemented over the last two decades and their potential implications for the productivity growth. Uzbekistan adhered to the 'gradual path' of reforms by retaining partial state control over the agricultural sector. Land market reforms succeeded to transfer land from large-scale state and collective farms to small private and *dehkan* farms. However, private ownership is not recognized; farms can access land only through lease arrangements from the state. Further, strong market regulations were introduced in the output and input markets through centralized state procurement system. Labor productivity, crop yields and TFP increased significantly over the two decades of reforms induced by land use rights transfer to private farms and *dehkans* and by partial deregulation of output markets.

## Keywords:

agrarian reforms, farm organization, land market, property rights, productivity.

## Introduction

Since 1991 after gaining independence from the former USSR, Uzbekistan embarked on transition process aiming at dismantling the old system inherited from the communist regime. Uzbekistan adhered to the 'gradual path' of reforms by retaining certain state control over the agricultural sector. This is in contrast to several other former Soviet Central Asian countries (CAC) which embraced 'shock therapy' model of rapid transition to market economy (Kotz 2004; Rustemova 2011; Rozelle and Swinnen 2004). The Uzbek reform process is well summarized by Kotz (2004) who pointed out that "Uzbekistan's reluctance to follow the conventional policy recommendations became apparent very early. Ignoring warnings from abroad, the government of Uzbekistan followed a policy of gradual transformation of the economy". Similarly, Pomfret (2000) argues that "The government explicitly avoided the shock therapy advocated by the international financial institutions and also avoided the economic collapse... Its economic performance, measured by change in real gross domestic product (GDP) between 1989 and 1999, was one of the least bad among transition economics and the

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best of all former Soviet republics". One of the explanations behind the choice of this reform path (particularly in the first years of transition) was the objective of the government to prevent output collapse and unemployment growth (UN-DESA, 2011) threatened by disruption of economic linkages existent within the former Soviet Union countries.

One of the main driving factors of economic growth in Uzbekistan represented the agricultural sector. From macroeconomic perspective, the agricultural sector generates foreign currency income for the economy and supplies key raw-material to the industry. The hard currency earnings from agricultural exports allowed to realize several development projects in the economy and to attract foreign investments in the industrial sector. The agricultural sector is directly connected with several industrial sectors of the economy such as chemical, machinery, textile and food processing. Further, local agricultural production generates around 35 to 40 percent of all industrial output in Uzbekistan which represents approximately 8 percent of GDP (Rudenko, 2008). Moreover, the agricultural sector in Uzbekistan contributes to food security, employment and rural livelihoods.

This paper aims to describe development of agricultural reforms in Uzbekistan implemented over the last two decades and their potential implications for productivity growth since the collapse of communist regime in the early 1990s. More specifically, this paper focuses on farm restructuring process, output market organization and state procurement system and impacts on agricultural productivity.

## Agricultural development

Compared to other former Soviet Central Asian countries (CAC), Uzbekistan avoided dramatic decrease in the agricultural output in the first years of transition. Although Uzbekistan did not experience an initial output decline, it neither generated output increase beyond the pre-reform level in the first decade of transition (Table 1).<sup>5</sup> The development of agricultural production index reported in Table 1 shows that Uzbekistan performed better than other CAC in the first years of transition, whereas its performance was in-between these countries in the second half of 1990s. An important player among CAC is Kazakhstan. Agricultural production dropped significantly in Kazakhstan. Kazakhstan was one of the main grain producers in the former USSR. The reduction of grain production in Kazakhstan had huge implications for food security in the region (including for Uzbekistan). The neighboring countries relied heavily on grain imports from Kazakhstan during the Soviet period. A different development to Uzbekistan is observed in Kyrgyzstan. The liberalization process implemented in Kyrgyzstan led to initial agricultural output decline followed by growth at the end of the 2000s. In fact Kyrgyzstan is the only CAC which exceeded its pre-reform agricultural output level in less than one decade since the start of transition process.

**Table 1. Agricultural production indices for Central Asian countries** (1989-91 average = 100)

Country name	1992	1993	1994	1995	1996	1997	1998	1999	2000
Kazakhstan	108.7	96.4	80.7	63.5	61.2	60.4	49.5	67.6	62.3
Kyrgyzstan	100.6	97.0	88.0	81.2	89.8	98.0	101.0	106.6	112.8
Tajikistan	75.9	71.5	69.3	60.4	52.7	50.4	48.5	47.6	52.3
Turkmenistan	88.9	99.4	105.8	103.8	68	78.2	85.7	98.9	97.4
Uzbekistan	97.9	100.2	100.2	100.9	92.4	94.7	98.7	97.2	99.6

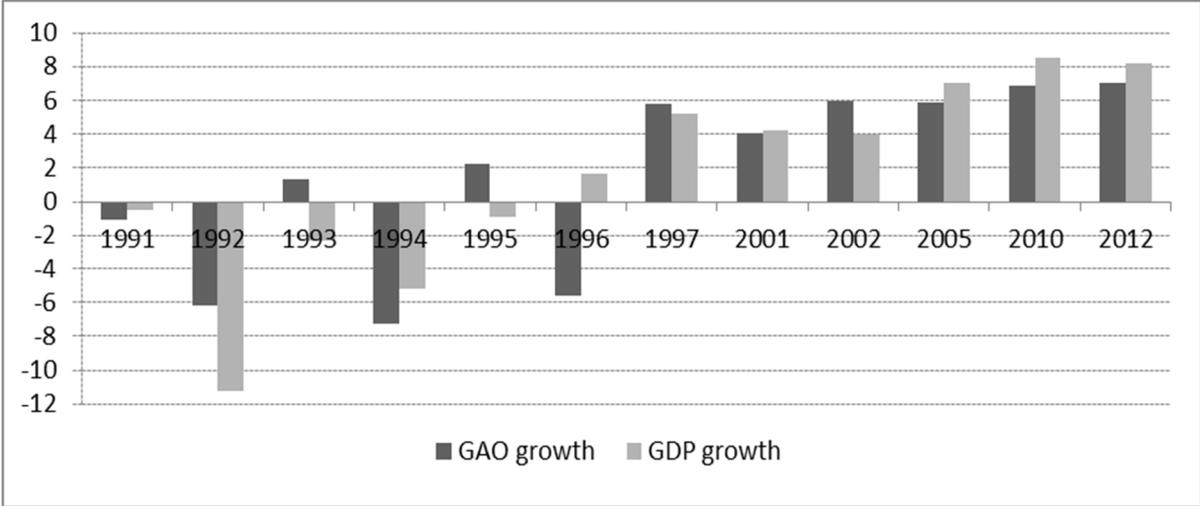
Source: FAOSTAT

Overall, the transition reforms in Uzbekistan resulted in a stable growth of gross agricultural output (GAO) and its development shows similar pattern to GDP growth (Figure 1). At the

<sup>5</sup> It is important to note that in 2000-2001 Uzbekistan suffered from water scarcity problem.

beginning of the transition, both GAO and GDP growth showed mixed development, whereas they show a consistent positive growth from 1997 onwards.

**Figure 1. GAO and GDP growth rates in Uzbekistan in 1991-2012, percent**



Source: State Statistical Committee of Uzbekistan, 2012

Uzbekistan oriented its economic policy towards industrialization, and consequently the share of the agricultural sector in the overall economy has declining steadily. Agricultural contribution to GDP sharply decreased from 37.3 percent in 1991 to 17.5 percent in 2012. Similar pattern is observed for exports and agricultural employment. Agricultural export’s share decreased from 63.4 percent in 1991 to 17 percent in 2012, while the agricultural employment decreased from 42 to about 27 percent over the same period. The main agricultural export product is cotton representing more than 90 percent in total agricultural exports.

**Table 2. Share of agriculture in main sectors of the economy in Uzbekistan, in percent**

Indicators	1991	1997	2000	2001	2004	2005	2010	2011	2012
Share in GDP	37.3	28.3	30.1	30	26.4	26.3	18.0	17.6	17.5
Share in total export	63.4	40	33	26	22	23	15.9	16	17
Share in employment	41.9	40.7	34.4	33.5	30.7	29.1	26.8	27.1	26.6

Source: State Statistical Committee of Uzbekistan, 2012

In spite of a gradual decrease of the agriculture’s share in the overall economy, the sector still plays a significant role in the socio-economic development of the country. A significant share of population resides in rural areas which in fact increased in 2012 relative to the 1992 level. Further, agricultural employment is sizable in relive terms and there exist a strong linkage between agriculture and other sectors of the economy (Table 2 and Table 3).

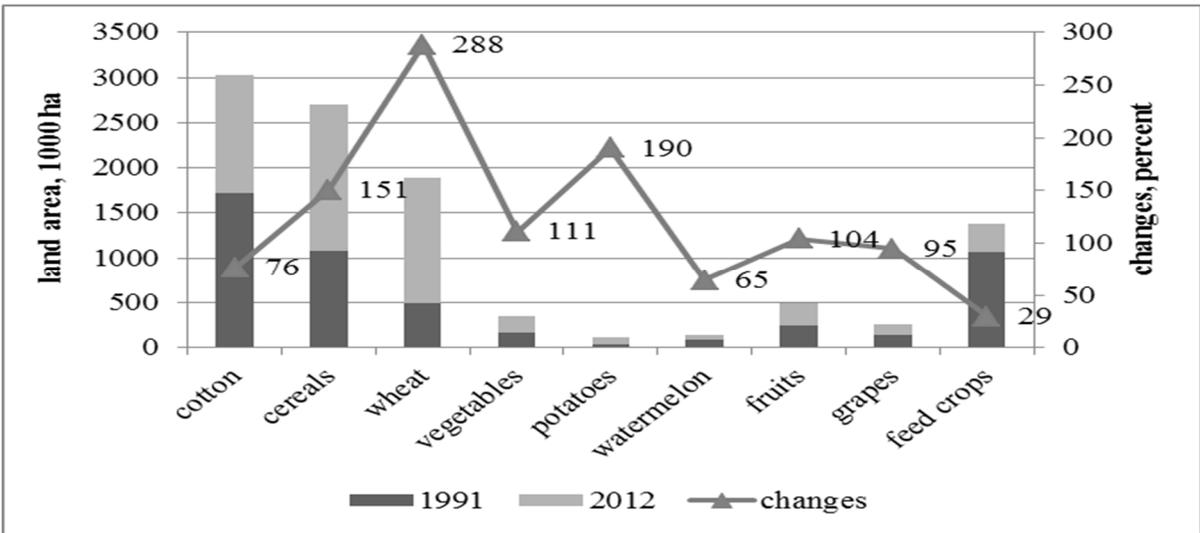
**Table 3. Development of population in Uzbekistan, 1991-2012**

Indicators	1992	2012	Changes	
			(+/-)	%
Rural population, thousand people	12,981	18,969	5,988	146.1
Rural population, %	61	64	3	105.3
Total population, thousand people	21,449	29,775	8,326	138.8

Source: World Bank

The pre-reform production structure in the agricultural sector was characterized by strong concentration in cotton monoculture cultivation. This system was gradually broken down from the start of the transition process. Cotton monoculture was reduced significantly and production was diversified into other crops particularly into wheat cultivation. According to data reported in Figure 2, cotton area reduced by 24 percent whereas wheat area increased three-fold in 2012 relative to 1991. Also fodder area experienced a significant decline (70 percent), whereas area of grapes, fruits, vegetable and potatoes increased respectively by 5, 4, 11 and 100 percent over the same period.

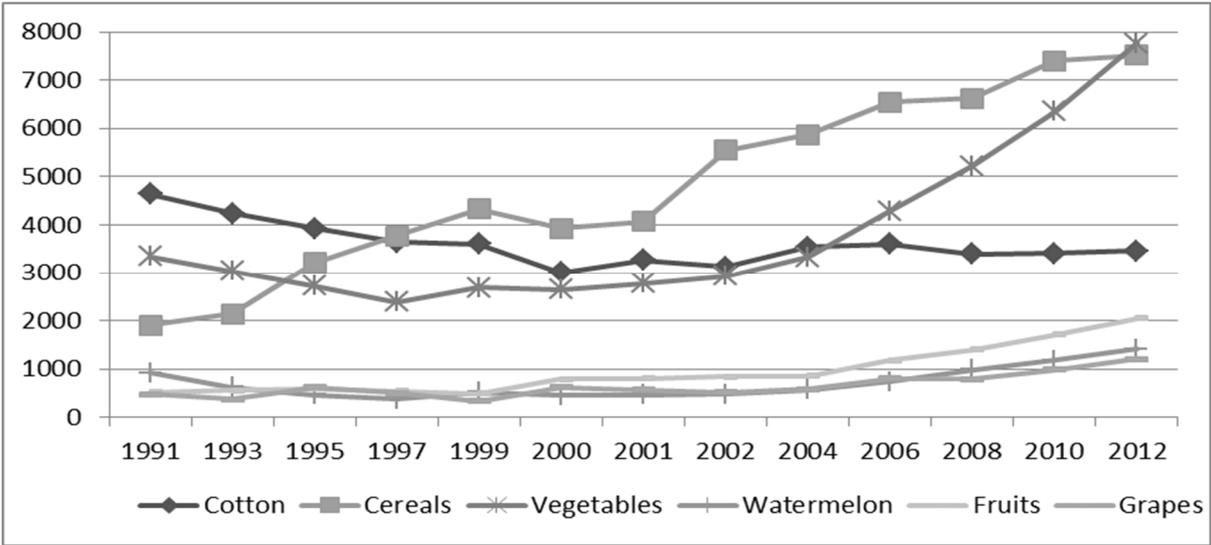
**Figure 2. Development of agricultural crop area in Uzbekistan**



Source: State Statistical Committee of Uzbekistan, 2012

The restructuring of agricultural production had important implications for food security in Uzbekistan. Although, Uzbekistan remained the world’s fifth largest producer of cotton and the second world’s largest cotton exporter (after the USA), important changes occurred for food related products. During the communist period food security was heavily depended on imports from other soviet countries (e.g. Kazakhstan). Around 82 percent of wheat, 50 percent of meat and potatoes, and about 60 percent of milk and milk products were imported (MAWR, 2012). As a result of agrarian reforms, the production food commodities sharply increased in detriment of cotton. Particularly, wheat production increased eleven-fold and almost fully replaced imports. Similar developments were observed for other crops such as fruits, vegetables, potatoes and grapes. Production of fruits and vegetables increased about four-fold, potato six-fold, while grape production doubled. Uzbekistan became one of the largest producers and exporters of fruits and vegetables in Central Asia. In the livestock sector production also sharply improved: meat and milk production increased about two-fold, while egg production increased less than two-fold (Uzstat, 2012). Overall, these structural changes in the Uzbek production contributed to food security and welfare of the rural population.

**Figure 3. Production of agricultural crops in Uzbekistan**



Source: State Statistical Committee of Uzbekistan, 2012

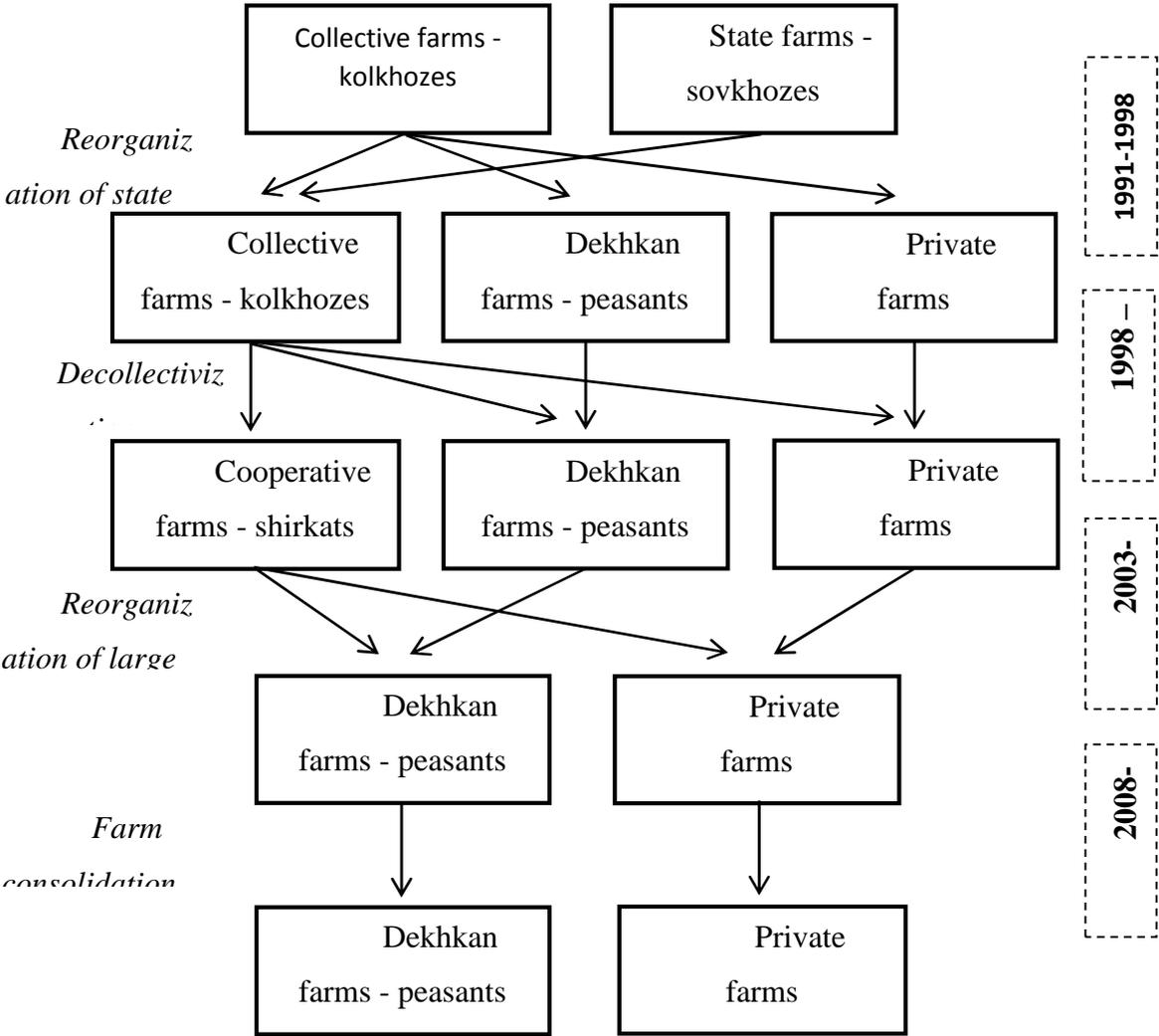
**Agricultural reforms**

Key components of agricultural reform in a transition country include privatization and establishment of property rights to land, land market regulations, and input and output liberalization (Spoor 2004; Rozelle and Swinnen 2004). This is particularly relevant for Uzbekistan where expanding population and rising water scarcity problem put pressure on the agricultural sector. Thus reforms are critical to ensure food security and welfare of the rural population. The agricultural reforms in Uzbekistan were based on gradual adoption and introduction of market principles and institutions. This was inspired by the Chinese or the Vietnamese models which were used as a blueprint for implementing reforms with expectation of generating rapid economic growth (Pomfret, 2000). The case of China demonstrated that transition in agriculture could succeed, at least in the early years, without disruptions caused by the dismantling of government-run marketing channels and in the absence of well-functioning markets (Rozelle and Swinnen, 2004). At the other hand, Bloch (2002) argues that “The relatively slow process of real privatization in Central Asia can be explained by slow development of input markets, the problem of funding social infrastructure and public health, persistent political power of the rural “nomenklatura,” the design of the existing large-scale irrigation systems; and, finally, inter-ethnic problems”.

**Farm restructuring process**

As mentioned above, Uzbekistan followed a gradual reform path in the agricultural sector similar to China and Vietnam. The different elements of reforms were implemented step by step after checking the effects of previous decisions. The farm restructuring process in Uzbekistan can be divided into four phases (figure 4).

Figure 4. Farm restructuring process in Uzbekistan during the period of 1991-2012 years



Source: Own work based on Djanibekov et al, 2012

Phase I: Reorganization of state owned farms – 1991-1997

Uzbekistan inherited from the former Soviet regime, an agricultural production system heavily centralized into large units represented by *kolkhozes* (collective farms) and *sovkhoses* (state farms). In total there were 940 *kolkhozes* and 1,108 *sovkhoses* in Uzbekistan. *Sovkhoses* functioned as state farms and were financed directly from the state budget, and thus their entire management was under the full government control, whereas the *kolkhozes* were non-budgetary enterprises and had legal right to market their output. This type of production organization is widely considered as inefficient and was the main driver for reforms (Lerman, 2008; Bloch, 2002, Djanibekov et al, 2012). Alongside large collective and state farms, *Dekhkan* farms (peasants) coexisted in Uzbekistan covering around 6 percent of total agricultural area.

To reduce government financial responsibility and subsidization, *sovkhoses* were converted into collective farms (i.e. into *kolkhozes*). However, the government production and price controls were maintained. The government set the production plans for the collective farms and established a fixed procurement price for agricultural products in the framework of the state planning system. Only surplus agricultural production was allowed to be sold on the free

markets. This procurement system was established for vegetables, fruits, meat and milk products, cotton and grains (Pomfret, 2000).

Collective farm leased land from the state in the framework of the state procurement system and in-turn they sub-leased it to rural population (family leaseholds) on the basis of *pudrat (leasehold) system*. According to the *pudrat* system, the family leaseholds produced agricultural products for collective farms, while collective farm supplied them with inputs. The capital of the collective farms belonged to their members and collective farms could legally use it in the production process. However, in practice their independence was strongly limited by the state intervention (through centralized state procurement system). Collective farms were partially able in fulfilling state orders for cotton and grain production mainly due to availability of agricultural machineries. However, this was obtained at high costs particularly linked to inefficient resource use (especially, water, land and energy) as well as central price setting system rendered collective farms unprofitable.

In this phase of the reforms, partial *decollectivization* was also implemented via distribution of agricultural land to *dekhkan* farms and *private farms*. The primary aim of the initial land distribution was to increase the size of garden-plots of rural and also urban dwellers from irrigated land reserves.<sup>6</sup> This measure contributed to socio-economic stability of rural areas by reducing unemployment and by improving income level and food security of rural population. *Dekhkans* were allowed to manage an agricultural production operation on personal household plots of a size from 0.17 up to 0.35 hectares of irrigated area and up to 0.5 hectares of non-irrigated area. *Dekhkans* could receive two types of private plots: one attached to household dwelling which was usually used intensively for fruit, vegetable or livestock production; and the second one located at a distance from the dwelling and was most often used for rice, wheat or maize production (Djanibekov et al, 2012). By 1993, a total of 650,000 new households had received plots and 1.6 million households increased the size of their previously owned area.

A third category of farmers officially recognized were *private farms*. Private farms functioned according to the *law on peasant (private) farms and entrepreneurship* adopted in 1992. They accessed land through long-term (10 years) and renewable lease contracts with the state. State provided subsidized inputs such as agricultural machinery, fertilizers and fuel. In return they were required to deliver a predefine share of production to the state. The rest of production could be disposed freely on the market.

#### Phase II: Decollectivization and development of individual farming – 1998-2007

The second phase covered the period between 1998 and 2007 during which several legislative documents were adopted such as “Land Code”, “Law on Agricultural Cooperatives”, “Law on Private Farms”, “Law on Dekhkan Farms” and “Law on Land Cadastre”. The “Land Code” served as a reference legislation for other legislative acts concerning land management, land regulation and land protection. It also defined the main categories of agricultural producers that were officially recognized: (i) agricultural cooperatives and other agricultural enterprises, (ii) scientific and research establishments, (iii) private citizens (private farms and peasant farms), and (iv) non-agricultural enterprises and other establishments.

In this phase, unprofitable *kolkhozes* (i.e. collective farms) were transferred into *shirkats* and private farms (see Figure 4). The concept of *shirkat* was applied to agricultural cooperatives created on the basis of *kolkhoz* divisions by dividing them into smaller structural units. The main reason of transforming collective farms into *shirkats* was to increase production efficiency, improve management systems and implement some elements of the market economy. *Shirkat* consists of several former brigades, which used to work before the break-up of the collective farm within a certain division (Ilkhamov, 2007). *Shirkats* tended to specialize in cotton and wheat production. However, they remained under strong state control; i.e. under the state procurement system which regulated crop allocation and sowing strategy, pricing, and marketing of production. The main principles of *shirkats* were voluntariness of

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<sup>6</sup> This was established by the Presidential Degree No 124 from January 11, 1991

membership, work carried out on the basis of the family contract, and proportional distribution of profits among members of the cooperative according to their property shares. *Shirkats* were obliged to guarantee the supply of all necessary materials and technical resources for their members who produced agricultural products for *shirkat*.

The “Law on Dekhkan Farms” strengthened the status of *dekhkans* and considered them a part of the agricultural development strategy. Since 1999, the term *dekhkan* was formalized as a form of household farm, which uses household labor and private plot of land given to the head of household as lifelong inheritable ownership. The *dekhkan* farms were not subject to state procurement system, were free to make own decisions on production and marketing and were subject only to minimal taxation. *Dekhkan* farms were not part of the farm restructuring process in this phase of reforms, and their land share increased only as a result of the rural population growth (Djanibekov et al, 2012), because according to the laws each family in rural area could receive land for agricultural production from the land reserves of the *shirkats* (before phase two from collective farms).

Regarding *private farms*, a new law was adopted in 1998 which further strengthened the position of this type of farms. According to the law, the private farm was recognized as an independent economic unit which carries out agricultural production on leased land. The law also stressed that private farm represents the main agricultural production unit in Uzbekistan. Further, the law established a minimum size of leased land and minimum herd size of private farms depending on production specialization: (i) the minimum land area for livestock rearing farms was set from 0.3 up to 0.45 hectares per head of cattle in irrigated areas, 2 hectares per head in non-irrigated areas, whereas the minimum number of cattle was set to 30 heads; (ii) the minimum size of horticultural private farms was set to at least 1 hectare; and (iii) to 10 hectares for cotton and wheat private farms. Private farms could lease land based on decisions of the head of the district administration and the special commission after competing in an open tendering process. The duration of land lease could vary from 10 to 50 years.

#### Phase III: Reorganization of large-scale farms – 2002-2007

According to Lerman et al. (2002), collective farms were de facto just re-registered enterprises under the new category of *shirkats* but in practice they had not changed their behavior and performance; they remained unprofitable similar to collective farms (Bloch, 2002). However, *shirkats* were relatively successful in fulfilling the production quotas (state orders) for strategic crops such as cotton and wheat due to having access to agricultural machinery park. Despite of this partial production advantage of *shirkats*, government decided to reorganize non-profitable *shirkats* into private farms. Actually, fragmentation of non-profitable *shirkats* into smaller private farms has started since 1999 and it accelerated after the adoption of the Presidential decree No 3342 in 2003. The decree provided to private farms guarantees for higher economic independence, incentives for efficient land use and improved financial and input delivery system. It aimed at increasing the share of private farms in land use from 17.5 to 63.3 percent of total land and to double their contribution to total agricultural production. Further, the decree attempted to improve access of private farms to inputs, agricultural services and to deliver other infrastructural facilities such as machine-tractor parks (4.1 times), water users` associations (4.6 times), stations for fertilizer supply (4.4 times), stations for fuel supply (4.6 times), consulting and information support (1.9 times), mini-banks (3.1 times), veterinary science (1.2 times). As a result of these reforms, the land use by private farms increased at the expense of agricultural cooperatives reaching about 85 percent of total land area in 2007. Practically, private farms became dominant producers in the agricultural sector (especially in cotton and wheat production) but were still operating in the framework of the state procurement system.

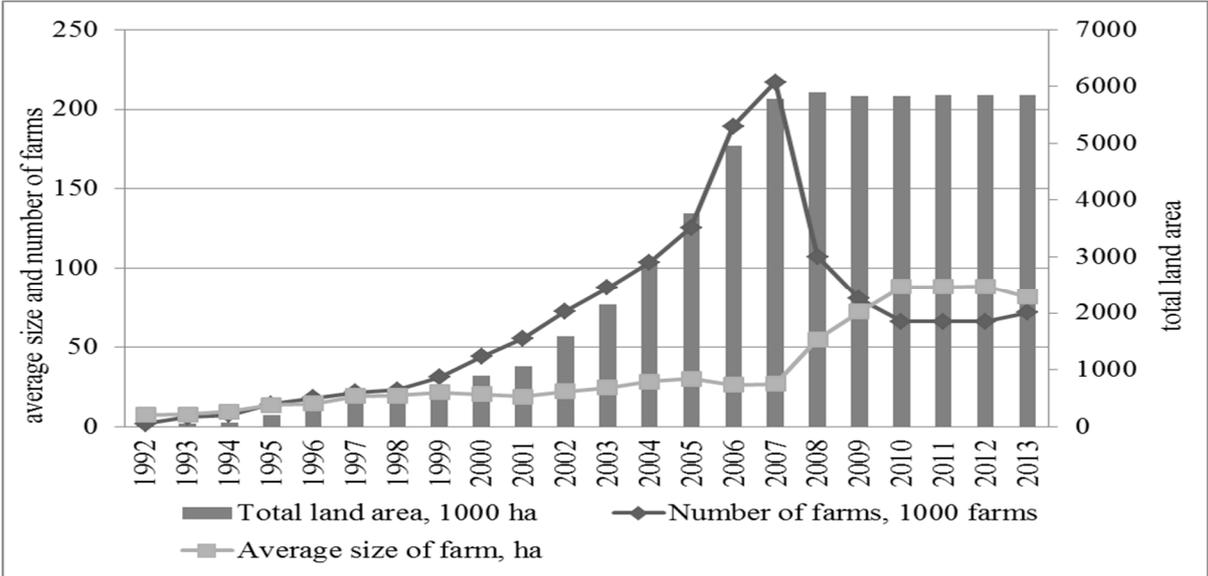
#### Phase IV: Farm consolidation or optimization – 2008 – 2014

The reform process resulted in fragmentation of agricultural sector in small production units. Particularly vulnerable were, small farms which were found to be inefficient due to difficult

access to water, capital and machinery (Djanibekov et al, 2012; Bloch, 2002). The machine-tractor parks (MTP) created from the former agricultural cooperatives did not solve that problem of access to machinery due to their monopolistic position on the market. Further, many small farms cultivated small plots of land, where application of MTP machinery was not profitable. This was the case especially in areas located far from MTP station due to high transportation costs and low benefits per service delivered to small farmers. Additionally, access to water distribution system was unfunctional for small farms (also due to coordination problem) leading to a low productivity for farms located in irrigated areas.

All these factors prompted adoption of measures to promote farm consolidation starting from 2008. The adopted land consolidation reforms increased minimum size of private farms. The minimum size of cotton and wheat farms increased from 10 to 30 ha, and for horticultural and gardening farms from 1 to 5 ha (Djanibekov et al, 2012). As a result of consolidation, the average size of private farms more than doubled in a short period; it increased from 26.7 hectares in 2008 to 55 hectares in 2009 and to 88 hectares in 2012, while the number of private farms decreased from 217.1 thousand to 107.1 thousand and to 66.1 thousand, respectively (Figure 5). It is important to note that, the small scale land consolidation processes was also implemented at the district level.

**Figure 5. Farm restructuring, 1991-2013**



Source: State Statistical Committee of Uzbekistan, 2012

The changes adopted in this phase of reforms have also gradually improved the provision of agricultural machinery and inputs to farms. Machinery acquisition by private farmers significantly increased after the land consolidation process. For example, tractor purchases increased from 6 units in 2008 to 297 units in 2011. Moreover, land consolidation improved water access in irrigated areas driven by the reduction of the number of water consumers. Before the consolidation, Water Consumers` Association had to distribute water resources among a large number of small farms leading to coordination failures due to difficulty to implement and enforce irrigation schedules for crops. For similar reasons, the enforcement and management of the state procurement system improved. Land consolidation concentrated agricultural production on fewer and larger farms which made it easier for the government to control and manage the state procurement policy (Djanibekov et al, 2012).

In spite of the state land ownership, by 2012 99.9 percent of gross agricultural output was produced by the private sector. By this period, *dekhkan* farms produced 63.5 percent of the gross agricultural output, including 43 percent of crop production and 93 percent of livestock production. Private farms produced 34.4 percent of gross agricultural output, including 56 percent of crop production and 4.4 percent of livestock production (Uzstat, 2012).

## Land property rights

The Uzbek government owns land and controls its use allocation. The Land Code of Uzbekistan established, with few exceptions, that the state is the sole owner of land. Further, the code stipulates that land must be used rationally, it is protected by state and it is not liable to sale, exchange, donation or mortgage. Private farms can lease land from the state and are obliged to conduct a share of agricultural production activities under the state procurement system, while the remaining production is permitted to be transacted on the open market (Table 4). Land sub-lease to private individuals not allowed. Any changes made by private farms for the cotton area usage can be a reason for forfeiture or seizure of the farmland by the state. Furthermore, the state as the single landowner can expropriate private farms if deemed necessary. This makes private farming only quasi-private, as the main productive asset is not owned privately (Lerman, 2008). Further, private farms specialized in cotton and wheat production do not have full rights to decide on what crop to plant. Cotton and wheat farmers are required to devote a share of land to cotton and wheat cultivation which are enforced by local state authorities. The compulsory acreage quotas required to be cultivated with cotton and wheat are set by the central governmental decree and are passed down to farms through the provincial district authorities. The decree adopted in 2012 relaxed slightly these acreage controls. Private farms which achieve high productivity (high yields) are allowed to use five percent of land area for cultivation of other crops than cotton and wheat and this production is not subject the state procurement system.

It is important to note that after the wheat harvest (i.e. from July until October-November) farmers have an opportunity to cultivate other cash crops (i.e. intercrops) not regulated by the state. Most common crop choices for farmers are vegetables, maize or rice. After the intercrop harvest (i.e. in October or November), farmers plant winter wheat or prepare land for planting of cotton in the spring. The intercropping allows farmers to generate additional income stream, to improve forage reserve for cattle rearing, allows farm workers to earn extra income (in kind or cash) through seasonal works or by renting in land during the intercropping season through short-term informal rental arrangements.

The two cropping systems (cotton/wheat versus intercrop production) are interdependent and likely mutual cross-subsidization occurs between them. The benefits obtained from intercropping serve as an incentive for continuing farming which indirectly supports the state procurement system. On the other hand, production of cotton and wheat by private farms is heavily depended on the state procurement and particularly on the input delivery system. Hence, the support leakage could go other way around: from the procurement system to intercrop production. Private farms may divert the use of subsidized inputs obtained from the state procurement system for cotton or wheat production to intercrop cultivation. Other types of farms such as horticulture and livestock private farms have more freedom in making crop choice and in trading production on the open market but do not have access to subsidized inputs.

*Dekhkan* farms or rural households are granted lifetime and inheritable use rights to land as well as they are not subject to the state procurement system (Table 4).

**Table 4. Main characteristics of farms of different types in Uzbekistan**

	<b>Dekhkan farms</b>	<b>Private farms</b>
Definition	A partially commercial farm based on a household plot	An independent commercial farm organized as a legal body
Labour	Family members	Family members, hired workers
Land tenure	Lifetime inheritable Possession	Long-term lease up to 50 years
Owners	Workers of private farms, rural employees	Any adult person with sufficient agricultural qualifications or experience; typically former worker of agricultural enterprise
Production specialization	Horticulture, livestock	Crop sector, livestock, etc.
State procurement	Not applied	Cotton and wheat

Source: Updated from Lerman, 2008

### **Market organization and state procurement system.**

Rozelle and Swinnen (2004) argue that the success of agricultural reform requires two key elements: secure property rights and an institutional environment within which agents can exchange goods and services and access inputs. From the start of the reform process, Uzbekistan introduced heavy regulations in output and input markets. One reason behind this choice, at least in the first years of reform process, was the budgetary constraint and the intention to collect financial resources through taxation of the agricultural sector. After the collapse of the communist regime in 1991, Uzbekistan was cut off from the budgetary grant received from the USSR, and thus the government was forced to find new sources of revenue. Extraction of surplus from agriculture by driving a wedge between the procurement price and the export price of cotton was a readily available alternative (Kandiyoti, 2002). The intervention system upheld by the Government of Uzbekistan for cotton and wheat is often criticized and pointed out as the key obstacle to the income generation of agricultural producers as well as for building the necessary farm capital for investments and long-term planning (Rudenko et al, 2007).

### **Price setting and selling of agricultural products**

In the early 1990s most main agricultural products were subject to the state procurement system and land-use regulations. Over time procurement system was gradually liberalized. Only for cotton and wheat the administrative arrangements for land-use and state procurement system remained in place until the present days (Table 5).

The cotton policy is predominantly export oriented and aims at generating revenues in hard currency (Guadagni et al, 2005). The production quota for cotton which is required to be delivered to the state at a fixed price (usually lower than the world price) is set at 30 percent, while 20 percent is bought at a contractual price, which is also based to the state prices. Farmers are free to sell the remaining 50 percent of the cotton harvest on the open market. However, there are no free cotton markets in Uzbekistan, so in practice all cotton is sold to the state at a fixed price (Ruzmetov et al. 2003).

**Table 5. State procurement for agricultural production**

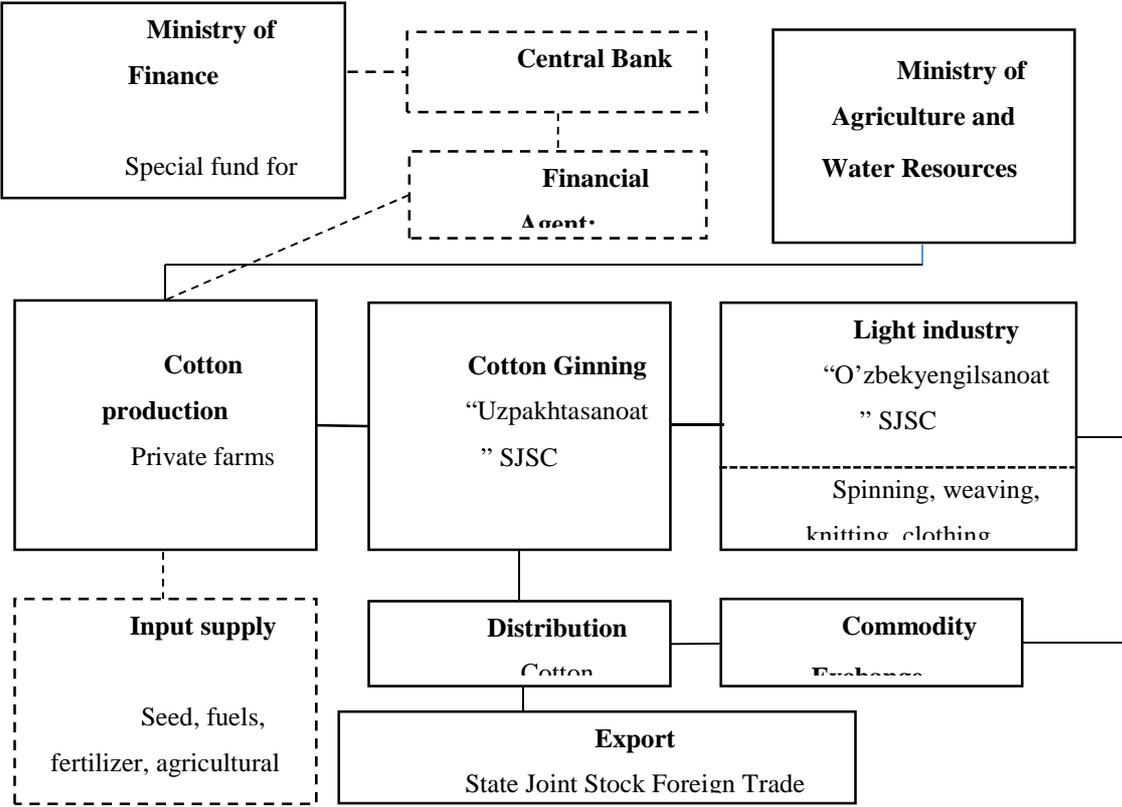
Crops	1991	1992	1993	1994	1995	1996	1997	2002	2012
Cotton	95	85	80	75	60	40	30	30	30
Wheat	100	100	80	75	50	50	50	50	50
Vegetables	100	50	50	-	-	-	-	-	-
Fruits	100	100	50	-	-	-	-	-	-
Meat and milk	100	100	80	50	-	-	-	-	-

Source:

In order to incentivize farmers in cotton production, the government narrowed the difference between the world market and the prices for cotton fiber by increasing the farm-gate prices for raw cotton (Djanibekov et al, 2012). Since 2002 (established by the degree No 3114), the state farm-gate prices of raw cotton are based on the average world prices of cotton fiber. The calculation of fixed state prices for raw cotton take into account projections of world prices of cotton fiber, transportation costs, marketing costs of trade companies, exchange rate (UZSoum/USD), costs to ginning company and the average fiber content of cotton. The Presidential degree No 1024 of 2008 exempted cotton ginning companies from paying value added tax (VAT) for exported cotton. This was accompanied by an increase of state farm-gate prices of cotton. Farmers can receive additional payments from the state for supplied raw cotton if the world cotton prices are high. The additional payment is around 25 percent of the world price increase. Furthermore, subsidies are also provided to cotton farmers in form of price differentials for inputs and cotton byproducts, maintenance and operating costs of irrigation system, postponement of credit repayment, tax rebates and preferable credits (Djanibekov, 2008).

To better understand the procurement system, the whole cotton chain is illustrated in Figure 7. The Ministry of Agriculture and Water Resources of Uzbekistan defines yields to be attained and land area which private farms are required to allocate to cotton cultivation. Private farms make a contract for the cotton supply with regional branches of the state joint stock companies "Uzpakhtasanoat" (Uzcottonindustry), which are specialized in cotton ginning. A special fund of the Ministry of Finance for purchasing agricultural products transfers money to commercial banks. At the start of planting season, commercial banks allocate (step by step) credit to farms for input purchases by charging a low interest rate. Maximum amount of credit which farmers can receive is 60 percent of the contract value. The credit can be used for purchasing inputs only from official input suppliers authorized by the state. Farms can buy fuel, fertilizer, herbicide, and pay for agricultural machinery and plant protection services, as well as they can pay salaries to hired labour. Farmers can make repayment of credits after receiving payment from cotton ginning companies for the supplied cotton. Private farms supply raw cotton to cotton ginning enterprises, which process raw cotton into cotton fibre. In turn, cotton ginning enterprises send cotton fibre to regional cotton terminals for reserving and distributing cotton fibre between textile companies and foreign trade companies, which are authorized to export cotton. Cotton ginning companies also distribute cottonseed to cotton seed corporations and oil extracting plants. Oil extracting plants process the cottonseeds into cotton oil, cotton cake, acid producing plants and other cotton by-products.

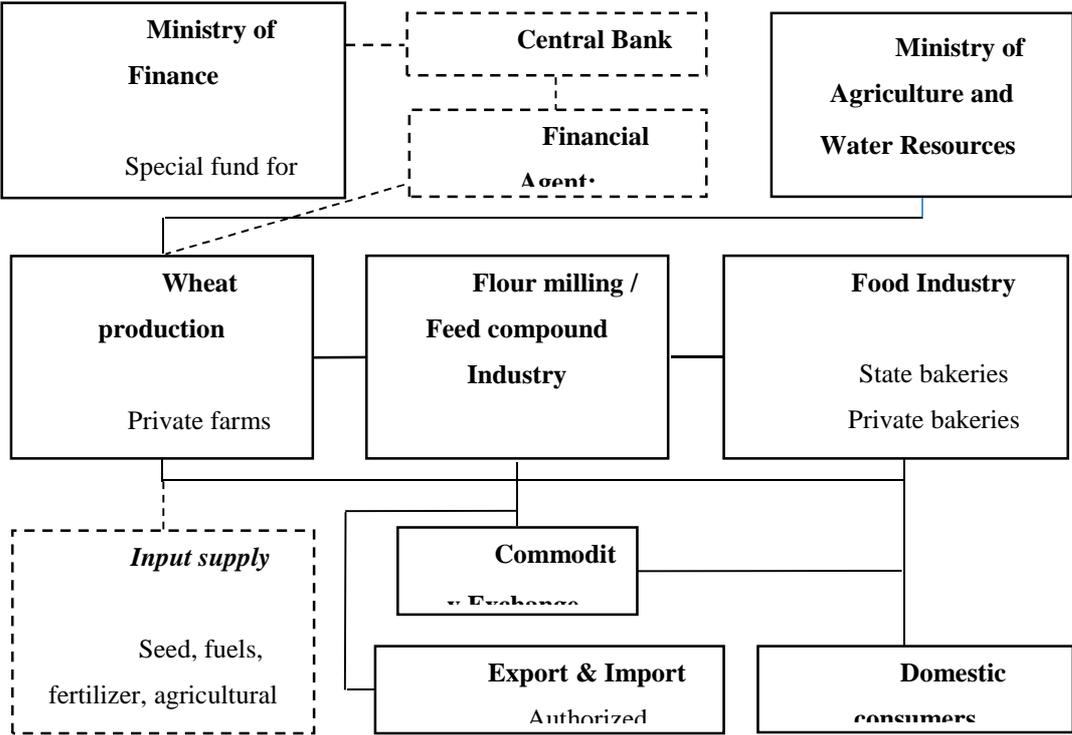
**Figure 6. Cotton Chain in Uzbekistan**



Source: Own work based on Rudenko, 2008

Wheat is a second strategic crop in Uzbekistan and is also subject to the state procurement system similar to cotton. Farmers have available the same subsidy scheme as in the case of cotton (Figure 7). Farmers receive credit to purchase the necessary inputs for wheat cultivation. Farmers conclude a contract with regional branches of the state joint stock company “Uzdonmahsulot” (Uzcerealproduct) for 50 percent of the wheat harvest at the fixed state price. The Ministry of Finance in cooperation with the Ministry of Agriculture and Water Resources announces fixed prices of wheat for state order every year. Private farms supply wheat to regional enterprises of SJSC “Uzdonmahsulot”, which further distribute processed product to commercial companies and bakeries. Authorized companies can import and export wheat products depending on harvest level.

**Figure 7. Wheat chain in Uzbekistan.**



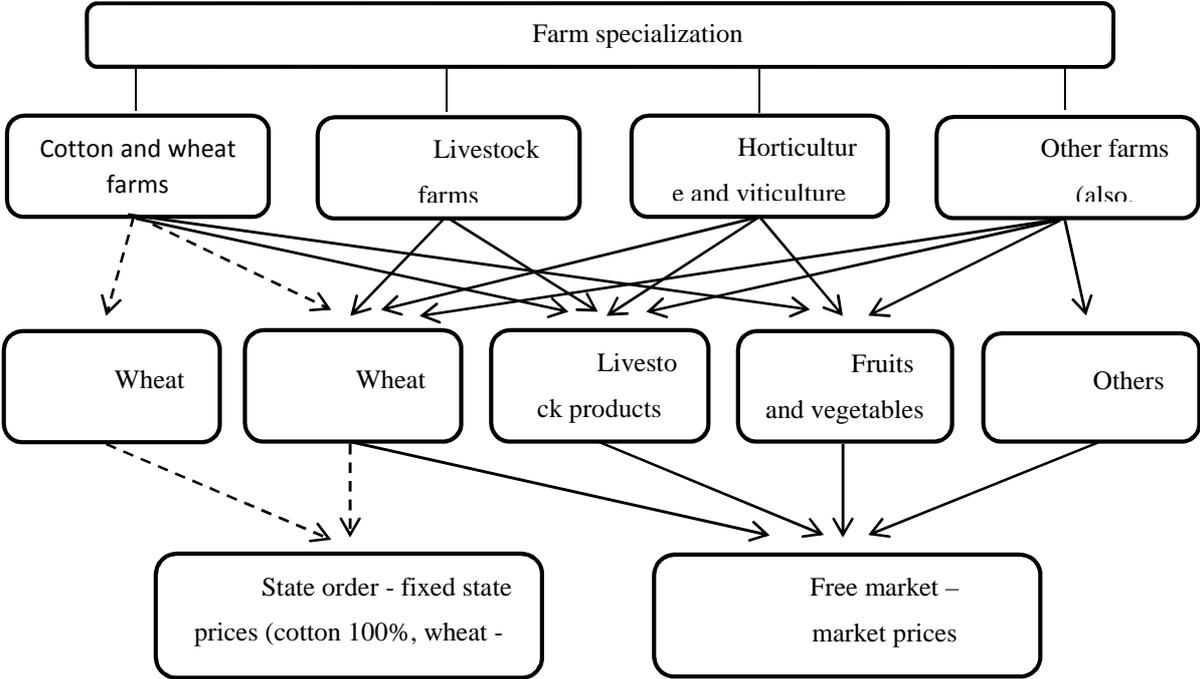
Source: Own work based on Rudenko, 2008

The prices of other agricultural products are not regulated by the state but are market based as well as there is no state procurement system in place. Government may buy other agricultural products like fruits, vegetables, meat and milk based on free market prices. Farms producing other agricultural products (e.g. *dekhkans*) do not have access to subsidized inputs which are available only for cotton and wheat farms. As mentioned above, the input supply channels for cotton and wheat farms are controlled by state agencies. They sell inputs at subsidized prices to cotton and wheat farmers who produce for state order. The inputs necessary for the production of crops other than cotton and wheat are exchanged through parallel private markets (Djanibekov, 2008).

**Agricultural output markets**

As mentioned above, cotton and wheat markets are regulated by the state and thus are subject to the state intervention. Other agricultural output markets in Uzbekistan were liberalized in the early 1990s (Spoor, 2006) (Figure 8). The main selling places (of private farms and *dekhkans*) of non-regulated products are local markets or bazaars. Bazaars are very widespread in the country, and in each district there are several bazaars, where agricultural products can be freely sold. Private farms independently of their specialization can supply different type of agricultural products because they can produce agricultural crops other than cotton and wheat for their own consumption or for the market. For example, horticultural private farms can keep cattle, produce fodder crops, wheat and other crops; livestock private farms can produce fruits and vegetables, wheat and other crops (Figure 8). Even cotton and wheat farms can produce other crops than cotton and wheat. However, cotton is sold exclusively through the state procurement system. Wheat is marketed both through the state procurement system (50 percent) and on the open market (50 percent). *Dekhkan* farms are not subject to the state procurement system and can cultivate any type agricultural crop on own plots, keep cattle and sell products on open market.

**Figure 8. Selling of agricultural products**



Source: Own work

**Impact of agricultural policy on agricultural productivity**

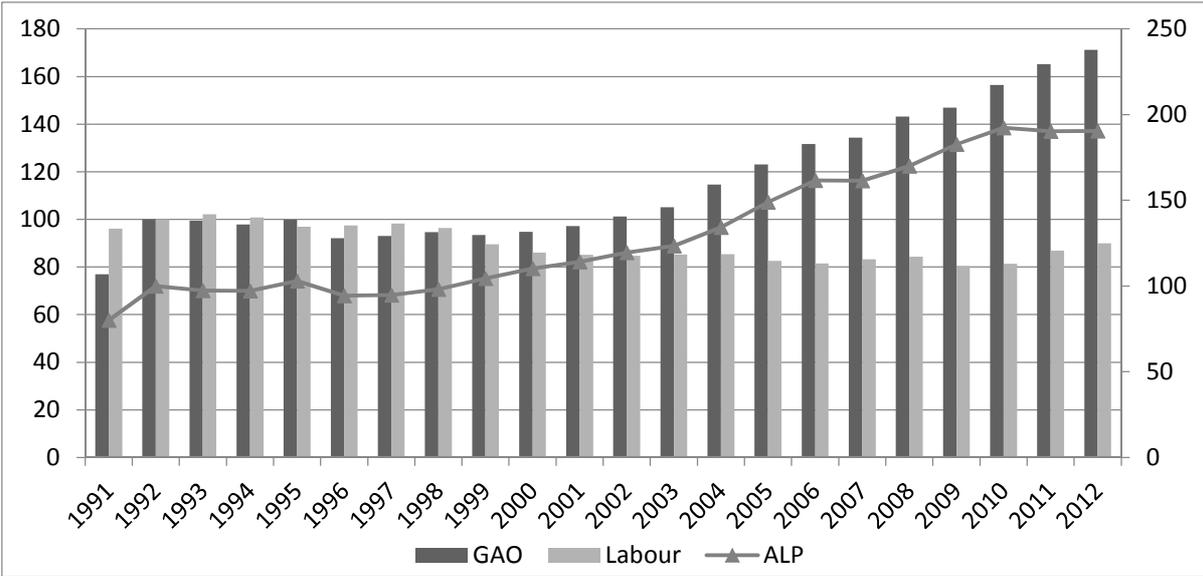
According to Rozelle and Swinnen (2004) “When measuring success, it is important to carefully compare the performance of transition nations on the basis productivity, not output. Definition of success changes fundamentally when comparisons are based on productivity”. Agricultural productivity growth can help to achieve many economic goals, such as it may be conducive for meeting the growing demand for food and non-food agricultural products (Coelli and Rao, 2003, Swinnen et al., 2010), for improving the sector’s competitiveness and resource use efficiency and for rural development.

We illustrate the productivity development in the agricultural sector in Uzbekistan by assessing labor productivity, land productivity (yields) and total factor productivity.

***Agricultural labour productivity***

Figure 9 depicts the development of agricultural labor productivity (ALP), measured as GAO per unit of labor, for the period 1991-2012. The figure also compares ALP with the development of total agricultural output (GAO) and total labor used in agriculture. As the figure illustrates, ALP increased strongly during the two decades of the agrarian reform. The productivity increase was driven by a reduction of agricultural labour and strong growth in GAO. The agricultural labour decreased from 3.45 million in 1991 to 3.23 million persons in 2012 (i.e. by 6.5 percent), while the GAO more than doubled during the same period. The increase in GAO and ALP coincide with the implementation of the second and third phases of reforms (from 2001 onwards) when agricultural cooperatives were transformed into private farms and state procurement system was eliminated for several product markets (other than cotton and wheat). This indicates that even partial land privatization led to a significant labor productivity growth. This is consistent with the findings of Macours and Swinnen (2000) and Rizov (2005) for other transition countries.

**Figure 9. Agricultural output, labour and labour productivity, 1992=100**

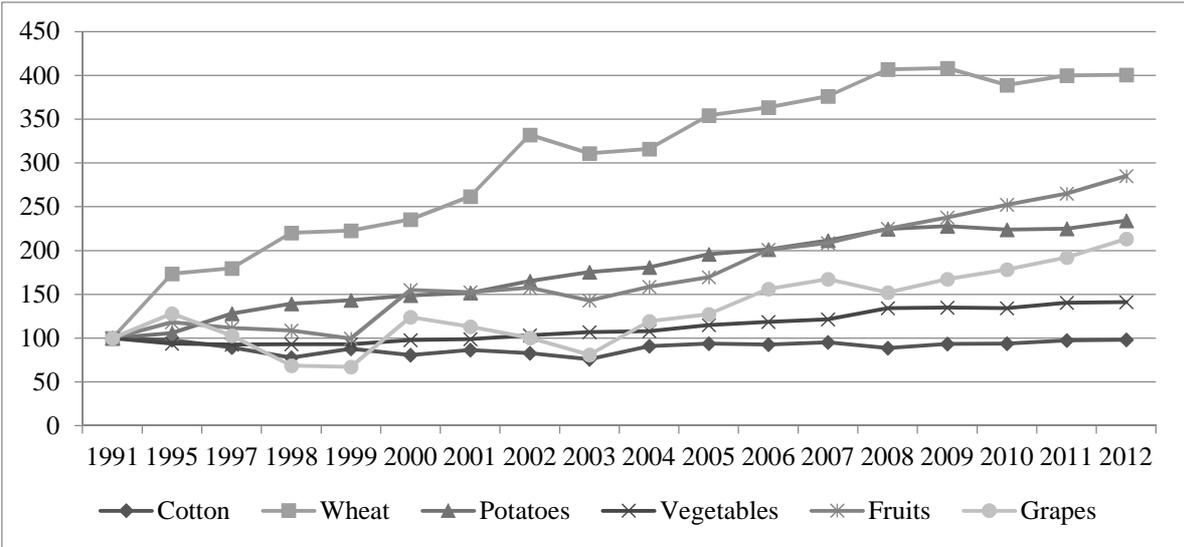


Source: Own calculation based on FAOSTAT

***Agricultural land productivity***

According to the data reported in Figure 10, yields increased significantly for all selected crops in the period 1991-2012. Wheat yield increased more than four-fold; potato and grape yields more than two-fold; fruit yields almost three-fold and vegetable yields close to two-fold;. The wheat yield grew more rapidly than other crops because it was a new crop cultivated in Uzbekistan (during the soviet period it was almost fully imported) leading to high productivity gains with accumulation of experience by farmers. Similar to ALP, the yield increase is particularly visible during the second and third phases of reform implementation (from 2002 onwards) (with exception of wheat). Only cotton yield shows weak performance. Practically the cotton yield did not change during the period showed in Figure 10. This can likely be attributed to the presence of strong state intervention in this sector; cotton remained under full control of the state procurement system. Further, during the Soviet regime, cotton production was heavily supported and benefited from intensive application of fertilizers and irrigation. The reduction of input support (and use) during the transition period thus may also have contributed to the weak performance of cotton yields.

**Figure 10. Development of crop yields, 1991-2012 (1991=100).**

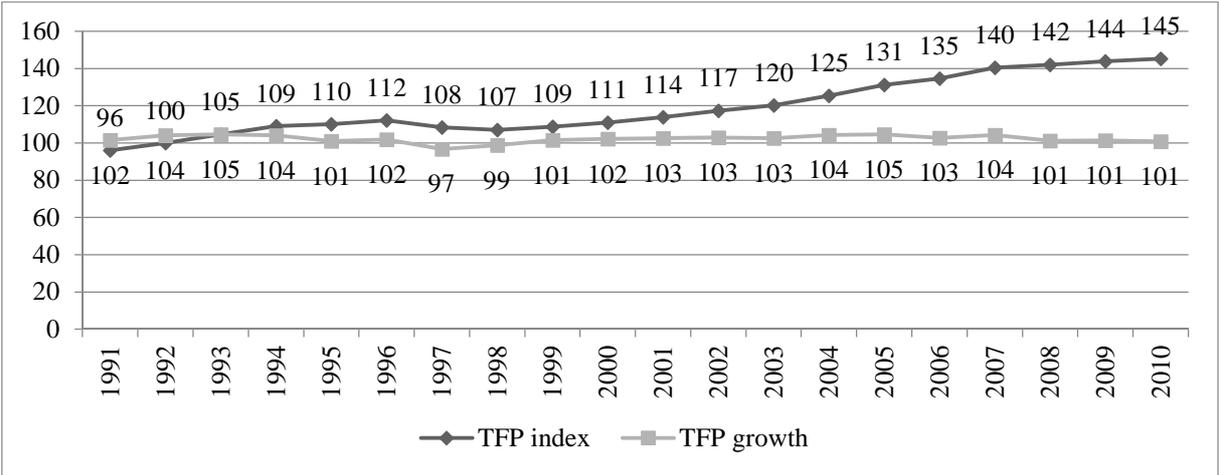


Source: State Statistical Committee, 2012

**Total factor productivity**

Figure 11 shows agricultural TFP index and TFP growth in Uzbekistan for the period 1991-2010 as estimated by Fuglie (2012). The average annual TFP growth rate of the Uzbek agriculture was 2 percent over the period 1991-2010. Only in 1997 and 1998 TFP growth rate was negative, i.e. -0.3 and -0.1 percent respectively. A higher rate of TFP growth (around 4.5 percent on average) was achieved during 1992-1994 and 2004-2006. The TFP index increased from 96 in 1991 to 145 in 2010. The implementation of the second and third phases of the agricultural reforms can be attributed to have caused this agricultural productivity expansion in Uzbekistan, i.e. after 2001 when the farm structure shifted to private farms and *dekhkans* away from collective and *shirkats* farms.

**Figure 11. TFP development in Uzbekistan, 1991-2010 (TFP index 1992=100).**



Source: Fuglie, Keith O., 2012.

## Conclusions

Agricultural sector represents a significant share in the overall economic activity in Uzbekistan and thus its development is important for poverty reduction, food security, rural employment, hard currency earnings and for raw-material supply to industrial sectors. Uzbekistan implemented reforms which resulted in a gradual transition from the communist system to market based system. However, the reforms only partially deregulated Uzbek agricultural sector as well as the adoption of reforms was very heterogeneous across different agricultural markets and sectors.

Land market reforms succeeded to transfer land from large-scale state and collective farms to small private and *dekhkan* farms. While land was transferred to private sector relatively successfully through lease arrangement, the private ownership rights are not fully recognized. The state is the sole owner of land resources; farms can access land only through lease arrangements from the state. Land sub-lease to private individuals or land sales are not allowed.

Uzbekistan introduced strong market regulations in the output and input markets through implementing a centralized state controlled procurement system. Farms are required to produce agricultural crops under the quota system. Although, several product markets were liberalized over the course of the transition period, the two key sectors, wheat and especially cotton, have remained under the state control.

Agricultural productivity increased significantly in Uzbekistan over the two decades of reform process. This was particularly evident with the implementation of the second and third phases of land reforms when land was transferred from the collective farms to private and *dekhkan* farms and when the centralized state procurement system was withdrawn from a number of product markets. These productivity developments indicate that there is potential for additional growth if further deregulation of agricultural markets is implemented, in particular linked to land tenure and ownership rights and input and output market liberalization.

## Acknowledgement

This work was co-funded by European Community under project no 26220220180: Building Research Centre „AgroBioTech”.

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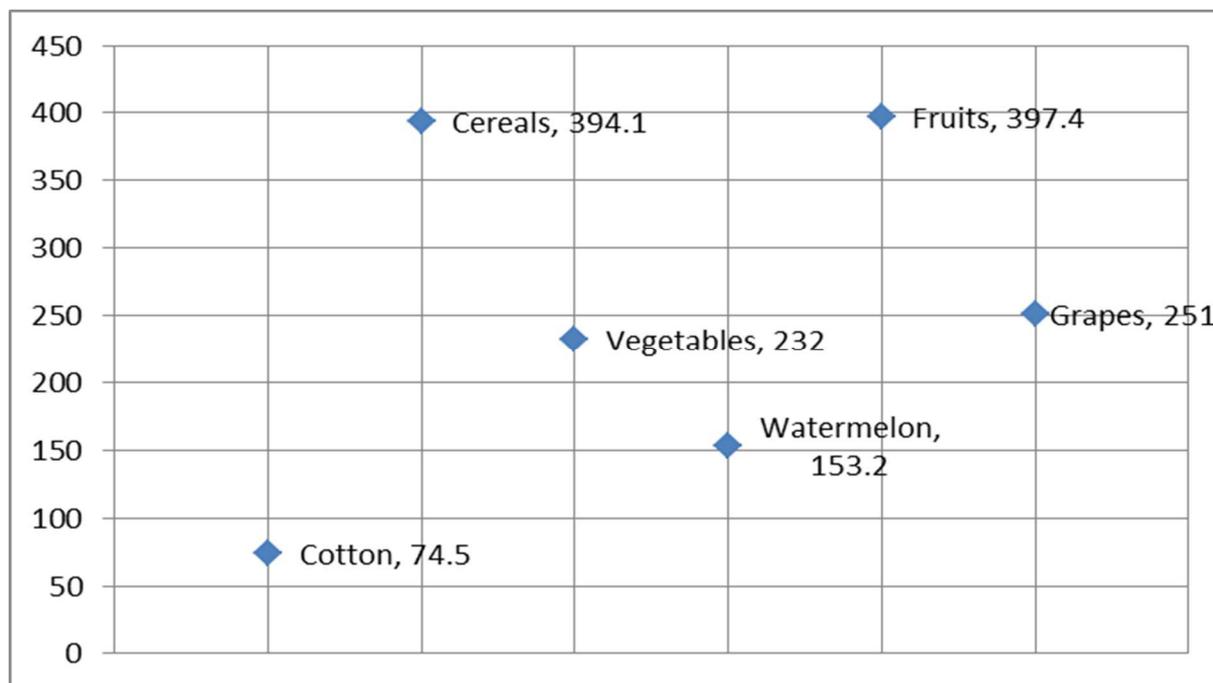
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## Appendices

### Appendix 1.

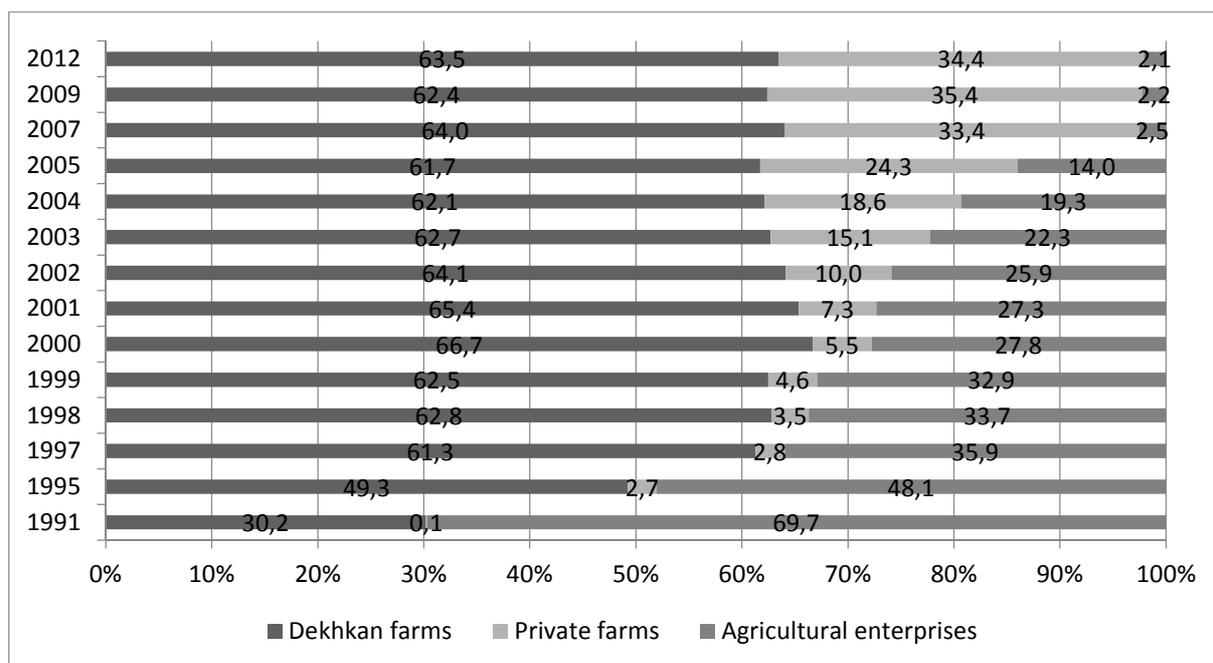
Dynamics of changing of the agricultural production in Uzbekistan during the 1991-2012 years



Source: State Statistical Committee, 2012

### Appendix 2.

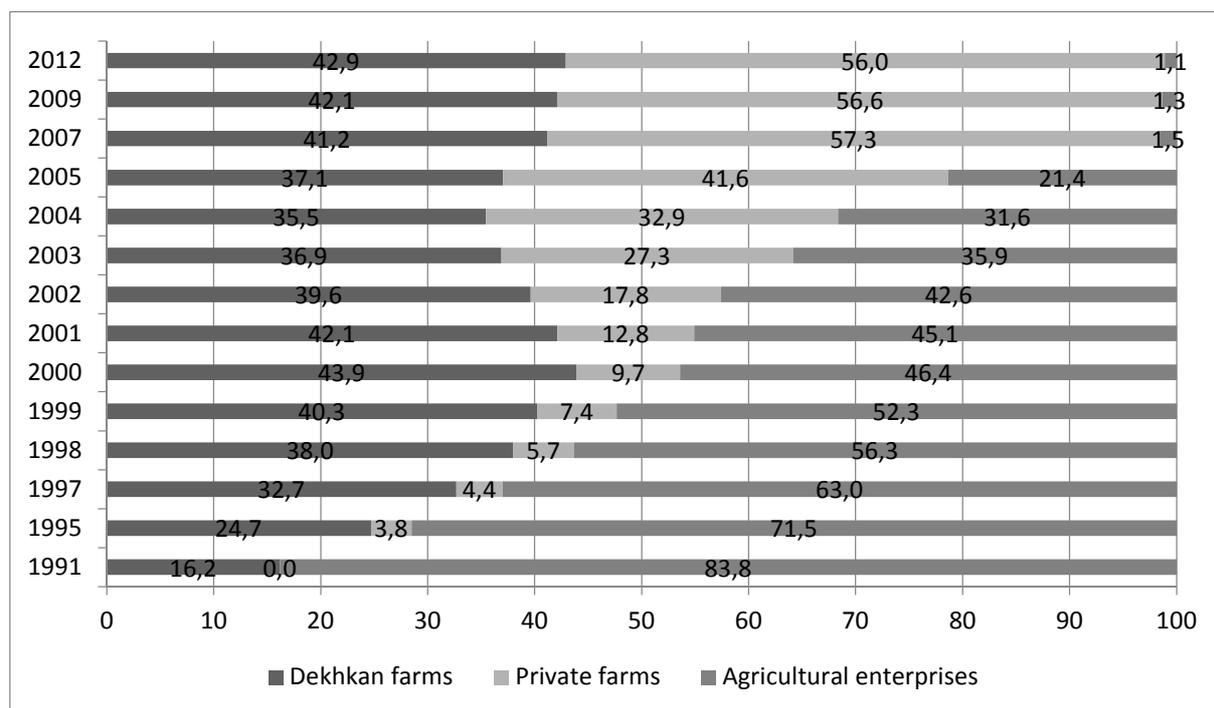
Share of agricultural producers in total agricultural production



Source: State Statistical Committee, 2012

### Appendix 3.

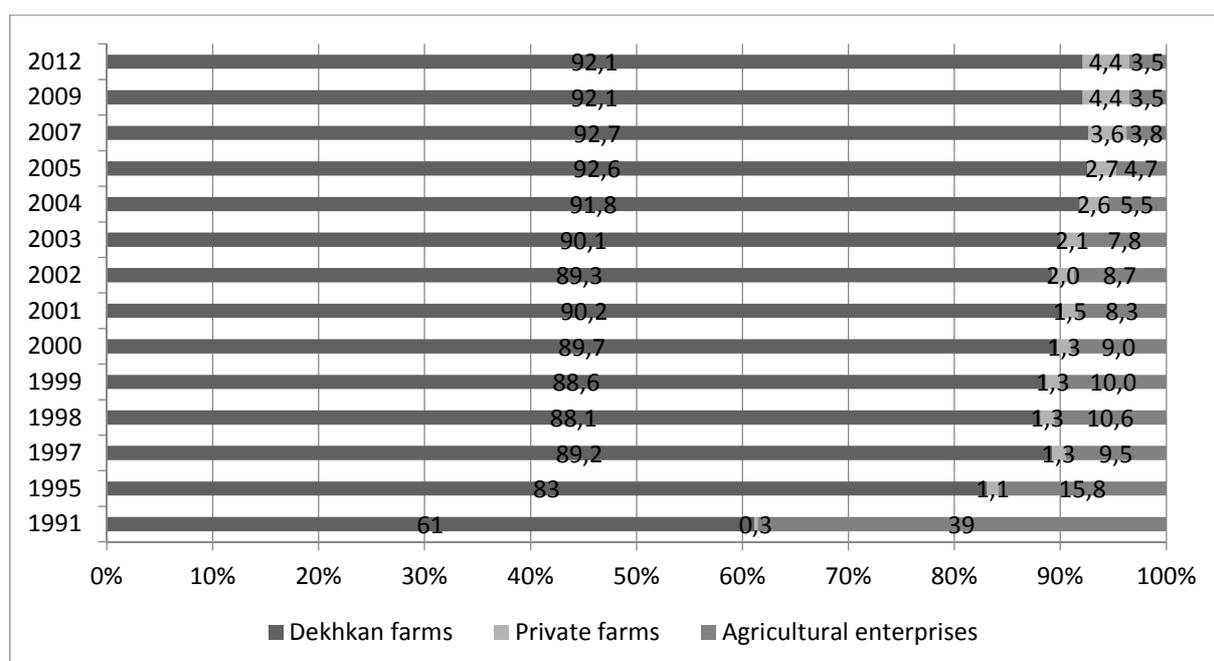
#### Share of agricultural producers in total crop production



Source: State Statistical Committee, 2012

### Appendix 4.

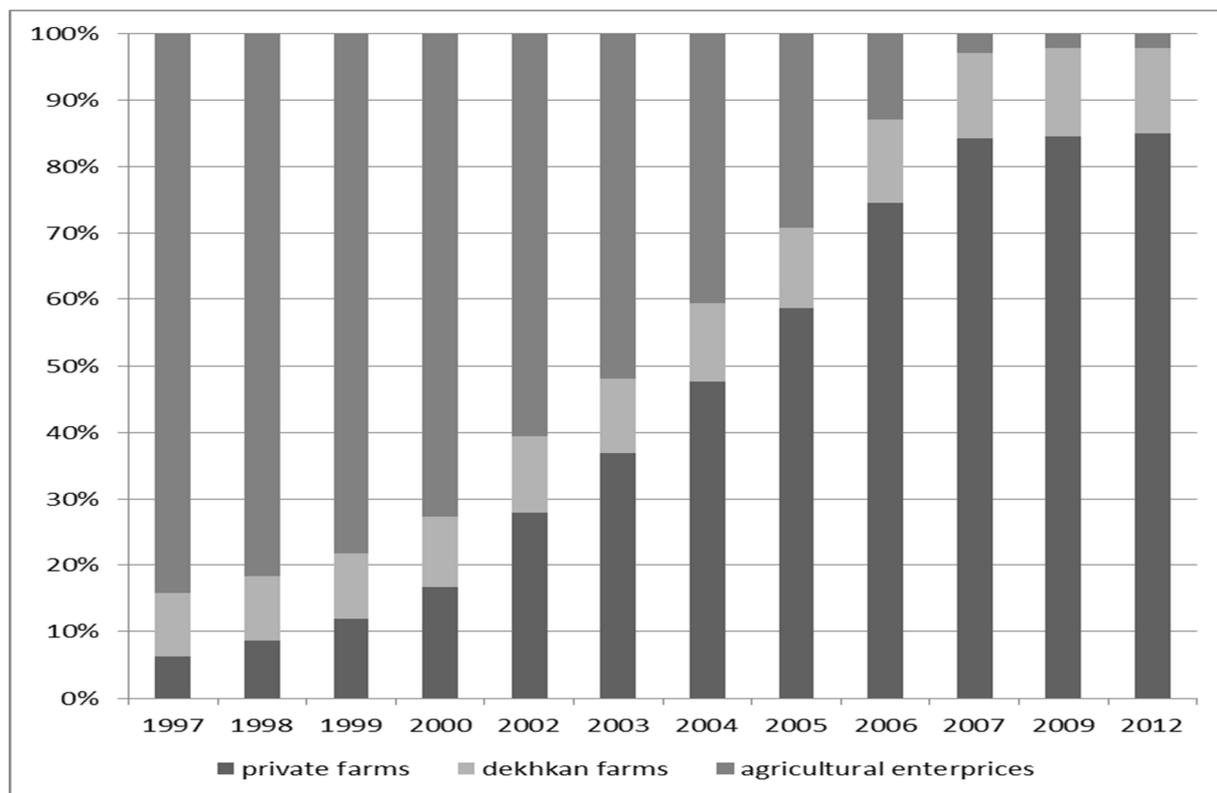
#### Share of agricultural producers in total livestock production



Source: State Statistical Committee, 2012

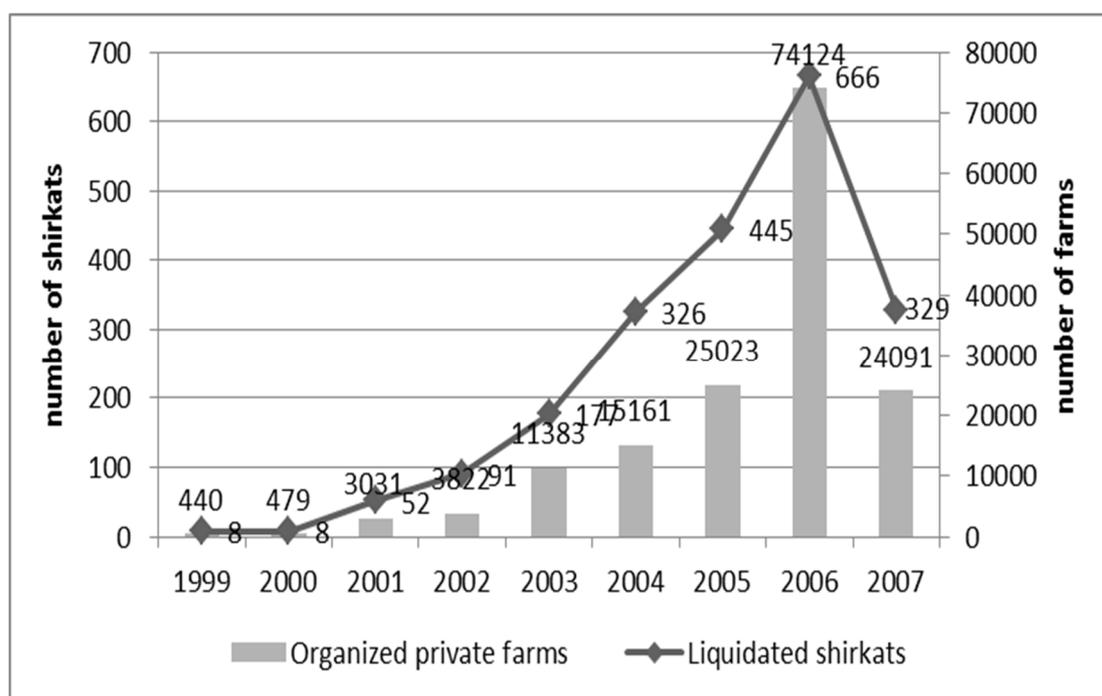
Appendix 5.

Share of agricultural producers in total cultivated land area



Source: State Statistical Committee, 2012

Appendix 6: Number of private farms organized on the base of liquidated shirkats, 1999-2007



Source: State Statistical Committee, 2008

# Modelling of natural water retention using stepwise regression in the catchment basin of a river

Milan Palát

## Abstract:

Water belongs to the most important and, at the same time, also to the most widespread natural resources, being the condition of life and an unsubstitutable component of the environment. In connection with a climatic change and methods of management, time and spatial uniformity of its occurrence (which is very affected by the landscape retention capacity) it becomes a considerable problem. The significance of the landscape retention capacity consists in balancing runoff conditions and reducing dangerous culmination discharges causing otherwise disastrous impacts on population and the landscape. From the point of view of the landscape retention capacity the organization of land resources and using the landscape play an important role at storm rainfalls unlike long-term precipitation.

The occurrence of storm floods caused by rainfalls of very high intensity, short term duration and limited extent show evidence of the urgency of changes in the structure, use and the landscape arrangement resulting in the support of infiltration and thus increasing the soil retention capacity.

The aim of the analysis involved in the article is to define the significance of separate factors affecting the natural process of retention in the catchment basin thus can assess the priorities in undertaking flood protection. The analysis was based on results achieved by using a new method how to determine water retention in the catchment basin. Resulting dependent variables of effective long-time retention, effective short-time retention, effective total retention and maximum specific runoff for single catchment basins of the river, were evaluated statistically by means of linear regression and correlation analysis, stepwise regression and multiple regression. It is possible to say, that the results achieved may suggest to re-evaluate some established views concerning the role of separate factors influencing natural retention of the landscape. The results of the research testify the fact that in case of densely settled floodplain regions the combined flood protection measures, i.e. as technical and nature friendly ones should be applied.

## Key words

catchment basin, natural water retention, effective short-time and long-time retention, effective total retention, maximum specific runoff, stepwise regression, multiple regression

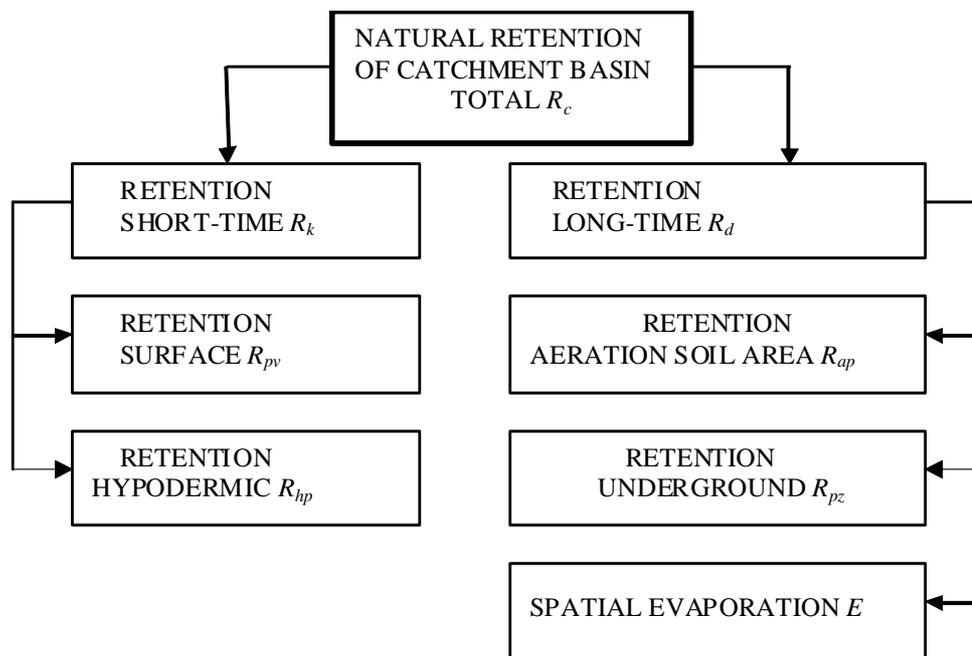
## Introduction

Water belongs to the most important and, at the same time, also to the most widespread natural resources, being the condition of life and an unsubstitutable component of the environment. In connection with a climatic change and methods of management, time and spatial uniformity of its occurrence (which is very affected by the landscape retention capacity) it becomes a considerable problem. The significance of the landscape retention capacity consists in balancing runoff conditions and reducing dangerous culmination discharges causing otherwise disastrous impacts on population and the landscape.

From the point of view of the landscape retention capacity the organization of land resources and using the landscape play an important role at storm rainfalls unlike long-term precipitation.

The occurrence of storm floods caused by rainfalls of very high intensity, short term duration and limited extent show evidence of the urgency of changes in the structure, use and the landscape arrangement resulting in the support of infiltration and thus increasing the soil retention capacity. For example, Dostál et al. (1997) and Kulhavý, Kovář (2000) dealt with changes in the land resources organization and using the landscape affecting hydrological and water-management conditions within partial drainage areas.

The subject of our research was to evaluate statistically the effects of physical-geographical factors on the retention of water and runoff conditions in parts of the Opava catchment area. Statistical analyses were preceded by the assessment of hydrological conditions of the studied drainage area at the design storm rainfall depending on the actual condition of the landscape cover.



## Materials and methods

Preparation and analyses of source data necessary to express the drainage basin characteristics from the aspect of retention and runoff conditions were carried out in the UNISTAT system. As for hydrological characteristics, potential retention, the flood wave volume, concentration time and culmination discharge were monitored. The significance of particular physical-geographical factors affecting the retention of water and runoff conditions in particular parts of the Opava drainage basin was quantified by the statistical method of multiple regression and correlation analysis.

To determine hydrological characteristics of particular parts of the Opava drainage basin and the subsequent statistical evaluation it was necessary to describe the present condition of

the landscape cover, topography, to determine the proportion of hydrological groups of soils (HSP) in the drainage basin and to evaluate each of subbasins by a CN number and the coefficient of surface roughness.

To evaluate the significance of physical and geographical factors showing the highest effect on the retention of water and runoff conditions in particular parts of the Opava drainage basin modelled on the design storm rainfall a statistical method was used of the multiple regression and correlation analysis. Calculations were carried out using the UNISTAT calculation system. As dependent variables entered the statistical program, i.e. the drainage basin potential retention, the volume of direct runoff from 1 km<sup>2</sup>, the time of concentration and specific discharge. As for independent variables (physical-geographical factors) affecting dependent variables the significance was assessed of geometrical and geomorphological factors (the thalweg length, the thalweg average inclination, slope area, the slope average inclination), soil characteristics and the landscape cover (the runoff curve number CN, roughness, the relative area proportion of arable land and permanent grassland, forests, town residential area, HSP B, HSP C and HSP D).

For the selection of independent variables – factors important for the quantitative determination of each of the dependent variables mentioned above, the method of step analysis by forward selection was used (Table 1). The method makes it possible to select independent variables by successive steps from the most significant to the least significant ones. In the final stage, a certain number of independent variables affecting most the size of a respective dependent variable was selected though the step linear regression together with quantification of their effect through regression coefficients.

The significance of the selection was assessed on the basis of the correlation index  $r$ . The regression coefficient value of the respective independent variable expresses a change of the dependent variable by this value in case of a change of the respective independent variable by one unit. The closer to one the higher dependence (Mašíček, 2010a, 2010b, Mašíček et al. 2011). For the statistical evaluation of hydrological conditions methods described in papers of Palát et al. (2008, 2010), Seger et al. (1998), Prudký (2002) and Palát (1991, 1997) were used.

Basic concepts of the process of natural water retention are:

*Total natural water retention of catchment basin*  $R_c$  is water temporarily delayed on the terrain surface, in the soil, in the stream bed, etc. in a natural way, i.e. without retention in artificial water reservoirs and in inundations. It can be further divided into five sub-components:

- *surface retention*  $R_{pv}$ , containing water delaying on the surface and in the stream bed,
- *hypodermic retention*  $R_{hp}$ , containing subsurface water moving in the immediate layer below the surface without reaching the water table,
- *retention in the aeration soil area*  $R_{ap}$ , consisting of water trapped in the capillaries of the unsaturated soil area and water infiltrating into the groundwater,
- *underground retention*  $R_{pz}$ , consisting of infiltration water increasing of groundwater supplies,
- *spatial evaporation*  $E$ , i.e. evaporation from the soil surface area with transpiration (evaporation by the plants) and interception (evaporation of the precipitation that sticks to the surface of the plant).

## Results and discussion

Basic data of 16 sub-basins of the river Opava selected for statistical analysis is given in Table 2. They are all river basins in the closing profiles as they were measured during the flood in 1997 by hydrometric stations of the Czech Hydrometeorological Institute.

For effective long-time retention for single catchment basin  $R_{def}$  [mm] a following relation was derived:

$$R_{def} = - 464.7 + 0.1066\Sigma H'_i + 4.79F'_{OP} + 7.30 F'_{TTP} + 5.54F'_L - 1.117s_t \quad [\text{mm}] \quad (1)$$

where:  $\Sigma H'_i$  - average height of flood precipitation in catchment basin [mm],

$F'_{OP}$  - relative area proportion of arable land [% area of the basin],

$F'_{TTP}$  - relative area proportion of permanent grasslands [% area of the basin],

$F'_L$  - relative area proportion of forests [% area of the basin],

$s_t$  - average terrain slope [angular degrees].

**Tab. 1: Overview of the dependent and independent variables entering the statistical analysis**

Dependent variables Independent variables	Effective long-time retention for single catchment basin $R_{def}$	Effective short-time retention for single catchment basin $R_{kef}$	Maximum specific runoff for single catchment basin $q_{max}$
Coefficient of catchment basin shape $\omega$	NO	NO	YES
Catchment basin area	YES	YES	YES
Stream length L	YES	YES	YES
Flood precipitation height	YES	YES	YES
Coefficient of previous precipitation API	YES	YES	YES
Effective long-time retention of catchment basin	NO	NO	YES
Effective short-time retention of catchment basin	NO	NO	YES
Maximum height of daily precipitation	YES	YES	YES
Proportion of arable land in catchment basin	YES	YES	YES
Proportion of permanent grasslands in catchment basin	YES	YES	YES
Proportion of the other types of land in catchment basin	YES	YES	YES
Proportion of hydrological group of soils B	YES	YES	YES
Proportion of forests in catchment basin	YES	YES	YES
Average terrain slope in catchment basin	YES	YES	YES
Proportion of drainage in catchment basin	YES	YES	YES

Relation (1) represented more or less the expected characteristics (independent variables) such as surface proportion of forest, grassland and field crops, the average slope of

the terrain and of course the average height of the flood precipitation in the catchment basin. If we make a step back in stepwise regression and reduce the value of F-value to 0.25 or 0.30, there input into a relation other characteristics such as catchment area  $F$  in  $\text{km}^2$ , Stream length  $L$  in km, Coefficient of catchment basin shape  $\omega$ , and percentage of other areas (paved areas from hydrological point of view) with infamous rapid drainage. Due to the area occupied by the basin (often 3-5%) are not negligible. An interesting characteristic (though not unexpected) is the coefficient of previous precipitation API.

For effective short-time retention for catchment basin  $R'_{kef}$  [mm] a following initially relation was derived:

$$R'_{kef} = 309.204 + 1.11H'_{max} - 2.36 F'_{OP} - 4.48 F'_{TTP} - 2.40 F'_L - 8.33 s_t \quad [mm] \quad (2)$$

where:  $H'_{max}$  - average maximum height of flood daily precipitation in catchment basin  
[ $\text{mm} \cdot \text{day}^{-1}$ ],

$F'_{OP}$ ,  $F'_{TTP}$ ,  $F'_L$  a  $s_t$  see relation (1)

**Tab. 2: Basic data on the Opava river sub-basins selected for statistical analysis**

Catchment basin serial number	Data bank number	Name of hydrometric station in the conclusion profile of catchment basin	Stream name	Number of hydrological catchment basin	Catchment basin area [km <sup>2</sup> ]
1.	285 1	Mnichov	Černá Opava	2-02-01-003	51.46
2.	259 0	Železná	Střední Opava	2-02-01-008	54.28
3.	261 2	Karlovice	Opava	2-02-01-011	151.29
4.	263 0	Krnov	Opava	2-02-01-037	370.50
5.	265 0	Krnov	Opavice	2-02-01-056	175.98
6.	266 0	Opava	Opava	2-02-01-089	929.65
7.	268 0	Malá Morávka	Bělokamenný potok	2-02-02-006	16.50
8.	269 0	Rýmařov	Podolský potok	2-02-02-016	50.67
9.	270 0	Velká Štáhle	Moravice	2-02-02-021	168.06
10.	270 1	Valšov	Moravice	2-02-02-027	243.28
11.	271 1	Mezina	Černý potok	2-02-02-048	92.16
12.	272 3	Slezská Harta pod nádrží	Moravice	2-02-02-055	464.31

13.	273 0	Kružberk pod nádrží	Moravice	2-02- 02-065	566.67
14.	274 0	Branka	Moravice	2-02- 02-077	716.33
15.	274 1	Jakartovice	Hvozdnice	2-02- 02-080	31.08
16.	275 0	Děhylov	Opava	2-02- 03-023	203 9.11

Again, in step backward in step linear regression and set the F-value to 0.9 or 1.0 gain 8 characteristics, where in addition to recurring  $H'_{max}$ ,  $F'_{TTP}$ ,  $F'_L$  a  $s_t$  and we can see a further characteristic of surface drainage percent of the basin area  $F'_{OP}$ , then the length of the stream L in km, index of previous precipitation API and shape coefficient of catchment basin  $\omega$ . Compared to the relationship remained unclassified arable land expressed as a percent of the basin area  $F'_{OP}$ .

Since the total size of the effective natural retention of catchment basin  $R_{cef}$  expressed in mm is the sum of effective long-term and short-term retention of catchment basin can be determined by the sum of equations (1) and (2) to modify the expression:

$$R_{cef} = -155.496 + 0.1066 \Sigma H'_i + 1.11 H'_{max} + 2.43 F'_{OP} + 2.82 F'_{TTP} + 3.14 F'_L - 9.447 s_t \quad [\text{mm}] \quad (3)$$

where:  $H'_i$ ,  $F'_{OP}$ ,  $F'_{TTP}$ ,  $F'_L$ ,  $s_t$  see relation (1),

$H'_{max}$ , see relation (2).

Again it is clear that the wider the relationship as described above would be included in both relationships investigated further the characteristics. It is not the aim of this work to treat the creation of new, expanded relationship even if it was not impossible and all necessary documents with the authors of this post is available. However, they consider that the disclosure will lead to enhanced relations leads too crowded this work. Will be done only for the maximum specific runoff from the catchment area  $q_{max}$  as an example.

Maximum specific runoff from the catchment basin  $q_{max}$  in  $\text{l}\cdot\text{s}^{-1}\cdot\text{km}^{-2}$  is determined by the relation:

Even this relationship can be imagined in a rather widespread in the form of a step backwards in step linear regression analysis. Other members from the original five when determining the value of F 1.8 to 1.5 will become the catchment area in  $\text{km}^2$  F, then  $F'_{OSP}$  the percentage of other areas in the basin, precipitation coefficient previous API, the percentage of hydrologic soil groups B and the percentage of the reclaimed land in the basin.

$$q_{max} = 3284 + 5.147 H'_{max} - 30.968 F'_{OP} - 53.26 F'_{TTP} - 34.729 F'_L + 37.746 s_t$$

$$[l \cdot s^{-1} \cdot km^{-2}] \quad (4)$$

where:  $H'_{max}$ , see relation (2),

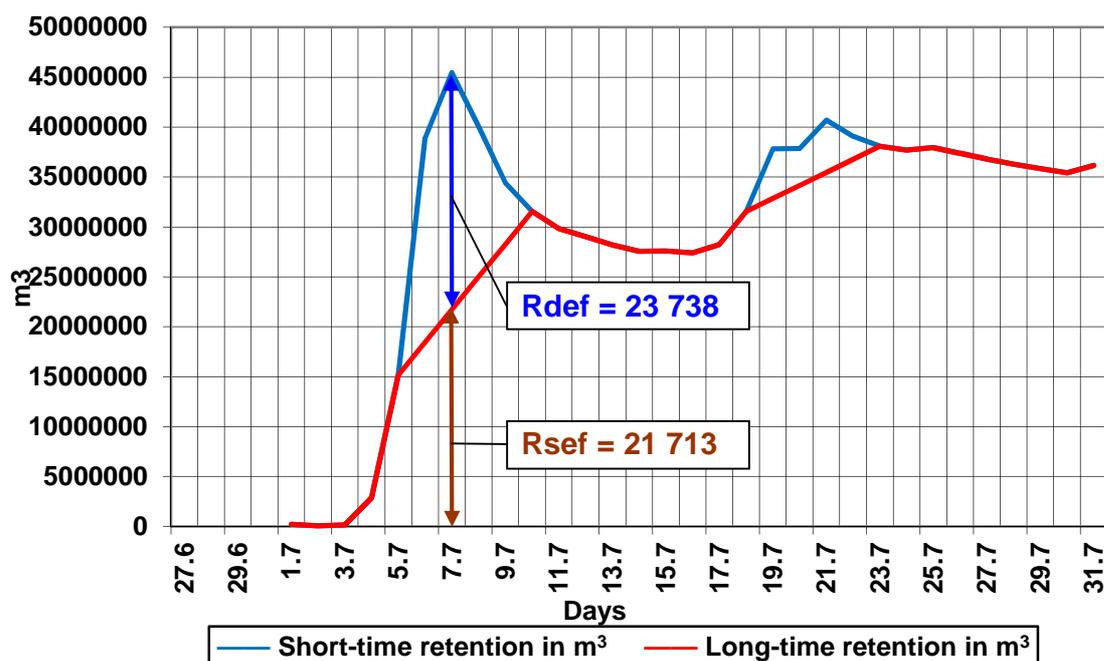
$F'_{TTP}, F'_{OP}, F'_L, s_t$  see relation (1).

Maximum specific runoff from the catchment basin  $q_{max}$  v  $l \cdot s^{-1} \cdot km^{-2}$  in extended form with seven independent variables determined by the relation:

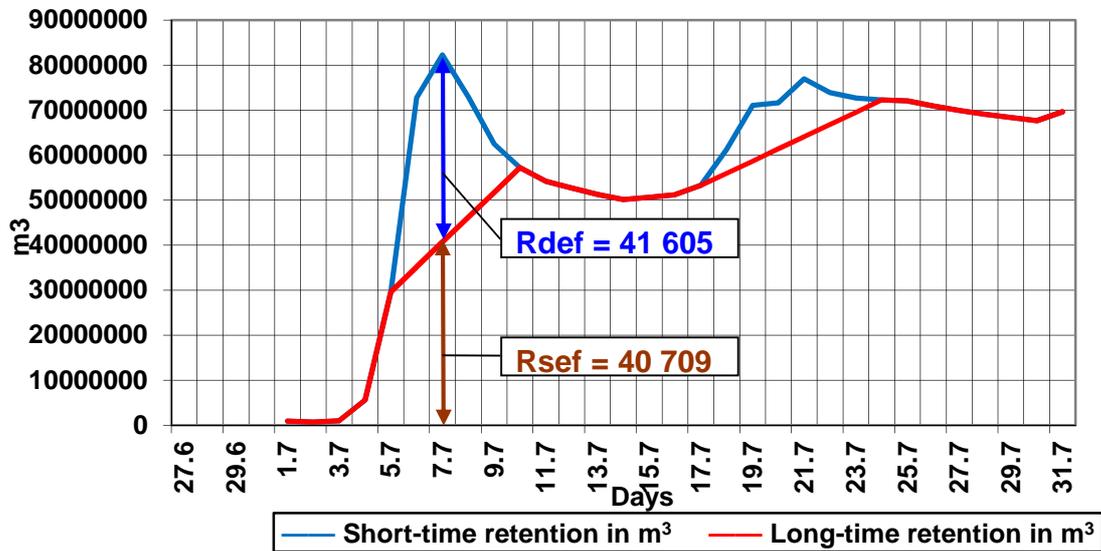
$$Q_{max} = 1221 + 8.86 F_{OSP} - 47.64 F_{TTP} - 0.331F + 2.35 API + 1.636 \Sigma H'_t + 35.44 s_t - 36.25B$$

Even this relationship can be imagined in a rather widespread form of a step backwards in step linear regression analysis. Other members from the original five when determining the F-value of 1.8 to 1.5 will become the catchment area F in  $km^2$ , then  $F'_{OSP}$  the percentage of other areas in the basin, Coefficient of previous precipitation API, Proportion of hydrological group of soils B and the Proportion of drainage in catchment basin.

The above equations were derived for the floods of summer extreme long-standing regional rainfalls in the Opava catchment basin. The equation is valid for the following ranges of values independent variables: average amount of flood precipitation  $\Sigma H'_t$  from 167.6 mm to 686.0 mm, maximum daily precipitation  $H_{max}$  from 46.7 mm to 198.8 mm, proportion of the area of arable land in catchment basin  $F'_{OP}$  from 0% to 53.51%, permanent grasslands  $F'_{TTP}$  from 0.81% to 26.55% and forests  $F'_L$  from 23.38% to 98.07%, the average terrain slope from  $4.9^\circ$  to  $11.3^\circ$ . (Prudký 2003)



**Fig. 1: Course of long-time and short-time retention in the catchment basin of Opava.  $R_{def}$  – effective long-time retention,  $R_{sef}$  – effective short-time retention. Hydrometric station Karlovice in the conclusion profile of catchment basin.**



**Fig. 2: Course of long-time and short-time retention in the catchment basin of Opava.  $R_{def}$  – effective long-time retention,  $R_{sef}$  – effective short-time retention. Hydrometric station Krnov in the conclusion profile of catchment basin.**

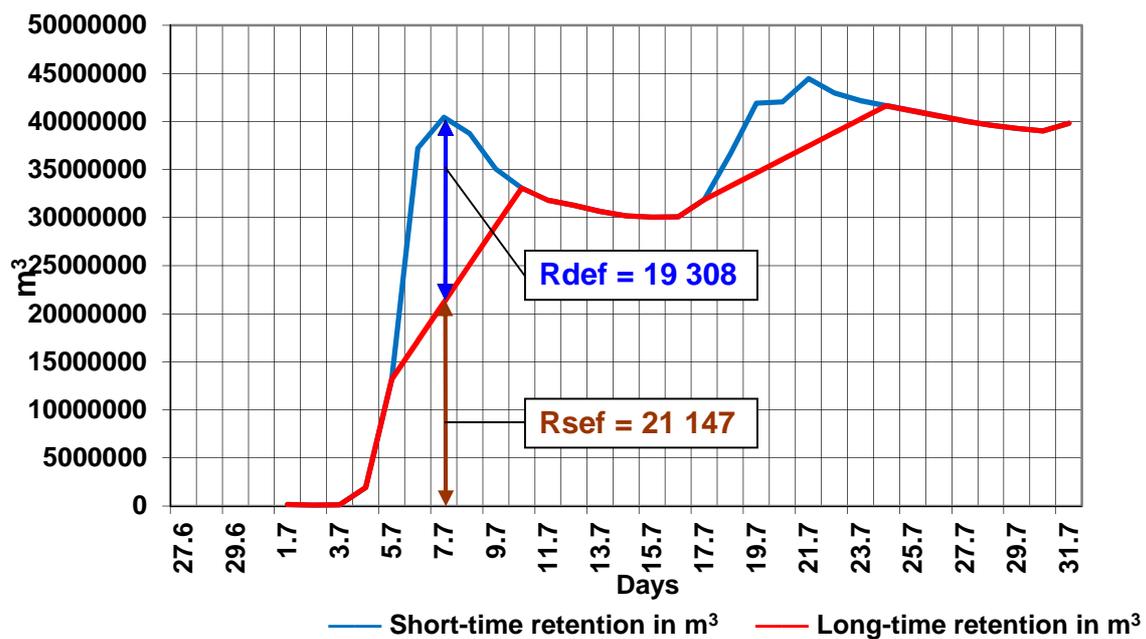


Fig. 3: Course of long-time and short-time retention in the catchment basin of Opavice.  $R_{def}$  – effective long-time retention,  $R_{sef}$  – effective short-time retention. Hydrometric station Krnov in the conclusion profile of catchment basin.

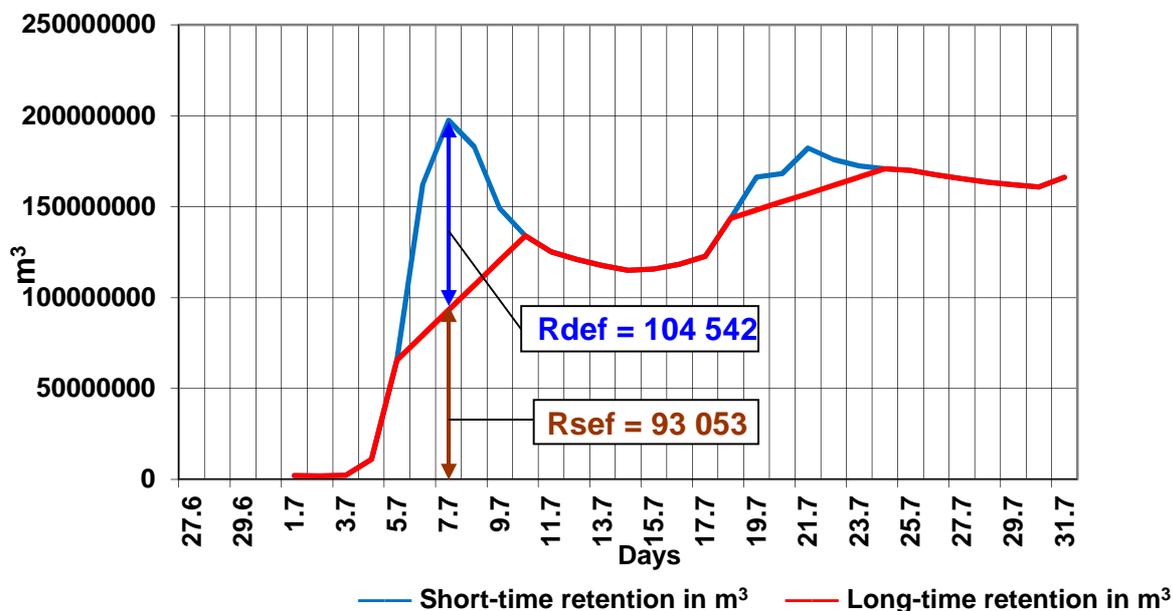
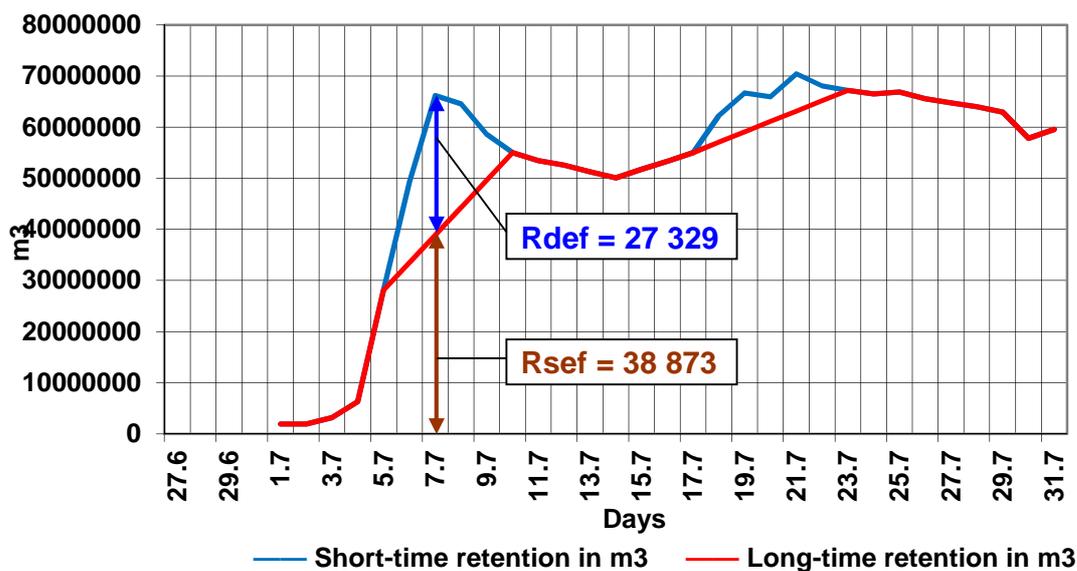
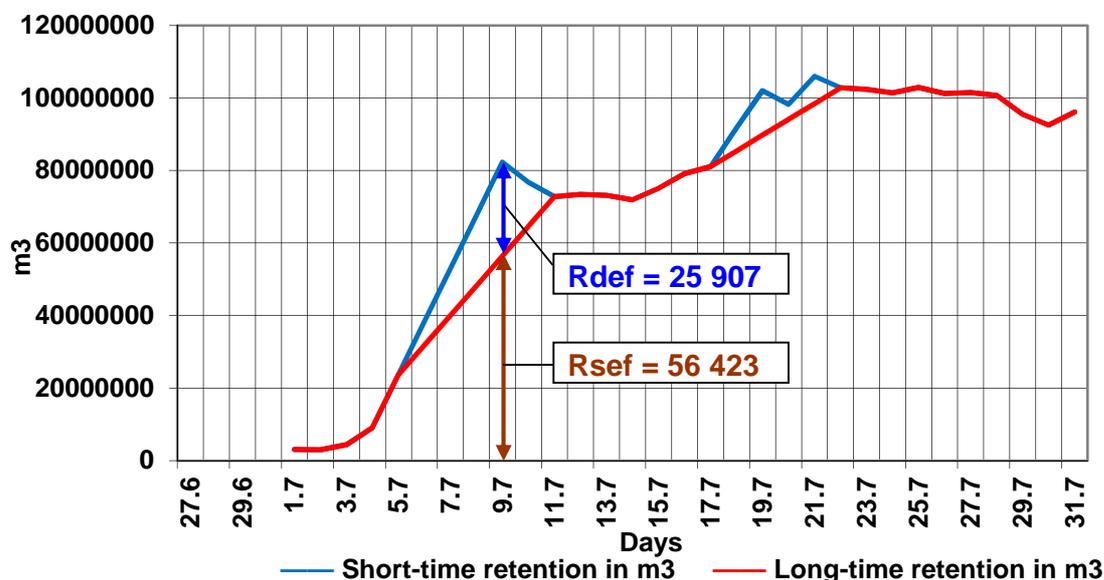


Fig. 4: Course of long-time and short-time retention in the catchment basin of Opava.  $R_{def}$  – effective long-time retention,  $R_{sef}$  – effective short-time retention. Hydrometric station Opava in the conclusion profile of catchment basin.



**Fig. 5: Course of long-time and short-time retention in the catchment basin of Moravice.  $R_{def}$  – effective long-time retention,  $R_{sef}$  – effective short-time retention. Hydrometric station Slezská Harta pod nádrží in the conclusion profile of catchment basin.**



**Fig. 6: Course of long-time and short-time retention in the catchment basin of Moravice.  $R_{def}$  – effective long-time retention,  $R_{sef}$  – effective short-time retention. Hydrometric station Branka in the conclusion profile of catchment basin.**

### Conclusion:

Based on the evaluation of the statistical analysis of floods caused by extreme regional rainfall in July 1997 in Opava River basin can draw conclusions on the significance of the various factors affecting the size of the retention capacity of the landscape. These factors can be simultaneously viewed as the hydrological characteristics of the catchment or landscape. For a broader generalization of these results would be statistically evaluate a larger set of observations.

Results of statistical analysis can be summarized in the following findings:

- The magnitude of the effective retentions of catchment basin  $R_{def}$ ,  $R_{kef}$ ,  $R_{cef}$  and maximum specific runoff from the catchment basin  $q_{max}$  most affects either the average height of flood precipitation in catchment basin  $\Sigma H'i$ , (for variables  $R_{def}$ ,  $R_{cef}$ ) or the average maximum height of the flood daily rainfall in the catchment  $H'_{max}$  (for variables  $R_{kef}$ ,  $R_{cef}$ ,  $q_{max}$ ).
- Higher relative area proportion of arable land  $F'_{OP}$  increases the effective long-term retention of the catchment basin  $R_{def}$  and reduces the maximum specific runoff from the catchment basin.
- Higher relative area proportion of permanent grasslands in the catchment basin  $F'_{TTP}$  increases the effective long-term retention of catchment basin  $R_{def}$  and reduces the maximum specific runoff from the catchment basin  $q_{max}$ .

- d) Higher relative area proportion of forests  $F'_L$  increases the effective long-term retention of catchment basin  $R_{def}$ , and reduces the maximum specific runoff from catchment basin  $q_{max}$ .
- e) With a higher average terrain slope of catchment basin  $s_t$  adversely reduces the effective long-term retention catchment basin  $R_{def}$  and adversely increases the maximum specific runoff from the catchment basin  $q_{max}$ , reduces the effective short-time retention of catchment basin  $R_{kef}$ .
- f) The higher the index value of the previous precipitation API adversely reduces the effective long-time retention  $R_{def}$  and adversely increases the maximum specific runoff from the catchment basin  $q_{max}$ .
- g) With a higher relative abundance of other surfaces (hard surfaces) increases the maximum specific runoff for catchment basin  $q_{max}$  and reduces the effective long-term retention  $R_{def}$ .
- h) With a higher proportion of hydrological group B of soils B (filtration 0.06 to 0.12 mm/ min) increases the effective long-time retention and reduces the maximum specific runoff from catchment basin  $q_{max}$ .
- i) A higher value of effective long-time retention for catchment basin  $R_{def}$ , reduces the maximum specific runoff from the catchment basin  $q_{max}$ .
- j) Effective long-time retention of catchment basin  $R_{def}$ , that expresses what proportion of torrential or regional rain is catchment basin harmlessly able to delay and distract (i.e. what proportion is trapped in the soil and evaporates) has a positive effect on reduction of flood flow and to reduce harmful overflowing. In landslide areas may cause landslides.
- k) Effect of effective short-time retention of catchment basin  $R_{kef}$ , containing water delays on the ground, in the bed of the stream and water hypodermic is not for positive transformation floods clear. When large floods is usually harmful component of overall retention, as it may cause harmful water overflow. For smaller floods, however, can help to reduce flood discharge.
- l) The significance of individual factors expressing the hydrological characteristics of the catchment basin referred to in points a) to e) can be judged by the size of their coefficients in the regression equations.
- m) The positive effect of arable land emerged from the state of all crops in the first half of July 1997, when particularly for cereals and fodder was very well developed root system to support the infiltration of water.

It is also necessary to mention briefly about the quantitative process of natural water retention of the catchment basin, as it has great practical significance. For a certain ambiguity effect of effective short-time retention of catchment basin  $R_{kef}$ , (see point h). There was selected the effective long-time retention  $R_{def}$  for monitoring the effects of retention. The coefficient of effective long-time retention  $p_{def}$  is the ratio between the value of effective long-time retention and flood volume of precipitation.

Values  $p_{def}$  vary for different sub-basins as follows: 0.22 for the river Moravice under Kružbersk reservoir, 0.23 for the river Opava at Karlovice and in Krnov, 0.24 for Bělokamenný stream in the Morávka, 0.25 for Černá Opava in Mnichov and Opava, Opava, 0.26 for Opavice in Krnov 0.27 for Moravice profile Slezská Harta under the reservoir and Střední Opava in Železné, 0.28 for Černý potok in Mezina, 0.32 for Opava in Děhylov, 0.35 for Moravice in Velká Štáhle, 0.36 for Moravice in Valšov, 0.37 for Hvozdnice in Jakartovice and 0.48 for Podolský potok in Rýmařov.

Long-time effective retention, expressed in millimeters, has the following values in the same order: 67.7, 143.5, 10.9, 85.9, 169.5, 100.1, 78.8, 120.2, 83.7, 130, 1, 83.6, 78.7, 129.9, 127.1, 62.6 and 134.9.

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# Turkey's integration prospects into European structures and Turkish immigration

Milan PALÁT<sup>1</sup>

## Abstract

The objective of the paper was to evaluate Turkey's integration prospects into European structures and relationships between immigration from Turkey and economic indicators in Germany using adequate quantitative methods. Despite Turkey's unclear European integration prospects further Turkish immigration to the established member countries of the EU will continue. The strongest waves may flow to Germany, Netherlands or France, where numerous Turkish minorities are already present and where the living standards are high. The results from the statistical part of the paper show the positive correlation between immigration total and the growth of gross domestic product, the negative correlation of immigration total and unemployment and a positive relationship between immigration total and income total which is in agreement with the expected dependency direction. As regards the immigration from Turkey it is less correlated to unemployment than immigration total. But there is a correlation between immigration from Turkey and the stock of foreigners in Germany This is in accordance with the theoretical concept of network theory where an existing community of migrants keeps attracting new migrants because the costs and risks associated with migration are lower, thanks to established linkages to the country of origin. The observed correlation of migration and unemployment points to the fact that immigration to Germany responds to changes in demand in the labour market. Even though a time lag may occur in the case of unemployment and immigration, migration appears as a relatively effective mechanism to offset existing imbalances in German labour markets.

## Keywords

EU accession, immigration, correlation, Germany, Turkey

JEL: F 22, J 61, O 15

## Introduction

Turkey is a country that comes from a different tradition between Europe and the Near East and nowadays there are in fact news that are not encouraging in terms of they coming closer to European Union. So this prompts the question doesn't it that if it's that different, maybe it doesn't belong in the European Union anyway. But to this critical rhetoric it is important to quote that all the member states of the European Union have supported the beginning of negotiations with Turkey. And that's what European negotiators are doing on behalf of all the countries of the European Union. So the issue of Turkey is not whether to join the European Union but when to do so. International migration is one of the accompanying phenomena of a globalized society and has significant impacts on individual economic subjects and also broad economic and non-economic causes and consequences. This paper is aimed at evaluation of Turkey's integration prospects into European structures and relationships between immigration from Turkey and key economic indicators in Germany using adequate quantitative methods. It puts together relevant facts regarding international migration and provides explanations of their linkages to the macro and microeconomic development. To determine parameters of a regression function methods of regression and correlation analysis

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were used including testing the statistical significance. In my paper I exclusively focus on legal migration, not on illegal labour mobility or trafficking of workers from one country to another, despite these situations may also present a serious problem with considerable economic, social and personal consequences.

### **Turkey's integration prospects into European structures**

Turkey expresses its willingness to participate in European integration structures already since many decades. The country became very early a member of the Council of Europe (in 1949), was a founding member of the OECD (Organisation for Economic Co-operation and Development) in 1961 and the Organization for Security and Co-operation in Europe (OSCE) in 1973. Turkey has been an associate member the European Economic Community, a predecessor of the European Union, already since 1963 and applied for accession in 1987 (EURACTIV, 2012a). In 1995, the European Union and Turkey signed a customs union agreement. In 1999, Turkey was officially recognised as a candidate for full membership and finally in 2005, negotiations with this country were started. The European Commission President José Manuel Barroso said in an interview to the length of transition period and EU accession of Turkey in 2006 that "Turkey's a long term problem. It's a long term issue." and that "We cannot expect Turkey to become a member let's say in less than fifteen, twenty years." (European Commission, 2006).

In 2007, Turkish government unveiled an agenda for adopting most of EU laws by 2013, even in the areas blocked by the EU (Kubosova, 2007), but European officials have refused to back this as a deadline for membership. The concerns about Turkey are high because the pace of reforms is rather slow. The pace of negotiations depends on progress in legal and democratic reforms and especially in their implementation. But there were also complains from Turkey's side at slow EU accession pace. Turkey told the European Union that the slow pace of its accession talks was causing public enthusiasm for membership of the bloc to wane, but the EU insisted it was up to Ankara to push harder on reforms (NTVMSNBC, 2008). Jurčik (2007, 2012) argues that corruption and public procurement has a significant influence on business environment. In 2006 only the Chapter on Science & Research was opened and closed.

In 2012, the Prime Minister of Turkey Erdogan confirmed that Turkey still wants to join the European Union mentioning that there are 5 million Turkish people living in Europe. "We are natural members to the European Union. Only in Germany, that invited the Turkish labourers 50 years ago, there are 3 million Turkish people, however 50 years have passed and we have waited at the European Union's doorstep. No other country has experienced such a thing." (CNN, 2012) And later that year he expressed his disappointment regarding the length of the EU accession process: "I have to mention this of course. We are at the EU's doorstep for 50 years, we are still not a member. We are still an EU negotiating candidate. At such a position, I wish EU accession." (EURACTIV, 2012a).

In 2013, negotiations continue but since then only one chapter of total 15 was closed. In the same year, in the wake of Ankara's crackdown on mass demonstrations on the Taksim square located in the European part of Istanbul, Germany blocked the start to new EU accession talks with Turkey. German officials said that its reservation stems from a technical issue, but German chancellor Merkel, an opponent of Turkish entry into the EU, criticized use of overwhelming police force against mostly peaceful demonstrators in Turkey (Dombey, Fontanella-Khan, & Peel, 2013). Also France is not willing to waive their veto over unfreezing four accession chapters with Turkey until after elections for the European Parliament in June 2014 (Gültasli, 2011). So it is obvious that the process of accession of Turkey (until it respects all the economic and political criteria of the European Union) would take at least one or two decades from now.

In the end of 2013, EU Commissioner for Home Affairs Cecilia Malmström signed the EU-Turkey readmission agreement and launched the visa liberalisation dialogue with Turkey including a process towards the visa-free regime. The main objective of the readmission

agreement is to establish, on the basis of reciprocity, procedures for the rapid and orderly readmission, by each side, of the persons having entered or are residing on the territory of the other side in an irregular manner (European Commission, 2013). According to the Commissioner Malmström, “*the cooperation between the European Union and Turkey has made a significant step forward and these two initiatives in parallel which will boost the relations between Turkey and the European Union and bring benefits for their citizens*”.

### Turkish populations in Europe

The apprehensions for the increase of the number of immigrants from countries of Central and Eastern Europe after the big-bang enlargement of the European Union in 2004 and 2007 were immense but didn't fulfil entirely. Similar opinions keep appearing with the discussion on the potential accession of Turkey to the European Union in the future. Although the process of negotiations with the European Union is likely to take at least a decade or two to complete, this enlargement and prospective impacts for European labour markets has already become a very controversial topic in the European Union. Tab. 1 shows Turkish populations in the countries of the European Union.

**Tab. 1: Turkish populations in European countries**

Country	Turkish population est.	Country	Turkish population est.
Austria	350 000–500 000	Ireland	3 000
Belgium	200 000–250 000	Italy	21 000
Bulgaria	800 000–1 200 000	Netherlands	400 000–600 000
Czech Republic	1 700	Poland	2500
Denmark	70 000–80 000	Romania	30 000–80 000
Finland	10 000	Spain	4000
France	500 000–1 000 000	Sweden	100 000–150 000
Germany	3 500 000–4 000,000	Switzerland	100 000–120 000
Greece	80 000–130 000	United Kingdom	500 000

Source: EUROSTAT (2013)

The most numerous Turkish populations in the European Union can be found in Germany and is estimated between 3.5 and 4 million people. The estimates for Turkish population in France and Bulgaria are of wide range 800 000–1 200 000 and 500 000–1 000 000 respectively. The numbers of Turks in Austria and Netherlands seem to be lower but Turkish population makes even higher share in the total population of these countries than for instance in Germany. Possible incidence of Turkish EU accession on the emigration from Turkey to the European Union has been evaluated by Glazar, Strielkowski (2010). Their results reveal that both the network effect and target country labour market conditions represent the strongest determinants for migration, whilst the effect of per capita income is actually relatively low.

### Impacts of immigration on the economy of a receiving country

Are the apprehensions for the increase of the number of immigrants from Turkey reasonable? We can illustrate the impacts of immigration on the economy of a receiving country by a supply-demand analysis on the labour market. The inflow of new labour force from abroad will increase the labour supply and thus, the price of labour (wage) will decline.

The critics of free movement of labour from abroad point that immigrants are in most cases willing to accept lower wage than domestic workers and this will increase the unemployment of local population. But this conclusion is very simplified because one of the factors that need to be taken into consideration is the substitution or the complementarity of immigrant labour in the labour market of a receiving country. Empirical findings concerning international migration between European countries imply that the complementarity is more spread than the substitution, see Baldwin & Wyplosz (2004).

To avoid broad generalizations, we may look at the specific case between Turkey and Germany. Since early sixties Turkish "gastarbeiter" (guest workers) have come as cheap manual labour in order to fill in labour shortages in the booming German economy. Therefore, these immigrants became complements to skilled German workers and vice versa substitutes for unskilled German workers. This resulted in an increase in wages of skilled workers in Germany but might have had negative impacts on wages for manual workers of both German and Turkish nationality, compare for instance Hoekman & Togan (2005) that mention reducing wages for manual workers.

Due to stiff competition among less skilled workers, lower wages and language barriers immigrants often faced the problem of unemployment. There might be a risk of frequent utilization of social benefits which ultimately may become a loss for the country if the average immigrant draws more from the social system than he pays. However, past and recent research carried out in Germany refutes this hypothesis. "It confirms the positive impact of the average immigrant on the state treasury, since immigrants are often coming into the country at the beginning of their working life and contribute to paying off the national debt." (Arikan, 2006). A very low importance of opening the German labour market for Turkish migrants was found in recent research studies, see for example Glazar, Strielkowski (2010).

After the accession of Spain, Italy, Portugal and Greece to the European Union a return migration to the country of origin has emerged. And it might be the case of Turkey too, because according to the public opinion survey among Turks in France and Germany more than 30 percent of them considered returning to their homeland (Baldwin & Wyplosz, 2004). The opening of labour markets of particular member countries would in the case of Turkey probably take place with a substantial delay after the country's accession to the European Union, similarly to transitional periods introduced by the most of the established member countries towards new member states during the big-bang enlargement of the EU in 2004. The United Kingdom ranks along with Ireland and Sweden the first countries that opened their labour markets for job-seekers from the new member states in 2004. Germany, Austria and France have used the option to restrict the influx of new workers from enlargements of 2004 and 2007. Although new workers in Britain and Ireland helped the growth and competitiveness of both national economies, Bulgarians and Romanians have already experienced the introduction of the transitional period from the British and Irish governments. This, however, was more a media panic of uncontrolled immigration that has spread among the public after the media and politicians relatively often argued with emigration numbers torn out of context. It was therefore rather utilization of the political capital of voter-pleasing populist anti-immigration policies than an evaluation of real economic consequences.

France transitional period ended in 2008, when it became clear that the concerns of the influx of cheap labour from Eastern Europe were much exaggerated. Germany, along with Austria decided to extend the transitional period to the maximum (until 2011). Different approaches of these three countries in the pace of opening of labour markets are related to differences in labour law and employment policies. The higher is the price for the dismissal of non-efficient employees (set by laws and agreements with the unions), the less likely will employers hire new workers (Arikan, 2006). It's about the legal specification of the period of notice, on what legal grounds the employer can dismiss an employee, probationary period, etc. British law in this regard, particularly through labour market reforms of Margaret Thatcher, is very flexible, unlike France or Germany.

The flexibility in the labour market is also affected by the minimum wage and unemployment benefits. The minimum wage isn't set by law in Germany, so it is possible to

compare the amount only in France and Britain. France has one of the highest minimum wages in the European Union, 48 percent of the average gross monthly wage received in sectors of industry and services, while in Britain it is around ten percentage points less. This is the lowest minimum wage among the established member states of the European Union. Conversely, French unemployment benefits are more generous than the German and British Baldwin & Wyplosz (2004). These few examples show that the less rigid labour market in the UK is better prepared for an influx of new workers from abroad.

### Correlations For immigration from Turkey to Germany

The objective of the paper was to evaluate the relationships between immigration from Turkey and key economic indicators in Germany using adequate quantitative methods. Statistical techniques used in economics were described by Mason and Lind (2000) or Hindls et al. (2007). I assessed possible existence of correlation between immigration and other economic indicators such as gross domestic product growth, unemployment rate, total income and stock of foreigners. The data sources are EUROSTAT (2013). The reference period has been set for the years 2001–2011. A calculated correlation matrix for all analysed indicators, incl. statistical significance of correlation coefficients is shown in Tab. 2.

**Tab. 2: Correlation matrix for immigration and selected economic indicators in Germany**

$I_{yx}$	IM	ITR	G	U	TE	FOR
IM	X	0.6267 <sup>+</sup>	0.0233	-0.5958 <sup>+</sup>	0.3353	0.2526
ITR		X	0.0773	-0.0602	0.8767 <sup>++</sup>	0.3722
G			X	-0.0733	0.2209	0.0232
U				X	-0.5418	0.1730
TE					X	-0.6646 <sup>++</sup>
FOR						X

Source: own calculations

Note 1: IM – immigration total, ITR – immigration from Turkey, G – gross domestic product, U – unemployment, TE – total earnings, FOR – stock of foreigners

Note 2: Correlation index:  $I_{yx}$  Significance level: <sup>+</sup>  $\alpha = 0.05$ ; <sup>++</sup>  $\alpha = 0.01$

The correlation matrix in Germany consists of indicators of immigration (immigration total, immigration from Turkey) and of indicators of gross domestic product growth, unemployment rate, total income and stock of foreigners. The results show the positive correlation between immigration total and the growth of gross domestic product, the negative correlation of immigration total and unemployment and a positive relationship between immigration total and income total. These correlations are in agreement with the expected dependency direction. As regards the immigration from Turkey it is less correlated to unemployment than immigration total. The last indicator which has been linked to immigration is the total number of foreigners in the country. The reason why this indicator has been included is based on the idea stemming from migration theories, which argue that an already existing community of foreigners in the receiving country attracts other migrants from that country through established linkages to the countries of origin; see for instance Brettell and Hollifield (2000). A high stock of foreigners in the country facilitates to overcome various kinds of barriers for new immigrants. This analysis shows the positive correlation between immigration and the stock of foreigners. However, not all correlations proved to be statistically significant.

## Conclusion

A deeper understanding of broader migration patterns and identification of key determinants of migration described in this paper may serve as a starting point for the determination of macro- and microeconomic benefits and costs of international migration or better evaluation of migration policies. Despite Turkey's unclear European integration prospects further Turkish immigration to the established member countries of the EU will continue. The strongest waves may flow to Germany, Netherlands or France, where numerous Turkish minorities are already present and where the living standards are high. The results from the statistical part of the paper show the positive correlation between immigration total and the growth of gross domestic product, the negative correlation of immigration total and unemployment and a positive relationship between immigration total and income total which is in agreement with the expected dependency direction. As regards the immigration from Turkey it is less correlated to unemployment than immigration total. But there is a correlation between immigration from Turkey and the stock of foreigners in Germany This is in accordance with the theoretical concept of network theory where an existing community of migrants keeps attracting new migrants because the costs and risks associated with migration are lower, thanks to established linkages to the country of origin. The observed correlation of migration and unemployment points to the fact that immigration to Germany responds to changes in demand in the labour market. Even though a time lag may occur in the case of unemployment and immigration, migration appears as a relatively effective mechanism to offset existing imbalances in German labour markets.

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# Analysis of Vacation Behaviour in Rural Tourism and Agrotourism in the Slovak Republic Conditions

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Roderik VIRÁGH<sup>3</sup>

## Abstract

The Slovak Republic has good conditions for tourism development, especially good conditions for the development of rural tourism and agrotourism. More than 85% of the land has a rural character. The question is: Is it able to use the potential of itself? We can say that agrotourism mostly serves to capture new farm customers, educate the public about agriculture and enhance the quality of life for the farm family, which represents both economic and non-economic benefits. At present, there is no day without stress. In this period, it is a return to the traditions of man, to activities which directly procure basic needs of subsistence, the return of man to nature, manual labour on the soil, planting and help farmers to animal welfare, which can be seen as a major article in agrotourism. This all can be seen like the world trend.

Aim of this paper is not only to analyse the holiday behaviour of the Slovak population, but also visitor's perception of rural tourism and agrotourism in the Slovak Republic. Background data were obtained from the World Economic Forum, Statistical Office of the Slovak republic, Slovak tourist board and from our electronic surveys. In our survey 386 respondents participated. Information from Slovak tourist board used as the background data for creation of this paper were the result of a quantitative market research and public opinion of citizens of Slovakia with the aim to know their behaviour in travel, choosing vacation destinations. Random sample of 1,245 respondents aged over 18 was representative in terms of region, place of residence, gender and age. We have compared their survey with our survey connected with analysis of holiday behaviour of citizens of the Slovak Republic. The random sample is representative in terms of region, age and gender. By the processing and evaluation of holiday behaviour in rural tourism and agrotourism of respondents we have used many methods of comparison, synthesis, mathematical and statistical methods. Examined data were statistically processed and analysed in MS Excel 2010.

We have determined the range of sample with statistical method and we selected option without repeating. The basic set, population of Slovakia by the date of 12th of December 2012 was 5,410,836 people according to Statistical Office of the SR. Sampling error is set to 5 % and the variability on 65. Calculation was made for significance level of 95 %. From this data we obtained respondents in sample, which are 649 people. In terms of time we could not analyse the whole sample. Querying was done on 386 respondents willing to answer through an electronic questionnaire. For data processing were used some tests, e. g. Friedman test to calculate the results, statistic formula:

$$F = \frac{12}{nk(k+1)} R - 3n(k+1)$$

Based on the current and the potential offer of rural tourism, we can assume three basic types of clients, among which we would qualify for less affluent visitors as families with children, pensioners. To the second and third groups, we included "eco-friendly" and affluent clientele, which will search facilities of rural tourism or agrotourism with higher levels of amenities.

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Holidays usually takes up to two weeks, only occasionally visitors opt for a shorter or a longer vacation. Less Slovaks (32% of respondents) spend in the Slovak Republic vacation less than a week. Slovaks are spending more and more in terms of homeland shorter stays, mainly weekends. In the field of rural tourism and agrotourism, visitors prefer holiday in foreign country, mainly for two fundamental reasons like providing better services and more elaborate program of holidays.

### **Key words:**

The Slovak Republic, Tourism, Rural tourism, Agrotourism, Visitors, Preferences.

## **Introduction**

Tourism is a dynamic and competitive industry that requires the ability to constantly adapt to customers' changing needs and desires, as the customers' satisfaction, safety and enjoyment are particularly the focus of tourism businesses. Consumer is an individual who buys products or services for personal use and not for manufacture or resale. A consumer is someone who can make the decision whether or not to purchase an item at the store, and someone who can be influenced by marketing and advertisements. Although many of us have been tourists, every one of us is different and has different needs, interests and opportunities. Here are some important questions. What consumer behaviour depends on? Are they more willing to seek out their ideal destination using search engines? Will customers continue to look for price of their holiday or the best deal, not just to save money? Will travellers make careful compromises to be able to save money and fulfil their travel dreams? And others.

Rural tourism represents the return to nature with the opportunity of accommodation in rural houses and facilities in countryside. To these services also board is offered or a wide range of different countryside activities.

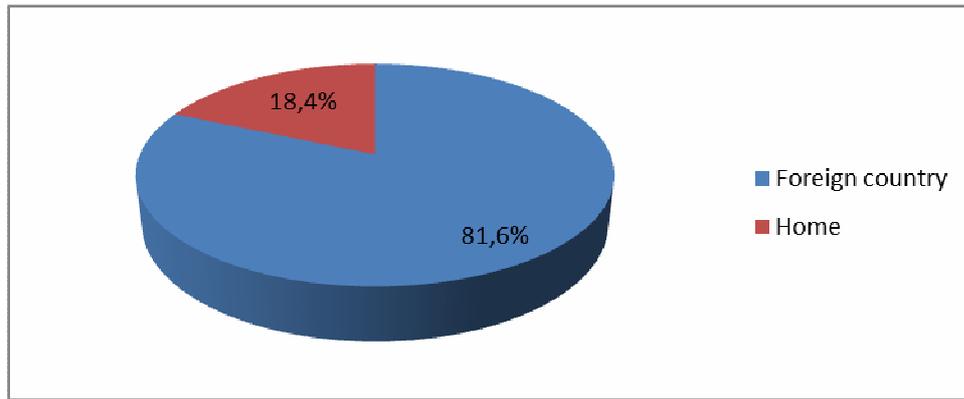
For a good power and health recovery is the home atmosphere and clean air without noise of town the best. All this and an active relaxation can an agro or ecological facility offer. Do you want to experience the life and work on farmer's yard? For adults and mostly for children are more attractive typical farmer's activities, e. g.: animal feeding, milking, cheese and butter making, mowing and hay drying, harvesting, fruit and berries picking, etc.

## **Results**

Rural tourism and agrotourism in the Slovak Republic conditions is not developed and many authors speak about it as an up-to-date phenomenon. But in the world it is a very often used type of tourism. Especially in Austria, where it is the most effective segment using the nature, allowing relaxation, recreation and generating new workstations in countryside. Switzerland, France, Germany, Great Britain and Ireland use agrotourism like Austria and we can learn much from their experiences and knowledge. It is important to make from the Slovak countryside a prosperous place for economic development of regions with the rural tourism. Rural tourism is an important source of regional development mostly in mountain and under mountain regions. In these regions incomes from the agricultural production are low.

Consumers have an interesting view on the rural tourism and agrotourism as a specific way to spend free time. They have the possibility to know cultural and social traditions, farmers' life and work, nature and beauties of the Slovak countryside. Do consumers indulge a vacation in typical rural conditions? Do they participate on attractive agrotouristical activities like hunting, fishing, mushrooms picking, riding school or relaxation by testing traditional Slovak dishes, vines and cheeses? Do they know the production of traditional regional products?

For more than 86 % of respondents is the main vacation season the usual summer time. By the youngest categories is it more than 90 %. Older people, over 50 years, on the other hand prefer much the spring and autumn time. It depends on more factors, e. g.: out of season lower prices and less strict time schedules (free nest). These tourists use better prices and before or after seasonal discounts and quieter tourism resorts.

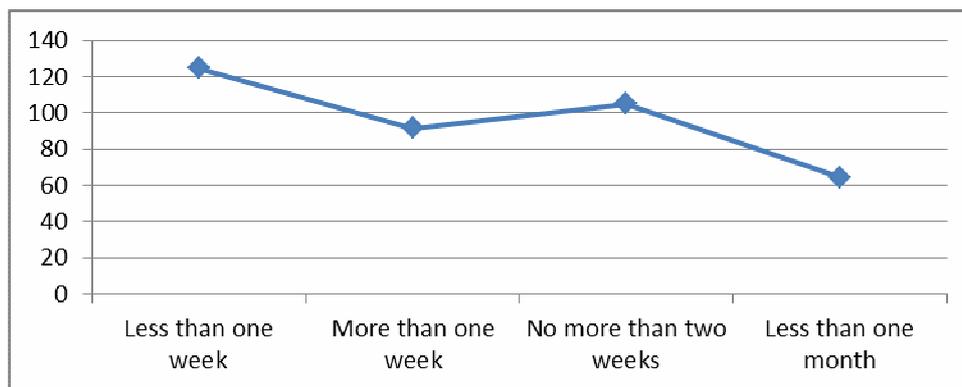


**Pic. 1 Respondents' decision in selection of holiday's country**

As we can see from the picture No. 1, the main part of Slovaks prefer much foreign countries as the home country when they choose they vacation destination.

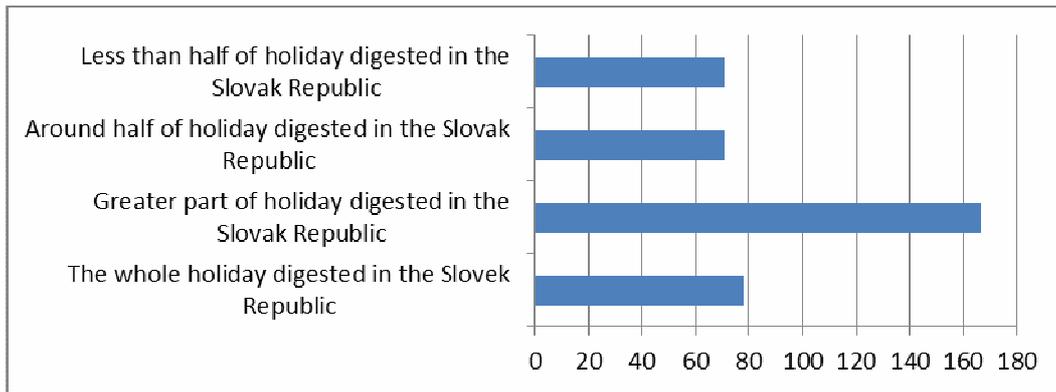
The vacation period is about two weeks in the Slovak conditions. But in the third of cases it is only a week. Only insignificant groups of respondents choose shorter or longer vacations.

From a group of respondents we can conclude following results. As we can see from the graph, only a bit about 32 % of respondents spend in the Slovak Republic they vacation less than a week. A group that spends its vacation and stays in home country is more significant, although not from numerical values (64). By these respondents we can suppose that they spend all they vacation at home country and they do not prefer foreign seaside destinations.



**Pic. 2 Length of taking holidays in the Slovak Republic conditions**

Only 20 % of asked people spend all their vacation in conditions of the Slovak Republic, 43 % spend most of their vacation time in the Slovak Republic and less than a half of respondents spend a half and less free time in the Slovak republic. We can expect that the respondents who spend less than a half vacation time (last group) prefer much shorter, weekend stays in the whole year.



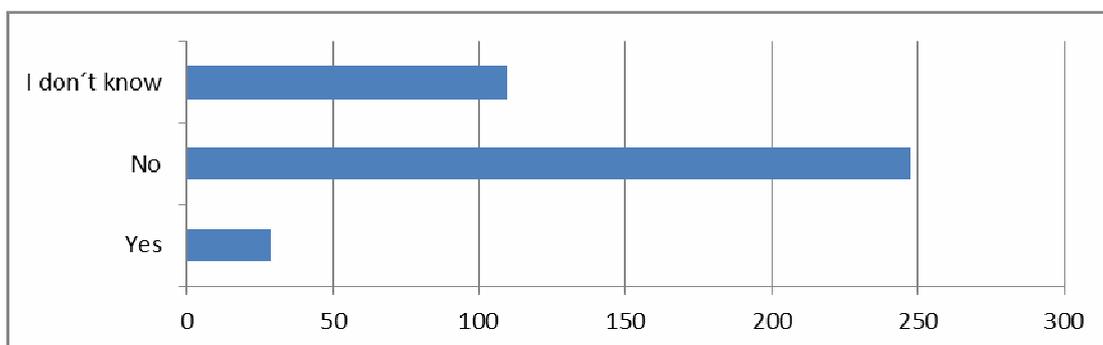
**Pic. 3 Part of the holiday digested in the Slovak Republic**

Small and medium entrepreneurs in rural tourism and agrotourism advertise their services in their region and on tourism exhibitions by catalogue issued by professional association. The most effective advertisement in rural tourism is via the Internet. In today's conditions when regional and zone organisations of tourism exist, it will be important that rural tourism should get a wide propagation space. The Slovak Tourist Board also should offer much space for rural tourism advertisement in their activities. The Slovak Association of Rural Tourism and Agrotourism should use its membership in the European Federation of Rural Tourism /EUROGITES/ to be seen in Europe.

As we can result from our research performed on a selected group of agricultural entities, they mostly use advertisement via the Internet. Potential tourists so can make reservations for stays directly on the web page. Compared with foreign entrepreneurs in this field of business, our entrepreneurs spend significantly less money for a year and bed. We can suppose that the amount of the turnover from rural tourism and agrotourism depends on financial resources used for advertisement.

MURA, L. and KOZELOVÁ, D., 2012 state in their scientific article that according to their survey research made on a research sample of 21 small and medium-sized enterprises operating in rural tourism and agrotourism, 43% of respondents have not chosen cooperation. From this survey, they state that there is no cooperation between these subjects. Mutual cooperation between these subjects in region or county can markedly increase the interest of customers for these facilities. Customers can then be more informed about events in region where they spend their holiday.

Advertisement in the rural tourism and agrotourism area may be inadequate. This feeling has also people (Graph 4). 248 respondents consider rural tourism and agrotourism as insufficiently promoted, 110 respondents could not answer on this question, and only 29 respondents think that rural tourism and agrotourism is good advertised.



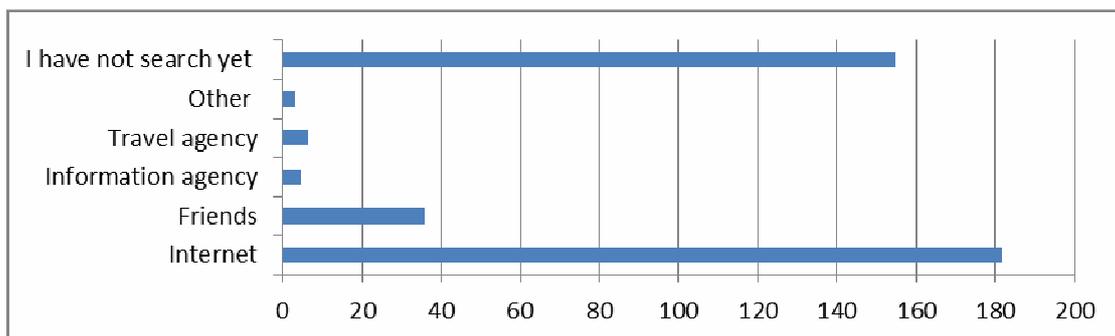
**Pic. 4 Respondents' reasonable about promotion of rural tourism and agrotourism in the Slovak Republic**

In general, the inhabitants of Slovakia reflect global trends in terms of information sources. As reflected our previous research, the most used source in obtaining holiday information is the Internet, which prefer 60 % of respondents. Internet is becoming a strong leader in the group of respondents from 25 to 35 years. SACR results indicate that group 36 to 49 years has two main sources of information: the internet and friends. Older ages (over 50 years) rely primarily on friends, family and travel agencies and this finding corresponds with the results of our survey, where the most common answer of age group was just the option "travel agency".

Although the Internet has become the dominant source of information, travel agencies have maintained a stable position. In the future, the importance of travel agencies decline, but still have quite a secure future, but in a slightly modified form – will act as consultants. Travel agencies can give advice by choosing the optimal destination to travellers who cannot decide for various reasons.

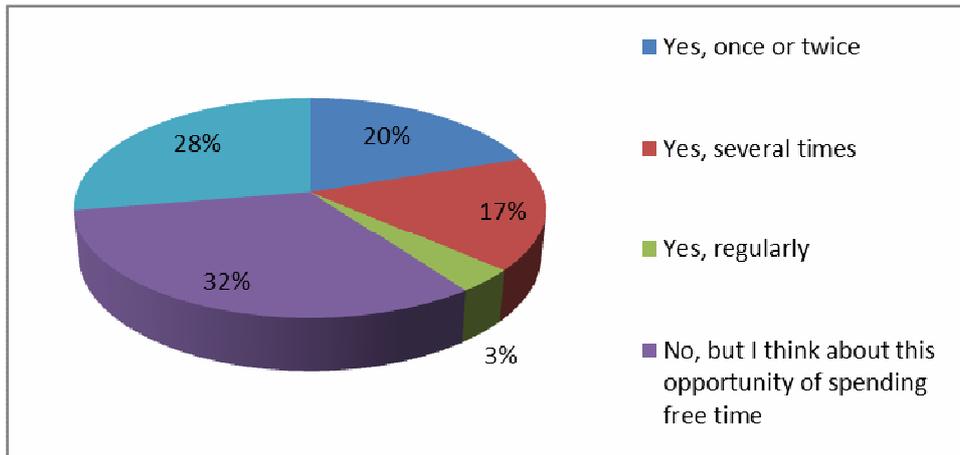
From our survey, it can be concluded that none of the respondents did not mark the option "fairs and exhibitions". The fact that Fairs holidays and tourism are a key element in obtaining information is also confirmed by the survey of SACR.

Nowadays general public is more informed about the concept of rural tourism and agrotourism. But most people are not very interested in rural tourism and agrotourism and they do not search for information about this kind of tourism. From our research we can assume that people are not familiar with the concept of rural tourism and agrotourism, however from our sample, 80 % of respondents answered that they know these kind of tourism for a longer time. But almost 50 % of respondents use the Internet when searching for an ordinary vacation and 40 % does not searched for information yet, although mostly younger people under 35 years participated in the result.



**Pic. 5 : Searching information about rural tourism and agrotourism**

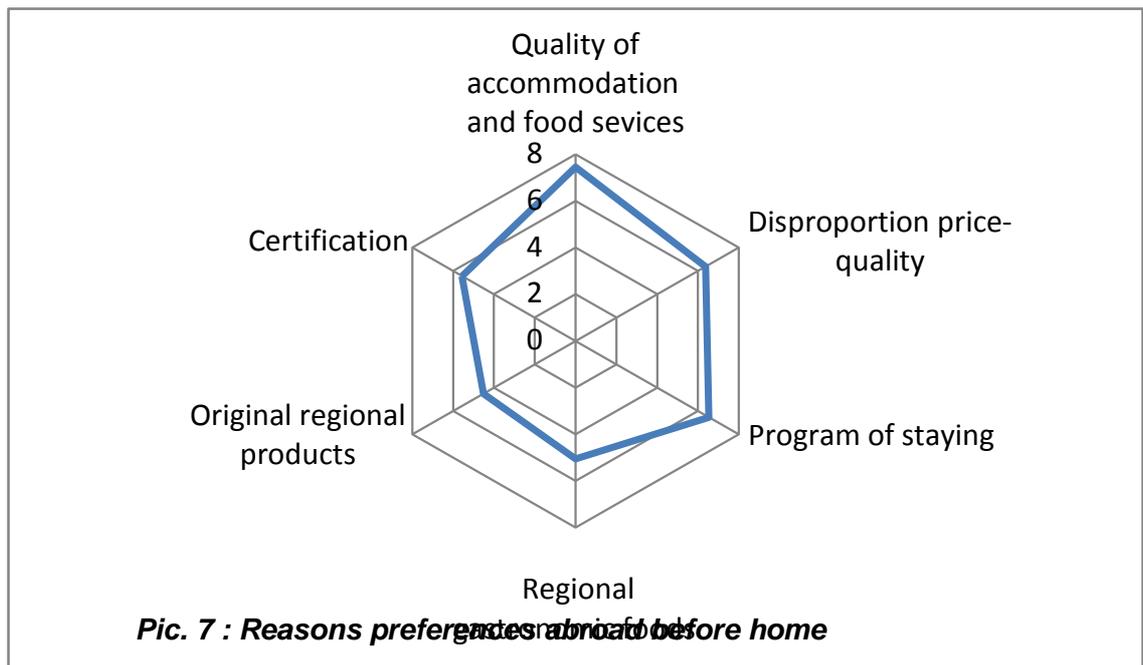
From the following graph we can see that more than 50 % of respondents do not had a vacation in conditions of rural tourism and agrotourism. We can again assume that people are not familiar with the concept of rural tourism and agrotourism. They do not know what does this tourism is about. Mostly older people regularly spend their holiday in rural tourism or agrotousim conditions. Respondents over 46 years mostly answered for this question. People around 50 years prefer much a vacation in spring or summer and mostly in quieter tourism resorts and not longer than one week.



**Pic. 6 : Frequency of spending holidays by using the services of rural tourism and agrotourism**

Most 64 % of respondents who use services of rural tourism or agrotourism in the Slovak Republic want these services also in foreign countries when they prefer rural tourism or agrotourism from an ordinary vacation. Only around 35 % of respondents prefer such services only in the Slovak Republic conditions and only 1 % in foreign countries.

Nearly 75 % of respondents prefer a vacation in rural tourism or agrotourism conditions in foreign countries and they prefer for this kind of tourism mostly the Czech Republic and Hungary, Austria 16 % and Italy 6.5 %.



**Pic. 7 : Reasons preferences abroad before home**

Respondents prefer foreign countries much more than a vacation spent in home country and they have many reasons for it. In our survey we want to know respondents preferences and they had to add a rating from one to ten points to six statements. As we can see from the graph the most significant reason is offering more better services by foreign establishments (7.45), price-quality disproportion (6.39) and a stay schedule is much more organised as in our conditions (6.53). Other options were: Regional dishes are missing in rural restaurants of the SR. Also in rural facilities in the Slovak Republic there are no regional products, e.g. from wood, clay, leather or other souvenirs. There is a lack in certification of regional products in the rural tourism of the SR.

In our previous survey in analysis of holiday behaviour of citizens of the Slovak republic we had included following options – price level, quality of accommodation and food services, disproportion of price and quality, unattractiveness of home country, limited options of choice, insufficient offer of attractions. This question of questionnaire was directed to thinking of Slovaks about attributes why don't choose holiday in the Slovak Republic. Respondents had the option to assign a weight from 1 to 10. Number 1 means the lowest weight and 10 the highest.

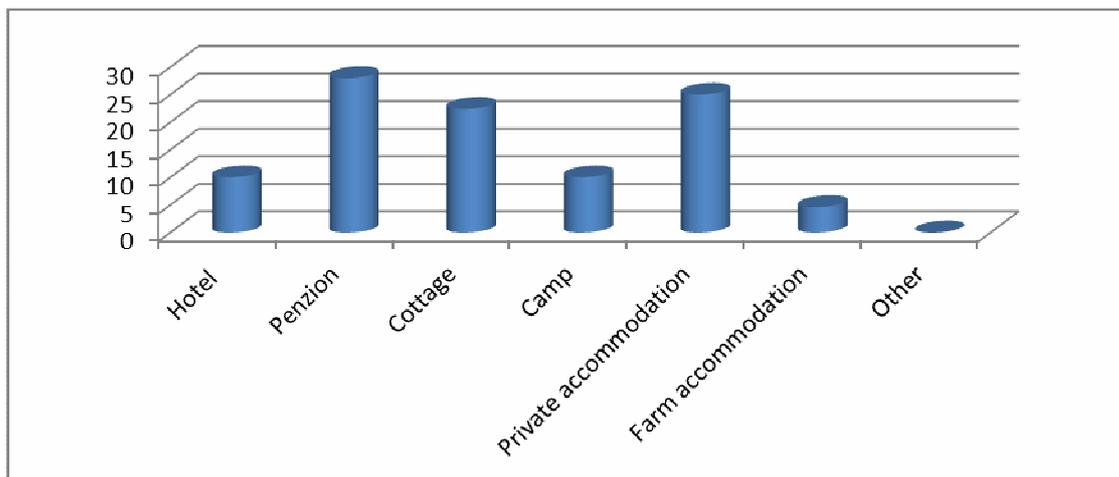
Average weight of option “disproportion of price and quality” reached an average weight of 6.5; followed by “quality of accommodation and food services” with average weight of 5.5. The option “insufficient offer of attractions” closes the trinity of these options with an average weight of 5.14.

We included a similar question in the current survey. Respondents had to mark options of preferring foreign countries when choosing agrotourism or rural tourism for a vacation. They had many options to choose from but they choose mostly foreign countries for offering better services (7.45). According to respondents is the schedule for a stay in rural tourism facilities abroad much better organised (6.53).

According to a survey of SACR Slovaks usually opt for private accommodation or lodges, respectively less luxury hotels (one-star to three-star). Just the most solvent groups in the age group 26 – 49 are taking four-star and five-star hotels. Use of camping is typical for younger generation, while living with friends or family is more common among older generation.

These facts are also confirmed by our previous survey, where only 50 % of respondents said they prefer hotel accommodation, specifically 54 %. Private accommodation is also frequently used type of accommodation. As we can see in Pic. 6, this type of accommodation is used by 21 % of respondents. At least utilized type of accommodation is camping (5 %).

As concluded from the present survey respondents choose hotels when they go on holiday abroad. The greatest part of respondents, younger than 26 years, prefer as accommodation a hut or cottage on holiday in the Slovak Republic. Only 4.7 % of respondents would choose a ranch, estate or a chalet as accommodation in our conditions.



**Pic. 8: The choice of accommodation during rural tourism and agrotourism in the Slovak Republic (in percent)**

All agro-subjects offer in addition of the basic offer of accommodation and boarding, also a service that customers feel their self-comfortable in their facilities and to have good experience. These subjects want to diversify their customer stays with complementary activities.

Subjects offer complementary activities in many seasons. But the offer depends not on seasons, but on the nature and location where these subjects are situated in, the area

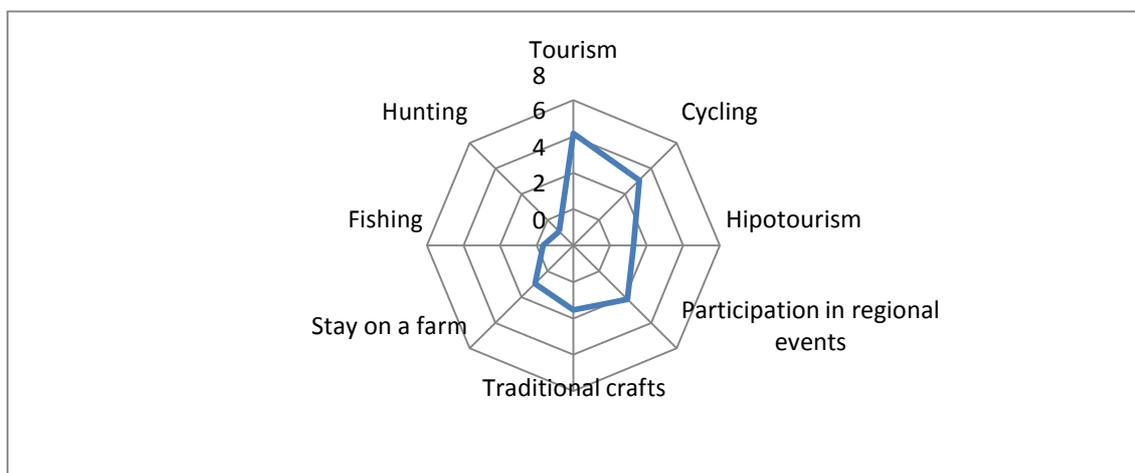
options for agrotourism and primary focus of these subjects (MURA, L. – KOZELOVÁ, D., 2012)

Facilities which offer these kinds of services holiday are mostly situated in beautiful nature surrounded by mountains, woods where are options for good tourism, cycling or berries and mushroom picking, etc. Because many clients have children only few facilities do not have a playground for children. Many visitors come in these facilities because of livestock or horse riding. Many subjects have extended their offers by hipotourism or mini-zoo for children. It depends on legal forms of business and the intention of the company itself. In a cooperative can the rural tourism or agrotourism be a significant element of additional income. But some enterprises are mainly created for tourism. They offer sport and relaxation services connected with nature, e. g. skiing, tourism and swimming. The service offer is complemented by wellness services, in the past mostly typical for spa tourism. In business for individuals is lower range of additional equipment which is related to a lower amount of additional services offered. That fact reflects that facilities of business entities are larger, where is enough space for better facility equipment and additional services which can satisfy customers.

The Slovaks mostly prefer these activities when on holiday in countryside: walking, cycling, hipotourism, less hunting, fishing or working with animals on farm.

We can therefore conclude that the offer of facilities corresponds with the interests of vacationers and therefore, the missing offer of specific activities associated specifically with agrotourism and rural tourism is not so significant.

From the graph can be seen that from options connected with rural tourism and agrotourism respondents would definitely choose tourism. Tourism chooses 60 % of respondents and so it became number one activity. The second activity was cycling chosen by 46 % of respondents and others would prefer hunting or fishing. From eight possible activities was the hipotourism selected as the third most preferred activity by 17.34 % of respondents, although it is a very young segment of rural tourism.



**Pic. 9: Respondents' preferences of leisure time activities in agrotourism and rural tourism**

Regions which the Slovaks prefer most rural tourism and agrotourism – Banská Bystrica region (29.1 % of respondents), Žilina region (20.9 %) and Prešov region (16.9 %). Bratislava region, Trnava region and Košice region were preferred less.

## Conclusions:

Quick way of life, mental tension and stress cause man's desire for satisfaction and release. This all can be found in the nature. According to this fact higher interest for a dynamic element, the agrotourism is documented.

Rural tourism is an activity based on resources and potentials of country house where economic, social, cultural environments and traditions are integrated together. This classification is based on "rurality" as differentiation criteria in comparison with other activities in tourism, based on the rural environment and which are considered as "rural tourism".

Agrotourism is a special free time activity where we can recognise cultural and social traditions, live and work of farmers, nature and beauty of the Slovak countryside. Why not to try a holiday in typical rural conditions and participate on attractive agro-tourism activities, e. g. hunting, fishing, mushroom picking, horse riding school, or just to relax by tasting traditional Slovak meals, wines or cheeses and know the making of traditional regional products.

The trends in development of rural tourism were dependent on the customers' preferences and modern age as in other services connected with free time. That means that there are marked with time period of stronger or weaker growth or by temporary recession. Nevertheless from data which has Eurogites – European federation for rural tourism, it is clear that in the last 10 or 15 years the average annual growth in demand and supply was approximately at the level of 10 - 15 % which is a higher value as, e. g. for growth of tourism in the Europe, which was in the same period on level 4 – 5 % p. a.

Large share of favourable development has the increase of capacities in countries which began to offer rural tourism in last few years. In Spain every three years capacities nearly double, which causes a temporary excess of supply over demand. In countries which offer rural tourism for years is the growth much lower (close to zero). Strong competition in these countries forces the active players to improve, innovate and specialise the offer of services.

In Europe, the proportion of rural tourism on the tourism landscape is very different and values ranging from 2 - 40% depending on the country. The mean value reached level of about 25% of the accommodation capacity in rural areas, the total accommodation capacity of the country. In terms of official statistics it represents a value of approximately 6.5 million beds. Markets for rural tourism are very fragmented. Therefore there is not a single, coherent or even a majority demand model. Success of services or accommodation lies in specialization, attraction and meeting the needs and expectations of visitors and in market segments in the whole concept of rural tourism.

In the first place we must know how is the rural tourism perceived by entrepreneurs and how by customers. Entrepreneurs must place the offer or service in this global picture, otherwise it will not be considered as other option. The view of customers on rural tourism and agrotourism is interesting. According to provided research we can demonstrate some detected facts.

Typical season for holiday is the summer, for more than 86 % of respondents. In younger categories it is much more, over 90 %. Older people, over 50 years prefer spring and autumn for holiday. It depends of some factors, e. g. non-seasonal prices and less strict time schedules.

Most of Slovaks prefer a foreign country for a holiday instead of the home country. Average holiday time in Slovak conditions is two weeks. But the third of cases it is only a week. Only insignificant groups of respondents choose shorter or longer holidays.

In Slovak conditions only an insignificant group of respondents spend their holiday in the Slovak Republic. In our country they spend shorter, weekend stays in the year.

Small and medium sized entrepreneurs in rural tourism and agrotourism promote their services in region and on tourism exhibitions by catalogue issued by professional association. The most effective advertisement in rural tourism is via the Internet.

The advertisement in rural tourism and agrotourism can be considered as insufficient. More than a half of respondents do not spend a holiday in rural tourism conditions. Therefore we can assume that people are not familiar with terms rural tourism and agrotourism. Holiday in rural tourism or agrotourism conditions regularly spend older people over 46 years.

Consumers prefer a holiday in rural tourism or agrotourism in foreign countries. They prefer countries like the Czech Republic, Hungary, 16 % - Austria, 6.5 % - Italy. Tourists prefer foreign countries from a holiday in home country for many reasons. The most important

reasons are the quality of offered services offered by foreign entrepreneurs, the price-quality ratio and time schedule is much better prepared as in our conditions.

The greatest part of respondents under 26 years would prefer a stay in a cottage or a hut in Slovak conditions during their holiday. Only 4.7 % from all respondents would choose accommodation on a ranch or farm. Facilities which offer these kinds of services holiday are mostly situated in beautiful

nature surrounded by mountains, woods where are options for good tourism, cycling or berries and mushroom picking, etc. Because many clients have children only few facilities do not have a playground for children. Many visitors come in these facilities because of livestock or horse riding. Many subjects have extended their offers by hipotourism or mini-zoo for children. It depends on legal forms of business and the intention of the company itself. In a cooperative can the rural tourism or agrotourism be a significant element of additional income. But some enterprises are mainly created for tourism. They offer sport and relaxation services connected with nature, e. g. skiing, tourism and swimming. The service offer is complemented by wellness services, in the past mostly typical for spa tourism. In business for individuals is lower range of additional equipment which is related to a lower amount of additional services offered. That fact reflects that facilities of business entities are larger, where is enough space for better facility equipment and additional services which can satisfy customers.

We can state, that the offer of subjects corresponds with holidaymakers interests and therefore the absenting offer of specific activities connected with rural tourism and agrotourism is not so important.

As in other countries of the world, neither in the Slovak Republic is not recorded a detailed statistic about rural tourism and agrotourism. According to this fact the current number of subjects operating in rural tourism and agrotourism is not known.

On the basis of data from Information sheets of Ministry of Agriculture and Rural Development provided by Research Institute of Agricultural and Food Economics we can state, that the most subjects operating in agrotourism is in Žilina and Banská Bystrica region. On the other hand the less is in Prešov and Nitra region. Taking into account the geographic location of most numerous facilities operating in rural tourism is in mountainous area of production. Because of unsatisfactory conditions for development of agriculture in these areas the entrepreneurs in agriculture concentrate on other ways how to make additional income.

Following regions the Slovaks consider being best for rural tourism and agrotourism – Banská Bystrica region (29.1 % of respondents), Žilina region (20.9 %), Prešov region (16.9 %) and less Bratislava, Trnava and Košice region. Of course the choosing of customers reflects the potential of individual regions for actively digested relax.

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# Efficiency of agriculture in European FADN regions

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## Abstract

Competitiveness of the regions is an actual topic. Regional competitiveness in general is related to various spheres of regional activities. One of the most important factors, influencing especially rural regions, is agriculture. This is important not only for the food security at regional and national level, but also for development of regional environment and overall attractiveness of region. On the other side the primary role of the agriculture is to ensure sufficient food supply with adequate quality. Path to developed agriculture is effective and efficient use of production factors. The main objective of presented paper is to compare European regions with regard to efficiency of their agriculture production. Analysis was based on the data provided by Farm Accountancy Data Network database (FADN). From the methodological point of view was used stochastic frontier analysis to estimate efficiency of each FADN region. For this purpose was used Cobb-Douglas and translog production function to estimate efficient production frontier. Quality of both functions was evaluated using Akaike information criterion (AIC) and Schwarz criterion (SBC). For the final analysis was used function with lower value of both criterions. Total output (SE131) was used as dependent variable. Explanatory variables used in the final model (inputs) were capital (SE 510) and labour (SE010) in logarithm form. Agricultural area was also taken into account, but this input was insignificant in all estimated models. This could be caused by different orientation of investigated farms. Some of them are oriented primary to crop production, and some to stockbreeding. Especially the second group's efficiency is not influenced by agricultural area, which could cause this result.

The least efficient regions were Malta, Asturias (Spain), Pohjois-Suomi (Finland), Lann i norra (Sweden), Slovenia, Canarias (Spain), Sisa-suomi (Finland), Limousin (France), Galicia (Spain), Etela-Suomi (Finland) with technical efficiency less than 0.69.

The most efficient regions were: Calabria (Italy), Champagne-Ardenne (France), Ile de France (France), Liguria (Italy), Severoiztochen (Bulgaria), Alsace (France) with technical efficiency higher than 0.95. The average value of technical efficiency was 0.85. From the number of 135 FADN regions, 82 have performance over average and 53 under this value. In general, we can conclude that most efficient agriculture is in Italy, United Kingdom and France, least efficient were regions in North Europe, which is primarily caused by local weather conditions.

Major part of inefficient regions were less favoured areas (e.g. regions of Finland), on the other side there were some areas where should be expected more efficient agriculture regard to its climate (Spain).

## Keywords

Efficiency, agriculture production, FADN, stochastic frontier analysis

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## **Introduction**

Nowadays, European agriculture faces numerous challenges. It is connected with multidimensional character of this sector. Agricultural farms and their production are affected not only by economic factors, climatic and environmental conditions, but also by the policy decision on national and also regional level. On the other hand, agricultural production in regions also affects their environment, social and economic situation and affects their position within national and also international space.

Agriculture plays important role especially in rural regions and affects their competitiveness. On the other side, in metropolitan and industrial regions does not have agriculture such important role. But in general, the primary role of the agriculture is still to ensure sufficient food supply with adequate quality.

Agriculture is therefore closely connected with regional environment, production of food and also regional competitiveness on this field. Road to efficient creation of regional environment, except the other factors, is also closely connected with efficient use of production factors. Efficient agriculture leads to efficient creation of regional environment, to efficient production of food and also contributes to the competitiveness of the region, especially in rural areas. Through the last years a proportion of land used for construction purpose is increased while a proportion of agricultural land declined. Therefore increase of the outputs with the use of existing inputs is essential. The assessment of technical efficiency provides information to policy makers about differences in performance among production units and the potential for improvements.

The main objective of presented paper is to compare European regions with regard to efficiency of their agriculture production. Analysis was based on the data provided by FADN database. Results on one side reflect conditions for the agriculture in analyzed regions, which is influenced by nature and climate condition and also by local policy and government decision with regard to agriculture. On the other side, efficient farms and development of the agriculture enterprises contributes to competitiveness of their region, and also influence quality of environment.

## **Measuring the efficiency in the agriculture**

According to Greene (1997), producers are efficient if they have produced as much as possible with the inputs they have actually employed and if they have produced that output at minimum cost. The measure of efficiency can be decomposed into technical and allocative efficiencies (see for detail, Coelli, Rao, O'Donnell, and Battese, 2005). Following Farrell's (1957) definition, technical efficiency is defined as the ability of a decision making units (DMU, e.g., a farm) to produce maximum output given a set of inputs, while allocative efficiency is the ability to produce a given level of output using cost-minimizing input ratios. Consequently, the technical efficiency can be described by the relationship between observed output and some ideal or potential production. There is wealth of methodological and empirical literature focusing on the issues in efficiency and productivity (standard theoretical references Coelli et al., 2005; Kumbhakar and Lovell, 2000).

In general, there are two main approach of measuring technical efficiency. Parametric approach is based on using stochastic frontier analysis (SFA). Data envelopment analysis (DEA) is a well-established non-parametric efficiency measurement technique.

The stochastic production frontier models were proposed by Aigner, Lovell and Schmidt (1977). A production function defines the technological relationship between the level of inputs and the resulting level of outputs. If estimated econometrically from data on observed outputs and input usage, it indicates the average level of outputs that can be produced from a given level of inputs (Schmidt, 1986). An implicit assumption of production functions is that all firms are producing in a technically efficient manner, and the representative (average) firm therefore

defines the frontier. Variations from the frontier are thus assumed to be random, and are likely to be associated with mis- or un-measured production factors. In contrast, estimation of the production frontier assumes that the boundary of the production function is defined by “best practice” firms. It therefore indicates the maximum potential output for a given set of inputs along a ray from the origin point. Some white noise is accommodated, since the estimation procedures are stochastic, but an additional one-sided error represents any other reason firms would be away from (within) the boundary. Observations within the frontier are deemed “inefficient”, so from an estimated production frontier it is possible to measure the relative efficiency of certain groups or a set of practices from the relationship between observed production and some ideal or potential production (Greene, 1993).

A general production frontier model is given:  $\ln q_j = f(\ln x) + v_j - u_j$

Where  $q$  is the output produced by firm  $j$ ,  $x$  is a vector of factor inputs,  $v_j$  is the stochastic (white noise) error term and  $u_j$  is a one-sided error representing the technical inefficiency of firm  $j$ .

The production of each firm can be estimated as:  $\ln \hat{q}_j = f(\ln x) - u_j$  and its efficient level of production:  $\ln q^* = f(\ln x)$

Then technical efficiency can be is given:  $\ln TE_j = \ln \hat{q}_j - \ln q^* = -u_j$

So TE can be calculated:  $TE_j = e^{-u_j}$  and is constrained to be value between zero and one. If  $TE$  equals one, production is said to be technically efficient.  $TE$  is therefore a relative measure of firm's output as a proportion of the corresponding frontier output. A firm is technically efficient if its output level is on the frontier.

Stochastic frontier analysis is widely used not on the firm level (Rani, A., Kunniyoor Cheemani R., Naicy T. (2013); Kourtesi, S., Fousekis, P., Polymeros, A. (2013), but it is also useful for modeling on the regional and also national level. (Sojková, Z., Kropková, Z., Benda, V. (2008) also Covaci (2005)). It is effective tool for efficiency comparison of DMUs. Non parametric approach is used by Fandel, P. (2007).

## Data

The main objective of presented paper is to compare European regions with regard to efficiency of their agriculture production. Source of the data is FADN database. Dataset include information about agricultural farms (4852250) for 135 European regions (FADN classification) in 2011. Analysis compared overall efficiency in regions.

Following variables for each region were used:

Total output (SE131) – total of output of crops and crop products, livestock and livestock products and of other output (Euro) was used as dependent variable.

Explanatory variables used in the final model (inputs) were:

Capital (SE 510) – average value of working capital (Euro)

Labor (SE010) – total labor input expressed in annual work unit

Variables were used in form of natural logarithm. Agricultural area was also taken into account, but this input was insignificant in all estimated models. This could be caused by different orientation of investigated farms. Some of them are oriented primary to crop production, and some to stockbreeding. Especially the second group's efficiency is not influenced by agricultural area, which could cause such result.

## Results

Basic methodology used for the efficiency analysis was stochastic frontier models. There were estimated more models using different functional forms (Cobb-Douglas, translog) and also various explanatory variables (capital, labour, agricultural area). Final model used further for the efficiency analysis was Cobb Douglas functional form with capital and labour used as explanatory variables. Estimated production function has following form:

$$\ln Y = 2,78 + 0,15 \ln L + 0,75 \ln K + v_j - u_j$$

Sum of estimated regression coefficients is less than 1, which means that analyzed regions belongs to decreasing returns to scale. Thus, output increases by less than proportional change in inputs. Especially capital plays important role in agricultural production, when 1% increase in capital is followed by 0.75% increase in output. On the other side, 1% increases in labour causes only 0.15% increases in output. Given function was evaluated as the model with highest explanatory ability from all estimated functions and was used further for the efficiency analysis. Evaluation was based on AIC, SBC and log-likelihood value. Selected function was used to calculate overall technical efficiency of agricultural farms in European FADN regions.

Average value of technical efficiency in analysed regions was 0.85 with standard deviation 0.08. Minimum value was 0.61 (Malta) and maximum value 0.97 (region Calabria). From the number of 135 FADN regions, 82 performed over average and 53 under this value. Left tailed distribution of technical efficiency among regions is on the figure 1. Agriculture in 42% of regions has technical efficiency between 0.81 and 0.9.

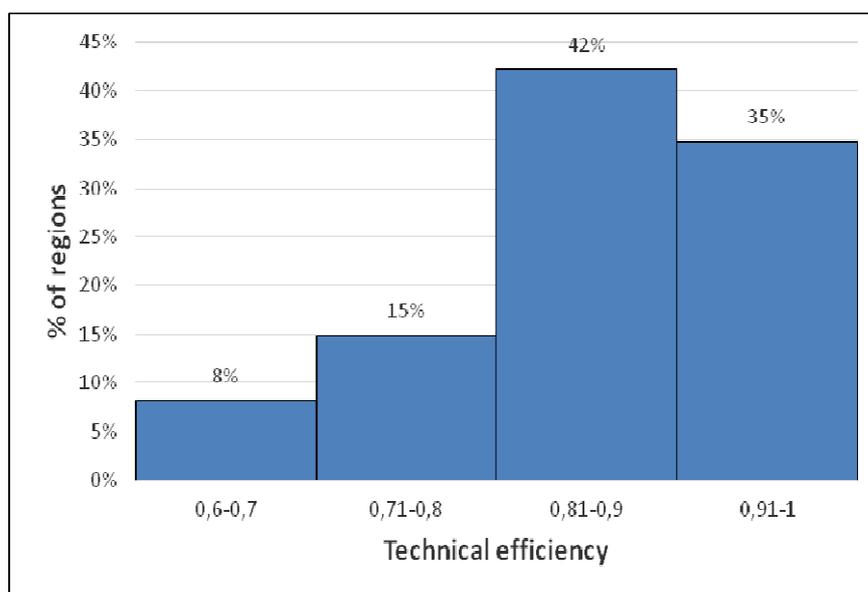


Figure 1: Distribution of regions by level of technical efficiency

The least efficient regions were Malta, Asturias (Spain), Pohjois-Suomi (Finland), Lann i norra (Sweden), Slovenia, Canarias (Spain), Sisa-suomi (Finland), Limousin (France), Galicia (Spain), Etela-Suomi (Finland) with technical efficiency less than 0.69.

The most efficient regions were: Calabria (Italy), Champagne-Ardenne (France), Ile de France (France), Liguria (Italy), Severoiztochen (Bulgaria), Alsace (France) with technical efficiency higher than 0.95. Best performing United Kingdom region was East England (TE 0.93 raking 11 among regions), best Portugal was Ribatejo e Oeste (Te 0.93 rank 16 among regions). From the north-European countries, where was expected lower level of technical efficiency due to climatic conditions was best performing Denmark (ranked 57 with Te 0.889).

Other northern countries reached results consistent with expectations: Estonia (Te 0.83, rank 91), Lithuania (Te 0.84 rank 93). Best Swedish region Slattbygdsland with technical efficiency 0.8 ranked 105 which meet average efficiency level of central European regions. Slovakia placed 108 with level of technical efficiency 0.78, Czech Republic was 119-th with technical efficiency 0.75. Best Finish region Pohjanmaa with technical efficiency 0.7 ranked 124.

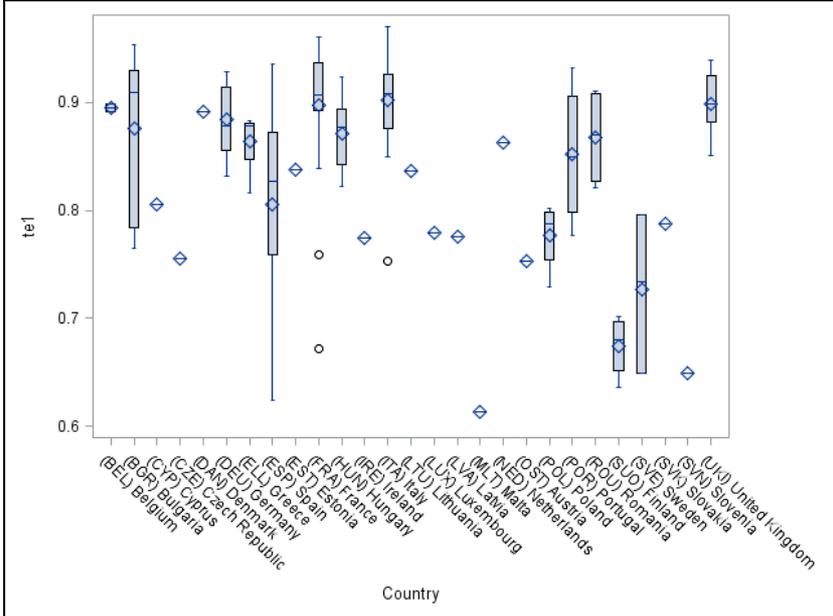
**Results aggregated for countries**

In technical efficiency are evident differences not only between analysed regions considered as individual units but also within particular countries which are divided into different number of regions. It is necessary to mentioned that some FADN regions (in number 13 from 135 of total) correspond to particular country thus one FADN region represents whole country (e.g. Cyprus, Czech Republic, Denmark, Estonia, Ireland, Lithuania, Luxembourg, Latvia, Malta, Netherland, Slovakia and Slovenia). Other countries consist of several regions (e.g. 22 regions in France, 21 in Italy, 17 in Spain, 8 in Romania, etc.).

Our main aim presented in this part is comparison of technical efficiency between countries using the basic descriptive statistics (each country is considered as group of particular FADN regions). As most suitable form was applied box plots that display summary statistics for technical efficiency around countries.

On the figure 2 we can see the highest difference of technical efficiency within country 0.31 in Spain (from 0.62 in region Asturias to 0.93 in region La Rioja) followed by France 0.28 where minimum level of TE was 0.67 in Limousin and maximum level 0.96 was achieved in Champagne-Ardenne. Third country with high difference between less efficient region (Aosta 0.75) and the most efficient region (Calabria 0.96) was Italy. In France and in Italy are shown extreme minimum values of efficiency which are caused by significant differences of technical efficiency in individual regions. In both regions are evident regional disparities in efficiency of agricultural production. Region Limousine and Auvergne had least level of TE in comparison with other regions of France. Average level of TE in France was 0.89 hence in the two mentioned region were 0.67 and 0.76 respectively. Average TE achieved in Italy was 0.90 and it was the country with the highest average level of TE.

In the countries with smaller number of FADN regions were differences visible not in the wide range of TE but in the deviations of the values. It is obvious especially in Bulgaria and Sweden. There is great difference between average level of TE (0.87 in Bulgaria, 0.72 in Sweden) and other values of TE. Differences in other countries are smaller.

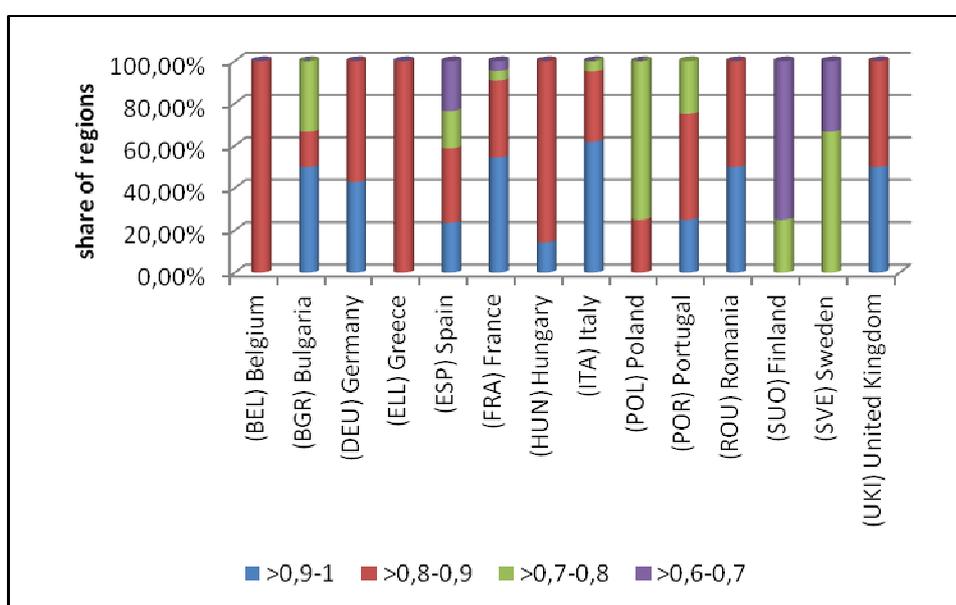


**Figure 2: Technical efficiency of FADN regions around countries**

To get better information about technical efficiency of FADN regions in particular countries was analysed also proportion of regions in each country determined by level of their technical efficiency (figure 3).

Italy was the country with highest average level of technical efficiency of agricultural production. Also it is a country with highest share of FADN regions with TE higher than 0.9. Followed by France and United Kingdom where share of most efficient regions is bigger than share of least efficient regions. Country with small regional disparities and high technical efficiency is Belgium. In Sweden and Finland were not evident any significant regional disparities, but regions reached the least level of technical efficiency. Regions with greatest potential are in the United Kingdom, where was not find any region with efficiency smaller than 0.85.

FADN regions identical with entire country have technical efficiency from 0.61 in Malta to 0.89 in Denmark.



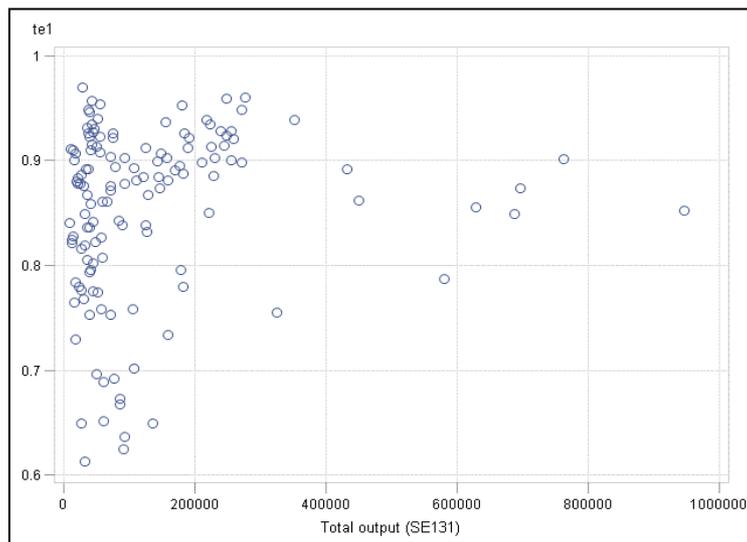
**Figure 3: Differentiation of FADN regions among countries according to their TE**

From the figure 3 is obvious that from countries, which are created by more FADN regions, were most efficient United Kingdom, Romania, Hungary and Germany. This is partly influenced by climatic conditions on one side, on the other side it is cause by efficient usage of production inputs. Especially result of Romania is surprise. This is result of efficient production, and low level of used inputs. In general, lowest efficiency reached Finland and Sweden, this result is outcome of climatic and environmental conditions in these countries which are not so suitable for agricultural production.

### Relationship between output and technical efficiency

Relationship between agricultural production and level of reached technical efficiency is displayed on the figure 4. There was not proved any relationship between agricultural output and technical efficiency. It is obvious in the left part of the chart in the region of low output where can be found various values of technical efficiency. Region with highest value of technical efficiency Calabria (Ita)  $Te=0,96$  reached output 28318 €. On the other side, region with largest amount of agricultural output (right side) Thuringen (Ger) reached  $Te=0,85$ .

Regions with amount of agricultural output over 400000€ reached technical efficiency in the interval 0,85 to 0,9. The only exception was region Slovakia with agricultural output 579917 with technical efficiency only 0.78. In current situation has Slovakia lowest efficiency from regions which reached agricultural output over 400000€. Another outlier in between regions with output over 200000 € is Czech Republic with technical efficiency 0,755. This is given by similar character of both regions. In this case it would be recommended to produce more output to be more efficient and therefore competitive on the field of agricultural production. Region with lowest value of technical efficiency Malta has also lowest level of agricultural output.

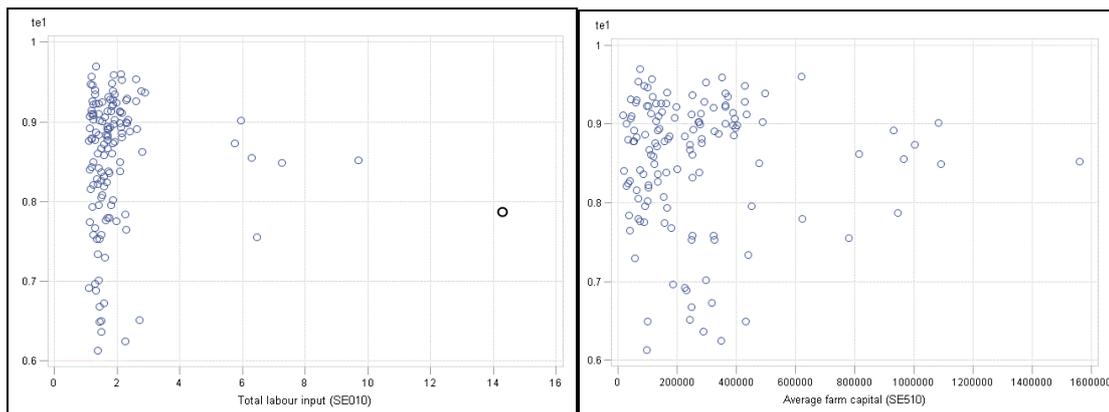


**Figure 4: Technical efficiency vs. agricultural output**

### Input variables and technical efficiency

Relationship between technical efficiency and inputs are on the figure 5 and 6. Slovakia had in 2011 highest level of labour input from all investigated regions. Other regions with high level of labour input are Thuringen, Brandenburg, Czech republic, Sachsen, Sachsen-Anhalt, and Mecklenburg-Vorpommern. All mentioned regions performed under expectation in relation to their labour input. Especially Slovakia and Czech Republic reached low level of technical efficiency with regard to their labour input (Figure 5). On the other side, regions with lowest level of labour input are Molise (Ita, TE= 0,88) and Etela-Suomi (Fin, TE=0,69).

Situation concerning farm capital is shown on the figure 6. Regions with highest amount of average farm capital are mainly German (Thuringen, Brandenburg, Sachsen-Anhalt, Mecklenburg-Vorpommern, Sachsen), then Slovakia, Denmark, Netherlands and Czech Republic. Lowest efficiency level from these regions reached Slovakia and Czech Republic. On the other side, regions with lowest amount of farm capital are all Romanian regions.



**Figure 5: TE vs. Labour input**

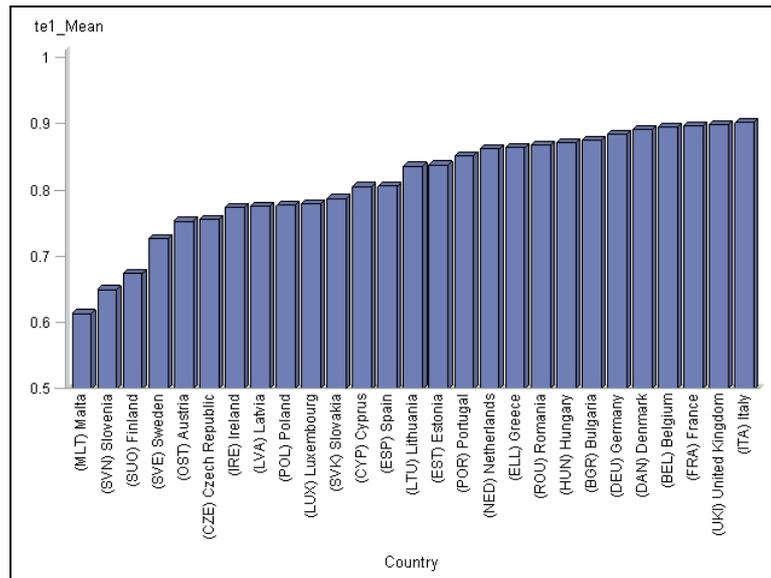
**Figure 6: TE vs. Average farm capital**

From the regions with agricultural output over 400000 should Slovakia and Czech Republic decrease level of both inputs with current level of agricultural output, or this regions should increase volume of their agricultural output.

## Conclusions

Efficiency of agricultural production in regions is influenced on one side by environmental and climatic conditions in each region, on the other side by conditions created by legal authorities. There could be question if it is reasonable to compare efficiency on regional level. These results are not only comparison of climatic conditions, or regional agricultural policies, but also comparison of efficient agricultural management in analysed countries. Figure 7 shows conclusion of performed analysis for countries, where are located analysed FADN regions. Level of Te means average technical efficiency in each country. In countries which consists from multiple regions it is their average regional performance. For countries which consist from one particular region it is their technical efficiency.

We can conclude that most efficient agriculture in general is in Italy, United Kingdom France, least efficient regions were Malta, Slovenia, Finland and Sweden. Low level of reached efficiency, especially in northern regions was caused by local weather conditions. From the Northern regions only Denmark performed over expectations, on the other side, Slovenia and Limousin (France) performed below expectations. Major part of inefficient regions were less favoured areas (e.g. regions of Finland), on the other side there were some areas where should be expected more efficient agriculture regard to its climate (Spain). Very good results achieved also Romania, where low level of used input is transformed into output in very efficient way.



**Figure 7: Mean results of regional agricultural efficiency across countries**

From the countries with agricultural output over 400000 was least efficient especially Slovakia and Czech Republic. Level of their used inputs would be appropriate to greater volume of production. Especially Slovak agriculture use largest amount of labour input from all investigated FADN regions.

Another fact provided by performed analysis shows that in countries with more FADN regions were great differences between the least efficiency and the most efficiency region. But on the other side, differences among technical efficiency countries created by one particular region were not significant. On the other hand countries with small number of regions had high differences in technical efficiency among them.

Presented paper offers comparison of efficiency across FADN regions and also countries where they are located. There should be also noticed that purpose of the agriculture is not only to provide efficient transformation of inputs into output. Agriculture has also other important social and environmental roles. These roles very often decrease overall efficiency of agriculture in particular regions. Low efficiency of agriculture in region therefore does not mean necessarily bad management or policy in such region. It could also mean, that more sources are devoted to ensure social, and environmental roles of agriculture connected with rural development. It would require deeper analysis of environmental and development indicators in examined regions. Such analysis is limited by accessibility of necessary data.

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# Evaluating of the financial management of the municipalities via parameters of data matrix in the Slovak Republic conditions

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## Abstract

The aim of this paper is to evaluate the development of the financial credibility of the municipalities in Slovakia. Financial parameters, which are evaluated in the article, are parts of the methodology of authors Vomočil - Hájek - Olej (2007), who suggested these parameters for the evaluation of the financial credibility of the municipalities in the Czech Republic. These parameters evaluate the quality of financial management of the municipalities. These indicators will be evaluated in time period 2005-2013. The calculated indicators will represent vectors of financial parameters of the financial management of municipalities, which will be subsequently express in the form of a data matrix.

## Keywords:

Data matrix, Credibility, Financial management, Municipalities, Vector of financial parameters, Municipal budget

## Introduction

Measure the effectiveness of management of municipalities is essentially impossible task, because the aim of the municipality should provide well-content and quality life of inhabitants. The effective municipality is one, which correctly estimates the demand for public assets and can provide them in sufficient quantity, but not an excessive with the minimum expense. In terms of character of public goods as this aim are in principle a qualitative point of view and every inhabitant of purely subjective, because every inhabitant has different needs and preferences. According to the author one of the possibilities is rating of the municipality, which focuses on the question whether the municipality will be able to provide to the inhabitants the same or higher level of public goods in the future. Quantitative evaluation of this system is based on analysis of indicators of income, expenses and debt (Hábová, 2001).

Rating is an independent valuation of municipalities, whose goal is to determine (based on a comprehensive analysis of all known risks), if the municipality is able and willing to fulfill its obligations timely. The rating valuation is based on quantitative and qualitative parameters. Rating municipality is the most common approach for modeling credibility of the municipality (Vomočil – Hájek - Olej, 2007).

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Credibility of the municipality is a certain expression of the quality of the municipality. Credibility in the broad sense represents properties, which correspond to the character of the requirements placed on the municipality. Credibility is formed by their significant aspects, in particular with the financial management, property and development conditions of the municipality (Peková, 2011).

Sometimes credibility of the municipality is identified with a rating of the municipality, which is better known, usable tool - evaluating ability to pay its obligations in the short and long term, the term "brand" solvency and credibility of the municipality. Credibility of the municipality is wider content conceived, it enables to evaluate a complex situation of the municipality on the basis of its three components – financial credibility, property and development credibility (Žárska – Ferčíková, 2014).

Holeček (2009) defines the individual components of credibility of municipalities:

- The financial credibility – it deals with the most important parameters of management of the municipalities and depends mainly on the financial indicators. It is based on comparison of income and expenditure components per capita. The emphasis is also placed on the implementation of the annual municipal budget and the quality of the budget process. Also important role plays debt of the municipality.
- The property credibility – it follows the structure of the municipal property and deals with the assessment of the effectiveness of using the property and possibilities of its use on the basis of need. The property credibility also includes profitability of the financial and rented property.
- The development credibility - is difficult quantified and evaluative category, but still provides a comprehensive comparison method of development assumptions of the municipality. It evaluates except economic aspects also economic, social, cultural and political conditions and assumptions.

Too high credibility means a low credit risk, whereas a low credibility expresses high credit risk. A high credibility enables the municipalities to reduce the costs associated with loan financing, but if the credibility of the municipality is lower, loan providers ask for higher credit risk higher reward (Peková, 2011).

The application of indicators of financial credibility of the municipality is relatively simple and can be greatly assisted by the relevant professional department of the municipality or financial manager of the municipality in the creation and presentation of materials on financial management municipalities providing a basis for decision-making of the municipal/city council and mayor of the municipality/city. Identified indicators may be also useful for the subjects that have the financial resources, which the municipality can provide for their development plans for example banks, financial funds or for projects financed by additional resources from the European Union (Balážová – Gecíková 2013).

In addition, evaluating of the financial credibility of the municipalities via parameters of the data matrix provides a new view of the financial management and also contributes to increasing the transparency of financial management of municipalities.

This is also confirmed by several authors for instance Beresecká – Petrášová (2012), who say, that the inhabitants of municipalities are not often sufficiently informed of their rights and the duties which to have been created legislative conditions. Awareness of the important changes in the municipalities is a major problem in condition of Slovakia. Local press and possibly regional television or radio is mostly dedicated to the propagation activities of municipalities and not practical problems that must be addressed in the municipalities.

Fil'a – Schwarczová (2014), say that at present it is more and more stressed that we are living in the so-called "information period" and is creating the knowledge based society built on the pillars of information and knowledge economy. The information period brought also the much greater openness and access to information of different nature. This actual trend has to be definitely followed by the state and public administration as well as by regional and local municipalities since the identification and consequent accessibility of information is perceived by the citizens as the tool of public control and at the same time the way of permanent enhancement of the level of public services provided.

## Methodology

The aim of this paper is to evaluate the development of the financial credibility of the municipalities in Slovakia. Financial parameters, which are evaluated in the article, are parts of the methodology of authors Vomočil - Hájek - Olej (2007), who suggested these parameters for the evaluation of the financial credibility of the municipalities in the Czech Republic. These parameters evaluate the quality of financial management of the municipalities. These indicators will be evaluated in time period 2005-2013.

The reason for the choosing period was the fact that in 2005 was fiscal decentralization in Slovakia which changed the method of financing of the municipalities and this period also monitor impact of the financial crisis. The most significant change was the introduction of tax on personal income as a single shared tax for the municipality from the state budget (before fiscal decentralization has been reallocated three types of taxes to the municipalities from the state budget). During the analyzed period there have been changes within the redistribution of revenue from this tax. This tax is the part of the tax incomes of the municipalities and its share constitutes about 70% of these incomes, which means that any change in the volume of these incomes will ultimately significantly affect the actual financial management of the municipalities.

Financial parameters provide information about the financial management of the municipalities. For the analysis, we chose the following financial indicators of the authors Vomočil - Hájek - Olej (2007), which we modify them on Slovak condition:

$$F_1 = \frac{\text{current incomes of municipalities}}{\text{current expenditures of municipalities}}$$

Parameter points to the quality of the financial management of the municipality. The authors note that, if the parameter is steadily more than one, it means that current budget is in surplus and the financial situation of municipality is good. Parameter value greater than 1, allows municipalities to use the current budget surplus to financing its commitments.

$$F_2 = \frac{\text{non - tax revenues of municipalities}}{\text{total revenues of municipalities}}$$

According to the authors, if the value of indicator going to be higher, municipalities will be to feel the lower need to borrow financial resources.

$$F_3 = \frac{\text{capital expenditures of municipalities}}{\text{total expenditures of municipalities}}$$

According to the authors, the higher value of this indicator refers to the investment of the municipality, which ultimately allows for its further development.

$$F_4 = \frac{\text{capital incomes of municipalities}}{\text{total incomes of municipalities}}$$

According to the authors, if the value of indicator going to be higher, municipalities will be to feel the lower need for further indebtedness of the municipality in relation to investment activities.

$$F_5 = \frac{\text{tangible fixedproperty}}{\text{number of inhabitants}}$$

According to the authors, it is important to know the trends of this indicator, if the municipality should be requested a loan from the bank, where the property will be used as security for the loan.

Data on individual parameters represent the time series. For the analysis we used MS Excel tool for modeling by trend lines. Modelling by trend lines is used if the trend of data corresponds to some known function (e. g. linear, quadratic, power type, exponential, logarithmic). In analysis of parameters  $F_1$  to  $F_5$  we used the tools of MS Excel and in graphical presentation of the data we added trend line. The corresponding trend line illustrates the changes of existing data or forecasts of future data.

The figure for the observed parameter contains the equation of trend curve and reliability coefficient. The trend line is the accurate if the value of the reliability coefficient close to 1 or is equal to the number 1. Polynomial trend line is a curve which is used in case of the data with irregular fluctuations. For better illustration, in graphs we modified the scale on the y-axis.

The underlying data for analysis were obtained from the Ministry of Finance of the Slovak Republic from the state final account. Article reviews the development of the financial credibility of all the municipalities in Slovakia (it is the cumulative assessment).

## Results

Pic.1 shows that during the analyzed period from 2005 to 2013 annually indicator  $F_1$  reaches a value greater than 1, it means that the financial situation of municipalities is good and they achieved to manage with the current budget surplus.

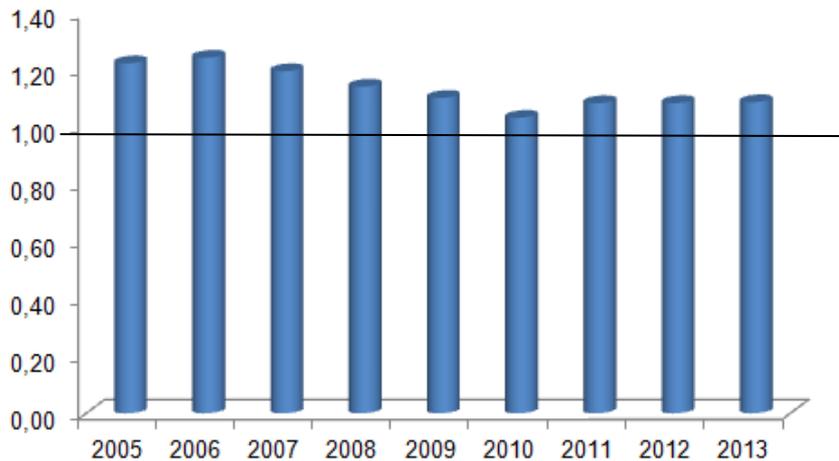
Despite the fact that in 2009 the onset of the financial crisis and there has been a reduction in the total volume of collected funds through taxes of personal incomes, in relation to the municipalities there was no reduction the coefficient.<sup>4</sup> On the basis of regulation No. 868 dated from 2 December 2009 the municipalities got special subsidy from the state budget of the Slovak Republic worth 100 mil. € to cover the loss of tax on personal incomes and on improve the situation starting in 2010.

This subsidy was sent across the board to all towns and municipalities during the month of December 2009 in the amount of uniformly 8.56% from the yield of the tax for the given municipality. Municipalities used it for current expenditures in 2009 and for the current expenditures to 31.March 2010, however, these financial resources could not be used to pay wages, salaries, business activities and other personal settlement. This fact has caused, that in 2010 financial management of municipalities has finished with its surplus current budget at 86 407 ths. €.

Another change happened in 2012, when the state reduced the rate from the 70.3% to 65.4%, but despite this fact, the municipalities ended with an accounting surplus.

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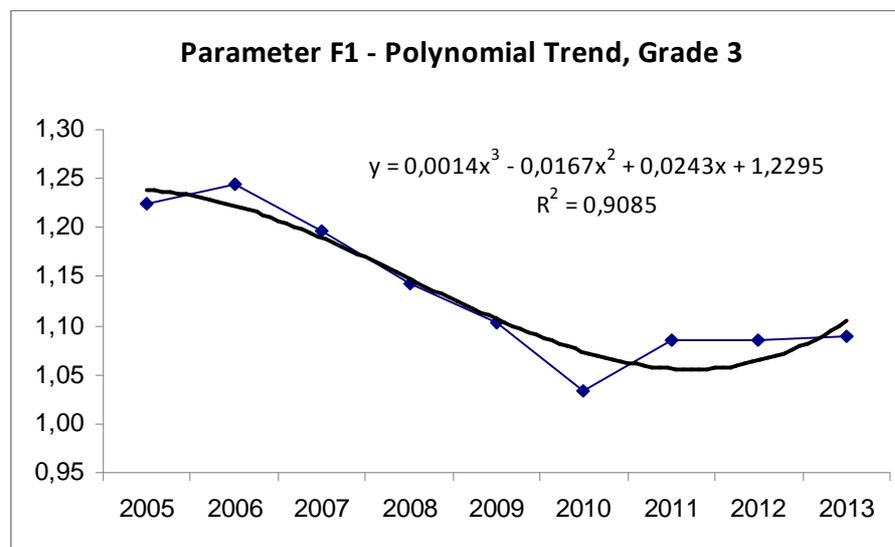
<sup>4</sup> The yield of the tax of personal incomes from 01.January.2005 to 31.December 2011 was divided: municipalities (70.3%), Higher Territorial Units (23.5%) and state (6.2%)



Source: Ministry of Finance of the Slovak republic, own processing

**Pic. 1 The development of the parameter F<sub>1</sub> in the period 2005 - 2013**

We display the data graphically and then we will add a trend line (Pic.2). Assuming that the character of the analyzed time series does not change, via a trend curve we can estimate the future value of parameter. Based on the established trend line we can predict for the next period, that the value of the parameter F1 will be increasing.



Source: own processing

**Pic.2 Trend line for parameter F<sub>1</sub>**

The development of indicator F<sub>2</sub> shows during the analyzed period variable character. In the period 2005 - 2007 there was a yearly decline in the value of the indicator. From 1 January 2005 Government approved a new system of financing of self - government (fiscal decentralization), which reinforced the autonomy and accountability of local governments in the use of public funds to provide services to inhabitants.

After the fiscal decentralization, was changed the structure of municipal budget. Until 2004, municipalities was largely dependent on state funding, but the base of fiscal

decentralization were aimed at strengthening the creation of own revenues primarily through non-tax revenues. Non-tax revenues are mainly created from revenues of use of municipal property, but also with administrative fees for services that are provided to inhabitants.

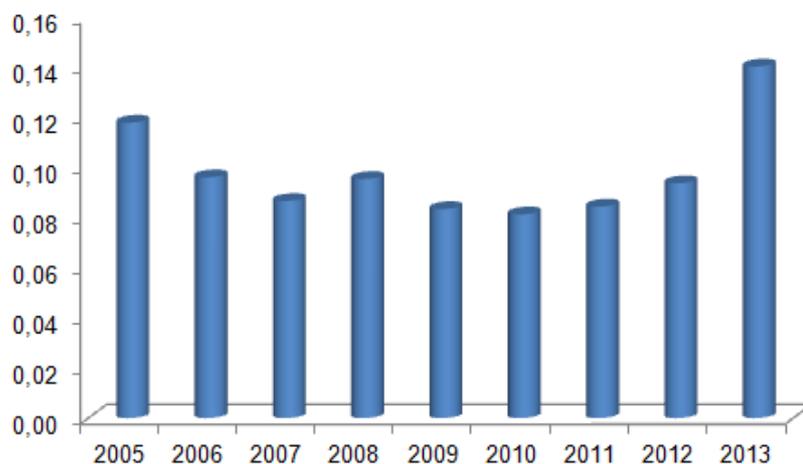
Municipalities receive funding primarily from rental property. Although between 2006 and 2007, non-tax revenues were increasing every year, but the total municipal revenues have grown rapidly than non-tax revenues, which caused a subsequent decline in the value of the indicator.

Change occurred in 2008, when the increase of non-tax revenues for municipalities was 17 mil.€ with compare on the previous year and also there was increase the total municipal revenues by 0.4 mil. €. In the following period 2009 to 2011 there are no significant changes of indicator, its value is around 0.08. (Pic.3).

In 2012, was signed a Memorandum of Cooperation in the application of fiscal policy oriented to ensure financial stability of the public sector in 2013 between the Government and the Association of Cities and Municipalities of Slovakia.

In the memorandum, the government has committed itself to the fact, that in 2012 and 2013 will be adopt the legislative measures to stabilize revenues and cut expenditures cities and municipalities without negative impact on the general government budget for public administration in order to create conditions to ensure their statutory obligations towards its inhabitants (Memorandum of Cooperation between the Association of Cities and Municipalities of Slovakia and the Slovak Government, 2014).

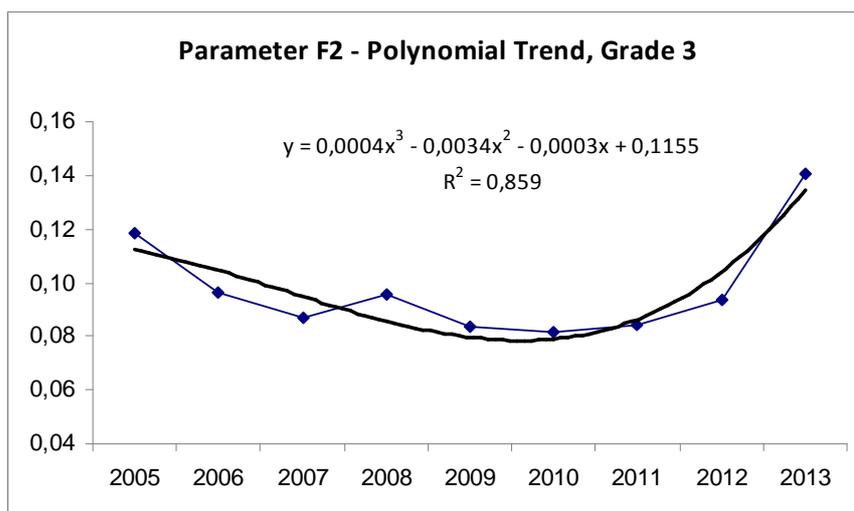
In this context, the municipalities tried more intensively to raise the additional funds. The result was, that in that year the municipalities managed to increase non-tax revenues and grants in the current year compared to the previous one, which is ultimately reflected in the increase in the value of indicator.



Source: Ministry of Finance of the Slovak republic, own processing

**Pic. 3 The development of the parameter  $F_2$  in the period 2005 – 2013**

We applied the same steps in the procedure of modeling and estimation the future value of the parameter  $F_2$ . From the results (Pic.4) we can see that the data are approximated data by the polynomial function of the third degree. From that we estimate that in the next period, the value of the parameter  $F_2$  will increase.



Source: own processing

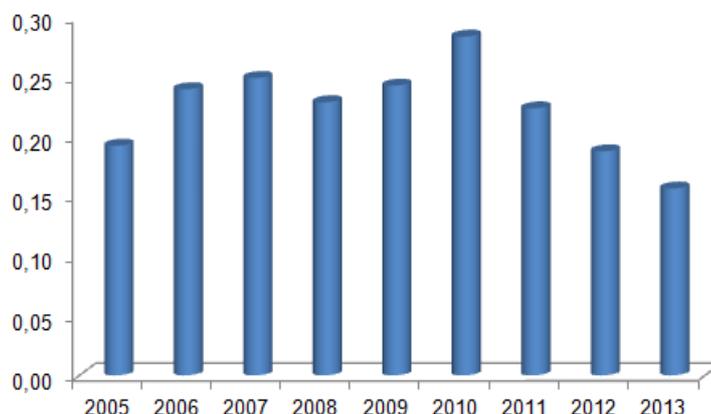
**Pic.4 Trend line for parameter F<sub>2</sub>**

The municipalities using the capital budget for its investment activities. They get capital incomes through capital transfers and subsidies, that they receive it from the state budget or from the EU funds. The increasing of capital expenditures show, that the municipalities develops and evaluates their property. During the analyzed period the development of indicator F3, which gives to the ratio capital expenditure of municipalities in relation to the total expenditures of municipalities, amounted to fluctuating character.

The reason is, that municipalities do not have annual capital incomes, respectively capital expenditures. Often the investment activities of municipalities are expensive and capital incomes, which manages to get municipalities annually are not sufficient, so municipalities several years accumulate their funds and then to use them in the form of capital expenditures for major infrastructure projects (eg. building sewer, building of water treatment plants or revitalization of the municipality centre).

Indicator reached the highest value in 2010 due to the increase in capital expenditure as well as total expenditure of municipalities. In the next three years we are watching the decline of parameter due to reductions capital revenues. (Pic.5).

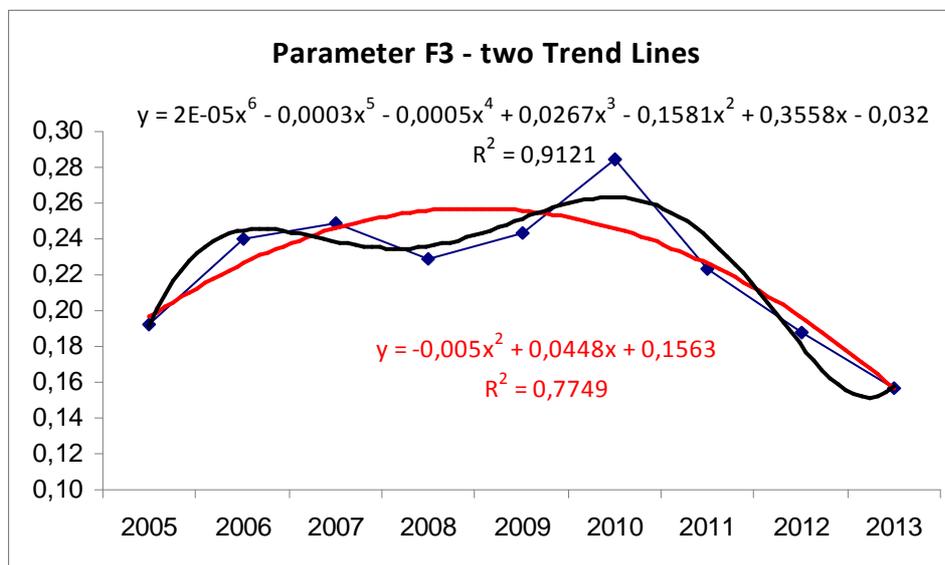
While in 2010 has been invested in municipalities more than 1105 mil. € in the form of capital expenditures, the following year it was only 861 mil. € and even in 2013 has been invested only 576 mil.€.



Source: Ministry of Finance of the Slovak republic, own processing

**Pic. 5 The development of the parameter F<sub>3</sub> in the period 2005 – 2013**

For parameter  $F_3$ , we created two trend lines (Pic.6), so we could compare the reliability coefficients, graphical outputs and estimate the future value of the parameter. We used polynomial functions of the second and sixth grade. The trend line of the 2nd degree is decreasing, trend line of the 6th grade has the upward character. Based on the confidence coefficient we estimate that the value of the parameter  $F_3$  will grow in the coming period.



Source: own processing

**Pic.6 Trend line for parameter  $F_3$**

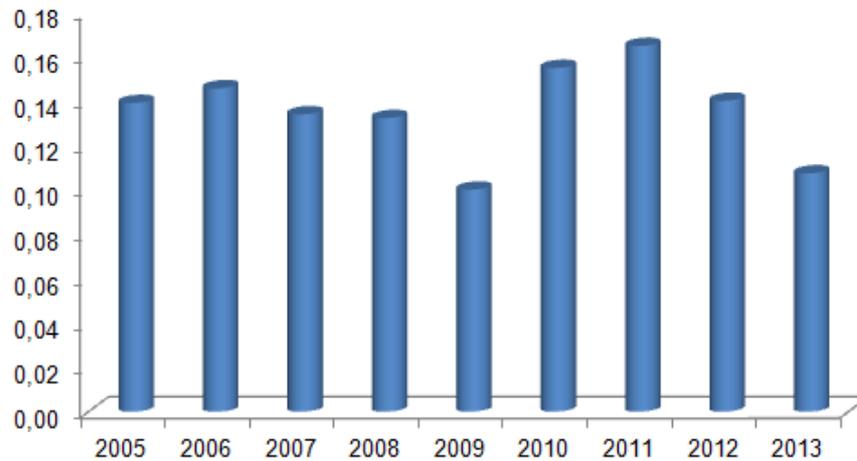
Total capital incomes of the total revenues of municipalities consist about 10%. Capital incomes flowing primarily from the sale of municipal property. If the municipalities sell own property, they lose ability to use them in the future period. From this kind of form municipalities receive only limited funding, which ultimately are not sufficient to investment activities. If the municipalities do not have enough own funds for their investment activities, they are looking for lending opportunities. Therefore, another important source of the capital incomes are capital transfers, that flowing from the state budget, but they are earmarked for specific investment activities. In recent years, a major source of investment activities of municipalities has become EU funding. But, if the municipalities wants to realize this project, which is financing from EU funds, they must have for realization 5% own financial sources. But especially small and medium-sized municipality lack sufficient own funds, they decide to take out a loan for the implementation of the project

Act No. 583/2004 Collection of Laws About the Financial Regulation, however say, that the municipality can to fulfill their tasks use repayable financing sources only, if the total amount of debt municipality does not exceed 60% of the actual current income of the previous financial year and the amount of annual installments of repayable funding sources, including the payment of yields does not exceed 25% of the actual current income previous financial year.

Parameter  $F_4$  evaluating the relationship between the capital incomes of municipalities to the total incomes of the municipalities. If the value of this parameter is higher, the municipalities use less foreign funds to finance for their investment activities (Pic.7).

We record a significant decline in of indicator in 2009, due to the fact, that this year reached municipalities only 376 mil. €. of the capital incomes.

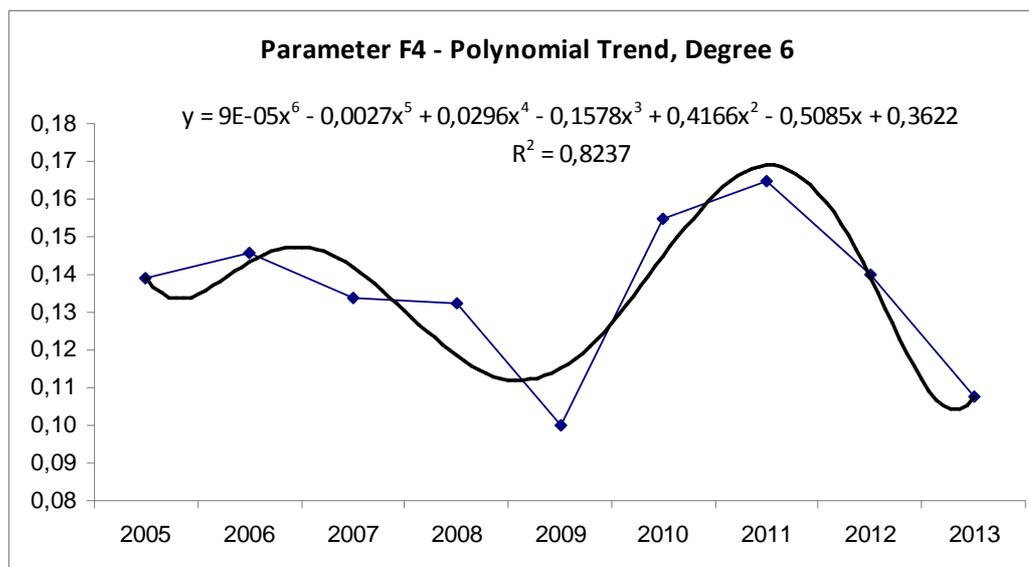
Between 2010 and 2011, municipalities reached the highest capital incomes (from 2011 - 659 mil. €, 2012 - 518 mil. €), but the total municipal revenues were almost at the same level, causing a subsequent increase in the value of this indicator.



Source: Ministry of Finance of the Slovak republic, own processing

**Pic. 7 The development of the parameter F<sub>4</sub> in the period 2005 – 2013**

Parameter F<sub>4</sub> also shows fluctuation in values (see Pic.8). The best model of trend line is the type of polynomial of the 6th grade. From this we assume that the future value of the parameter F<sub>4</sub> will increase slightly.



Source: own processing

**Pic.8 Trend line for parameter F<sub>4</sub>**

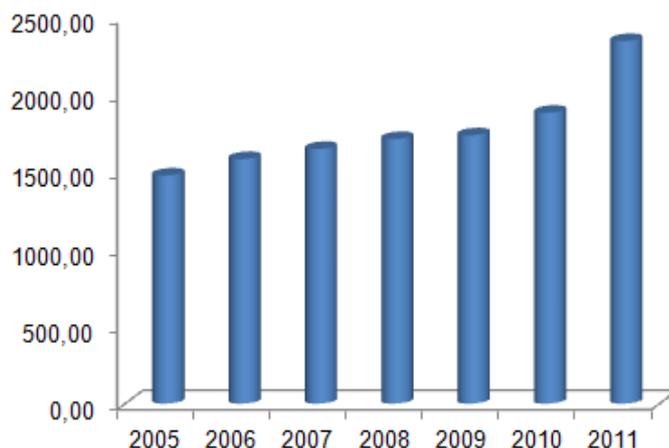
Tangible fixed property is composed primarily land and buildings owned by the municipality. The total value of tangible fixed property accounts on average for over 80% for the total value of the property.

Property right of municipalities was renewed after 1989 as part of the transformation of property relations, which had old tradition, but it was destroyed by legislative in 1949. Municipalities may obtain property by different ways (transfer from the state, own business activity, but also buying or exchanging).

Most of property which obtained the municipalities was transferred from the state, but not only in 1990, when the municipalities has been established, but also within the decentralization

of public administration, when municipalities acquired not only competences, but also the property to ensure that these competencies will be provided for inhabitants.

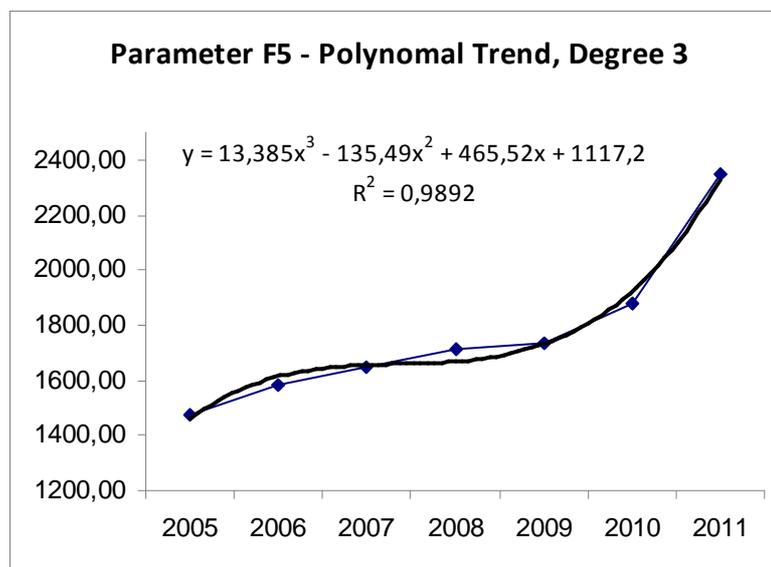
Since that municipalities are gaining competence gradually and in addition they trying to enhance the value of their property through its reconstruction respectively construction of new structures, is also reflected on the course of development of indicator  $F_5$ . Its annual growth is due to the increase of value of tangible fixed property of municipalities in each of the analyzed years (Pic.9).



Source: Ministry of Finance of the Slovak republic, own processing

**Pic. 9 The development of the parameter  $F_5$  in the period 2005 – 2013**

From the graph we see that values of parameter  $F_5$  are increasing (see Pic.10) The polynomial of the 3rd degree, which we have added as a trend line, has already a high reliability coefficient. From this we can estimate that the parameter  $F_5$  will be growing in the future period.



Source: own processing

**Pic.10 Trend line for parameter  $F_5$**

## Conclusion

In this paper we evaluated the financial management of municipalities through selected financial indicators. In addition to analysis of the development of individual indicators in the period 2005-2013, we used a modeling using trend lines.

	$F_1$	$F_2$	$F_3$	$F_4$	$F_5$
2005	1,22	0,12	0,19	0,14	1475,73
2006	1,24	0,10	0,24	0,15	1582,23
2007	1,20	0,09	0,25	0,13	1647,47
2008	1,14	0,10	0,23	0,13	1711,49
2009	1,10	0,08	0,24	0,10	1736,06
2010	1,03	0,08	0,28	0,15	1881,78
2011	1,08	0,08	0,22	0,16	2345,72
2012	1,09	0,09	0,19	0,14	–
2013	1,09	0,14	0,16	0,11	–

Source: own processing

**Pic.11 Data Matrix of financial management of municipalities**

Based on the calculated values of the individual indicators, we created a data matrix. Individual rows in the matrix represent vector of financial parameters of financial management of the municipalities (Pic. 11). Generated data matrix can be part of feed-forward neural networks, which are used to classify creditworthiness of municipalities. Parameter vector contains 5 parameters ( $F_1$  to  $F_5$ ). Due to the unavailability of data in a data matrix missing results of  $F_5$  indicator for the years 2012 and 2013. This is also confirmed Vomočil - Hajek - Olej (2007), who argue that for the evaluation of the creditworthiness of municipalities is the best use of feed -forward neural network and the function of Quick - propagation. The use of modeling by using feed - forward neural networks, which result classification the municipality into the appropriate quality categories, gives to municipalities the opportunity to compare with each other and also providing a basis for rating of the municipalities.

## Acknowledgments

The results introduced in this paper are a part of research project supported by Slovak Science Foundation via grant No. VEGA 1/0699/14 „The principles of fiscal equivalence with the relation of the transferred competencies from the state to the municipalities.” 2014-2016

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# Competitiveness of Pig farming on the Level of primary Production of Slaughter Animals in the Slovak Republic

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Iveta ZENTKOVÁ<sup>2</sup>

## Abstract

The situation in the European and Slovak market for agricultural commodities is currently in surplus. It has an impact on price drop of commodity and simultaneously it generates production-economic uncertainty for primary producers. The pork production has undergone several periods of crisis in the last decade and still it is not fully recovered. The cause of this condition was the unpreparedness of Slovakia to join the EU, which is related to the absence of significant subsidy incentives for the development of pig farming. In comparison with surrounding countries is considered as a primary disadvantage for Slovak farmers. In 2004, there were 1472 pig farms, in 2012 it was only the 860.

The aim of this paper is to evaluate the economics of pig farming as a whole in terms of real cash flows while respecting the production and economic relations between different breeding categories. The aim is to provide a global model view on economy pig farming. Information needed to resolve the defined issues; we obtain from the official Statistical Office of the Slovak Republic and its archived agricultural and food publications, from the Research Institute of Agricultural and Food Economics (RIAFE) and its publications: Situation and outlook reports and Farms' costs and economic results in Slovakia. In this paper, the situation on the pig farms is monitored in details, such as:

- Analysis of number of pigs,
- Analysis of productive and reproductive characteristics of pigs and their impact on the economy of production,
- Analysis of the costs of individual categories of pigs,
- Production of slaughter pigs in the Slovak Republic,
- Development of sales of slaughter pigs.

The results showed that the observed sector is significantly affected by the competitive pressure on the EU market, international price developments, the high costs of production animal commodities (sector is without of grant support in a loss), low intensity parameters of production, limited financial budget for the implementation of investment projects (including modernization of technological equipment ) and unbalanced supplier-customer relationships. Slovakia reports deficits on pork, while the share in the total domestic consumption is decreasing with time while meeting the needs of the processing industry and domestic consumption in domestic market.

In the fact, more and more pig farmers carry their production directly through exports, which are returned to Slovakia in the form of processed products. In 2012, Slovak meat products were contained only 35.2% of the whole products of the meat industry on the shelves of Slovak retail stores. It is alarming.

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In the recommendations, we recommend to government prepare and to adopt the balanced and stable set of the terms of financial support for pig farmers in the new programming period 2014 - 2020. Only this action has the positive consequences on developments in this sector. Indeed, the determination of optimal exercise price would be a competitive advantage in the CEE region. Long-term stabilization of the sector and the subsequent building competitiveness of pig farming is conditioned by the fact that so far existing subsidy system does not let to procure the quality feed mixtures, medications, recovery of genetic material and does not let to realize investment in reconstruction and technological equipment.

### **Keywords:**

pig farming, prices, costs, self-sufficiency, competitiveness, Slovakia

### **Introduction**

The transition of the economy from a centrally planned economy to a market economy is a complex and long process. Slovakia's accession to the EU was significant change in the business environment for the Slovak agricultural entities. Market of the Union became the internal market and is opened without restriction to all Slovak enterprises. However, on the other hand, the Slovak agrarian businesses have more partners from other European countries. This naturally brought about the expansion and reinforcement of competition on the Slovak market.

Agriculture is a sector that performs a wide range of socially significant functions. Based on the socio-historical development as well as strategic objectives and tasks of the current agricultural policy of the EU. It includes functions such as social, manufacturing, national economy, economic, landscaping. The ecological function has great importance in the current period of agricultural policy of the EU. This policy also includes Slovak Republic. Agrarian system, given its specifications, as well as its biological nature, a strong interaction of natural conditions for the production of raw materials of plant and animal origin and the existence of special reproductive process in agriculture is significantly different from other sectors of the national economy. Represents the primary sector with biological character and areal spread of production. We can say that is an organic part of the national economy of each country.

The situation on the Slovak market for agricultural and food commodities is unstable and considerable disproportions exist. Large fluctuations in supply and demand for specific commodities raise the uncertainty in production and its economics for primary producers, consumers also affecting the volume and price of food.

Subsequent to above listed, problems arise in the production and economics of pig breeding and subsequent processing of pork in the recent period. While transition to a market economy, the supply and demand problems have been highlighted. Linking marketing verticals commodity of pork meat "production-processing-trade-customer" is still being developed and is under pressure from large retail chains. The effort is to maintain the necessary amount of production to reduce costs, quality assurance and marketing of production on the market so that Slovak manufactured products become competitive in the EU.

An important prerequisite for achieving these tendencies is the rationalization of livestock, especially breeding of pigs, while a full-featured, cost-effective and balanced nutrition has the largest impact on the progressivity of production. Good-quality composition of compound feed in animal nutrition and maximum the genetic potential of pigs create conditions for achieving competitiveness and profitability.

Pork meat is still one of the most requested meat products in Slovakia. Demand is affected not only by the price of the commodity, but also by the good-quality of pork and its processing.

Producers and processors are trying to satisfy consumers by offers of rational products with the required quality and quantitative parameters of nutritional value.

Preconditions for rational and economically efficient production of pork production can be create by analysis of current problems and identifying important retarding factors of not only production processes but also production activities and consequently eliminating negative factors.

## **Data and Methods**

The aim of the article is to analyse the possibilities and conditions for the economic competitiveness of pig farms in economic and production conditions of the Slovak Republic.

To reach that aim, the following partial objectives are required:

- Analysis of number of pigs,
- Analysis of productive and reproductive characteristics of pigs and their impact on the economy of production,
- Analysis of the costs of individual categories of pigs,
- Production of slaughter pigs in the Slovak Republic,
- Development of sales of slaughter pigs.

Information needed to resolve the defined issues; we obtain from the official Statistical Office of the Slovak Republic and its archived agricultural and food publications, from the Research Institute of Agricultural and Food Economics (RIAFE) and its publications: Situation and outlook reports and Farms' costs and economic results in Slovakia for the period 2003 – 2013. The obtained numerical information was sorted, processed and evaluated. When processing the underlying data we used professional publications, statistical publications and legislative documents relating to the issue of research. Data sources are listed in the references. In evaluating the underlying data, the following methods were used:

The analysis represents a logical analysis of the subject (pig breeding) or phenomenon, which covers in detail the different parts (categories of livestock). Under the synthesis of the research we mean joining or merging individual components of breedings (categories pig-rearing) into unit (block thinking about pig farming as a whole). Under the induction we understand the way the reductive reasoning and general these patterns based on generalizations examined factors and economic phenomena. Under understand logical inference deriving conclusions from the calculated general knowledge. Under the comparison we understand the comparison of the resulting values. During the processing of the data we used calculation of base indices and chain indices changes that allow us to express the growth and decline observed values with respect to the baseline period and the previous period.

## **Characteristics of production and reproduction indicators of pig breeding in the production-economic conditions of the Slovak Republic**

The pig breeding is one of the major sector of agriculture and in addition to breeding of bovine is a key livestock sector in Slovakia. It plays an essential role in ensuring nutrition of the population. The Slovak Republic is the state with the predominant consumption of pork. This status is considered standard based on the traditions and customs of Slovak consumers. In addition, it also has business relevance since the pigs efficiently utilize the cereals and they are a source of financial income while respecting good-quality purchase and sale relations.

While in 2003 there were 1443 thousand pieces of pigs, thereof 105.2 thousand pieces of sows, in 2013 there has been reduction to 622,3 thousand pieces of pigs, representing 56,87% share decrease compared to 2003 in the Slovak Republic. In 2003, the pig meat production covered whole consumption of the Slovak population. After the accession of the Slovak

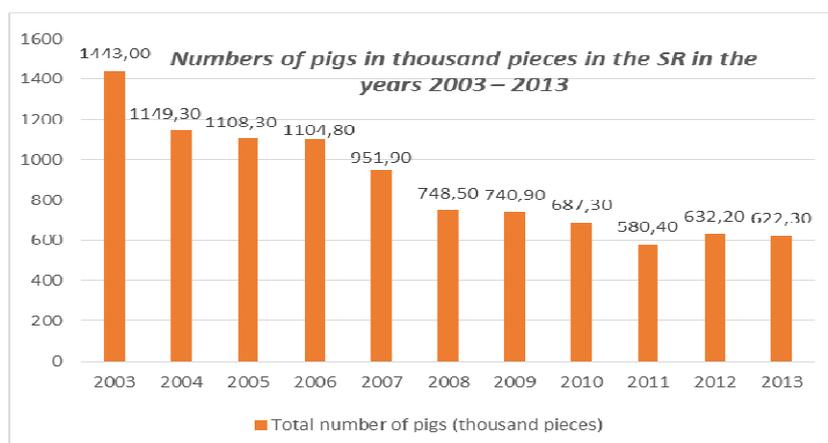
Republic to the European Union and the removal of tariff barriers of the Slovak Republic on pork imports and opening the Slovak market in agricultural commodities comes to a significant reduction in the numbers and breeding pigs. The decline in amount of the pigs has been accompanied over the whole analysed period 2003 - 2013. So, as it is exemplified in Table 1.

**Tab. 1 Numbers of pigs in the SR in the years 2003 – 2013**

Year	Numbers of pigs			
	Amount (thousand pieces)	Year-to-year change +/- (thousand pieces)	Index change (%)	Basic index +/- (%)
<b>2003</b>	1 443,00			
<b>2004</b>	1 149,30	-293,70	79,65	-20,35
<b>2005</b>	1 108,30	-41,00	96,43	-23,19
<b>2006</b>	1 104,80	-3,50	99,68	-23,44
<b>2007</b>	951,90	-152,90	86,16	-34,03
<b>2008</b>	748,50	-203,40	78,63	-48,13
<b>2009</b>	740,90	-7,60	98,98	-48,66
<b>2010</b>	687,30	-53,60	92,77	-52,37
<b>2011</b>	580,40	-106,90	84,45	-59,78
<b>2012</b>	632,20	51,80	108,92	-56,19
<b>2013</b>	622,30	-9,90	98,43	-56,87

Source: Situation and Outlook Reports - Slaughter Pigs 2003-2013, RIAFE, author's own processing

In general, we can state distinct decrease of annual growth in the years 2003 - 2013. In 2011, there were historically lowest numbers of pigs (580,4 thousand pieces). In 2012 and 2013, the amount of pigs has begun stabilize on the level 632,2 thousand pieces - 622,3 thousand pieces to slightly rise what may be characterized by modest revival of production of pork.



**Pic. 1 Numbers of pigs in the SR in the years 2003 – 2013**

The decline was also recorded in the evolution of amount of sows (Table 2). Where decline was from 105,20 thousand pieces in 2003 to 37,4 thousand pieces in 2013 which is 60.93 % of loss.

**Tab. 2 Numbers of sows in the SR in the years 2003 – 2013**

Year	Numbers of sows			
	Amount (thousand pieces)	Year-to-year change +/- (thousand pieces)	Index change (%)	Basic index +/- (%)
<b>2003</b>	105,20			
<b>2004</b>	82,20	-23,00	78,14	-21,86
<b>2005</b>	79,50	-2,70	96,72	-24,43
<b>2006</b>	76,90	-2,60	96,73	-26,90
<b>2007</b>	62,00	-14,90	80,62	-41,06
<b>2008</b>	44,50	-17,50	71,77	-57,70
<b>2009</b>	43,90	-0,60	98,65	-58,27
<b>2010</b>	41,30	-2,60	94,08	-60,74
<b>2011</b>	37,40	-3,90	90,56	-64,45
<b>2012</b>	40,70	3,30	108,82	-61,31
<b>2013</b>	41,10	0,40	100,98	-60,93
<b>Average annual +/-</b>	59,52	-6,41	91,71	-47,77

Source: Situation and Outlook Reports - Slaughter Pigs 2003-2013, RIAFE, author's own processing

Number of piglets was 15.40 pieces per sow (Table 3) in 2003. This indicator achieved the significant increase to 21.80 pieces per sow by year 2013 which means an increase of 41.56% in percentage terms. The average weight gain in fattening pigs was 0.522 kg.piece<sup>-1</sup>.day<sup>-1</sup> in 2003 and rose to 0,596 kg.piece<sup>-1</sup>.day<sup>-1</sup> in 2013. The increase represents 14.18 % in percentage terms. The high price of piglets, one of the highest in the European Union, was a negative in the past year. This price obviously deteriorating profitability of the sector already on the start of its process. Average price of the Slovak piglets started around 65 € per piece in 2013. The EU average was around 45 € per piece. The price reached maximum boundary of 70 € per piglet, while the EU average increased only slightly to 47 € per piglet at the end of 2013. Price per piglet is reflected indirectly into the total price of pork approximately 35 % of share. Pig farmers consider this as a major problem and they are trying to solve it by importing cheaper piglets from abroad in recent years.

**Tab. 3 Selected performance parameters of slaughter pigs the SR in the years 2003 – 2013**

Year	Selected performance parameters of slaughter pigs			
	Number of piglets per sow (in pieces)	Basic index +/- (%)	Average weight gain in fattening of pigs (kg.pieces <sup>-1</sup> .day <sup>-1</sup> )	Basic index +/- (%)
2003	15,40		0,522	
2004	15,80	2,60	0,526	0,77
2005	16,60	7,79	0,558	6,90
2006	17,10	11,04	0,568	8,81
2007	17,40	12,99	0,569	9,00
2008	17,90	16,23	0,568	8,81
2009	18,20	18,18	0,583	11,69
2010	18,20	18,18	0,588	12,64
2011	18,90	22,73	0,574	9,96
2012	19,50	26,62	0,619	18,58
2013	21,80	41,56	0,596	14,18
<b>Average annual +/-</b>	17,89	17,79	0,570	10,13

Source: Situation and Outlook Reports - Slaughter Pigs 2003-2013, RIAFE, author's own processing

**Tab. 4 Selected indicators of production and reproduction of pigs in the SR in 2003 – 2013**

Indicator	Unit	Year										
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Mating gilts	pieces per 100 sows	47,90	38,70	47,70	48,70	36,30	36,40	43,50	40,80	35,80	48,10	55,30
Mating sows	pieces per 100 sows	189,20	154,40	182,30	173,20	145,30	123,90	137,50	120,80	104,20	117,80	153,40
Transfer to sows	pieces per 100 sows	44,10	34,70	43,20	47,80	43,10	42,20	54,50	45,70	46,30	60,00	53,10
Culling rate of sows	pieces per 100 sows	38,60	42,40	33,10	36,30	49,90	46,60	40,90	34,30	40,50	37,60	40,50
Mortality of sows	pieces per 100 sows	10,10	11,60	8,30	8,80	8,70	14,80	9,90	10,00	10,10	10,60	9,70
Number of litters per sow per year	-	1,92	1,92	1,94	1,97	1,98	1,98	1,94	1,85	1,84	1,83	1,96
Pigs born live	pieces per 1 litter	9,04	9,36	9,49	9,55	9,73	10,11	10,26	10,82	11,25	11,58	12,16
Pigs born live	pieces per 1 sow	17,32	17,95	18,37	18,81	19,24	20,01	19,92	20,06	20,70	21,24	23,77
Pigs born dead	% from born	11,30	11,80	9,80	9,40	9,60	10,70	8,70	9,50	8,90	8,20	8,50

Source: Situation and Outlook Reports - Slaughter Pigs 2003-2013, RIAFE

One of the important aspects of competitiveness of production of pork is also the economic efficiency of the reproductive process that significantly affects the economics of production. Table 4 shows the evolution of the main production and reproduction indicators in the economic production conditions of the Slovak Republic. In general, we see a positive trend grow of indicators from 2003 till 2013.

**Tab. 5 Own costs in the pork production in the economic conditions of production in the Slovak Republic in the years 2003 - 2013**

Category of the pig breeding	Indicator	Year										
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Pig fattening	Own cost of 1 kg live weight	1,53	1,61	1,59	1,55	1,63	1,75	1,53	1,58	1,46	1,52	1,34
	Own cost of 1 feed day in €	0,70	0,75	0,71	0,74	0,79	0,85	0,74	0,78	0,76	0,89	0,90
Sows	Own costs of 1 weaner in €	52,35	54,47	54,70	57,13	59,22	70,17	57,61	51,61	48,78	57,15	51,72
	Own cost of 1 feed day in €	1,95	2,51	2,02	2,63	3,23	2,94	2,50	2,52	1,65	1,58	2,35
Prices paid to producers	Average realization prices of 1 kg carcass weight in €	1,25	1,30	1,32	1,35	1,15	1,24	1,15	1,12	1,21	1,4	1,24

Source: Cost-effectiveness of Agricultural Products classified by Production Areas in the Slovak Republic 2003 -2013, RIAFE

Unit cost per production is determined by calculation of its costs. In accordance with the Act on Accounting. Under the Act no. 431/2002 Coll. Accounting (§ 25 par. 4 letter c) under their own costs in own products means the direct costs of production or other activities, as well as indirect costs, which bind to the production or other activities. It follows that total own expenses are the sum of direct and indirect costs together.<sup>3</sup>

Development of own costs in pig fattening category is analysed for the period 2003 to 2013. Own costs are calculated per 1 kg of live weight in Euros and per 1 feed day in Euros. If we evaluate the overall development (increase or decrease) own costs in category of pig fattening, we can state that in 2003 the cost was 0.70 Euros per 1 feeding day and in 2013 increased expense for 0.90 Euros per 1 feeding day, representing an increase of 28.57 %.

In the category of sows, own costs are recognized gradual increase in the cost per feeding day until of the outbreak of the economic crisis in year 2008. Followed by reduction of own costs in 2009. In the assessment period 2003 - 2013 own costs increased by 20.39%. In 2013, own cost on feeding day was 2,35 Euros. In 2003, own cost on feeding day was 1,95 Euros.

Own costs per weaner are achieving a relatively balanced cost values with a significant increase in costs in 2008 (about 10,95 Euros) in comparison to year 2007. In 2009 comes to a significant decline in the cost per weaner as it is documented in Table 5. In 2013, the cost per weaner achieved level of 51,72 Euros. When comparing the overall development of this indicator, own cost decreased by 1,20 Euros in 2013 in comparison to 2003, when own costs reached 52.35 Euros per weaner.

When comparing the development of own costs between 2003 and 2013 in categories sows and pig fattening, we note a significant difference in the rate of growth when it was

<sup>3</sup> Cost-effectiveness of Agricultural Products classified by Production Areas in the SR for the Year 2013, RIAFE, ISBN 978-80-8058-595-2, p. 7. Retrieved October 01, 2014, from <http://www.vuepp.sk/dokumenty/vn/vn2013.pdf>

recorded an overall increase of 20.39% in the category of sows and it was recorded an overall increase of 28.75% in category of fattening pigs.

In the last decade, the situation in the production and sale of pork is negatively reflected with deteriorating economic situation (Table 6, Table 7).

**Tab. 6 Gross domestic pork production and pork consumption in tonnes of carcass weight in the Slovak Republic in the years 2003 - 2013**

Year	Gross domestic pork production and pork consumption in the Slovak Republic			
	Production (t <sup>-1</sup> )	Total pork consumption (t <sup>-1</sup> )	Distinction between production and consumption (t <sup>-1</sup> )	Distinction between production and consumption (%)
<b>2003</b>	181 547	173 783	7 764	4,47
<b>2004</b>	161 275	171 702	-10 427	-6,07
<b>2005</b>	132 700	177 457	-44 757	-25,22
<b>2006</b>	118 027	173 676	-55 649	-32,04
<b>2007</b>	117 059	173 794	-56 735	-32,64
<b>2008</b>	99 723	174 766	-75 043	-42,94
<b>2009</b>	86 558	173 629	-87 071	-50,15
<b>2010</b>	86 621	167 144	-80 523	-48,18
<b>2011</b>	88 197	170 550	-82 353	-48,29
<b>2012</b>	77 767	162 047	-84 280	-52,01
<b>2013</b>	75 781	183 000	-107 219	-58,59

Source: Cost-effectiveness of Agricultural Products classified by Production Areas in the Slovak Republic 2003 -2013, RIAFE, author's own processing

In 2003, the Slovak Republic was self-sufficient in the production of pork. After the accession to the European Union in 2004, the production of pork meat was significantly decreased due to replacements intra-EU imports. The basic indices show a decline in gross pork production in Slovakia for all evaluated years. From the calculated results, we can conclude decline in gross domestic production by 58.59% (production reached 75 781 tonnes carcass weight) in 2013 compared to 2003, when the Slovak gross production reached 181 547 tonnes carcass weight.

**Tab. 7 Development of sales of slaughter pigs in the Slovak Republic in the years 2003 – 2013**

Year	Sales of slaughter pigs			
	Sales (thousand t <sup>-1</sup> live weight)	Year-to-year change +/- (thousand pieces)	Index change (%)	Basic index +/- (%)
2003	172,56			
2004	151,11	-21,45	87,57	-12,43
2005	123,11	-28,00	81,47	-28,66
2006	127,32	4,21	103,42	-26,22
2007	130,92	3,60	102,83	-24,13
2008	101,53	-29,39	77,55	-41,16
2009	83,57	-17,96	82,31	-51,57
2010	84,18	0,61	100,73	-51,22
2011	79,27	-4,91	94,17	-54,06
2012	72,64	-6,63	91,64	-57,90
2013	75,67	3,03	104,17	-56,15

Source: Situation and Outlook Reports - Slaughter Pigs 2003-2013, RIAFE, author's own processing

The decline in sales of pigs (Table 7) is 56.15 % share, t. j. 75,67 thousand tonnes live weight (666 222 pieces) in 2013 compared to 2003 when it was sold 172.56 thousand tonnes live weight (1 591 310 pieces).

After 1989, consumption of pork meat decreased from 44,80 kg per capita to 32.30 kg per capita in 2003. In 2013, the consumption of pork per capita was 33.80 kg.

## Conclusions

The pig breeding is in crisis in the current economic and production conditions in the Slovak Republic. Prices paid to producers for slaughter pigs are below the level of their own cost of production due to excess supply on the EU market. Economically unprofitable production is reflected by reducing the number of pigs that from the beginning of 2003 to the end of 2013 fell by 622.30 thousand pieces which is 56.87% loss. Indicator the average daily gain of pig in the category pig fattening and the number of piglets born per sow in 2013 did not reach the desired intensity of the growth of modern commercial types pigs. Another serious risk is the increase in the prices of cereals and soybeans in pork meat production.

In pork production, we are not self-sufficient for several years. In 2013 we imported to Slovakia 58.59% pork. In the next period cannot be expected to assume direct support pig breeding. Even after Brussels announced intervention to market pigs animal slaughter rates will likely not increase enough to cover the total cost of Slovak farmers. As a result, the number of pigs will be further reduced or stagnated in the SR. If this trend continues, in the short term we expect a further increase in imports of pork, a decrease in production and self-sufficiency will not be covered at 40%. Given the fact that the European Union is self-sufficient in pork meat, we assume that trade with that commodity will take place mainly between Member countries of the Union.

Low economic efficiency of pig breeding in Slovakia resulting economic non-competitive sector, not only at foreign market but also domestic market. The industry needs to invest heavily in new technologies and to meet the EU requirements for environmental protection and "welfare" of animals. Slovakia has the potential of gradual intensification in breeding assuming the improvement in productive and reproductive parameters.

## **Acknowledgments**

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# Bovine tuberculosis in cattle in Central American continental countries during the years 2003-2012

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## Abstract

Bovine tuberculosis is serious zoonotic infection which primarily infects cattle around the world. Seven Central American continental countries (in alphabetical order: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama) with 41.5 mil inhabitants are located between the Atlantic and Pacific Oceans in a territory of 522,300 km<sup>2</sup> with more than 13 mil head of cattle kept on 485,237 establishments. More than 70% of the population lives in rural areas where consumption of unpasteurised milk and milk products from unpasteurised or non-heat-treated milk is common. From this viewpoint, milk contaminated by the causal agent of bovine tuberculosis represents high risk for human infections (especially for children). Based on the OIE (World Organisation for Animal Health) data the epidemiological situation was analysed during the last decade (2003-2012). Bovine tuberculosis was diagnosed in six countries (except of Belize which is officially free of bovine tuberculosis in cattle) in a total of 642 herds (0.132%). Higher prevalence of infected cattle herds with bovine tuberculosis was found in Costa Rica (0.237%), El Salvador (0.267%), and Guatemala (0.221%). The last outbreaks of bovine tuberculosis were diagnosed in Belize in 1991 and in Panama in 2008. These results represent risks for trade with cattle and dairy and beef products and negative economic impact. The consumption of not properly heat-treated food (meat, milk, meat, and milk products) should be considered as highly risky. Infected humans are disabled to work and their treatment is expensive as well.

## Keywords:

zoonosis, food safety, *Mycobacterium bovis*

## Introduction

Bovine tuberculosis is long-lasting (chronic) disease caused by *Mycobacterium bovis* (*M. bovis*). A large scale of animal species is sensitive to this infection; e.g. husbandry animals, such as cattle, pigs, sheep and goats; and wildlife, such as antelopes, buffaloes, lions, wild boars, badgers, etc. Most frequently, the source of infection is infected animal which sheds the causal agent via all secretions, as well as excretions and excrements. According to a place, where the infection has established in the animal body, *M. bovis* is shed in sputum, faeces, milk, uterine secretion, urine or semen. Infected human beings have not been the source of infection for other patients. Most frequently, a host organism (including human) is infected by direct contact with infected animal. Bovine tuberculosis can be imported to animal breeds with bought infected animals in an early stage of the infection. In such an animal, results of intravital diagnostic tests (bovine tuberculin skin test) are negative. So called "reservoir animals", which can maintain *M. bovis* in a given region present another one risk factor for spreading of this causative agent (Thoen et al., 2005, 2014).

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Domestic ruminants can be infected by *M. bovis* as early as in their mother's uterus, mainly if the mother has infected uterus or a late stage of the infection in various internal organs. However, young ruminants are mostly infected after birth via respiratory or gastrointestinal route. Small droplets (up to 0.01mm in diameter) containing single cells of the causal agent can spread to lung alveoli after inhalation of aerosol. After deglutition of infected or secondarily contaminated food the causative agent can penetrate tissues of the oral cavity: frequently observed tuberculous lesions of cervical lymph nodes in children after consumption of raw milk, i.e. milk not-treated by heat. *M. bovis* can infect intestinal mucosa after passage through stomach. This leads to spreading of the causative agent by faeces (Ayele et al., 2004).

Humans can be infected by *M. bovis* via three routes: by inhalation, ingestion or through injured skin. The first two routes (infected aerosol or contaminated food) are important mainly for consumers of raw milk and meat, hunters, animal keepers, slaughterhouse workers processing carcasses or organs of infected animals, people processing non-properly heat-treated animal products, etc. The third route is less frequent and can occur after direct contact with infected animal tissues (Francis, 1947; Cosivi et al., 1998).

The character of clinical symptoms depends on localization of tuberculous process in the organism. Lung tuberculosis in cattle manifests itself by gradually increasing cough with dyspnoea and weight loss. Recurrent diarrhoea and weight loss can be observed in animals with infection of gastrointestinal tract (mainly small intestine). Tuberculosis of mammary gland proceeds mostly without evident clinical symptoms in the early stage of the disease. Later, nodular lesions (tubercles) in the affected mammary quarters occur. The infection leads to a decrease of milk yield and the causative agent is spread by milk. This pathological process can penetrate surrounding soft tissues including skin, which can be the source for direct skin infections for farmers. Womb (uterus) tuberculosis manifests itself by reproduction disorders and calves can be infected as early as at birth. Tuberculous lesions in kidneys can open up to urinary tract and urine could be contaminated by the causative agent in such a case (Thoen et al., 2006, 2014).

Intra-vital diagnostic tests are used for detection of infected animals (mainly intra-dermal tuberculin test). Epizootiological investigation has been performed by workers of the relevant State Veterinary Administration mostly once a year. Animals-reagents have been slaughtered and costs of these control measures have been funded from state sources (OIE, 2004, 2005, 2007, 2008a,b, 2009-2013).

Bovine tuberculosis is still serious disease of animals and humans. Because of compulsory notification of each new case of this disease there is possibility to obtain numbers of newly diagnosed cattle with bovine tuberculosis from the OIE (World Organisation of Animal Health) statistic data. Some countries have registered cases of bovine tuberculosis in humans, as well. The occurrence of bovine tuberculosis is different in various countries around the world. According to a definition given by the "International Animal Health Code" of OIE, a country is free of bovine tuberculosis in cattle if the proportion of infected cattle herds is lower than 0.2% per year. Bovine tuberculosis in cattle herds was eliminated in frame of various national control programs in many economically developed countries. In developing countries, however; severe economic losses in husbandry animals have been caused by this disease. According to WHO estimates approximately one third of rural inhabitants are infected by *M. bovis* (Anon., 1994; Grange and Yates, 1994; Cosivi et al, 1998).

In the Central America, bovine tuberculosis is still severe problem both in animals and humans (Ritacco et al., 2006; de Kantor et al., 2006, 2008, 2014). The aim of this work is to provide a summary of published reports of the bovine tuberculosis occurrence in cattle and humans in seven countries of the Central America during the period 2003-2012.

## Material and methods

**A profile of areas of respective states.** The study was focused on seven countries of the Central America laying between the Atlantic and Pacific Oceans (in alphabetical order: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama), covering an area of 522,300 km<sup>2</sup> with more than 41.5 mil of inhabitants. At 2012, a total of more than 13 million head of cattle were kept in 485,237 establishments (Table 1).

**A source of statistic data.** Data on the occurrence of bovine tuberculosis in cattle were obtained from published reports from the period between the years 2003 and 2012 (OIE, 2004, 2005, 2007, 2008a,b, 2009-2013).

**Intra-vital and *post-mortem* diagnostics of bovine tuberculosis in cattle.** Epizootiological investigation of cattle using single bovine tuberculin skin test was performed in all animals older than two years of age at least once per two years within the observed time period. Reagent animals were slaughtered and further investigated *post-mortem*. In Panama, a PCR method for direct investigation of nasal mucosa of bovine tuberculin-reagent cattle has been available since 2005 (Cedeno et al., 2005).

## Results

Bovine tuberculosis was diagnosed in six countries (except of Belize with eradicated diseases in 1991) in a total of 642 (0.132%) out of 485,237 cattle herds (establishments). Higher prevalence of infected cattle herds with bovine tuberculosis was found in Costa Rica (0.237%), El Salvador (0.267%), and Guatemala (0.221%). In Panama, the last outbreak of bovine tuberculosis was diagnosed in 2008 and the disease was subsequently eliminated (Table 2).

Table 1 Characterisation of seven Central American continental countries

Country	Area (km <sup>2</sup> )	Inhabitants (mil)	Cattle heads	Establishments (herds)	Infectious status <sup>a,b</sup>
Belize	22 900	0.3	61 429 <sup>d</sup>	2 177 <sup>c</sup>	Eradicated in 1991
Costa Rica	51 100	4.6	1 957 799 <sup>d</sup>	52 730 <sup>c</sup>	Infection present
El Salvador	21 000	6.2	1 200 000 <sup>d</sup>	60 000 <sup>c</sup>	Infection present
Guatemala	108 900	14.0	2 000 000 <sup>d</sup>	98 750 <sup>d</sup>	Infection present
Honduras	112 500	7.5	2 077 460 <sup>d</sup>	99 911 <sup>c</sup>	Infection present
Nicaragua	130 400	5.7	4 126 422 <sup>d</sup>	136 687 <sup>c</sup>	Infection present
Panama	75 500	3.5	1 728 748 <sup>d</sup>	34 982 <sup>c</sup>	Eliminated in 2008
Total	522 300	41.5	13 151 858 <sup>d</sup>	485 237	

<sup>a</sup> OIE, 2004, 2005, 2007, 2008a,b, 2009-2013.

<sup>b</sup> National control programmes against bovine tuberculosis implemented.

<sup>c</sup> No. of animals and establishments in 2012 (OIE, 2013).

<sup>d</sup> No. of establishments in 2005 (OIE, 2006).

The highest prevalence of bovine tuberculosis was registered in El Salvador, where a total of 0.267% of cattle herds was infected. The highest prevalences were recorded in 2008 (0.058%) and in 2010 (0.055%). Significant decrease of bovine tuberculosis prevalence has been observed in Costa Rica since 2006 when 0.176% of cattle herds were diagnosed as infected. In 2012, only one infected herd (0.001%) was found (Table 2).

Bovine tuberculosis was diagnosed in cattle in Guatemala and Nicaragua in each year during the observed period (for 2008, there were no data available for Guatemala). In Guatemala,

prevalence of the disease in cattle has risen since 2007 (except of 2011, when there was a very slight decrease of the prevalence). In contrast to this, only sporadic cases were detected in Honduras, whereas in 2005, 2006, 2008, and 2009, there were not detected any infected cattle. In Panama, bovine tuberculosis was eliminated in 2008, when the last infected cattle herd was found (Table 2).

According to available data from OIE, bovine tuberculosis was reported in a total of 23,044 patients in Nicaragua in the period between the years 2005-2012. The number of patients varied between 29.3 and 67.2 per 100,000 inhabitants per year. Any case of human death due to bovine tuberculosis was reported except of 2012, when the data were not available (Table 3).

Table 2 Bovine tuberculosis in cattle in seven Central American continental countries (OIE reports) during the years 2003-2012

Country No. of herds	No. and % of infected cattle herds in respected country and year										Total No. (%)	
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012		
Belize 2 177 <sup>a</sup>	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
Costa Rica 52 730 <sup>a</sup>	13 0.025	7 0.013	8 0.015	93 0.176	1 0.001	1 0.001	+n	+n	1 0.001	1 0.001	125 0.237	
El Salvador 60 000 <sup>a</sup>	6 0.010	12 0.020	7 0.012	14 0.023	12 0.020	35 0.058	17 0.028	33 0.055	17 0.028	8 0.013	161 0.267	
Guatemala 98 750 <sup>b</sup>	3 0.003	1 0.001	2 0.002	2 0.002	36 0.037	N	33 0.033	37 0.038	30 0.030	74 0.075	218 0.221	
Honduras 99 911 <sup>a</sup>	3 0.003	1 0.001	0 0	0 0	1 0.001	0 0	0 0	1 0.001	n	+n	6 0.006	
Nicaragua 136 687 <sup>a</sup>	10 0.007	21 0.015	3 0.002	2 0.002	2 0.002	1 0.001	18 0.013	4 0.003	5 0.004	13 0.010	79 0.058	
Panama 34 982 <sup>a</sup>	20 0.057	13 0.037	6 0.017	10 0.029	3 0.009	1 0.003	0 0	0 0	0 0	0 0	53 0.152	
Total 485 237	55 0.011	55 0.011	26 0.005	121 0.025	55 0.011	38 0.008	68 0.014	75 0.016	53 0.011	96 0.020	642 0.132	

a No. of herds (establishments) in 2012 (OIE, 2013).

b No. of herds (establishments) in 2005 (OIE, 2006).

n Official data not available.

## Discussion

Cattle breeding represent very important part of agriculture in all the seven Central American continental countries focused in this work. Animal protein from milk and milk products is a major component of human nutrition, mainly for children. Therefore governments in these countries pay considerable attention to control of bovine tuberculosis (Cosivi et al., 1998; Kazda et al., 2009). According to the results, it is evident that bovine tuberculosis still occurs in five out of the seven studied countries. Especially in Guatemala the epizootiological situation is unfavourable. Whereas there were one to three infected herds in the period 2003 to 2006, the epizootiological situation got worse in the next years (Table 2). The reasons for this unfavourable state of cattle herd health are not explained in the available literature.

The data on the occurrence of bovine tuberculosis in humans are only available for Nicaragua for the period 2005 to 2012. The disease prevalence reaching 67.2 patients per 100,000 inhabitants in 2007 is to be considered highly unfavourable. With regard to relatively low prevalence of bovine tuberculosis in cattle (Table 2), the reasons for such a spread of this condition are not clear. Probably, the cause of many infections by *M. bovis* may be consumption of raw (unpasteurised) milk by children and adults, as observed in other countries, as well (Pavlik et al., 1998, 2003; Prodinge et al., 2005; Kazda et al., 2009). Because of very long incubation period since the infection occurs to development of clinical disease (up to decades), high prevalence of bovine tuberculosis in inhabitants of Nicaragua may be expected in the future.

Table 3 Bovine tuberculosis in humans in Nicaragua (OIE reports) during the years 2005-2012

Year	No. of		No. of patients per 100 000 inhabitants
	cases	deaths	
2005	1 931	0	33.9
2006	3 156	0	55.4
2007	3 831	0	67.2
2008	3 733	0	65.5
2009	3 114	0	54.3
2010	3 338	0	58.6
2011	2 273	0	39.9
2012	1 668	n	29.3
Total	23 044	0	

n Official data not available.

## Conclusions

Following aspects can present risk of new outbreaks of bovine tuberculosis in cattle in these Central American continental countries:

1. Spreading of *M. bovis* with purchase or smuggle of infected animals.
2. Transmission of *M. bovis* from infected animal keepers or persons infected in their youth. In case of immunity breakthrough in these persons, the disease can occur. *M. bovis* is subsequently spread via sputum and in some cases in urine and stool of patients.
3. Cattle kept on pastures can be infected directly (by contact with infected animal) or indirectly (contact with infected faeces, urine, sputum and/or milk. The role of infected wildlife in spreading of *M. bovis* is not known in these countries).
4. From the viewpoint of spreading of *M. bovis*, the largest risk in developing countries is presented by military conflicts which are associated with breakdown of agriculture including cattle breeding. For example, military conflict in Nicaragua led to worsening of epidemiological situation of human tuberculosis (Garfield, 1989).

These results represent risks for trade with cattle and dairy and beef products and negative economic impact. The consumption of not properly heat-treated food (meat, milk, meat, and

milk products) should be considered as highly risky. Infected humans are disabled to work and their treatment is expensive as well.

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# TURSALUD: Health & Tourism in a BOX

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## Abstract

This document is an abstract as the result of the collaboration between Spain and Brazil with the following participants, Worldnet21, Spanish company based in Madrid (Spain) with a high TIC expertise, with 15 years experience, Technoeuro, Brazilian company with different line of business in Health, Tourism and Social services based in Campinas (Brazil), in the other hand Agricultural Economics and Social Sciences Dpt., Univ. Politécnica de Madrid (UPM), with *Professor Jose Luis López*. and UNICAMP, Universidade Estadual de Campinas (Brazil), Faculdade de Engenharia Civil, Arquitetura e Urbanismo with the participation of *Professor Carlos Alberto Mariottoni*.

In recent years, the ever-increasing demand for quality healthcare services coupled with the need for optimizing processes and resources in the health sector has based on new technologies to get solutions. In this way, the adoption of new models of disease monitoring through mobile virtual platforms and communities becomes a key element in the development of competitive models and enhancing the added value for both the patient and health professionals.

## KEYWORDS:

Health Care, Value added Health & Tourism Services, Medical Tourists, Mobility health, Mobility Tourism, Wellness and Tourism

Within these trends it has been developed a novel phenomenon named medical tourism or tourism scalpel that could create a surgical exchange between countries, generating a new industry that requires the generation and integration of new solutions with innovative models so far nonexistent. This phenomenon is used by tourism of the development countries (Europe and USA mainly) that demand interventions of all kind (stetic or health) in other emerging countries with lower healthcare costs (Washington Post, 2006).

The profile of these medical tourists is not as might be expected, we are not talking about people with a high purchasing power, but rather people with a medium or medium low scale whose purchasing power does not reach the quality services that other countries offer and can access the same services in countries such as Mexico, Brazil, Colombia offer, Southeast Asia, South Africa and Hungary [Bezara 2012]. For example, in Mexico, there is a project to create a medical city in Cancun [Economist, 2011].

There is a stream of tourists looking wellness health services such as SPAS and Historic wellness SPAS, where Spain is one of Europe's leading destinies because of the weather, locations and infrastructures.

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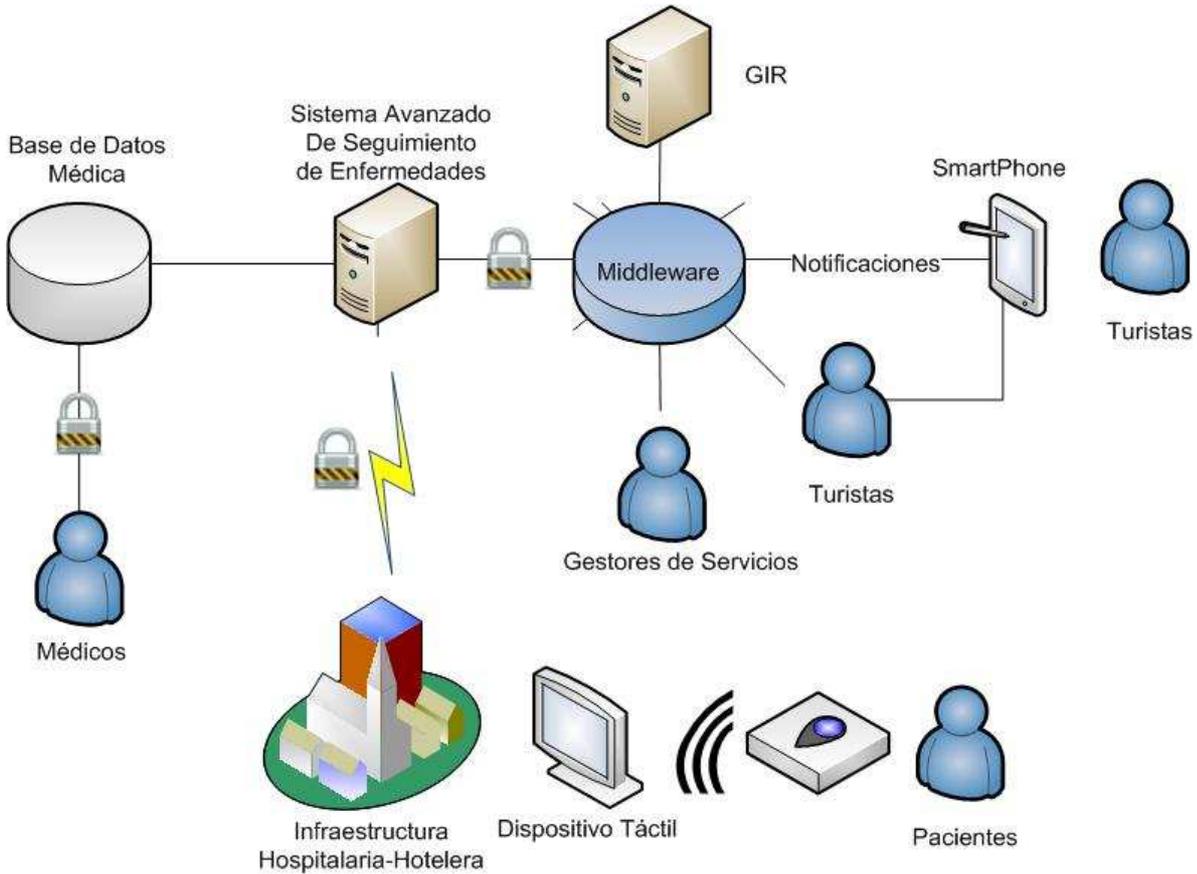
The medical tourism platform was born with the key objective of integrating all industry health and tourism players, based on, an intelligent platform that allows end users to choose among all the tourist-health offer the right product that suit their need, from the perspective of the socio-economic preferences, choices, etc. This system will evolve constantly improving suggestions supported on the data stored.

The platform will contain a telemedicine tool for tracking the most typical diseases within the health tourism; doctors registered on the platform will follow the patient before and after their trip, performing greater security and satisfaction when selecting the destination, knowing that they will be attended all the time and the diagnosis will be more accurate

The SMART (Smart Manager Recommended Tool) will provide intelligence, based on user experience and learning process, this presents a different point of view and a powerful element for the tourism agents and the health infrastructures associated (health centers, wellness spaces, etc) and of course to combine with Hotels Chains,, logistic and transport entities, and so on.

The market trend in these years and the facilities with the emergence of mobile phones families like iPhone, Android or Windows Phone that allows execution of complex services on the device and the widespread use of applications anywhere in the world. The potential customers are ready and listening to get Access to all this new offer, and the professionals had in their hands a powerful tool to recommend their value added proposition.

Patients have a mobile connection through a hub of biomedical devices connected to the available wireless networks, such as electrocardiograms, spirometers, pulse oximeters, etc. The key is the direct connection between the medical staff and the associated infrastructure.



## 1.- Health tourism and ICT platforms.

The TurSalud platform is an ambitious initiative to provide an ICT solution to a problem which until today, has been poorly structured from the organizational point of view. The services are currently provided separately, avoiding the added value of the integrated service. On the other hand, when we talk about health tourism there is always a distance that may be saved through modern telemedicine platforms and health tourism is not using, losing the cost savings associated that would allow them to reach a larger customer profile.

The TurSalud initiative aims to fill this gap, creating an ICT platform that addresses the health tourism sector in a holistic manner. In order to do this, Tursalud will need to tear down the drawbacks and myths that even today are still very present, through a quality and useful proposal.

## 2.- Health tourism in figures.

Although it is difficult to produce an analysis, because there are different sources to measure the data when it comes to health tourism, we can summarize the following data.

- it is expected that the volume of global business will increase from 56,000 million to 100,000 million in 2012 (healthcarefinancenews.com)
- European tourists make 9.4 million trips abroad to enjoy health or welfare holidays (Hosteltur)
- The turnover of 2011 health tourism and Spa Tourism in Mexico was 880 million dollars (Bancomext)
- The Americans spend 2,200 billion in health; 5,500 spent outside the USA
- In Spain there are 29 hospitals and clinics specialized in health tourism, 20 are certified.

### Myths and Realities of Health Tourism

There are many opinions about the health tourism that is appropriate to clarify in order for this industry to achieve better results. According to the expert consultant in Medical Tourism in Latin America Andy Bezara, the key features in medical tourism are:

- International patients belong to a medium (or medium-low) economic status in their country of origin. In the case of the United States are usually patients who have health insurance with very low coverage.
- Although the economic issue is one of the motivations of health tourism, the better quality of the clinics and hospitals in the destination countries stands within the patient's assesment. What really matters is the quality / price.
- Medical tourism is not only aimed at big hospitals. On the contrary, there are a lot of small businesses offering health services for international patients.
- There is an international accreditation in medical tourism which is an important requirement, but not a sufficient requirement for institutions. This accreditation must be accompanied by a strategy of internationalization of patients.
- Health tourism is a complex scenario in terms of logistics, since additional services such as international flights, transportation, medical treatment, recovery processes, lodging, food type, recreational and tourism activities or special nursing service as or interpretation come into play.
- Special attention must be paid to the accompanying people (though the patient is the priority figure), since they have their own needs and requirements that must be addressed in order for the tourist satisfaction to be complete.

- Although we talk of medical tourism, to take part in touristic activities is only the sixth reason in importance to travel abroad. Therefore, other factors must prevail such as the quality of treatment, care or service provision.
- There are numerous agents in the health tourism: hospitals, clinics, travel agencies, specialty centers, medical bodies, hotels and transport companies.
- Although medical treatment is the main reason for the trip, the patient needs to receive international support, guidance, support and assistance in scheduling the itinerary, choice of accommodation or even hours for religious services, currency exchange, etc.
- Although the touristic offer is marketed in through packages, the final offer must be individualized, the tour package being a guide for the patient to outline his journey.

### **3.- Myths and realities of ICT platforms Health**

The initial distance that separates patients from the health centres means that telemedicine platforms should be considered in the health tourism sector. Some press headlines in the recent years orientate the healthcare sector towards ICT platforms.

"The information and communication technologies have the potential to enable custom solutions without high costs, such as the use of a mobile phone," as stated in the International Report on chronic diseases in 12 countries. Health Dialog.

"The British government will encourage physicians to prescribe the use of Smartphone applications for control and monitoring of diseases. More than half of the people who use these facilities are better assisted, feel safer and reduce their visits to the doctor." Andrew Lansley, Secretary of the NHS, English Health System.

The presence of telemedicine in the treatment and monitoring of diseases, facilitates the emergence of new solutions in the healthcare field. They make it possible for foreign patients to start with the treatment even before they travel, optimizing the overall healthcare costs and increasing the quality of the services provided.

Therefore, it is necessary to have tools that integrate the technology available today, for the ambulatory/hospital monitoring of patients with risk of health crisis that will increase the efficiency of health services for the urban population. Furthermore, the progressive miniaturization of computing devices, the advances in wireless communication and sensor technology as well as geo-location systems and access to remote data servers; as well as the actual knowledge available in the cloud computing are advances that facilitate the development of monitoring systems of patients and therefore contribute to the improvement of their quality of life. These tools allow international physicians to treat patients remotely before and after intervention abroad.

TurSalud wants to revolutionize the health tourism, as currently all platforms in health tourism are only used for information purposes. On the platform all the elements will be coordinated on a large intelligent module that allows joining the tourism sector to the health sector, making expert recommendations based on the user profiles. In conclusion, patients using TurSalud get a personalized health-touristic offer.

### **4.- Objectives.**

The goal of TurSalud is to integrate all the agents present in the health tourism industry in an intelligent platform that enables end-users to choose among all those tourist-health deals to suit their needs according to the socioeconomic profile of each client, their preferences and choices, etc.

This new system will evolve constantly improving suggestions due to the use of stored data by a learning system. A new advanced telemedicine tool will be implemented to monitor diseases, in which integrated physicians can assist the patient before and after his trip, giving a greater feeling of security when selecting a destination, since the patient will be assisted from the very moment of purchasing the service (before leaving home) Therefore, the diagnosis will be more successful and the treatment will continue after the patient returns to his home country.

The TurSalud platform will allow the opening of new markets since it stands as the first comprehensive platform within the health tourism industry, implementing a quality standard by using artificial intelligence technologies and learning technologies in order to provide the best possible service, becoming a showcase for other health tourism stakeholders including health care, hotel chains, logistics companies, travel agencies, etc. On the other hand, technological challenges in this project are:

To address an international problem from a holistic point of view, introducing in the ICT world sectors such as specialists and health centers, patients, tour operators and service companies. This platform will take into account the relationships between the various entities involved, being able to elaborate an intelligent planning of trips, bookings, appointments, medical data, etc.

To develop a system of recommendations using artificial intelligence that would connect the interests of users of the system between different areas of interest: for example, the connection of the medical centers that meet the specific conditions for a disease treatment and hotel businesses located in the area.

To develop an innovative tracking module, monitoring and treatment of diseases that allows registered physicians to monitor patients at home before and after the trip, increasing the medical assistance of the doctor and the associated health center. Doctors can configure the clinic board of the different symptoms and diseases associated to each patient in a personalized way, choosing from a wide catalogue and defining the associated symptoms.

To design and develop mobile applications that contain the agenda of tourist-patients, information about the facilities and access to an advanced disease monitoring module to monitor, display and record data in it. These applications will have a significant geo-location component

To use the notification system of the mobile platforms to warn users of upcoming appointments in the agenda. From a commercial point of view, the TurSalud brand establishes the following to be a leader in this type of solutions: Generate a portfolio of new offers in order to differentiate various destinations, promoting the cities, companies, associations, etc.

Create an advanced tracking system for diseases that can be used by health and wellness centers.

Generate a new platform in a sector in which the impact of technology at the supply level is still lacking.

## **5.- Technological environment.**

The technologies considered in this project are located on three levels: provision and recommendation of the tourist-patient services, advanced monitoring and treatment of diseases and provision of mobile services.

Tourism is one of the sectors in which technological solutions have increased its presence in recent years, using technologies such as location-based services (LBS), semantic web, augmented reality technologies or roaming. All of these technologies will be used to create a

new element called Middleware center to coordinate the various modules that compose and provide location-based services to users.

## **6- Solution Architecture.**

Health tourism currently lacks tools that incorporate technology that allow an added value to the offered products. Today, it only includes informative applications (both Web and Smartphone).

The architecture of TurSalud is designed to fill the existing technological gap, creating a strong platform that is service-oriented, which is able to integrate more tools to treat diseases, new types of measuring devices, logistics management, integration with travel agencies, etc.

The TurSalud platform will provide a centralized service-oriented architecture (SOA), as shown in the diagram, whose services are to meet the specific needs of health tourism and, therefore, will focus on the following areas of interest:

- 1 The creation of a new intelligent platform that will integrate the various actors involved in the sector, developed using advance technologies. Keep in mind that the consumption of these services can be made from mobile terminals such as Smartphones, adapting the contents to the characteristics of these and creating specific products that can be distributed from the each online store. The core element is a layer called middleware, an smart engine that will guide users of the platform. This component has the maximum security technologies, since it deals with very private user data, making sure it meets the data Protection Act of each country.

- 2 The Smart Recommendations Manager (GIR) will evaluate, among the available service options, which are more suitable to the situation of a particular user, given their nationality and country of residence, medical needs, economic opportunities, and preferences. The GIR can provide the platform with "intelligence" that will be of great added value for users and for service providers, to build the best possible relationship between each other. The GIR, in short, is a set of recommendations developed by artificial intelligence techniques and machine learning, to improve the user experience and serve as a link between tourism and the health offer.

- 3 The advanced tracking module, monitoring and treatment of diseases introduces a novel and key concept for the assigned health centers, allowing these centers to differentiate themselves from their competitors through the offer of quality services other may not have. These differential technologies also help to distinguish between different destinations, allowing medical tourists to choose those that offer easier and better technology.

- 4 Applications for Smartphone can enhance the usability of the platform to empower the use of the services provided during roaming, together with the use of messaging services on mobile platforms as a means to notify reservations, appointments, promotions, etc. They also allow the platform to be updated with the users feedback, creating new channels of communication from the professionals (both health and tourism or logistics) to users or patients.

## **7.- Middleware Layer.**

The TurSalu Integrated Platform Middleware Layer is an advanced management system designed specifically for medical tourism, in which the platform users access the system through an established window, finding personalized services: doctors may offer services, patients can plan their trip, restaurateurs may include their hotels, health appointments hotel beds and the associated services will be coordinated (transportation, translation, etc) [Hadim 2006].

One of the main modules of the middleware layer is the management of the tourists' agenda: trips (flight schedules and internal transportation), quotes, reservations in rehabilitation centers, entertainment services, etc.

The interaction between the Middleware layer and the GIR is very important, as it will be this union what automates the process of choosing the most suitable alternatives, taking into account a number of constraints and criteria of convenience, as well as the patient personalized features.

GIR: Intelligent Recommendation Manager.

The Smart Recommendations Manager is proposed as a "broker" or "liaison" from the options of medical and complementary services to the users. It will group those with set of properties, such as age, nationality and country of residence, medical history and current condition and personal preferences, which must be taken into account for the ordering of what would be the best options for the user in terms of medical care, housing, etc.

The amount of available options makes the task of manual analysis of the various options an extremely difficult task, and it may cause the user to incur in a great cost. It may also have negative consequences for service providers, such as doctors and hospitals, travel agencies, etc. The Recommendations Manager catalogues the available options based on an estimated level of convenience for all of them (this is mainly for the user, but also for service providers).

The calculation of the best options requires:

1 First, to calculate which options linked to one aspect of the service (eg, medical operation) are compatible with which other aspects (eg, family housing). This requires the implementation of algorithms in order to calculate the different compatible options. For example, a critical aspect to make a plan of action for a user is to take into account the dates and times, including the trip to the place where it the medical care will be provided. Nevertheless, the visa requirements of the country is also very important, since each country has different deadlines and requirements to be taken into account. This leads to the need for some form of temporal reasoning, such as the "logic of intervals" [Allen 1984]. There are many ways to perform the compatibility analysis of the different options; efficiency being a fundamental aspect, which becomes more important when the number of available options increases.

2 Secondly, the rates of "convenience" for the different combination of services in contrast to the user characteristics need to be calculated. These should be expressed in quantitative terms, so that they can rank the options, from the most desirable to the less convenient.

3 Third, as the user gives clues about his attributes and preferences, these must be incorporated into the system to gradually improve the adequacy of the system to that user, which implies a "learning system". Learning is performed by adjusting coefficients in the formulas, identifying patterns and data mining.

## **8.- Medical Component: disease tracking tool.**

One of the components that give TurSalud an inovative character is its infrastructure, since there is no platform with a medical component in medical tourism. In this sense, the creation and development of a tracking module and advanced treatment of patients [Valero 2006] that allows the associated doctors to treat patients before and after their trip can be a differentiating factor for it to happen.

All records of the remote tracking system will use the HL7 [Health, 2012] standard, which will interconnect the TurSalud platform with other health systems around the world that already use this standard.

Furthermore, the field research of biometrics has advanced greatly over the past decade, generating a large amount of measuring devices, while reducing their manufacturing costs,

allowing many users to work with measuring devices. This was unimaginable only a few years ago. These measuring devices have incorporated wireless technologies that allow them to connect to data collection systems, to develop a system based on a Bluetooth standard called Continuous. This standard has allowed the emergence of numerous devices that incorporate it, opening a new channel of communication between the measurement devices and the next generation mobile devices (Smartphone).

TurSalud offers cutting-edge medical components, including a new type of mobile device with a touch screen that can be installed in hotels, thus enabling the provision of hotel services as well as medical assistance. This device will connect to measuring devices of different nature using wireless technologies. The new mobile device acts as a bridge between the advanced module for the monitoring and treatment of diseases and the other biometric devices. This allows to gathering trustworthy data and store it in patient module, allowing doctors to know the status of the recovery of the patient before leaving the tourist destination. The mobile terminal is also designed to connect to the security center of the tourist infrastructure, so that in the event of an emergency, the patient can be treated with the speed required by the tourist-health infrastructure.

The mobile terminal will be delivered to the patient / tourist at the beginning of their stay and could be installed in rooms, gymnasiums, common areas, rehabilitation centers, etc. There is an emergence of Android-based open-hardware developments that reduce the cost of mobile applications. Among these applications, the touch-screen applications would be the most suitable for the health tourism. The mobile terminal will have full connectivity to the Middleware layer, mainly the services to patients and visitors, making this new terminal is a broadcast channel of TurSalud platform.

## **9.- Application development in mobility.**

Advanced applications for mobility will feed from the Middleware layer to provision roaming services (both tourist and health), especially all operations related to the geo-location and LBS services. Some possible applications oriented to health tourism using mobile technologies are: information applications for touristic-health resources (hospitals, hotels, services, pharmacies, etc) depending on the patient's location, advanced trip planning applications or applications that monitor the patient's illness and the treatment.

All previous application will connect to data gathering systems of sensory information (pulsóxímetros, ECG, etc) for the alert detection. If the case of an emergency situation during the trip the application will connect to the Hotel and Hospital system to trigger an appropriate response.

## **10.- Market deployment.**

TurSalud is a versatile platform that can be fully or partially installed according to the needs and budget of each project, allowing the development with many business models: public, private or mixed.

Thanks to the service orientation, doctors that share hospitals around the world may be incorporated, providing services through the cloud.. All necessary resources can be distributed.

The market potential is very large. The South American market will be the preferred destination, with countries like Mexico, Peru, Colombia and Brazil, the main powers in the health tourism. The European market will also be explored, mainly through establishments oriented to wellness tourism in the Mediterranean arc.

Destination countries should influence business organizations to locate potential companies in the sectors of health, transport services, travel services and interpreters who want to internationalize their services and explore new markets.

Action is also needed in the countries that consume the tourism-health services by contacting travel agencies, transportation companies, rental agencies specialized in measuring devices for early assistance, companies to locate potential customers ...

On the other hand, the healthcare platform may be installed as a solution for tracking diseases, especially the chronic diseases that represent a large percentage of healthcare spending.

#### **11.- Conclusion.**

TurSalud is presented as an innovative platform that addresses the issue of health tourism, offering an innovative, intelligent, helpful solution and using the latest technologies in the market.

This is intended to generate new business opportunities, helping local companies to internationalize their services.

#### **KEYWORDS:**

Porter's diamond model; food security; wholesale and retail trade; distribution platforms; food marketing; and food safety.

# Methodology of researching organizational routines<sup>1</sup>

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## Abstract

The cognitive goal of the paper is to enhance and complete knowledge in the scope of the methodology of researching organizational routines. The structure of the paper is conducive to theoretical and methodological paper's aims. Theoretical-cognitive aims are concentrated on:

- theoretically conceptualizing organizational routines,
- verifying worked out and used techniques of researching organizational routines in
- Poland and in the world.

Methodological research issues are not less important than formulating a research problem. Additionally, in the field of soft management science areas, especially due to indeterministic elements of an organization (like organizational routines), methodological aspects of researching seem to be critically essential. Consequently, methodological objectives are as follows:

- working out the methodology of researching organizational routines,
- setting the proposal of a research procedure connecting various methods to make the research results reliable.

The paper is a result of literature studies and authors' experience connected with participating in many research-explorative projects. The paper includes the specificity and character of organizational routines, the review of research methods and procedures in terms of organizational routines as well as the proposition of research methodology in the field of organizational routines.

## Keywords:

organizational routines, triangulation methodology, research methods, management science research trends.

## Introduction

The dynamics of environment results in renouncing seeking a rational way of optimizing resources (a resource-based view) towards the analysis of dynamics and mechanisms of growing enterprises (an evolutionary approach). An evolutionary field in strategic management is concentrated mainly on organizational routines and their variation ensuring survival.

The Nelson and Winter's work [1982] is significantly salient and constitutes theoretical underpinnings for the concept of an evaluating organization and the beginnings of an evolutionary approach in management, especially strategic management. Since that work, in the area of evolutionary logics an explicit research gap has been still observed and available research (both international and Polish) is fragmentary and methodically not well structured.

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The main goal of the paper is to outline the problem of organizational routines and the research methodology. Theoretical and methodological objectives are as follows:

- theoretically conceptualizing organizational routines,
- verifying worked out and used techniques of researching organizational routines in Poland and in the world,
- working out the methodology of researching organizational routines,
- setting the proposal of a research procedure connecting various methods to make the research results reliable.

The first part of the paper presents the review of defining organizational routines. The organizational routines will be also located in an appropriate epistemological perspective what will facilitate the selection of research methods in terms of their specificity. Current research achievements and the assessment of research methodology and methods having been used in the scope of organizational routines will be described in the second part of the paper. Finally, the proposal of methodology due to researching organizational routines adequate to the phenomenon of routines will be presented.

### **The specificity and character of organizational routines**

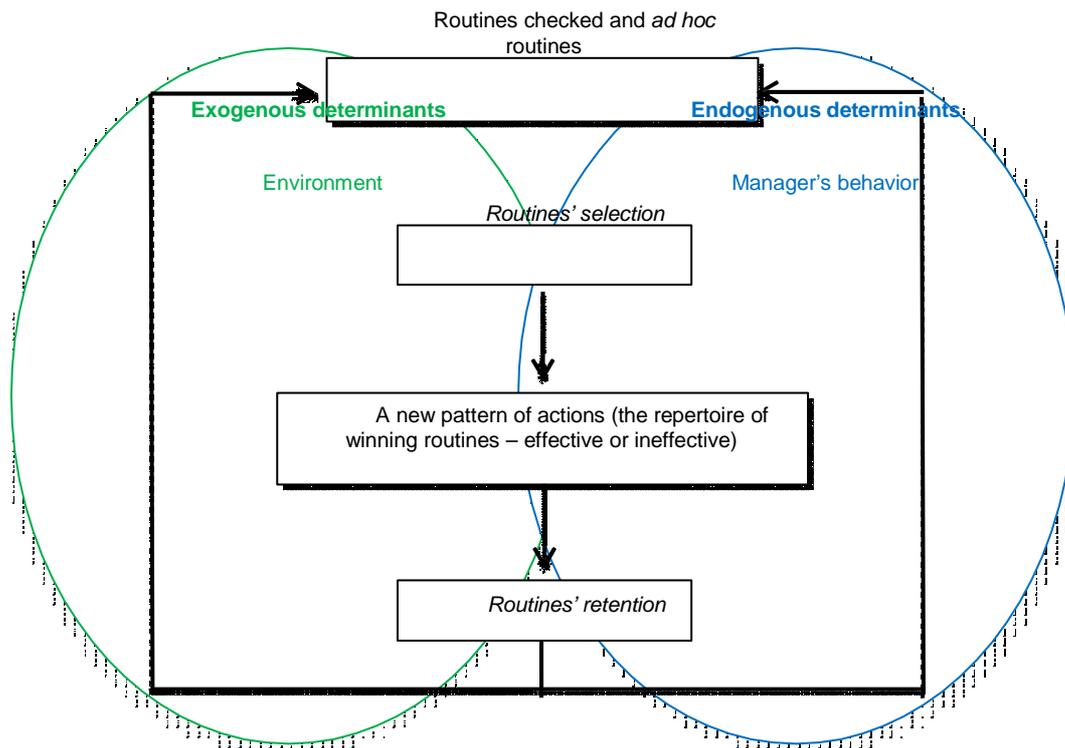
The phenomenon of organizational routines appears in the context of organizational changes constituting and explaining their essence. Considering changes in terms of routines is a different epistemological perspective in comparison with a popularized resource-based view. In other words, research interests transfer from seeking the sources of competitive advantage (optimizing resources) to recognizing the dynamics and mechanisms of the organization growth (survival).

As for the resource-based view that is frequently used in research projects, the basic category is the effectiveness of an organization as the consequence of possessing and using unique resources. The enterprise's development is created in here by using resources possessed. The development is intentional (knowledge) and deliberate (learning). Nevertheless, in accordance with environmental turbulence researchers more frequently go into the dynamics of the changes' process. The outline of the concept of organizational dynamics is rooted in an evolutionary approach that is based on the consciousness of bounded rationality of actions as well as on exploring the regularity of organizational behavior (organizational routines) [Nelson, Winter 1982]. Additionally, the development of an organization constitutes a consequence of organizational routines' evolution.

An organizational routine is a pattern of behavior or actions [Becker 2004]. It constitutes a behavioral pattern revealing in the form of repeatable behavior of an organization. It is also a collective reaction (of at least two persons) to a particular stimulus [Czakoń 2012, p.144, Strużyna 2013, pp. 29-30]. They can appear in the formalized or non-formalized procedures, programs (computer programming) or written and unwritten principles of actions.

On one hand, routines make the character of organization's functioning stable and they contribute to the stability amongst participants of an organization [Karpacz 2013, pp. 183-184], however, on the other hand, they create the enterprise's attitude to not routine problems, they lead to changes and organizations that easier discover regularities also 'easier survive and understand the dynamics of processes' [Strużyna 2013, pp. 29-30].

Organizational routines in the field of an evolutionary approach mean not usual standards or regular and predictable business behavior. Although they develop a repeatable pattern of actions, they are dynamic and change under the influence of the environment and directional manager's behavior. Even in a stable environment a perfect replication of organizational routines is impossible since it is impossible to repeat the same combination of organizational routines' determinants. The repertoire of organizational routines will be modified in an evolutionary way through keeping current routines, their change and the appearance of new *ad hoc* routines [Strużyna 2013, pp. 30-33]. The process of organizational routines' changes has been presented in the picture 1.



**Pic. 1 The essence of evolutionary changes**  
 Source: own study.

The process of evolutionary changes shows that copying routines in their primary version is not perfect on one hand, and on the other hand it is impossible. As the object of continuous evolution they will be changing determined by the changes of environment and manager's behavior (the changes in environment leads to other decisions and choices of development paths). Paradoxically, manager's activities in the processes of changes enhance contingency and unpredictability of organizational behavior. It is recommended that the attention should be focused rather on using routines possessed than on seeking new routines or copying them from other enterprises that succeeded thanks to them [Strużyna 2000]. The selection of current routines is also risky due to the choice of the pattern not appropriate for organization's survival (even though the risk is lower than in the case of seeking quite new routines). It is not the result of bad intention of managers, yet of unconsciousness of new pattern usefulness in a long run (temporarily a new pattern can be profitable, but in a long run it can be a threat as for development). Interestingly, however, threatening routines are difficult to be replicated, they have limited possibilities to proliferate [Strużyna 2000]. That fact should be taken into account in the process of choosing a set of patterns being under selection. Unfortunately, there are no any guarantees that easily replicated routines will be profitable in terms of organization's survival. Only one thing is predictable in this case – easily replicated routines will ensure the survival in current conditions; in the future, the results are always uncertain.

The unpredictability of evolutionary changes ought not to discourage managers to initiate changes and participate in the process of selection. The consciousness of complicated problems might deepen the knowledge about the essence of evolutionary changes what should result in due carefulness in interpreting facts and preparing many scenarios of events (in other words, it should result in flexibility).

The modification of routines in the process of changes reflects the evolutionary logics in accordance with the Campbell's model VSR (variation, selection, retention) [Campbell 1960, pp. 380-400; Campbell 1969, pp. 69-85].

Concluding the idea of organizational routines, it could be regarded that:

- The evolution of organizational routines constitutes the base of organization's development [Foss, Heimeriks, Winter, Zollo 2012, pp. 173-197];
- Organizational routines liberating behavior and cognitive regularities contribute to the stability amongst the members of an organization [Karpacz 2013, p. 184];
- Routines are not unchangeable [Strużyna 2013, pp. 30-31];
- Perfect routines' replication (repeatability) are not possible in a social system of an organization [Strużyna 2013, p. 31];
- The same routines having been applied to the new conditions will generate different results [Andersen, 1994, pp. 102-107];
- Routines are open for changes and create changes in environment [Strużyna 2013, p.31];
- Routines' changes are not deterministic, they are stochastic [Stańczyk-Hugiet 2013, p. 100].

While routines can have unconsciousness character, in the process of changes they reveal sooner or later. The reason is very simple – in stable conditions managers do not consider what they do routinely, however, during changes they feel the need of identifying that what in a set of new routines constituted the patterns of behavior [Karpacz 2013, p.184]. Simultaneously, discovering and realizing routines is the condition of organization's survival and understanding the essence of the process of changes. Consequently, organizational routines are both implicit and explicit. They stay in the shade so as to reveal in the process of changes what, amongst others, constitutes methodological problems in researching organizational routines.

### **The review of methods and procedures used in researching organizational routines**

The next challenge, apart from the problems resulting from the specificity of organizational routines as well as connected with their nature, is a methodological area. Distinguishing and defining the problems of the "routines" open next troubles – research ones. Initial recognition concerning the methodology of researching organizational routines illustrates that the researchers of the problem rather seek proper methods than are convinced of the legitimacy of a particular methodological path. Empirical research on routines makes serious difficulties. Routines are dispersed in the time and space of an organization and are also located in the background of organizational relationships. The research on routines are conducted in a variety of ways: from not-formalized approaches, intuitional ones [Nelson 2009], via qualitative research supported by Feldman's meta-theory [Feldman 2000; Pentland, Feldman 2005], ethnographic studies [Howard-Grenville 2005], log event research and its representation in the form of graph search [Van der Aalst, Reuers, Song 2005] to induction [Pentland, Haerem, Hillison 2009] or the analyses of sequences and their rules [Salvato 2009, pp. 68–102].

In details, the least formalized process of researching routines that might be recognized as intuitive and censorious is presented by Nelson [Nelson 2009] who has explored the following attributes of routines: a) the clarity of order and place, b) the ease of observing results, c) the ability to experiment, and d) the ability to indirect learning. The way of discussing research results is based on the unhampered presentation of generally known histories of changes in four case studies. One case study concerns one attribute of routines. In a similar qualitative vein, Feldman has explored the routines [Feldman 2000]. In the beginning she conducted twenty informal interviews with the members of the organization. Five routines were recognized during those interviews. Meanwhile, the observation and collecting artefacts were also used. The research was being conducted for a few years. The formal side of her research consisted of three stages. At the first stage the manuscript was written in which the changes of the routines during the period of the observation were described, especially i.e. culture, attitudes of workers, individual disposal to changes.

The second stage constituted the attempt of referring to meta-theory (i.e. ethnomethodology, semiotics, dramaturgy, or deconstruction) and its goal came to objectivity of data interpretation. Finally, the third stage concerned creating theory about a change as well as stability in organizational routines. That stage was supported by the structuration theory by Giddens and practice theory by Bourdieu. The approach having been used by Feldman emphasizes the role of qualitative methodology in researching organizational routines. The authors: Pentland and Feldman [Pentland, Feldman 2005] postulate also exploring internal structure and dynamics of routines what enables to understand such organizational phenomena like a change, flexibility, learning, and transfer. They propose to establish that routines are not a monolithic construct, yet they consist of both abstractions and specific achievements since abstractions, specific achievements and artefacts are internally connected in a complex way. Consequently, the relationships are various for different types of routines and make a lot of problems. According to Pentland and Feldman, expressing organizational aspects of routines requires explaining their generative properties as the object of empirical research. Additionally, the relationship between artefacts and organizational routines is also suggested by the authors to be researched, especially in terms of connecting some artefacts with ostensive aspects of routines. Moreover, due to the authors' proposal, exploring routines might be based on treating them as: undifferentiated black boxes (using analogies), isolated parts researched separately (using internal structure analyses, experimental studies, simulations, researching artefacts), and the relationship amongst those parts and processes during which the parts undergo changes (researching internal structure of relationships taking into consideration a dynamic character of routines; using maps, codification). Concluding, the work of Pentland and Feldman suggests directions in terms of identifying routines and conducting research on their dynamics. As for the Howard-Grenville's work [Howard-Grenville 2005] and her research on routines' flexibility and the conditions of a change (agency, organizational context), she conducted ethnographic studies (nine months) using mainly observation. Moreover, she inferred using induction and on the basis of the theory generation approach by Glaser and Strauss. The tools of collecting data were: notes, partially structured interviews, analyzing documents. The data collected were divided into those connected with selecting routines (roadmapping was helpful) and into those dealt with selecting circumstances of using routines. According to Van der Aalst et al. [Van der Aalst, Reuers, Song 2005] and their research on work flows or routines' changes, they used log event research and its representation in the form of graph searches. In accordance with the research of Pentland et al. [Pentland, Haerem, Hillison 2009] on generative properties of routines (11 months, observation), the main reason for conducting research concerned the doubt of using induction inference used by researches of routines. Induction inference supported with the techniques like mapping, diagrams, or procedures is helpful in making conclusions about an ostensive character of routines. Nevertheless, the routines tend to generate various patterns. Within a single performance, time is embodied in the pattern of events. When changes in the pattern over time are considered, it is obvious that a longitudinal (more macro-scale) approach is more appropriate. The potential research approaches proposed by the authors are presented in the table 1. As for the methods used by the authors, the following ones are worth to be mentioned: events research, graphs, matrixes, lexical analysis, string matching, optimal string matching, or sequences' comparison.

**Tab. 1 Approaches to identification and comparison**

	Properties	Patterns
Cross-sectional	Synchronic comparison	Identification
Longitudinal	Diachronic comparison	Evolution

Source: [Pentland, Haerem, Hillison: 2009, p. 51].

Interestingly, as for the subjects and objects in Pentland's research in the field of grammatical models of organizational processes [see i.e. Pentland 1995], the evolution of

methods/techniques used is noticeable: from lexicon, via syntax issues to rules and sentences. In a similar vein, due to sequences and their rules, Salvato conducted his analyses in terms of routines [Salvato 2009, pp. 68–102]. The Salvato's proposal is based on executive aspects of routines and using systematic mapping and comparing particular executions of the same routines in time (recursive aspect of operational actions) might result in setting a change path. It is suggested to be supported with optimal marching analysis. The author signalizes two limitations connected with researching routines. The first one deals with the method of optimizing, the second results from interpreting routines as cognitive regularity what ought to be completed with a behavioral approach.

Taking into account above theoretical and methodological underpinnings of routines, it is necessary to make a decision about a methodological approach and consequently of specifying research methods integrating various approaches, especially qualitative and quantitative, since described methodology, methods, and techniques have not yet been used in a complex integrative way. Obviously, it leads to the risk i.e. due to not adjustment of methodology to a problem, yet such a risk is planned to be minimalized through taking into consideration the recognition of current methodological solutions in related research fields and by an explanative value of research results achieved using various approaches. Nevertheless, what seems to be justified, behavioral-cultural aspects of researching organizational routines ought to be emphasized and used in terms of methodological issues concerning organizational routines.

### **Methodology in researching organizational routines – proposals**

The character of organizational routines and an epistemological perspective in which they are located explicitly emphasize the necessity to join qualitative and quantitative research. Obviously, exploring hidden aspects of organizational processes requires the rigorous qualitative research to be used – case studies, psychological tools, participant observation. Additionally, qualitative research enables to formulate hypotheses. The methods of qualitative research are accepted in social sciences and more frequently used in management science, so using intentionally and in a justified way the methodology of qualitative research seems to be approved. The review of research embedded in a similar terminology confirms also the legitimacy of using a qualitative approach. Open aspects of organizational research might be identified in quantitative research and qualitative one. However, taking into consideration the development of an evolutionary approach in strategic management as well as the fact that qualitative research is not deprived of disadvantages, the research objectivity ought to be ensured what might be realized through qualitative-quantitative consensus. Moreover, quantitative research enables to identify various co-relationships - for instance, determinants of routines' selection, or the type and degree of symbolically embedding routines. Consequently, polimethodological approach is proposed and various methods from two mentioned approaches would overlap. Nevertheless, both qualitative and quantitative methods of researching organizational routines bring some challenges and troubles.

The problem occurring in qualitative research is the issue of interpreting results achieved. Nevertheless, it allows to explore new phenomena, to create new categories, and to formulate empirically strengthened hypotheses that can be the subject of quantitative research. The results are interpreted from the perspective of a particular paradigm [Konecki 2000, p. 13, 86].

Using qualitative methods is justified as the research at the first stage is only to formulate hypotheses. Preparing hypotheses and specifying research problems is significantly important for further empirical research conducted at the final stage of research. Consequently, they constitute a very important stage of preparing an empirically extended research program.

Qualitative research is not representative from the statistical perspective and cannot be the base for generalizing as the number of interlocutors is significantly less than in

quantitative research. However, as for qualitative research it is said about 'conversational' representativeness. Such representativeness is mainly determined by sample selection. Sampling ought to meet some requirements. Firstly, respondents should represent various attitudes. Secondly, they should belong to a relatively homogenous group [Rost 2008, p. 23]. Consequently, not-probabilistic sampling, a small number of respondents, and a free (but structured) interview constitute main attributes of the research. The selection of qualitative methods in scientific research depends on many factors like, for instance, the type and character of information sought and the accessibility of information sources. According to the principles mentioned, the technique of a direct interview will be used and the research tool will constitute an interview scenario developed on the basis of deep recognition of current research. Questions will be partially standardized to code data and formulate hypotheses. The way of formulating hypotheses will be the analysis of frequency and the choice of a dominant indication. Many questions will be open and their order way of formulating will depend on the researcher. As a result, such a methodological approach will allow to collect unit data so as to gain aggregated data. Conducting qualitative research requires special accuracy in the process of sampling.

A set of hypotheses formulated on the basis of qualitative research (the first stage) would be the base for conducting quantitative research (the second stage) to test interrelationships. As a result, a triangulated methodology could be used to gather different types of data which can be used as cross checks.

The triangulation of data and research methods would allow to gain a wider context of a phenomenon, ensure better quality of the research, and would limit measure mistakes resulting from using only one method.

Using a set of various methods would enable to gain the cohesiveness of empirical base for concluding [Kostera 2003, p. 98].

D.T. Campbell and D.W. Fiske [1959, pp. 81-105] were the first who used triangulation as the connection of different methods in one research.

Since the time the principle of considering reality from various perspectives, setting and confronting data collected has been used in the qualitative-quantitative research proceeding. Such an approach is called complementary, complex, polimethodological, hybrid, idiotethic or as linking data.

The triangulation of data and methods gives wider data and more certain base for interpreting, however, it is recommended to connect related methods that complete each other [Stańczyk 2011] like: observation, interview, text analysis, artefacts analysis [Kostera 2003, pp. 101-156, Konecki 2000, p.133].

An observation enables to be orientated in customs, climate, and phenomena. Observation as a basic method could be the base for studying documentation, analyzing artefacts, interviewing and it also might complete methods mentioned. The connection of a participative observation and non-participative one is called a direct observation and shadowing.

An interview should be understood as a direct conversation, however, conducting an interview should be approved and accepted by two sides [Czarniawska 2001, p. 735]. According to the kind, aim, the following interviews can be distinguished: a standardized structured interview, a standardized not-structured interview, and a not- standardized and not structured interview.

A text analysis concerns current documents and archive ones. Current documents (letters, notes, plans, reports, announcements) ought to be compared with other data as concluding based only such current documents could be misled. Archive documents (chronicles, maps, archive data) should be verified in terms of their accuracy and the source of origin [Yin 1994, p. 80; Kostera 2003, pp. 121-142; Kędzior 2005, p. 98].

Summarizing, using many research methods is especially justified in the case of researching the process of changes. The explanations of change will be holistic and multifaceted. As a

result, the following methods useful in organizational routines' empirical research are proposed:

Focused group interviews ('One shot case studies') – provide depth, subtlety, and personal feeling. A group consists of 8-10 persons. A direct observation provides an access to group processes and can confront the researcher with discrepancies between what people have said during an interview and casual conversations and what they actually do. The sample should be purposive due to selected industries. The subject of the research: top managers.

An ethnographic interview – conducted in different sectors so as to collect, code, and analyze data and to make a decision which future data should be collected and where they ought to be sought. In each enterprise several standardized not- structured interviews should be done, but not-standardized interviews can be also taken into consideration.

A cross sectional survey is justified due to an informational strength of received data concerning the process of changes. A correct measure of a current state and the usage of retrospective information will allow to set interrelationships and causality. A sample group of respondents should not be large, however, if it is necessary, the process of repeated sampling will be conducted.

A direct observation and shadowing used for completing quality, knowledge and understanding data due to shot case studies and an ethnographic interview.

Researching artefacts permeating the methods having been mentioned before. Artefacts help analyze cultural features of the area observed. Artefacts include physical objects created by the members of culture, verbal signals visible in written and oral language, rituals, ceremonies and other forms of behavior. Artefacts are the expression of the core of organizational culture and might be the symbol of own identity and the way of formulating and achieving goals by the members of culture [Yin 1994, p. 80; Konecki 2000, pp. 132-134; Stańczyk 2008, p. 35]. Cultural artefacts include symbolically retained routines.

Researching managers' attitudes (including social ones) – see [Piórkowska 2012], behavior, behavior intention, temperament, personality, character, resistance to change/managing occupational stress (tests, sheets, structured interviews, psychological tests).

## **Conclusions:**

Concluding, the proposal of researching organizational routines assumes qualitative-quantitative research proceedings. At the first stage of the research the set of hypotheses ought to be established on the basis of qualitative research. At the second stage of the research the quantitative research should be conducted. The methodology used ought to be in accordance with the procedure of data and methods triangulation. Polimethodological research approach will allow to gain a wider context of the phenomenon researched, will ensure the better quality of the research conducted and will limit the measure mistakes resulting from using only one method. Data and methods triangulation will give wider survey data and more certain basis for interpreting, however, it is recommended to connect related methods that are completed each other.

Consequently, the following procedures, methods and techniques are proposed: shot case studies, ethnographic interviews, inquiry questionnaires, direct observation and shadowing, a cross sectional survey, researching artefacts, researching attitudes, behavior, behavior intention, and psychological characteristics like temperament, personality, character, resistance to change/managing occupational stress using tests, sheets, structured interviews, psychological tests).

Summing up, it seems that the theoretically-cognitive and methodological goals attained by the authors of the paper have been realized. In details, organizational routines have been conceptualized, current worked out and used techniques of researching organizational routines have been verified as well as the proposal of a research procedure connecting various methods to make the research results reliable have been set. As for the future

directions, the authors propose to conduct initial qualitative research and to work out a research framework so as to know which exactly variables would be set and hypotheses would be verified (in the context of relationships amongst the phenomena connected with organizational routines). Thus, quantitative research would be used in researching relationships and the determinants of routines.

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# The Impact of Non-financial factors on Prosperity of Slovak agriculture sector

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## Abstract

Slovak agriculture sector passed during the last decade a period of substantial changes and dynamics, caused by the Common Agriculture Policy assessment in 2004, new political regulations and quotas, unstable market and climate conditions, or crisis influence in 2009. These events have undoubtedly influenced the overall financial and economic situation of Slovak agriculture producers, as well as their ability to lead prosperous businesses. Generally, the Slovak agriculture tends to be low profitable, unstable and risky sector. It can be subjected to several reasons and factors affecting the production, income, and welfare.

In the previous studies several authors focused on identification of financial ratios that decide about successful performance of businesses, and determined their critical values. Moreover, there were constructed classification and prediction models of financial distress. The financial factors' impact on the financial distress in the case of Slovak agriculture companies has been analysed in the scientific papers of Chrastinová (1998), Gurčík (2002), Bielíková et al. (2014), and others.

However, only a few authors paid attention to the non-financial factors. Therefore, the sufficient evidence of their impact on agriculture companies' prosperity is missing. There are factors in the agriculture that may not be influenced by the producers themselves, such as climate conditions and weather. However, we assume that number of decisions made by farmers can lead to more effective production, profitability and risk elimination. In the previous studies was investigated mainly the impact of legal form, organisational and size structure on the performance of farms (Lančářič et al., 2013; Ciaian et al., 2009; Kopta, 2013). Generally, the non-financial factors impact on different businesses was emphasised in the works of Cumby and Condor (2001), Khizer et al. (2011) and others.

We decided to extend the previous studies and investigate, what are the key factors of prosperity, except of the financial results and ratios. The analysis will be applied on the 842 farms operating during each year of the period 2009 – 2012 in all regions of Slovakia. We will create sample of prosperous and unprosperous companies and analyses them according to their legal form, production orientation, size of utilized agriculture area UAA (LPIS) and number of owners and employees. With the use the linear discriminant analysis and decision trees we will try to find the non-financial factors, which determine the successful performance of farms in agriculture primary sector. The main objective of the paper is to examine and evaluate the non-financial factors' impact on prosperity of Slovak agriculture companies.

## Keywords:

Agriculture sector, prosperity, legal form, production orientation, utilized agriculture area, employees, owners, multivariate statistical methods.

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## Introduction

Prosperous, successful and productionally strong agriculture sector has been, generally, a long term objective of Slovak agriculture producers. However, the average economic results of businesses in agriculture sector show very high level of volatility of financial indicators such as ROE, 4.39% in 2007, 0.4% in 2009, 2.84% in 2011 or ROA, 1.76% in 2007, 0.04% in 2009, 1.11% in 2011, (Serenčėš et al. 2014). This low profitable, unstable and risky development of Slovak agriculture can be subjected to strong variability due to several reasons and factors affecting the production, income, and welfare. It is important to pay attention to identification of these factors as well as their elimination.

The division of farms into prosperous and unprosperous can be determined using several different criteria. In the previous analyses of Chrastinová (1998) or Gurčık (2002), were examined impacts of financial factors on prosperity of Slovak farms. CH – indexes criteria of prosperous companies were constrained by more than 5 % ROS and Current ratio in the range between 1.5 and 5. The unprosperous remained those achieving negative ROS and the value of Current ratio out of the range. G-index determined different criteria of prosperity, namely ROE more than 8 % and positive profit in last 3 years. Otherwise, the company with loss during 3 consecutive years is unprosperous.

We assume that not only financial factors play a key role in the prosperity issue. Therefore, we will continue in the works of Lančarıč et al. (2013), Ciaian et al. (2009), Krechovská and Taušl-Prochádzková (2014) and extend study by finding the non-financial factors' impact on the prosperity of Slovak farms.

## Data and Methods

The following part provides overview of data and methods applied, in order to meet the objective of the paper and find the non-financial factors, which determine the successful performance of Slovak agriculture firms.

### Data

The data used for the analysis was obtained from the Ministry of Agriculture and Rural Development of the Slovak Republic, processed in the internal dataset of the Slovak Agricultural University in Nitra. The dataset consists of financial statements of all agricultural farms operating in the Slovak Republic during the period 1993 - 2012. However, for the analysis were selected only information from balance sheets and profit and loss statement of farms operating during each year of the period 2009 – 2012, with legal form of cooperatives or capital companies. After outlier detection and classification criteria establishment, 240 farms created a sample for our analysis.

### Methods

The fundamental tool for examination the financial prosperity of enterprise, regarding different factors, represents the discriminant analysis. Discriminant analysis methods are divided into one-dimensional model, that predicts financial distress of company by using a single indicator (Beaver model, Zmijevsky model, and others) and multivariate discriminant analysis using a set of several weighted indicators (Bonity index, Altman Z – score, Fulmer model, Taffler model and others).

For constructing the classification model, using the discriminant analysis, is required to define relevant criteria of prosperous and unprosperous company. The unprosperous farms are considered to be those, generating loss (negative ROE) in each of years 2009 – 2012. Oppositely, the prosperous farms were considered to be all generating profit during observed period. Because very large sample of prosperous farms remained for the analysis we added the prosperous criterion with ROE greater than 5 %. We did not use the balance sample approach, to select the same number of prosperous and unprosperous farms, in order not to influence and deteriorate the results and include all firms meeting our conditions of prosperity. The particular samples consisted of 82 unprosperous and 158 prosperous farms.

The model was developed using the stepwise discriminant analysis. According to Stankovičová and Vojtková (2007), in the stepwise approach the examined variables are evaluated separately, and those with the best discriminant ability are chosen to become variables in the final equation. The results of stepwise selection process are determined by considering the statistically significant correlation between ratios. The condition for excluding some variable from analysis depends on the discriminant ability, described by the partial determination coefficient. To construct the equations the descriptives such as Univariate Anova's, Fisher's, Box's M and unstandardized function coefficients are requested. More detailed characteristic of the method can be found in Stankovičová and Vojtková (2007), or Král' et al. (2009).

To confirm the factors, which classify the businesses with respect to their prosperity, we decided to use the second method – decision tree analysis. Data mining technique decision trees create a model of hierarchical decision rules. It classifies cases into groups or predicts values of a dependent (target) variable based on values of independent (predictor) variables. The procedure provides validation tools for exploratory classification analysis. Determined decision rules ultimately allow us to classify the agriculture companies into prosperous and unprosperous. Theory of decision trees distinguishes several algorithms for creating the trees, however, in the paper the construction of decision tree is done interactively. The variables that were selected firstly, as the result of discriminant analysis, were later used as the inputs of our decision tree. The concrete aspects of the interactive tree creation, such as determination of criteria for classification are described in the next section.

**Tab. 1 Input variables**

Variable	Calculation	Variable	Calculation
Y	Prosperity	X <sub>5</sub>	$\frac{\text{Crop production revenues}}{\text{Total revenues}} \times 100$
X <sub>1</sub>	Legal form	X <sub>6</sub>	$\frac{\text{Animal production revenues}}{\text{Total revenues}} \times 100$
X <sub>2</sub>	UAA size (LPIS)	X <sub>7</sub>	$\frac{\text{Other revenues}}{\text{Total revenues}} \times 100$
X <sub>3</sub>	$\frac{\text{Employees}}{\text{Land size (ha)}}$	X <sub>8</sub>	$\frac{\text{Crop production revenues}}{\text{Land size (ha)}}$
X <sub>4</sub>	$\frac{\text{Owners}}{\text{Land size (ha)}}$	X <sub>9</sub>	$\frac{\text{Animal production revenues}}{\text{Land size (ha)}}$

Source: Authors

The farms in prosperous sample were signed by number 1 and unprosperous by number 0. All the input variables are the quantitative character except for variable X1 Legal form. For this reason the legal form Cooperatives was signed by number 0 and capital companies by number 1. All the calculations and methods were applied using the Microsoft Excel and statistical software IBM SPSS Statistics 20.

## Results and Discussion

The following part provides the overview of results with the objective to identify prosperity classification criteria of Slovak farms.

### Discriminant analysis

One of the fundamental assumptions of discriminant analysis is the homogeneity of intragroup covariance matrixes within individual groups. The results of our Box's M test Sig. are 0.00, which means we cannot consider the covariance matrixes to be equal. For this reason the quadratic discriminant analysis should be used, however, it is more sensitive to the failure of meeting the assumption of multivariate normality. Because, the analysed data do not have the character of a normal distribution, and we assume that the linear discriminant analysis is resistant to not meeting the normality distribution condition. When the sufficient number of observations is used, and the differences between covariance matrixes are not so big, we decided to apply the linear discriminant analysis. An eigenvalue in Fig. 1 indicates the proportion of variance explained, between-groups sums of squares divided by within-groups sums of squares. A large eigenvalue is associated with a strong function. The canonical relation is a correlation between the discriminant scores and the levels of the dependent variable. A high correlation indicates a function that discriminates well. In our case the results are more than satisfying with the value of Canonical correlation 0.902 which is extremely high, very close to 1. Wilks' Lambda is the ratio of within-groups sums of squares to the total sums of squares. This is the proportion of the total variance in the discriminant scores not explained by differences among groups that is in our analysis only 0,187.

**Eigenvalues**

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	4,345 <sup>a</sup>	100,0	100,0	,902

a. First 1 canonical discriminant functions were used in the analysis.

**Wilks' Lambda**

Test of Function(s)	Wilks' Lambda	Chi-square	Df	Sig.
1	,187	395,563	4	,000

**Pic. 1 Eigenvalues and Wilks' Lambda results**

Source: Authors, Output of SPSS

The 9 input variables were in the discriminant analysis independently evaluated using the stepwise selection, with the result that only 4 variables to have significant impact in prosperity classification: Legal form, Animal production (%), Employees per ha and Owners per ha. The rest of variables are not considered to have significant discriminant ability. The Standardized Canonical Discriminant Function Coefficients evaluates the impact of each factor, as well as its ability to discriminate farms into prosperous and unprosperous group. The Unstandardized Canonical Discriminant Function Coefficients indicate the unstandardized scores concerning the independent variables. It is the list of coefficients of the unstandardized discriminant equation. Each subject's discriminant score would be computed by entering variable values for each of the variables in the equation. The critical values for discriminant score from the final equation are stated by the results of Group Centroids, which give us the boundaries of scores for each farm, in order to decide about its classification into particular group.

**Tab. 2 Standardized and Unstandardized Canonical Discriminant Function Coefficients**

	Standardized Canonical Discriminant Function Coefficients	Unstandardized Canonical Discriminant Function Coefficients
	Function 1	Function 1
Legal form	-0,693	-2,455
Animal production %	0,578	2,777
Employees per ha	0,137	2,395
Owners per ha	0,465	6,400
(Constant)	-	0,120

Source: Authors, Output of SPSS

$$Y = 0,120 - 2,455X_1 + 2,395X_3 + 6,400X_4 + 2,777X_6$$

$$Y \geq 2.881 \quad \text{unprosperous}$$

$$Y \in (2.881, -1.495) \quad \text{average/indifferent}$$

$$Y \leq -1.495 \quad \text{prosperous (1)}$$

The equation (1) is constructed in the way that higher score than 2,881 reflects the unprosperous farm, the range between from 2,881 to -1,495 is the indifferent zone, and lower score than -1,495 classifies the farm as prosperous.

The variable  $X_1$  - *Legal form* is the only one entering the equation with mines sign, it means with the indirect impact. According to Standardised canonical coefficient is it the variable with the best discriminant ability. Previously, we assigned number 1 to Capital companies and 0 to Cooperatives. In this case the interpretation means to have legal form of Capital company decreases the score from equation and so decreases the possibility to be classified as unprosperous. Therefore, in the decision making of farmers in primary sector the legal form of Joint-Stock company, or Limited Liability company should be preferable.

The variable  $X_3$  – *Employees per ha* reached the lowest direct impact from the point of classification. The higher the ratio, the higher the score from equation what leads to the classification of farm into unprosperous group. It can be related to the efficiency of businesses and theory of economy of scale, when the lower portion of employees to the size of land could represent more efficiently used human capital in the company.

The variable  $X_4$  – *Owners per ha* achieved the highest unstandardized coefficient in the classification equation. The high portion of ratio Number of owners/Land size (ha) leads to the identification of farm as unprosperous. This result is corresponding with the fact that the agricultural firms with more owners are usually cooperatives.

The variable  $X_6$  –  $(\text{Animal production revenues} / \text{Total revenues}) * 100$  refers to the percentage of revenues from animal production to the total revenues of farm. The results of discriminant analysis show, the higher the share of animal production in the farm, the higher score from equation, it means higher possibility to be classify as unprosperous. The direct impact of variable in equation resulted from the fact that the companies oriented on animal production have more difficulties to become profitable than the crop oriented farm.

## Decision tree

To verify the results and extend our analysis, the data mining method decision tree was used. The dependant variable in our case, the prosperity, was evaluated by independent variables, the results of discriminant analysis – Legal form, (Animal production revenues / Total revenues)\*100, Owners per ha and Employees per ha. To build the classification rules, the CHAID growing method was applied. Parameters determining the structure of the tree were chosen according to the nature of the dataset, in order to minimize the complexity and misclassification of the tree. Constructed tree is composed of 9 nodes, using the entropy as dividing criterion. The first classification variable on the highest level of the decision tree is the percentage share of animal production, (Animal production revenues / Total revenues)\*100. This ratio divides the analysed observations into 4 intervals.

The Node 1 captured 96 cases (40 % of the total number of cases) %, which are all considered to be prosperous. If the share of animal production of the farm is less than or equal to 14.8 %, there is very high likelihood to be the prosperous farm.

In the interval (14.8 %, 43.7 %) of animal production revenues are included 37 prosperous companies, but also 11 unprosperous. Examining further split of this node helps us to understand the target variable. In this case the Legal form as the classification criteria was selected, and specified the 29 prosperous farms with legal form of capital companies and 11 unprosperous and 8 prosperous with the legal form of cooperatives.

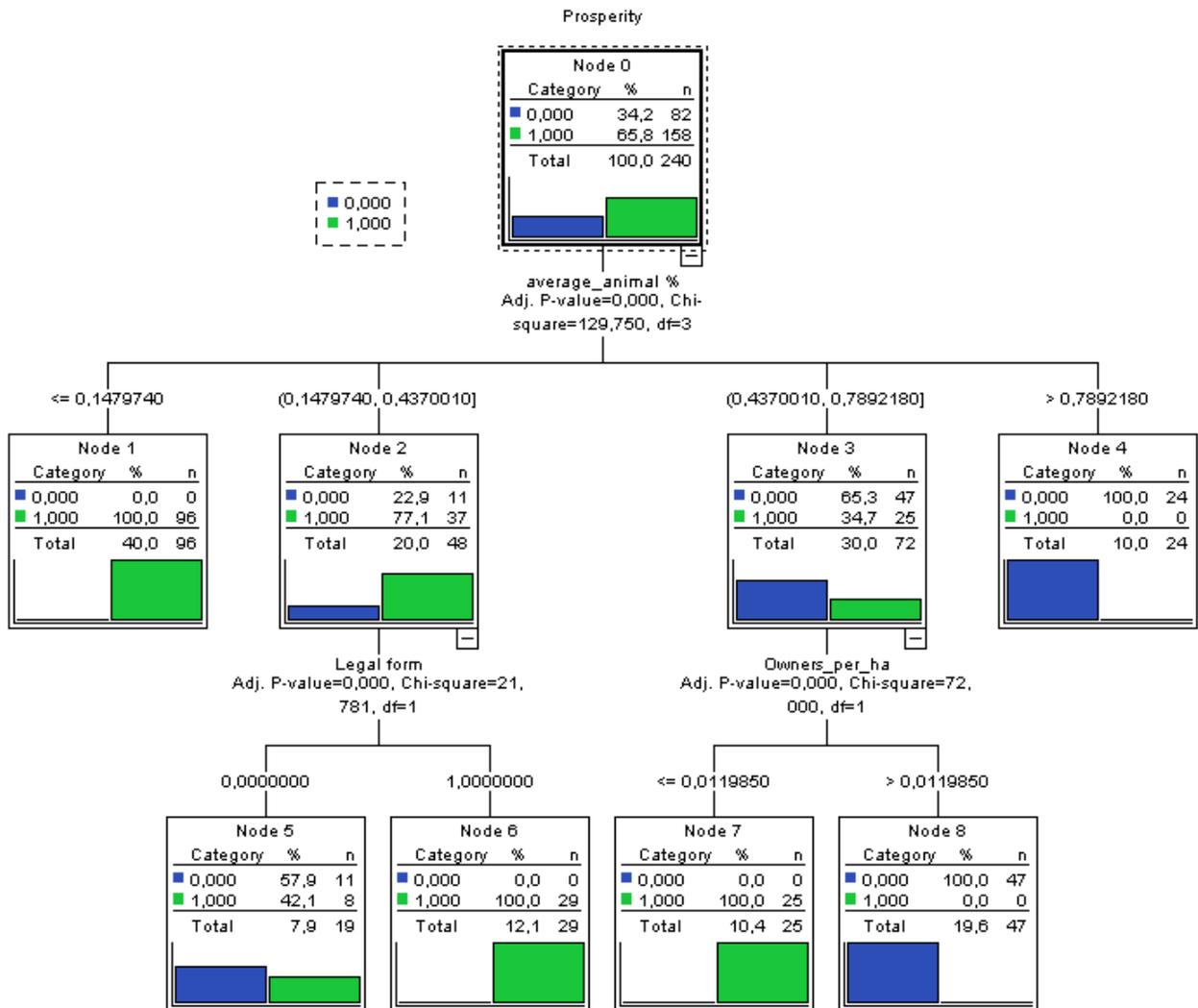
The next interval of animal production revenues (43.7 %, 78.9 %) includes the majority of unprosperous companies 65.3 % of total unprosperous sample and 34.7 % of prosperous sample. The tree tries to remove the misclassification by using other criteria selected from the variables, Owners per ha. Based on this criteria, all the farms with less  $\leq 0.012$  Owners per ha are prosperous, otherwise are classified as unprosperous.

If we consider percentage share of animal production  $\geq 78.9$  %, only unprosperous companies are allocated in the node.

Simply concluded, as the % share of animal production revenues increases, the farms are more likely to be unprosperous. We assume that the farms with low % of animal production revenues are oppositely crop oriented farms. Deduction leads us to assumption that the higher % share of crop production revenues the farm has, the higher probability to be prosperous. Other two variables removing the misclassification are Legal form and Owners per ha. Generally, the farm with legal form of capital company, or farm with less owners per ha tends to be prosperous.

The complex evaluation of constructed models can be found in the table 3. The classification results are a simple summary of number and percent of subjects classified correctly and incorrectly. Type I error represents the percentage of the unprosperous companies that have been wrongly classified as prosperous.

Percentage prosperous Type II error represents companies, which have been classified as unprosperous.



**Pic. 2**  
**Decision tree**  
Source: Authors, Output of SPSS

Based on the results, it is obvious that both constructed models are very accurate. However, it is important to realise that this result is overvalued, because the basic disadvantage of these methods is that the model is tested on the same dataset from which was constructed (Král et al., 2009).

**Tab. 3 Classification results**

Method		Number	Percentage	Correctly classified
Discriminant analysis	Type Error I	3	3.7 %	96.3 %
	Type Error II	5	3.2 %	96.3 %
Decision tree	Type Error I	0	0 %	100 %
	Type Error II	8	5.1 %	94.9 %

Source: Authors, Output of SPSS

## Conclusions

The identification of factors that would enable to provide necessary steps to improve the economic performance of the company, belong to the crucial point for each company management. Moreover, the importance of distress identification increases in such a low profitable sector as agriculture is. The number of studies emphasised the certain financial factors' impact of profitability and riskiness of agriculture firms, however the sufficient evidence of non-financial factors is missing. The structure of farms in Slovakia is different compared to EU average. The majority of UAA is cultivated by large farms with over 500 hectares. This results from the historical development of agriculture in former Czechoslovakia before 1989. In EU the UAA per farm is much lower. Therefore also measures implemented through CAP result different in Slovakia.

The first part of the paper focused on identification of prosperity factors of agriculture companies. With the use of linear discriminant analysis were from 9 input variables selected by the stepwise method 4 variables having significant impact on prosperity. We conclude that the profitability of Slovak farms can be anticipated by non financial variables. These variables have the highest discriminant ability for classification of farms into prosperous and unprosperous: legal form, share of animal production (%), employees per ha and owners per ha.

In the next part, the decision tree analysis was used to verify and accurate our first results. Three of four variables were defined as decision criteria of prosperity: legal form, share of animal production (%). Only variable employees per ha has not been included. The results showed that as the percentage of animal production revenues was increasing, the probability of unprosperous classification increased as well. To more specify the prosperous group, the variable Legal form was selected. In this case the legal form of capital company refers to higher probability to be prosperous. To more specify the unprosperous group, the variable Owners per ha was selected. Higher share of owners per ha, led to higher likelihood to be unprosperous.

Simply explained, classification of farm into the group of not prosperous farms in Slovakia is the case if the farm has the legal form of cooperative, is oriented on animal production, has high number of employees per ha and owners per ha. These results are in line with the general opinion that cooperatives are ineffectively managed, because of their higher number of owners and incorrect use of excessive human capital. The results show that the increase of animal production share (%) leads to increased possibility for company to be identified as unprosperous is also corresponding the nowadays situation. It supports the recent development, when the animal producers rather change their business orientation into crop production, because they are not able to cover the cost by the revenues. The other reason might be high level of subsidies depending on the hectares of farms, which is generally higher in the case of crop producers. From this point of view is surprising that the variable utilized agriculture area size LPIS have not been considered to have significant impact and haven't been selected in the final equation.

With respect to the legal form we can expect, that the number of cooperatives will decrease in future in favour of the more profitable cooperatives. This is the fact since 1989

and will continue. The animal production in Slovakia is decreasing because of the low profitability and therefore policy measures in the future should be more focused on supporting animal production. The market revenues from animal production do not cover the cost and therefore it is not profitable. The negative aspect in Slovak agriculture is the sharply decreasing number of workforce in agriculture. This is due to economy of scale and because of the farm structure with large farms in Slovakia. The less employees, the lower the cost and the higher the profit. But supporting rural development means also that public funds in form of CAP subsidies should not be concentrated in a small group farm owners which is the case in Slovakia. Therefore, further public support should also be linked to the ability of farms to generate rural development through higher employability.

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# Utilisation of social innovations in small and medium enterprises

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## Abstract

The paper examines the utilisation of social innovations in small and medium enterprises in Blansko and focuses on quantitative research of enterprise's social innovation use in the selected municipality. Results show there isn't a statistically significant relation between the type of innovations utilised and the successfully implemented employees' activities within small and medium enterprises.

## Key words:

Social innovation, small and medium enterprises

## Introduction

The theory of cultural and social capital is based on the finding that an individual (or social group), aside from economic capital, can also dispose of social relations, contacts, knowledge, skills and symbols, all of which can be exchanged for either similar relationships, contacts, knowledge, skills and symbols, or even directly for money. Social capital particularly represents relationships of social clientele and social protection, dependent on either the rest types of capital or on the status signs of the individual. Cultural capital mainly represents education and further knowledge and skills, as well as memory. The process of modernization, for example, makes for a certain kind of education and directly exchangeable cultural capital and thus makes cultural capital an important indicator of manpower on the labour market or a market with other mentioned kinds of cultural capital.

The effort to objectivize transfers mainly of economic capital is in global economy accompanied by doubts that economic intentions can bring unintentionally some negative effects in a social sphere or at an environmental level. These unintentional negative effects are surprising for investors since conducted studies of region pointed out the need to invest economic capital, which should have brought positive effects also to the social development of a region. Economic capital flows represent a priori a starting point for the development of a given place but the influence of social capital of inhabitants in a locality/region remains underrated. We can prevent these negative impacts by research of social capital and by such metrics that will be able to affect a model defined by inputs and by outputs. According to economical approach, a term social is understood in terms of the externalities generated by market activity or as a contingent factor in an individual's utility curve. For political science, the social is often framed as the realm of public goods interpreted by policy objectives and framed by cost-benefit analyses (Nicholls, Murdock, 2012).

According to Kadeřábková et al. (2012), social innovation is the process of social interaction which aims to achieve a certain result with participatory nature. It involves diverse actors and stakeholders who have a vested interest in solving a social problem, and strengthens the position of beneficiaries (empowerment) - innovation is the creation and dissemination of their participation. Empowerment is a prerequisite for sustainable innovation.

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The process of social interaction is itself the result of innovation because it creates social capital. The nature of social interaction identifies three types of social innovation - a solution to social demand (needs), solutions to social challenges and systemic change.

Nicholls and Murdock (2012) also claim that from some perspectives, all innovations can be seen as social. One argument suggests that since all new products and services have an impact on people's lives, all innovation has a social dimension. Those products and services that specifically enable improved human well-being can be seen as a sub-set of this larger group in that they have demonstrably positive social effects. Even innovations that do not have such effects typically require social participation in their production and diffusion, which may be novel or transformative. These arguments suggest that the differences in the positioning of the social in social innovation are primarily sociological issues and that, as a consequence, they can be somewhat resolved by careful attention to the actors involved in instigating and experiencing the innovation itself. These actors can be analysed at micro, mezzo, and macro levels, namely in the individual, organization/network, or systems context.

Social innovation creates social / societal benefit or income, which belongs primarily to the society as whole, rather than private individuals, as well as new social practices, relationships or partnerships, new institutional forms and procedures that stimulate behaviour change. Participation of end-users in the partnership as co-change increases the effectiveness of innovation activities (the change is implemented not only for citizens but also with them). Social innovation can take place in all institutional sectors and their interactions. Compared to business innovation, social innovations aren't primarily motivated by business interests, commercial opportunities or profits, but they can include them (Kadeřábková, 2012).

Non-technical and *"social innovations, however, although they exist constantly and widely in social systems, are largely ignored as a topic and are a little-recognized phenomenon"* (Gillwald, 2000), though this offers them no protection from the enormous expectations of providing answers to problems, given that issues such as massive unemployment, the erosion of the social security system or the intensification of ecological risks cannot be overcome without implementing social innovation. And in light of the current and extensive financial and economic crisis, it is becoming increasingly clear that social innovations, as they relate to extensive change in both the leading cultures that influence behaviour and the social practices in the economy and consumption, determine *"in what sort of world the next generation of the citizens of free societies will be living"* (Dahrendorf, 2009).

As a summarization, there is the theory of Kadeřábková (2007), who claims that social innovations are new tools, ideas, projects, products, services, institutions or ways of working that improve or fundamentally address the needs of society more effectively than existing traditional solutions. Social innovation may relate to education, social integration of excluded or disadvantaged groups, community development, and cost savings for citizens and the like. Social innovation is therefore a new innovative approach that responds to the challenges and approaches of local people.

The largest and most well-developed category of social innovation research focuses on innovation that addresses various dimensions of changes in social relations. Mumford (2002) summarized this research as exploring a continuum of activities from – at one extreme - the founding of new social institutions, innovating existing public institutions, or forming new social movements to – at the other – more modest action that aims to create new processes of collaborative or flexible work or instigate new organization practices.

In contrast to the stream of research that conceptualizes social innovation as change in social relations, a more recent and less well-developed strand of research focuses on social innovation as the answer to social market failures. This perspective is supported by the OECD (2011). This approach relates to the outcome-driven model of social innovation and focuses on innovation as the means by which new products and services can be provided to underserved market segments. At the macro level this includes the mechanisms by which new markets are created in weak institutional spaces or to address market failures. The latter is conceived of as not only encompassing failures in commercial markets, but also in public

sector “markets”, where the state fails to provide public goods, and the civil society “markets”, where charities, not-for-profits and non-governmental organizations fail to provide effective goods and services to their beneficiaries. Such failures typically provide innovation opportunities, but can also provide challenges in terms of reconciling potentially competing institutional logics and legitimacies.

As already pointed out, social innovation as a new and yet unsettled concept does not offer a generally accepted definition. Such a definition is not even possible to formulate, because it is necessary to adapt it to the business, application context and development of knowledge over time. For basic orientation there are two types of approaches to the definition of social innovations that can be distinguished by a focus on the dimension of output (goals) and the characteristics of the innovation process. The first aspect aims to clarify the nature of the concept of social innovation in relation to social change. A closely related concept is the development paradigm of traditional (economic) innovation. The second perspective focuses on the description of application-specific characteristics and methods of implementation of social innovation. In both approaches, however, their differences should be seen rather as complementary. Terms of outputs and the process of social innovation cycle concept combine flexibility and adaptability (Mulgan, 2012).

Social innovation isn't neutral, but always politically and socially constructed. Nicholls and Mulgan identify three levels of social innovations. Firstly, there is incremental innovation in goods and services to address social need more effectively or efficiently. This is the objective of many successful charities and not-for-profits. Secondly, there is institutional innovation that aims to harness or retool existing social and economic structures to generate new social value and outcomes. This level of social innovation is often (but not always) driven by experts repositioning new technology or intellectual capital to social rather than purely economic ends. However, while social in focus, such innovation should not be divorced from economic issues: indeed, institutional innovation is often a response to problematic patterns of economic change across sectors or societies (Hämäläinen and Heiskala, 2007). Finally, disruptive social innovation aims squarely at system changes from the beginning. This is the realm of social movements and self-consciously “political” actors, groups, and networks aiming to change power-relations, alter social hierarchies, and reframe issues to the benefit of otherwise disenfranchised groups.. Disruptive social innovation can be characterized by structured mass-participation in political parties or formal membership schemes of social movements on the one hand, or loose coalitions of individuals and interests united by an evanescent issue of technology, such as social media, on the other.

Another set of problematic issues for social innovation concerns the societal legitimacy of all innovations in their institutional contexts - the so-called liability of newness (Stinchcombe, 1987). From a neoinstitutionalist perspective, all sectoral or organizational change is constrained by existing social norms as the status quo attempts to maintain stasis by means of various processes of isomorphism (DiMaggio and Powell, 1983). In this context, innovation is a problem at the organizational level, as it undermines perceptions of legitimacy at normative, pragmatic, and cognitive levels with potentially fatal consequences in terms of resource acquisition and retention. (Suchman, 1995)

## **Materials and methods**

The town Blansko belongs to the most important settlement area of the northern part of the Southern Moravian region and it is the economic center of the region with a long industrial tradition, as well as the gateway to the popular tourist destination Moravian Karst and its environs. Since 2003, the town has become a municipality with extended powers over an administrative district covering about 56,000 inhabitants and 42 other towns and villages aside from Blansko. It is located about 30 km north of Brno.

Information about economic subjects in the municipality was gathered from the Czech Statistical Office, from the Trade Licensing Office in Blansko and also from the Strategic Development Plan of the Municipality 2013-2023. The main part of the survey is quantitative

research that assesses the utilisation of social innovations in small and medium enterprises. It encompasses the utilisation of social innovations and also questions in which ways these innovations are used.. The goal of the research is to assess ways small and medium enterprises in Blansko utilise social innovations. The subjects of the research are autonomous small and medium enterprises with the place of business in Blansko.

79 questionnaires were distributed among the remainder. The number of returned questionnaires was forty four (56 %), which is also the final number of our respondents and size of the sample.

According to Řezanková (2010), it is necessary to separate the analysis of individual variables and the analysis of dependencies. The basic types of analysis include identifying the frequency distribution of different variants of the reference values for each character, and the calculation of aggregate characteristics. For the hypotheses testing was used the Chi-square test.

Hypothesis H0: The frequency of successfully implemented activities related to the creativity of employees does not differ within particular types of innovations.

Hypothesis H1: The frequency of successfully implemented activities related to the creativity of employees differs within particular types of innovations.

## **Results and discussion**

On the basis of the results obtained we counted how many small and medium enterprises utilise social innovations. These values are always related to the total number of respondents and one enterprise can utilise social innovation at the same time as technological innovation, and for this reason the sum of the results is not 100 %. If we look at the structure of the utilisation of social innovations, we can see a prevailing position of technological innovations over social within both types of enterprises. Concretely 83 % of respondents from medium enterprises and 65 % of small enterprises utilise technological innovations. This result could be caused by the missing definition of social innovations in the Czech Republic and thus social innovations aren't recognised. As the European Union has announced that in the future there will be more funds and financial resources spent on the development of social (as well as technological) innovation, we can assume that social innovations will develop further and will help municipalities solve upcoming social problems and disparities. Nevertheless, 46 % of small enterprises and 50 % of medium enterprises utilise social innovations.

Next we focused on the structure of the innovations within innovative enterprises. We divided innovative enterprises of each type into five groups: enterprises utilising only process innovations; only product innovations; only social innovations and enterprises utilising both product and process, but not social innovation. The last group consists of enterprises utilising all of the surveyed innovations (product, process and social). Small innovative enterprises most often utilise process innovation and product innovation or both together. Only 13 % of small innovative enterprises utilise social innovation and all three types of innovations are utilised by 9 % of them. Looking at medium-sized innovative firms, we can see that the most utilised innovations within enterprises are product and process innovations together with 31 %. The two second largest groups utilised by medium innovative enterprises, both with 23 %, are product and process innovations. 15% of innovative medium enterprises have utilised both technological (product and process) and social innovations in the past 3 years. Only 8 % of medium innovative enterprises utilise solely social innovations.

46 % of small enterprises and 50 % of medium enterprises utilise social innovations. In absolute numbers this is 14 small enterprises and 6 medium enterprises. According to small and medium enterprises, their social innovations contribute mostly to the social development of the community in the town of Blansko, followed by education, cost savings for the inhabitants in Blansko, and lastly the social integration of socially excluded or socially disadvantaged people.

Currently, in the transition to a post-industrial industrial society, there is a significant polarization and growth of regional disparities. This is leading to the transformation of existing social structures and ways of working, causing the decline of traditional sectors of the economy and traditional professions. The processes of globalization reduce the possibility of public administration to regulate processes in the region. This has increased pressure on the management of municipalities in planning the future development of the region and its sustainability. It is necessary to strengthen the institutional capacity and efficiency of territorial public administration and public services, to take into account the social conditions, focusing on communication with the public, work with external firms and raising awareness of the opportunities to participate in the development of the social sphere.

In last ten years the population of Blansko has grown by 3 %. The population growth is caused primarily by a long-term positive migration balance, and after 2006 also by a positive natural increase of inhabitants. The rate of net migration in Blansko is 531 individuals. Age distribution of the region over the last ten years has changed with regards to the aging population, with an especially significant population decline in pre (-1.8%) and productive age (-0.2%), while a growing part of the population is in post-productive age (2%). According to the current situation and prognoses, there is a need for an increase in social services and to involve external enterprises in solving social issues together with the municipality office. There are a lot of socially excluded people or people somehow disabled with the limited opportunity to work. Mongolians and other minorities living in Blansko and not capable of finding a job because of the prejudice of its inhabitants present another issue.

Social care in Blansko includes a home for the elderly, an asylum for mothers with children, protected living, a day-care centre, a low-threshold treatment centre for children and youth, 2 social counsellors, 2 nursing homes, and a dormitory for men.

After calculating the expected values and Chi-square test according to the formula defined in the methodology the resulting value is 0,46. We decided to use a 5% level of significance, which means that a relatively low chance is being given that the alternative hypothesis will be verified. The statistical table revealed the critical value  $\chi^2_{0.05}(2) = 5,99$ . For the refusal of the null hypothesis the value of the Chi-squared has to be higher than the critical value. There isn't a statistically significant relation between the type of innovations utilised and the successfully implemented employees' activities within small and medium enterprises.

This analysis can be also supported by the theory of Nicholls and Murdock (2012) that traditionally, the private market has been seen as the primary source of innovation. This is because it has the structures, mechanisms, and incentives that drive innovation. In Joseph Schumpeter's formulation, it has the power of 'creative destruction', destroying the old in order to pave the way for the new. Neither the state nor the grant economies have the structure or incentive to innovate in this way. The household, on the other hand – the most distributed of economic systems – generates ideas but on its own lacks the capital, surplus time, and organizational capacity to develop them.

## **Conclusions:**

Education and cultural development are dependent on economic and social situation of a family. This principle generates social inequality, e.g. reproduction of power relations and unequal appropriation and transfer of cultural heritage in cultural sphere. For the purpose of dynamic development of society, cultural capital is an important factor of achieving economic, social and stabilized political development.

Perspectives of the development of society depend on the standard of education, richness of material life, opportunity for social equality, tendency to reduce the amount of the lowest social groups and their shift towards middle classes (theory of middle class society) and other phenomena associated with social and cultural life of society. All processes that shape the development of the perspectives of society are connected with industrialization and urbanization, the relationship between town and countryside. These processes are the basis

for spatial inequalities that play an important role even in industrial and post-industrial societies. The knowledge of causes of spatial inequalities of social development is the basis for solving economic, social, cultural and political problems of social reality. Spatial social inequalities separate not only individual states but also individual regions of these states into areas of perspective and desired social development and problematic areas. These processes have its historic origin without which some of the consequences of today's development cannot be explained. According Hübellová (2013) or Kováčik et al. (2012), more educated and healthier population is more productive and able to be fine, for instance, with population to ageing or social and political risks.

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# Implementation of cloud computing into the dairy enterprise in Slovakia

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## Abstract

Information technology is part of everyday life of almost all business units not only in the dairy industry in Slovakia. Today the situation is difficult and the future of the dairy industry in our country is unclear. Therefore the managements of dairy farms extend to streamline business processes in organizations through cost reductions especially in the field of IT. Cloud computing is a new term in information technology used both in information systems, as well as in information and communication technology services through the Internet. In the modern times it represents an important developing tendency in this field. It is a model of supplying the ICT services that are accessible via the Internet. In a metaphoric sense the cloud computing and its wide range of services becomes partly mobile corporate office, when we are able without significant obstacles immediately answer to the progress in the company and manage most processes only through a computer or mobile phone with an internet connection. Nowadays it is essential for the management of the company to follow the development of modern information technology in order to avoid unnecessary financial losses caused by the obsolescence of the hardware components that are increasingly difficult to operate, especially maintenance, while their performance is decreasing and are losing value. Over time, penetrate new trends in virtualization solutions to streamline and improve the quality of work with a wide scope of IT users in small, medium, but especially in large enterprises. A lot of managers in companies solve problems relating to issues of transition from the prior IT infrastructure solutions to cloud computing, either the entire IT infrastructure, or only parts of it. The article deals with the transition from classical IT infrastructure in a dairy enterprise to a virtual platform - cloud computing. The main aim is to identify the necessary issues related to gradual transition to a virtual solution. For this reason, was developed a practical proposal of transition from an existing IT infrastructure to a virtual platform which has proved to be more cost-effective and more economical version in the enterprise using the means of information technology nowadays. When preparing the transition in the enterprise from the previous equipment of IT for smarter, financially less costly and more effective resolution we used a personal interview with personnel responsible for the management and operation of IT in a medium-sized company with 63 employees. After comparing the current state of IT equipment in the company with a new proposal were elaborated practical proposals for the progressive implementation of cloud computing solution for the enterprise. Finally, there is shown a model example how it could work with a new cloud platform in the enterprise which is engaged in processing milk. This proposal just represents only a proposal for improving the IT resources. Therefore, the management of the company could choose a modern and efficient way.

## Keywords:

Information technologies, cloud computing, dairy industry, virtualization, IT infrastructure

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## Introduction

Cloud Computing is a model of IT services, enabling ubiquitous, convenient, respectively available on request in the network access to shared areas dynamically configurable computing resources (such as networks, servers, storages, applications and services) that can be rapidly deployed and released with minimal demands of their management or interaction with the provider of this service (Kováč, 2010).<sup>2</sup>

Companies invest about 70% of the IT budget in maintaining the existing systems and only 30% in the purchase of new technologies. It follows that even with constant budget, operational costs are still rising. Although the companies extraordinary upgrade its IT, their costs of operation continue to rise. Afterwards that the companies reduced their costs, it is necessary to change the approach to IT. Cloud computing represents a new concept of IT management resources accessed by the end user, and uses them as a service. Under IT means we understand enterprise applications, software platform or hardware infrastructure. To the user experience also contributes also the fact that the end user accesses to these resources through a web browser. The benefits of cloud computing:

- user pays only for the amount of resources which actually uses,
- services in the cloud computing are precisely measurable,
- user uses cloud services as needed, without the need of interaction with a service supplier,
- resources can be shared regardless of the location and the needs of service user.

Cloud computing allows dynamically adapt to the required load - scalability of processing power based on required current needs (Kohl, 2010).<sup>3</sup>

Actually, cloud computing makes people more productive, that can be done in an innovative way. The initial fixed costs are very low. In the traditional model of IT the money is spending for having fixed the system a lot of financial resources. Small and medium enterprises are now at a huge disadvantage. The most important thing about cloud computing is its elasticity. It does not matter whether you need thousands of servers for a minute or one server to one thousand hours, it is the same. This gives to small companies an enormous advantage (Muehlfeit, 2010).<sup>4</sup>

Experts consider that the cloud computing could be a great asset for the company during the recession. Some current definitions consider cloud computing as a form of outsourcing. Cloud computing enables the delivery of personal and business services from remote, centralized servers (called "cloud" - or cloud computing). Into the communication with the customer includes a variety of specialized equipment and represents a step forward in the use of computing resources - allows access to gigant computing power and to the analyze of very large volumes of data and to applications (Púchlo, 2009).<sup>5</sup>

## Material and methods:

When processing the proposal for a transition from classical solution of IT infrastructure to the cloud platform, we took from a personal interview with the head of IT department in the company, which is engaged in processing of raw cow's milk and dairy products. The interview was conducted in several phases. First, were submitted to the employee questions

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<sup>2</sup> Kováč, J. (2010). *CLOUD seriál: terminológia - časť prvá*. Retrieved September 10, 2014, from <http://www.virtualizuj.sk/cl/4/155/cloud-serial-terminologia-cast-prva?page=1>

<sup>3</sup> Kohl, B. (2010). *Čo umožňuje cloud computing?* Retrieved September 10, 2014, from <http://www.itnews.sk/2010-02-15/c131922-iw-co-umoznuje-cloud-computing>

<sup>4</sup> Muehlfeit, J. (2010). *Cloud computing prináša technologickú revolúciu*. Retrieved September 10, 2014, from <http://www.euractiv.sk/informacna-spolocnost/interview/cloud-computing-prinasa-technologicku-revoluciu-016267>

<sup>5</sup> Púchlo, J. (2009). *Cloud computing*. Retrieved September 10, 2014, from <http://www.instore.sk/news/cloud-computing>

related with using of information technologies in the enterprise. On the basis of the instructions the employee developed over a period of two months an overview of the current IT solutions. These documents were used to compare the existing infrastructure and new, less expensive and more economically efficient. After the comparison, was evaluated the whole benefit of implementation of the cloud platform in the enterprise and its potential impact on reducing operating costs in IT.

### **Results and discussion:**

Dairy industry belongs in Slovakia to the most stable long-term producing sectors in the agro-food complex. The actual production and processing of milk belongs among the one of the most important activities of the national economy of almost every country. Milk production has a great importance, especially from an economic perspective. Besides the fact that in the dairy is employed a part of the population, the milk production also benefits the health of the inhabitants of the country. We can positive evaluate also the fact that milk and milk products are competitive in the markets not only in the European Union. This positive trend is to be further developed, mainly by enhancing relations between producers and processors, and not least in the actual milk production in the country. As long as the entire dairy industry in Slovakia is competitive compared with other countries, we can continue to count on its active contribution in the development of country's total GDP. Slovak dairy industry in the last decade has undergone various changes. In the year 2004, the Slovak Republic joined the European Union and from this moment we started to apply different measures and regulations from Brussels and this did not avoid nor our dairy. Each year is determined the maximum allowance of milk quotas, which should not be exceeded at the national level, because after crossing Slovakia is threatened of sanctions from the European Union. The development in this sector of the economy has some indicators that are declined. This is particularly the decreasing number of holders of milk quotas, which are for a period of six years and this number decreased to almost a fifth. Then there is the annual decrease in the number of dairy cows and the associated decline in milk production. Every year in our country decreases the consumption of milk and milk products per capita per year. The positive indicator can be considered a higher annual milk yield per cow, which is due to technological advances and advanced technologies in the production and processing of animal products. This fact, however, transferred to the indicator of total costs per one liter of produced milk. Based on the mentioned facts, we can expect a further decline in this sector of the economy of the country. The basis of every production process is to some extent work with information. Information is the foundation of all production processes of our time, and without it is hard to move forward. The application of information technology is becoming the key issue in many enterprises management and is bringing a new efficient and flexible solution. The main economic benefit after the construction of information network in the enterprise is increasing the efficiency of all departments. Computers have replaced human labor and greatly streamlined the work and decision making managers. Their role is to provide information to employees and ensuring a flexible response to rapidly changing market conditions. Moreover, the information technologies in company are also involved in reducing not only the overall wage, but also the production costs. In some cases, the automation of production is involved in the portion concerned with reducing production costs. Of course there should be a presumption of highly skilled managers who come into the contact with computers within the organization. Therefore, managers need to keep up with the period and constantly monitor the development in the field of information technology, because today without a modern means for automating manufacturing processes will not move forward. This fact is especially important for creating enterprise information strategy. Without a built an information system and basic information strategy the enterprises should be hardly competitive with other companies of the same focus. As the development in the field of computer technology is advancing day by day and the establishment of an information network, managers should not forget to the regular investment in innovation not only into

the hardware but also into the software equipment of the enterprise because they lose steps with the competition, which follows this development and is regularly updating its computer base. Enough of information that is available to the manager is not enough for good management. To do this it is necessary to adopt good methods, approaches and powerful means for processing information for the preparation of strategic decisions that will ultimately benefit the entire organization. From this reason should everyone qualified manager actively educate all aspects that contribute to the qualification not only of their professional growth, but also that the overall benefit to the organization, which is part of the executive management. The positive benefits of virtualization for IT perceive today as undisputed. Consolidation of infrastructure by the centralization and virtualization is now a standard transformation tool for IT managers for reducing an overall IT costs and shorten time return on investment in them, and thus the costs of doing business as such. Improving IT resource utilization simultaneously with the simplification and streamlining their administration brings increased IT flexibility, agility and competitiveness of business. At the same time brings the basic conditions for a change of IT from the data center operator to organic component of the company, which flexibly provides complex IT services on demand. Nowadays it is essential for the management of the company to follow the development of modern information technology in order to avoid unnecessary financial losses caused by the obsolescence of the hardware components that are increasingly difficult to operate, especially maintenance, while their performance is decreasing and are losing value. Over time, penetrate new trends in virtualization solutions to streamline and improve the quality of work with a wide scope of IT users in small, medium, but especially in large enterprises. A lot of managers in companies solve problems relating to issues of transition from the prior IT infrastructure solutions to cloud computing, either the entire IT infrastructure, or only parts of it. Virtualization brings many advantages that were previously in practice in general unknown and unused. Cloud computing is not a hardware or software product, but is a model of delivery of ICT resources, respectively a model of providing ICT services through the Internet. Individual services are normally available through a typical web browser or by special client applications. Companies that use cloud computing are consuming ICT as a service and in that case only pay for the resources they actually use. Cloud computing in an organization can be accomplished in two ways:

- External cloud - when an organization uses an external cloud provider and pay only for the services, but does not have a direct control over the infrastructure.
- Internal cloud - where the organization has its own ICT infrastructure configured into the cloud form and pays all of its investment in ICT, but retains direct control over the infrastructure.

The advantage of an external cloud are the minimum costs of investment in ICT, the customer pays only for the operation of services that orders. On the contrary an advantage of an internal cloud is optimization of the utilization of ICT infrastructure, the ability of scaling a performance and resistance to failure, so there comes to the optimization of investment in ICT and to increasing the security of ICT services.

- Lower investment costs - it is not necessary to buy, own and maintain own hardware or software, it is only necessary to create the basic infrastructure and adequate connectivity to the Internet. Investment costs are thus transferred to the operating costs, which represent periodic payments for using of the service.
- Lower labor costs for ICT workers - in this case it is not necessary to employ a large number of different ICT specialists, is generally sufficient a small and efficient ICT department, or we can consider the outsourcing.
- Independence of the place, time and platform - cloud computing services can usually be used anywhere at any time, but the condition is a connectivity to the Internet. In contrast, it should be noted also the possible lack of drawbacks, to which belong the following areas:

- The data is physically stored at service providers - making it not under the direct control of customers/users. Today, data security is on a very high level in the leading providers, often much higher, that we should achieve by our own means.
- Considerable dependence on the service provider and its solution - used software and hardware solution is given by the provider and usually cannot be influenced.

But it is important to mention that the change of the provider of services can be very complicated and costly. The transition from the classical model of the operation of IS/IT to cloud computing - this is a fairly difficult process, which may include replacement, modification or creation of the necessary applications as well as data migration from existing systems. Technically, this can be quite a complicated task. In increasing of work efficiency and contributing to lowering the costs in enterprise, managers have to solve various difficult tasks, which they regularly meet in their work. Therefore, it is essential that in the enterprises have a fixed place IT departments that will solve a difficult problems related to operation of the entire organizational unit. As the organization has created its own IT department, where work trained managers it facilitates the work of other employees at a lower level. This is connected with the fact that modern businesses should have a well thought out and built an information strategy in order to more easily focus nowadays on the market. Based on the previous findings, there is a presumption that the ICT using in the industry is at an advanced level. According to the actual statistics there are in 2014 in Slovakia about 500 dairy farmers. Currently, enterprises not only in the dairy enterprise solve the future development of the economic situation, and it is the place to ask the question of where we can save even a small amount of the financial means. IT sector in modern times is certainly a necessary part of the operation of each of the developed entrepreneurial entity. In the past, this area began to develop very rapidly and now at least one personal computer is part of just any business organization. The benefits of IT are indispensable to, but also this element of enterprise has its negatives, which are extensively signed at great costs to the company. Therefore, the development companies constantly improve and streamlining the functioning of the entire IT segment. Modern technologies bring with them often multiple accelerate and streamline business processes within the organization. First, it is the benefit for the organization, but on the other side, information technologies are reflected in the operating costs. Therefore, in the present is placing importance on reducing costs related to IT operations. One of the other modern form of reducing operating costs in addition to IT outsourcing is also cloud computing. This form of IT solution in the enterprise represents a so-called virtualization of processes and the elimination of unnecessary externalities such as servers, desktop computers, a variety of software and many other benefits. Just have a little economical terminal, internet access and all operations can be easily solved in this way comfortably and can contribute to the long-term cost reductions in the company. Cloud computing is not yet very often used in enterprises or dairy industry, but not in the various enterprises in Slovakia. But we can find some businesses, in which is a normal part of business processes virtualization. This form of IT solution represents in modern times a very effective way of saving the costs connected with the IT operation. It is therefore at the consideration of company management or at IT manager, whether in the future, is not needed to move into the new, unconventional forms of IT solution in the organization. In modern times it is almost the need to use resources of information technology in the daily activities in the company. These financial means represent the effective management of time and allow workers to streamline their operations. Communication technologies find its stable place not only in contemporary society, but especially also in the management and current general processes in the company. Trusted companies offer cloud-based solutions and are concerned primarily about business processes and customer companies then the information infrastructure, of course, with regard to safety. Before starting the transition to cloud computing must IT managers who are responsible for managing of computers in an enterprise to solve a number of issues, of which the most important can be formulated as follows:

- How to realize a transformation - to reduce the cost of operating IT infrastructure, in order to increase the efficiency of the IT infrastructure, or both?
- Which processes need to be migrated? As for how to keep the standard of these processes and increase the homogeneity of both processes, but also the entire infrastructure?
- How will be realized the monitoring of costs after the implementation of cloud services?
- How will change the management decisions? How the company will exhibit a consumption (what and when was consumed, how will developed the consumption in the future)?

### **Analysis of the current state**

For an enterprise that is thinking about the transition to cloud computing, this is the most important phase and consists of the following components:

- Mapping of existing business processes – it should be defined what processes are running in the enterprise, and determine their gravity.
- Evaluation of maturity of business processes. After mapping processes it is needed to be assessed according to the corporate strategy (which processes are strategic for the company in the future). The transition to cloud computing is facilitated or hindered by how advanced the IT processes are.
- Identifying a potential for cloud. Potential for cloud means to define processes and applications suitable or unsuitable for cloud. First should carry out the survey strategy: what IT strategy the company has. This requires interviews with senior management, not only with the head of IT department. The result should be an identification of internal and external options. By internal options can be meant what a company must change internally to achieve greater efficiency. External options: what could be improved externally, for example: improving marketing, establish cooperation with new partners, improving cooperation with existing partners or customers. Another part in identifying is the evaluation of potential processes. After mapping the processes is necessary to be assessed whether any of them have the tip of process. Next, it must determine which of these processes are critical, which differentiate the company from the competition and which are not, which are smooth and can be simplified without much risk. The result of the identification of processes suitable or unsuitable for the transition to the cloud is the development of the table opportunities, which forms the basis for the procedure in the transition to cloud computing.

### **Transformation**

The first condition to transformation is virtualization of IT infrastructure. After virtualization the infrastructure, whether in the private or public cloud, accedes adapting applications and processes for the use of cloud model. At present, experts agree that the ideal is a hybrid cloud. This means that critical applications and processes that differentiate the company from competitors are recommended leave the private cloud and what the company is no different, which is shared between different departments within the company, can be moved to the public cloud. So phase of the transformation can be divided into smaller-scale activity:

- existing virtualization infrastructure - implementation of IaaS,
- transfer of non-critical applications to the cloud, for example applications that are shared between different departments, and are therefore low risk - an example is the mail service, office suites, etc.,
- transfer of back-office applications, for example applications that are also not critical to the cloud,

- transfer of critical applications to the cloud, for example applications that are crucial for the company. Modernization of key applications and offering new products and services are for the company a priority number 1 and the target of the transition to cloud.

### **Using the cloud services on demand, therefore, as necessary**

In this phase it is necessary to ensure a firm guarantees the security of use of cloud services and its handling. Elaboration of an analysis of the current state and further explanation of the procedure, the company should acquire knowledge, should have a documented way of transition to the cloud and should know which way to go. Quality evaluation should include also recommendations alongside risks and the financial benefits. Among these factors should occur a balance and simultaneously the evaluation should be consistent with the strategy of the company. On the basis of these documents the company management should clearly understand the opportunities that the transition to cloud computing offers. At the same time it is necessary to consider the costs and problems associated with the transition to cloud computing, possibly also in connection with a subsequent change in service provider. In accordance with the above categories of ICT innovations, the customer can reduce the costs and increase the operational excellence. As for the virtualization in this sector, enterprises have not yet worked out to the solution cloud computing because this is a way to actively participate in reducing costs and contributing to the continuous improvement of economic performance in the organization. Cost saved in the operation of IT can then be moved to other areas in the company. From this reason was elaborated a practical proposal of transition from the existing IT infrastructure to a virtual platform which has proved to be more cost-effective and economical variant in the enterprise in the means of the information technology nowadays.

This proposal was suggested for medium-sized company which could effectively operate on the optimal composition in terms of hardware components, and to allow a less financial burden. This solution consist from the following components:

- 20 x thin client ZOTAC ZBOX SD-ID14 Barebone with 20" LCD monitor, keyboard and mouse,
- 20 x VoIP telephone CISCO SPA301-G2,
- black and white laser printer Samsung SL-M2022 or other similar printer,
- ADSL router Tenda W150D with integrated 4-port switch LAN, 802.11g/n wireless, or other according to the type of WAN connection.

Software equipment consist from the components:

- operational system Ubuntu Linux as a working environment for users,
- office suiet OpenOffice,
- internet browser Google Chrome,
- VoIP central office Asterisk,
- Print server CUPS,
- another applications that are a part of OS Ubuntu, or other according to customer wishes, compatible with the used OS.

The price of the solution does not include items of cabling and a connection to the Internet. Price of this solution is € 4,200 plus a monthly fee of € 250, which includes the operation and management of virtual servers, providing remote desktop for the thin clients, office applications, digital VoIP PBX service and print server. In a case of using Windows for the environment of the thin clients is the monthly flat fee of € 350. To this amount must be added the charge for implementation, necessary training of personnel, means for the operation and maintenance of the system. From the first year we have to count in the new solution the

costs of depreciation. After counting all the costs elements we get in the first year when the company passed to a virtual platform of IT solution resulting volume of funds in the amount of € 10,045. In the next three years will be counted into the costs depreciation, annual license fees for the operation and maintenance of established solutions. Financial means for the purchase, implementation and training of employees will be no longer representing a cost items. The mentioned facts are shown in the table 1.

**Tab. 1 Costs of implementation and operation of virtual solution**

Costs	2014	2015	2016	2017
Purchase of HW+SW (€)	4,200	-	-	-
Depreciation (€)	1,050	1,050	1,050	1,050
Implementation (€)	480	-	-	-
Training (€)	920	-	-	-
Licensing fees (€)	3,000	3,000	3,000	3,000
Operation of system (€)	185	185	185	185
Maintenance of system (€)	210	210	210	210
<b>Total costs (€)</b>	<b>10,045</b>	<b>4,445</b>	<b>4,445</b>	<b>4,445</b>

Source: internal data of the company, own processing

After calculating the individual items of current and proposed solution for particular years, we found out that in the first year of implementation would be more costly the current solution about € 2,765 per calendar year. Second year of implementation would lead to cost savings for the operation of IT in a value of € 2,835 per year. Approximately the same amount of funds would be saved in the third and fourth year after the introduction of a virtual platform to the enterprise. As it is shown in the table 2 after counting the positive difference in the second and fourth year ( $3 * € 2,835 = € 8,505$ ) and after subtracting the negative difference (€ 2,765) in the first year, divided for all four years would be an average annual cost savings of nearly € 1,435 ( $€ 5,740/4 = € 1,435$ ).

**Tab. 2 Overview of the difference between the original and the new solution of IT**

**resources in the enterprise**

	2014	2015	2016	2017
Current IT solution (€)	7,280	7,280	7,280	7,280
New solution (€)	10,045	4,445	4,445	4,445
<b>Difference (€)</b>	<b>-2,765</b>	<b>+2,835</b>	<b>+2,835</b>	<b>+2,835</b>

Source: internal data of the company, own processing

In an effort to keep up with the times and thus reducing costs associated with the operation of IT, managers in enterprises are seeking to ensure the best using of these means and are looking for ways to handle this process as best as possible. Therefore, more and more of them are moving towards alternative forms of resolving the question of hardware, but also software

equipment business. Ultimately, it is necessary that organizations in the Slovak dairy industry should pass continuously on new technological solutions in the field of IT and actively participate in the effective management of the enterprises. An important part of the management of the organization is to keep up with modern times and adapt to the demands of a market situation. In that case will be ensured that the efficiency and labor productivity would be at least constant or higher, and thus contributing to the important issue of reducing costs and improving economic results of the dairy industry in Slovakia.

### **Conclusions:**

In times of crisis, when businesses have to deal with issues of survival, it is important that management should pay attention to the maintenance of profit through cost reduction. These problems are also related to the Slovak dairy enterprises. To reduce operating costs may also participates a computing technology, which is now an essential part of any functioning enterprise. One of the possibilities how to influence the results of operations in computing is cloud computing, which has become a tool for effective management of costs associated with the operation of information technology. Formerly used hardware was today replaced by the virtual servers on which the amount of stored data and thus were reduced the demands on the technical requirements of hardware equipment in the enterprise. Cloud computing is able under certain conditions create a space-saving for information technology costs and the financial means saved can be relocated to other areas in the company or used for improving the overall economic results of the organization. When the prior examining of using the cloud computing in the Slovak dairy industry, we found out that the virtual solution of information technology is at very poor level and is not so developed. Therefore, we attempted to model the specific example of dairy farm in Slovakia a transition from the classical using of information technology resources to the new platform based on virtualization - cloud computing. After evaluation and recalculation of all parameters, we concluded that under optimal conditions the solution of information technology through cloud computing is less costly and also contributes to the efficiency of labor activities of employees, because it is more powerful than the traditional IT solution of hardware. The transition to cloud computing is very important to compare the advantages and disadvantages of both solutions of compared computing technology in the enterprise, because not always have to come to the desired effect of the implementation of new information technologies. This is especially the human factor when veteran employees do not have to get used to working in a new computer environment. Therefore, it is at the consideration of the responsible person in the company to decide whether to go this way of reducing the costs of information technology or remain on the established way of carrying out work activities.

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# Adams' theory on equity between costs and benefits

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## Abstract

Project team is a company's organizational body consisting of individual members but according to results of work it is evaluated as a homogeneous complex. For the reason that project team consists of the individuals of various performance, different qualification, abilities, skills and experience, it is and will be a matter of a leader of project team to identify qualities of members and to be able to motivate them to complete the assigned tasks.

The contribution brings results of the research which aims to identify the feeling from deposits that are put into the fulfilment of given tasks by the workers with the intention what they acquired for the job from the company. The results of the research show that workers deposit their time, effort, loyalty, tolerance, flexibility, involvement and credibility. In return they gain financial reward, assurance of labor-law relations, credit, acknowledgement, responsibility and possibility of growth and development. It was found out that if expended effort is not balanced by the financial and moral reward, workers become unmotivated in the research. They are looking for change by leaving to another office or by reduction in work effort expended. If workers are convinced the deposits expended are appropriate to gained rewards, they express their attitudes to company positively. By that they contribute to improvement of its know-how. A part of paper is presented as an essay about the communication between managers and project team members as an essential factor of mutual understanding and opinion clarification.

The survey of employees' opinions on their satisfaction with work was done by Sodexo Benefitly, Inc., Prague, in 525 respondents from all regions of the Czech Republic.

## Keywords

Adams' equity theory, opinion survey, evaluation criteria, project team performance, executive positions

## Introduction

Adams' equity theory, sometimes referred to as theory on equity and justice, is one of theories of behaviourism. It is a motivation theory, focused on the significance of financial award of employee's work effort and social comparison of employees in a work group. Nakonečný M. uses a term Theory on equity between costs and benefits. By costs (outcomes) we understand decrease of financial means expended by an employee in relation to work effort and regeneration of physical and mental strengths. By benefits we understand the reward of work effort by employer. Prof. Žák M. et al, in Velká ekonomická encyklopedie, p. 556, (1999), defines work performance as "amount of work of an individual or a group in a period of time. The performance is determined by technical-organizational conditions in which the work is done, and personal prerequisites of workers." It has to be noticed that the carrier of work power is a man having ambivalent position in reproductive process. On one hand, he is a producer, on the other, he is a consumer.

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In these relations man is not an isolated part of human society. He enters various relationships among individuals. He is a part of human society. We can say that a man is a social creature. In order to produce, he needs a variety of tools, or machines that has to be constantly improved. Man is a technical creature. Despite all the features, above all, he is a personality, endowed with various volatile characteristics. One of them is the ability to work. "Work is a group of intellectual and moral activities of a man, for which he is awarded," C.D. Echaudemaison wrote in Dictionary of economics and social sciences, p. 245, (1995). "It is interesting that the most valuable economical source, work, cannot be changed into a commodity that can be purchased and sold as a private property. You have no freedom to sell yourself, you have to get hired for a wage." is stated in a textbook Economics, p. 51, (1991) by Paul A. Samuelson and William D. Nordhaus. The ability to work, i.e. fulfil a certain, in advanced assigned task, is a characteristics of will. With this in mind must we approach a man, a carrier of work force, every time we assign him a task, taking into account the quality of the work done or service provided.

### **Theory on equity**

Theory on equity between costs and benefits investigates behaviour and activity of a worker during working process in two ways. The first one is based on the fact that a worker compares the work performance and effort made to fulfil the task with the benefits he gained. He mostly compares the wage level paid by employer. According to economic situation of employer, the gained benefits are considerable motivating factors of appraising the initiative and effort made in order to fulfil the work task. Here the employers' opinions differ. One group assert higher portion of basic wage and smaller portion of motivation component. Others are of opinion that it is more effective for workers' motivation to pay lower basic wage and higher portion of flexible component. According to them, this results in higher material interest of employees. These opinions have to be proven. However, the fact is that if a worker is convinced that the costs correspond with his wage, then he speaks about his employer in a positive way, uses working hours in a sensible way and follow the rules of safe work place. Job stability is also a considerable motivation factor. If a worker fulfils the qualification conditions, shows initiative and responsibility at work, he is then given higher responsibility, or even promoted.

If a worker thinks that expended costs, i.e. time, energy and effort, is not adequately financially appreciated, he is dissatisfied. Whenever asked about his job satisfaction, the worker speaks about his employer in a negative way. He is trying to solve the situation in several ways. He may ask to change his working regime, to be shifted to higher tariff scale, gain employee benefits, and other. In case he does not at least partially succeed, he proceeds to a radical solution. This is backwardness when fulfilling his duties, absence, higher illness rate. A completely radical decision is severance of the labour relation. Decreased performance caused by a worker has to be replaced by other workers' performance. In case this is not fully possible, the deadlines are extended, usually with economic impacts. Unless the worker finds a new job in the given time period, he becomes unemployed with all the consequences for himself as well as for society.

The worker does not evaluate only his own work performance and his benefits. He compares his work performance with others in the work group and compares also financial rewards. The result is a subjective impression of equity, or inequity. When convinced that the financial reward does not correspond with the reward of his colleague gained under the same conditions, the worker is disappointed. This will also result in negative relationships in the work group.

## **Balance theory**

From economical point of view Equity theory is a balance theory. The main principle of the theory is that one side of equation must be equal to the other side. For work activity, on one side there is work performance or service provided, on the other side there is worker's energy needed. We can note:

work performance + extra-work activity + human physiological needs = energy needed for these activities

We distinguish several types of energy. All of them have an unsubstitutable position in reproduction of work force, however, having different level and period of use. Organic energy is used when refreshing physical and mental powers, improving qualifications, retraining, spending free time. and other activities related to regeneration of work force. The amount of energy used depends on the work performance, occupation, type and quality of work done or service provided as well as time period in which the work was done. Used energy has to be regularly compensated in order to regenerate work power. Regeneration of a workforce, in relation to type and severity of work, or service, depends on use of food and alternation of various types of active and passive relax. When refreshing workforce the utility values, fully or partially produced by a workforce, are used. If the amount of produced utility values was able to cover only the energy used in the working process, the development of human society would not be possible. Another type of energy is functional energy. It is instantly connected with basic physiological human metabolism (energy consumption, sleep) and other physiological processes.

If a man is to use his work force and ability to work, it is essential to have disposal of scientific knowledge gained during studies and improved during working process. This depends on the occupation and needs of the company in which a worker is employed. Qualification is improved with abilities, skills and experience. These signs are essential in manual professions. Workers in project groups have to have certain experience. They are expected to work on good quality projects, in all their parts. The quality of a project and meeting the arranged deadlines is a crucial criterion for grants from European funds and participation in tenders.

The ability to work is preserved only if the workforce is active in working process. As soon as a workforce stops to be active, does not participate in working process, it loses experience and skills. We can say that a workforce regenerates and develops based not only on consumption itself, but also based on production and provided service.

## **Time in workforce regeneration**

Work, both mental and physical, is done in certain place and time. Time and place are basic forms of matter existence. They cannot be separated. Time is an irreversible factor. It determines process duration. It has only one direction. Forward. "There is a strong conception in focusing on time, as acceleration of process of value creation and its feedback lowers the costs, improves quality and reduces resources" says Blaskburn, J. in his foreword to publication *Race with time*, (1991). We distinguish general and social time. Social time includes events and processes related to activities of human, work group, team and whole society. Every individual, work group, team and human society functions in certain time period. In this period they optimise their activities to certain needs and visions.

Some kinds of activities are done during so called total time. It is equivalent to duration of physical life. Economic science understands total time as one-day time (24 hours). This period is filled with various activities. Total time can be divided into:

- working time,
- extra-work time (free time).

Working time is crucial for work performance. 40 hours a week is usual for us. During this period a workforce uses his physical and mental abilities in order to produce certain values or provide service. In connection with needs of human society. Eg. ground work for water pipelines, construction of line buildings, water and underground buildings, etc.

Free time is a major part of total time. It is a period during which a man does not work, but uses it for regeneration of work force and relaxation. Free time can be divided into four individual parts. First part is related to work activities. It includes commuting to and from work, time needed for shift change, purchase of work instruments, etc. Second part includes time used for further education, culture, care of family and upbringing of children. Third part is used to fulfil physiological needs. Fourth part is the free time itself which is left for any use. Observation of use of free time is becoming a subject of individual scientific disciplines. The main source of extending the free time is shortening of working hours, which enables further use of scientific knowledge and innovations.

### **Motivation-stimulation-communication**

Adams' theory on equity between costs and benefits has to be updated with motivation, communication and stimulation of workers. These are factors affecting working process. In retail business and services in gaining customers, in education process in improving the study results.

### **Motivation**

In all the corporations, institutions and facilities motivation has become a notion, for its significance, justification and impact, one can expect from it. The essential problem lies within the method, which should be used to achieve the required result, as every single individual is a individualist. It requires specific approach. That's why the art of motivation the right direction is the goal of managers at all levels of management.

### **Motivation as a notion**

Motivation is a part of everyday decision making process of all the managers, concerning the use of the appropriate methods to achieve better work results. It is a new notion. It started being used at the beginning of 20th century. The scientists were coming to realize, that to encourage an individual the will, including a wide range of human behaviour, decision making and taking a stand, is not enough. Simultaneously there has to be some purposeful lead towards certain required direction.

That is why a new psychological phenomenon has begun to develop – a motivation. It is a specific approach to the worker, which we use to influence behaviour, action and taking a stand.

The word motivation is derived from the Latin word move – to move and mover – moving, In the figurative sense of word it expresses the moving forces of individual's behaviour and action. Motivation is a constant process of encouraging better performance. The dimension of constancy of motivational process is often called persistence and will. In other words it is the ability of a manager to get the worker and overcome various inner and outer obstacles to achieve work goal. We can perceive the motivation as a intrapsychical process, which has its source in the inner and outer situation of the individual. It is initiated by the initial motivational relationship, whose content reflects certain deficit in the physical and social existence. It aims for removing that condition, which is experienced as a certain type of satisfaction“, wrote Nekonečný, M in his publication Motivace lidského chování, (2004). Motivation is used in various activities of human behaviour and required action. Motivation is very significant in the business, where the seller motivates the buyer to purchase larger amount of good. In the publication Reklama a podpora prodeje, (2000) the author Tellis, G.J states on page 293, that „motivation by an individual causes particular motives, which change into impulses. In this relation an interesting finding is stated by Prucha and team on page 328 of the Pedagogical lexicon (1998). He considers the motivation as a „summary of inner and outer factors, which awaken, activate, supply energy to the human behaviour and experiencing, and is focused on this action and experiencing, it drives its course, the method of achieving results and is also influencing the way the individual responds to his action and experience concerning the relation to the others and to the world. „ In the popular papers the motivation is sometimes mistaken for motives. Motive represents inner impulse, the inner action of a human being. It can come from the man's heart. Motive doesn't stimulate and control behaviour of an individual. In the motivation on the other hand one can see inner and outer motives, which are getting stronger towards particular actions, alternative other series of following actions.

The most common mistake in the motivation is a surmise, that cash reward is the best stimulus for every individual. The truth is, that reward (wage, bonuses, salary ) is a significant means in motivation, but not a motivational factor, having corresponding influence on every worker. There are individuals, who value noncash rewards, such as social rewards or reminder of important events, the individual has taken part in. To motivate individuals with appropriate factors, which encourage better performance, punctuality, care about work aids is essential for every manager. In the motivation we can see only exogenous factors, but simultaneously endogenous factors coming out of the essence of human being and his natural curiosity and desire to achieve something. The need to achieve something, to be someone, who has a certain social prestige, is a natural quality almost every human being has. The fulfilment of these premises requires constant, purposeful and long-term endeavour.

We can divide motivational factors into:

1. intrinsic – they come from the man's heart.,
2. extrinsic – they are based on the surrounding of the individual. There are certain stimuluses and incentives directed the right direction and initiated at the right time.

The intrinsic motivation comes out from the natural curiosity and human's will. It's often focused on the evident result in the long term, It's and impulse on the cognition of something new, which is considered to be necessary, interesting and stimulating. The natural human's character is the curiosity. It is intensified thanks to the interest of an individual to impress, whereas others are left apathetic. We can say that inner stimulus is essential for life, the human being is being stimulated by them, they distract his thoughts and enable him to deal with the problems more effectively and get on well with people. The intrinsic motivation is characterized by the fact that inner incentives come out from the outer surroundings. These are the effects and events, which influence the individual. It can be a reward, praise, a warning because of bad behaviour and negative approach. These motivational factors do not come out from the inner motion of the worker, from his conviction, but from outer influences, which have effect on him.

## **Stimulation**

Stimulation is a term of manager decision making. It is translated as an encouragement, stimulation by another individual. It is always evoked by outer factors. We distinguish the outer stimulation as identified and integrated. It is essential, that the stimulation is accepted by the individual. The specific of the stimulation lay in the behaviour of an individual and the action of an individual is conditioned by certain sanction, unless he or she doesn't achieve certain goal. The best example is with the incentive component of the salary. If the goal is not achieved, then the worker receives only a certain part of his salary, but only its aliquot part, alternatively is not paid at all.

Stimulation is important because a man is willing to accept certain value as his own and is able to do so with a better awareness. The sense and the impact in the development of personality. The integrated stimulation is considered to be the highest form of outer motivation. In the process of outer stimulation comes about the merging of individual's values with his personality, who is then able and willing to solve conflicts of several targets at one time, without favouring any of them. The integrated stimulation is highly demanding on every single individual. The distinction of the factors, which function here, is possible to recognize only after gaining certain experience. It is the consequence of the fact, that individual is able to judge the seriousness of separate factors after getting some experience. The difference between stimulation and motivation is the following. Stimulation causes sensorial reaction, the incentive and the aim of the worker to achieve the goal, for which he was motivated by his managers. Motivation causes conscious moves. It conditions the execution of certain action. We can easily state, that motivation motivates someone to do something, and simultaneously he is stimulated in some way.

## **Relations between intrinsic and extrinsic motivation**

They represent a mutual interconnection and strength of both factors. Success is stronger and more stable if the factors of intrinsic motivation dominate in an individual, as they fully accept them considering the acquired skill and development of cognitive functions. If the extrinsic motivation gradually changes into intrinsic motivation, a considerable result of the motivation process will be achieved. However, there is still a problem with qualified assessment, strength and proportion of extrinsic and intrinsic motivation factors.

## **Communication**

Communication can be defined as a process of reaching mutual understanding between people. It can be divided into sensitive and functional. Sensitive communication is a prerequisite for creation of good friendly relationships mainly with emotionally unstable individuals. The functional communication manifests in a positive way in the usage of time which was limited for communication. Communication is an essential part of motivation and stimulation. To communicate means to get in touch with another person, and by that improve or reduce one's knowledge in certain field. Communication is a social phenomenon, mutual interaction among people. Professional literature of marketing says that price also communicates. Nakonečný, M. (2009) in his internal contribution added: "Information on price of goods is not communication. Price does not communicate, it only unilaterally informs."

Communication, as a conscious activity of human behaviour, is important in situations where people cooperate, where they get in touch with one another and where their behaviour is influenced. Communication is a complex event. It is characterized by cooperation of all senses, brain and mental perceptions. Communication is important in those fields of human activities where it is an essential component of required success. It was proven that suitable components of communication positively influence the achievement of positive results.

## Survey results

In August 2014 a business company Sodexo Benefity, Inc., Prague, did a survey on job satisfaction of employees, in 525 respondents (236 men and 262 women) aged 18 - 65 years. The survey was done in all regions of the Czech Republic. According to internal contribution of the head of Marketing division Ing. Tomáš Kopřiva, from the answers it ensures that 48 % of respondents is considering to change of job. Younger people with university education are keen to change a job. Employees aged over 45 years are loyal to their employers. 51,8 % of respondents answered yes and 48.2 % answered no to a question Are you considering to change a job? The reasons of considering to change a job are following:

- |  |          |
|--|----------|
| • I get low salary                                   | 41.9 %,  |
| • I want to change a job because it does not develop | 18.2 % , |
| • I do not like the job                              | 10.3 %,  |
| • employer does not appreciate me                    | 7.9 %,   |
| • work group is bad                                  | 4.7 %,   |
| • I cannot stand the boss                            | 3.2 %,   |
| • I get few benefits                                 | 0.8 %,   |
| • other reasons                                      | 13.0 %.  |

Although the survey results cannot be considered as crucial, they at least partially represent opinions of respondents on loyalty of employees to their company and satisfaction in the company. The survey done by a business company Sodexo Benefity, Inc., Prague proved that it is necessary that the companies themselves find out the opinions and attitudes of their employees. Think of how to improve the situation. Are able motivate their employees and induce a feeling of loyalty to the company. It will positively affect know-how.

## Conclusion

Use of Adams' theory on equity between costs and benefits is essential in every company. Mainly in companies which aim to increase their employees' loyalty. Managers should be able to motivate their employees to fulfil the working task and other duties. Motivation is always connected with communication. This fact has to be considered when talking to workers, taking into account also their mental condition. Motivation to fulfil a task is not sufficient, unless it is accompanied with material and moral stimuli. The opinion that financial reward of workers, as a ratio between a fixed reward and flexible part, must be exactly investigated, according to classification to tariff classes. The contribution describes the significance of energies used by a worker on the work performance and regeneration of physical and mental power. Opinions of 525 respondents, investigated by a company Sodexo Benefity, Inc., Prague, may be inspirational for an internal research in companies.

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# The Reflexion of the Common Agricultural Policy's reform on Agriculture in Slovakia

Adriana RAŠOVSKÁ<sup>1</sup>

## Abstract

Slovakia's accession to the European Union had an impact on the entire economy, especially on agriculture, representing the integration basis in Europe. The independent Slovak agricultural policy was abolished after entering the European Union and it was needed to adopt the unified agricultural policy, which represents a set of economic, institutional, legislative, and policy instruments to ensure a homogenous market.

The Common Agricultural Policy develops not only the traditional role of agriculture, a food production, but shapes the face of country, affects the quality of an environment and also helps to increase the potential of tourism development through the cooperation of direct payments system, capping and greening. The Common Agricultural Policy greatly affects the agriculture in the European Union mainly through the subsidies as they are an indispensable source of funding of agricultural firms.

The long-awaited European Commission's proposal of the Common Agricultural Policy reform has become the target of criticism, mainly from the central Europe countries. Its opponents argue that it does not sufficiently pay an attention on a fairer distribution of funds, increasing the competitiveness of the sector and the promotion of green farming practices.

However, positive or negative consequences of it cannot be taken into a consideration without a deep analysis. To demonstrate whether the new Common Agricultural Policy successfully deals with problems of its predecessor, it is necessary to get through several factors reflecting the impact of European Union's decisions on the Slovak agriculture development, as a representative country of V-4.

Joining the European Union in 2004, Slovakia has accepted rules of support to the agricultural sector, what means adapting the same support mechanisms as those used in the European Union and gradual increasing of farmers contributions from the European Union budget until 2013. However, there is a significant difference between the Slovak and European agriculture.

Slovakia is perceived as a leader among the European countries due to its size of farms. Despite of a high concentration of farms - up to 95.1% of the utilized agricultural land is farmed by large farms - the Slovak agriculture is considerably less productive.

Using the knowledge of a macroeconomics, statistical analysis and econometrics, the interaction of various Slovak economic indicators such as Gross Domestic Product, gross output, and employment are analysed due to respect of the Common Agricultural Policy's regulations in the period 2005 - 2013.

The overall intention is to analyse the influence of three most important points of the Common Agricultural Policy for years 2014 – 2020 – distribution of direct payments, capping and greening – on the Slovak agriculture; as well as to analyze the impact of Common Agricultural Policy on the economy of farms based on the analysis of a unique set of agricultural entities operating in Slovak Republic.

## Key words:

Agriculture, Common Agricultural Policy, Capping, Direct payments, Greening, Reflexion

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## Introduction

Joining the European Union in 2004, Slovakia has accepted the rules of support to the agricultural sector, what means adapting the same support mechanisms as those used in the EU and the gradual increasing of farmers contributions from the EU budget until 2013. However, there is a significant difference between the Slovak and European agriculture.

The analysis of Serenčėš et al. 2014 declared that the profitability in the Slovak agriculture after 2004 period is deep below the average EU-27 countries, as well as the support to agriculture calculated in Euros per hectare of agricultural land. Slovakia is at low level with the amount of total agricultural output per hectare of agricultural land. Not only it lags behind the average EU-27 (against which it achieves only half of the value), but also keeps behind the Czech Republic, Hungary and Poland, i.e. states which Slovakia joined the EU with.

In connection with the proposed reform of the current Common Agricultural Policy for period 2014-2020, the direct support should be split more equally between the Member States, namely by reducing the link to historical data and by taking into account the overall context of the EU budget. All Member States with direct subsidies below 90% of the EU average should reduce the difference between their current level and this level by one third. This convergence should finance proportionally all Member States with direct payments above the EU average. The discussion about the future multiannual financial framework for the period commencing in 2021, should be focused on the objectives of complete convergence through the equal distribution of subsidies across the EU. (Serenčėš et al. 2014).

The role of agriculture could be traditionally perceived as a food production, but agriculture significantly shapes the face of the country, affects the quality of the environment and also helps to increase the potential of tourism development. It is therefore evident that the industry will continue to benefit from public support. To make a right decision in allocation of this support, it is necessary to become familiar with its advantages and disadvantages especially in Slovak agricultural conditions.

## Common Agricultural Policy

The Common Agricultural Policy could be easily identified as a system of European subsidy programs, representing the largest community financial policy in the European Union. Opponents would say with irony that this policy costs each taxpayer “only” 30 cents a day.

In the last years, the agricultural policy had to respond to the accession of the new member states, increasing demand for high quality food, climate change, volatile food prices on world markets and the unbalance in the food chain in the EU. From the European Parliament point of view, there must be provided the public goods by means of food security and secondly the protection of the environment.

The main purpose of the Common Agricultural Policy is to help a stable and efficient production of high-quality foods that are competitive on world markets and made environmentally sustainable manner. It also aims to promote economic activity in rural areas and prevent the depopulation.

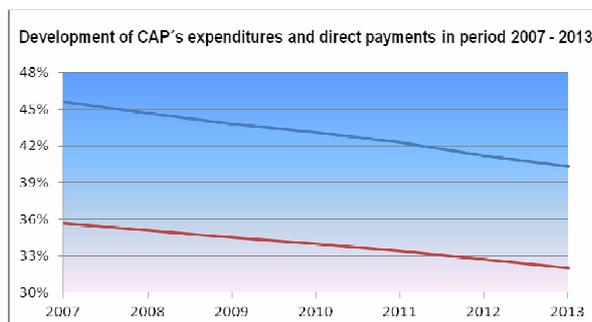
Marušinec, J. – Škriečka, M., in analyse of the agricultural support, pay attention on the financial framework dedicated to period 2007 – 2013. Expenditure on the Common Agricultural Policy can be found in the expenditure chapter - Preservation and management of natural resources – where CAP’s budget is given at volume of 418,125 mld € (table 1).

**Table 1: Financial framework 2007 - 2013 (million €)**

Expenditure chapter	2007	2008	2009	2010	2011	2012	2013	2007-2013
1. Sustainable growth	54 405	56 736	59 197	61 144	63 601	66 640	69 678	431 401
2. Preservation and management of natural resources	58 351	58 800	59 252	59 726	60 191	60 663	61 142	418 125
2.1 Market expenditures and direct payments	45 759	46 217	46 679	47 146	47 617	48 093	48 574	330 085
3. Citizenships, freedom and security	1 273	1 362	1 523	1 693	1 889	2 105	2 376	12 221
4. EU as a global partner	6 578	7 002	7 440	7 893	8 430	8 997	9 595	55 935
5. Administration	7 039	7 380	7 699	8 008	8 334	8 670	9 095	56 225
6. Compensation	445	207	210	-	-	-	-	862
<b>Total</b>	<b>128 091</b>	<b>131 487</b>	<b>135 321</b>	<b>138 464</b>	<b>142 445</b>	<b>147 075</b>	<b>151 886</b>	<b>974 769</b>

Source: Analysis of the support system in agriculture, Marušinec, J. – Skriečka, M., 2009

The development of CAP's expenditures in the examined period 2007 – 2013 decreased from the 45.6 % (58 351 billion €) to 40.3 % (61 142 billion €) – figure 1. CAP's expenditures represents the major part of the financial framework till the year 2009, after this year the expenditure chapter Sustainable growth comprehensive of "Competitiveness for growth and employment" and "Cohesion for growth and employment" leads with 0.9% difference (1 418 billion €).



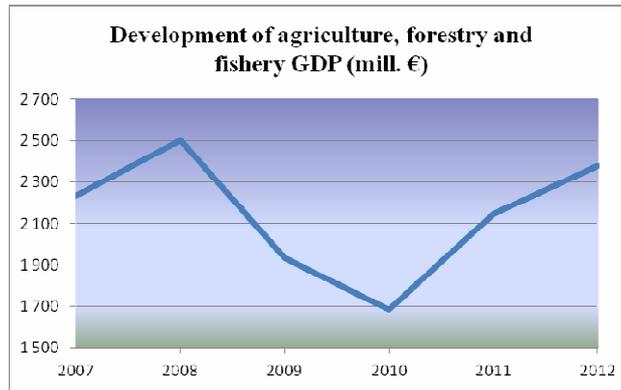
**Figure 1: Comparison of the development of CAP's expenditures (red line) and direct payments (blue line) in years 2007 – 2013, source: MF SR**

### Common Agricultural Policy 2007 – 2013 in Slovak Agriculture

In the examined period, the increase in subsidies is followed by lower ability to generate profit without subsidies. Agriculture in Slovak Republic is not able to cover cost by revenues without public support. This statement is also proved in analysis "Subsidies and profitability of farms in Slovak regions" by the Serenčes et al 2014.

#### ➤ **Agriculture, forestry and fishery GDP**

The share of agriculture in the created gross domestic product (figure 2) has oscillated from 3.6% in 2007 (2233.53 million €), through 2.56% in 2010 (1685.82 million €); to reach 3.32% in the year 2012 (2375.8 million €).



**Figure 2: Overview of the agriculture, forestry and fishery GDP in examined period (million €), source: ŠÚ SR**

The quarterly growth of agriculture gross production (figure 3) is defined using the logarithmic transformation of the exponential function:

$$\ln y_t = \ln b_0 + x \ln b_1 + \ln u_t$$

and based on it following conclusions can be made:

*Multiple R* = 0.3762...low leakage power dependence between y and exogenous variables

*R Square* = 0.1415...14. 15 % of the variability of the endogenous variable is explained by given regression function (model)

*Significance F* = 0.0338 ... < 0.05, i.e. model as a whole is statistically significant (+)

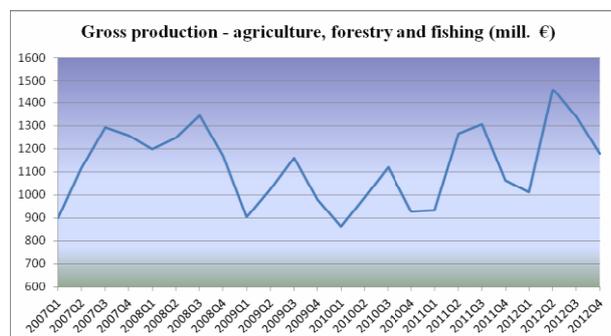
*Parameter  $b_0$*  is statistically highly significant, since the P-Value (4, 13E-41) < 0, 01 (++)

*Parameter  $X_1$*  is statistically significant, since the P-Value (0, 0338) < 0, 05 (+)

$b_0 = 954.4478$  ... In the zero period time, the gross output of agriculture is in the amount of 954.45 units (million €).

$b_1 = 0.007091$  ... 0.709059 Quarterly growth rate of agriculture gross production is **0.71%**  
2.836236 The annual growth rate of agriculture gross production is **2.84%**

Regression function form:  $y_i = 6,861 + 0,007x_1$

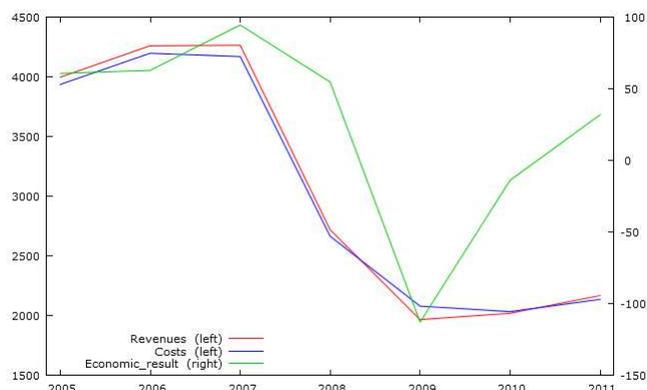


**Figure 3: The quarterly growth of agriculture gross production (million €), source: ŠÚ SR**

➤ **The economic production rate of agriculture and food processing**

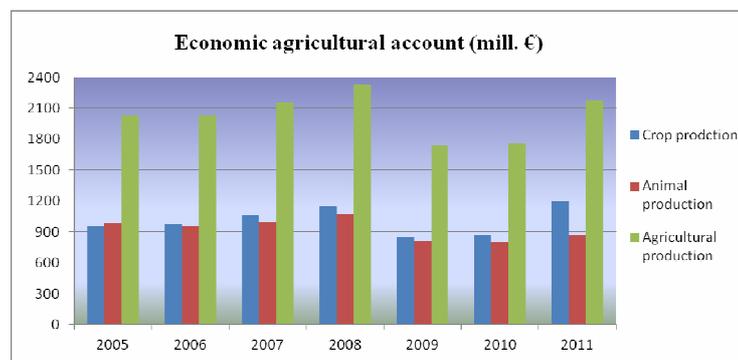
The economic profit of agriculture and the food processing (figure 4) reaches two important points in the examined period:

1. year 2007 – the revenues obtain their maximum value (4 264.3 million €) by costs of 4 169,8 mill. € → profit: 94.5 million €
2. year 2009 - the revenues obtain their minimum value (1 965.9 million €) by costs of 2 078,7 mill. € → profit: -112.8 million €



**Figure 4: Development of the revenues (red line), costs (blue line) and economic profit (green line) in the Slovak agricultural production (million €), source: ŠÚ SR**

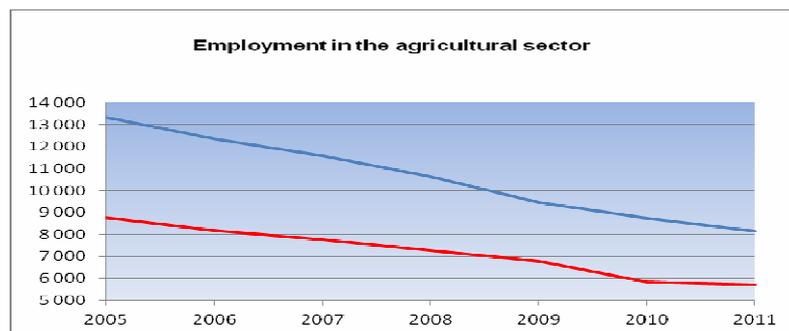
The economic agricultural account (figure 5) describes the ratio in which the crop production and the animal production create the total amount of agricultural production. The highest value of agricultural production can be noticed in year 2008 (2333.37 million €). Paradoxically, in the following year, the lowest agricultural production can be remarked (1740.14 million €). This interannual loss represents decrease by 593.23 million € on amount 1740.14 million €.



**Figure 5: Development of the crop production, animal production and the agriculture production, source: ŠÚ SR**

➤ **Employment**

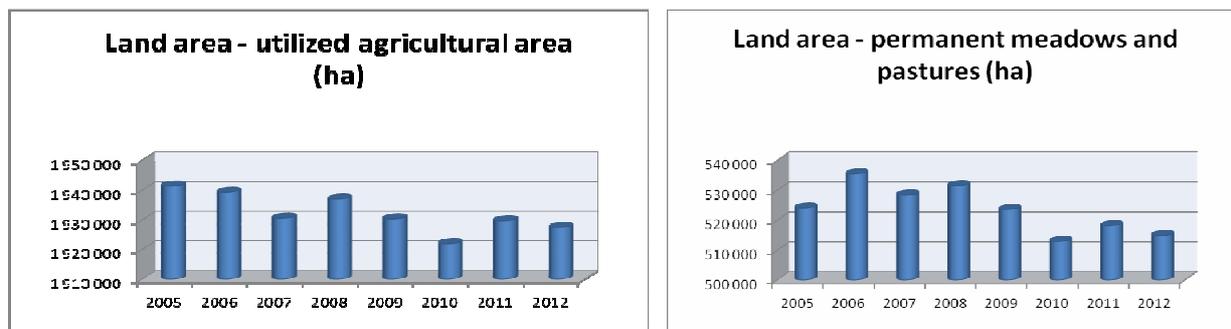
Employment in the agricultural sector (figure 6) has declining character; since the beginning of the examined period the number of employees in the crop production decreased by 35.07% (-3 076 employees) and the animal production employment decreased by 38.95% (-5 193 employees).



**Figure 6: Average number of employees in the animal (blue line) and crop production (red line), source: ŠÚ SR**

➤ **The land use**

In Slovakia during the examined years, the ratio between utilized agricultural area and permanent meadows and pastures is stabilized (3.7:1). There are only minimal changes between years values:



**Figure 7: Utilized agricultural area vs. permanent meadows and pastures (ha),**

**source:  
ŠÚ SR**

**Common Agriculture Policy in Slovakia 2007 – 2013**

After the Slovak Republic became a member state of the European Union, the agricultural support received a new dimension in form of CAP's expenditure patterns implementation. In Slovakia, following instruments are used by CAP:

1. Direct payments
2. Rural development
3. Market-oriented expenditures

Market-oriented expenditures' task is to support the export of agricultural goods in the areas outside of the EU, but also e.g. National programme of beekeeping and the Programme of school milk support.

Financing through the rural development focuses on the agro-environmental support, investments in the agricultural companies, improving of the agricultural products' processing and merchantability, agricultural proceedings' diversification, forestry and also support of farms with partly self-supplying, education, counselling and fish system.

Direct payments are the most important source of finance in terms of volume of funds. They are composed of two parts:

- a) resources of the EU (the volume is given by the regulation of Council)
- b) national equalization payments - co-financing from the state budget (volume is given by law on the state budget)

A significant dynamic growth in terms of the total amount of additional public funds flowing into agriculture can be noticed since the Slovak Republic became a member of the European Union. Detailed overview of the resources flowing into Slovak agriculture is shown in the table 2:

**Table 2: Financing of the Slovak agriculture**

	2004	2005	2006	2007	2008	2009	2010	2011
<b>Direct payments</b>	245.47	233.25	251.01	360.78	223.93	364.1	337.6	365.2
- Direct payments (funds of ES)	153.49	164.94	152.82	213.84	213.84	227	243.7	278.4
- co-financing (Slovakia)	91.98	68.31	98.19	146.95	10.09	137.1	93.9	86.8
<b>Rural development</b>	148.91	176.89	201.75	178.25	402.91	433.5	483.1	408.5
- Rural development (funds of ES)	119.00	141.37	154.92	138.78	309.80	331.8	369.3	313.4
- co-financing (Slovakia)	29.91	35.52	46.84	39.47	93.11	101.6	113.8	95.1
<b>Market-oriented expenditures</b>	26.49	37.87	37.68	37.68	39.00	39.8	13.6	13.1
- Market-oriented expenditures (funds of ES)	26.49	37.87	37.68	37.68	37.68	37.6	10.9	9.9
- co-financing (Slovakia)	0.00	0.00	0.00	0.00	1.33	2.2	2.7	3.2

Source: MF SR

One year after joining the European Union, Slovakia was given the minimum support from the European and Slovak funds (215.22 million €). Figure 8 provides a brief overview of the development of direct payments paid to Slovakia in previous years. The highest sum of support can be noticed in year 2008 (370.41 million €), followed by year 2011 with amount of support 365.2 million €.



**Figure 8: Comparison of direct payments development in Slovakia (€/person), source: MF SR**

## Reform of the Common agricultural policy 2014-2020

### Problematic provisions of the draft reform of view CAP:

- **Distribution of support** among the EU member states
- **Capping** - setting the upper limit of support for big companies
- **Terms of greening** and their close relationship to capping direct payments

## Direct payments

European Commission identifies the role of the future redistribution of direct payments as a dual one - support for income and provision of public goods by ensuring a better fit between these policy objectives and the budgetary means available.

The system, where the allocated appropriations (per Member State - and per farmer in the Member State) were based on historical references, will be avoided.

**Table 3: Comparison of CAP financing 2007-2013 and 2014-2020**

	2007 - 2013	2014 - 2020
1 <sup>st</sup> pillar – direct payments	1 944 059 000	3 054 205 654
2 <sup>nd</sup> pillar – rural development	2 597 053 717	2 076 757 259
EU financing	1 996 908 078	1 544 699 346
state budget co-financing	600 145 639	532 057 913
Common organisation of markets	105 000 000	105 000 000
EU financing	84 000 000	84 000 000
state budget co-financing	21 000 000	21 000 000
Internal funding	327 010 305	114 258 134
Total	4 973 123 022	5 350 221 046

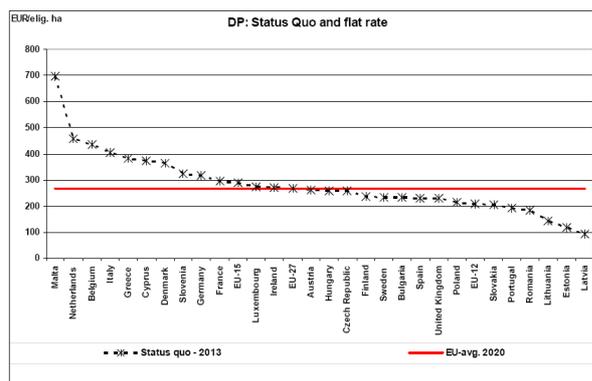
Source: VÚEPP

Implementations of the direct payments strengthen the idea of flat-rate market reforms enhancing the competitiveness of the agricultural sector by encouraging farmers to adapt to the market conditions. The European company's needs - basic income and basic public goods - are now supported by the uncoupled direct payments.

There are several options for redistribution of direct payments envelopes between EU Member States taken into consideration:

➤ **EU flat rate** – direct payments distribution on the total potentially eligible hectares across the European Union Member States with volume 267 €/ha of potentially eligible area (PEA).

As shown in Figure 9, there are considerable differences in payments between member states such as Malta, Belgium, Nederland, Italy, Greece, Cyprus, Denmark, and Slovenia – with higher direct payments and member states like: Latvia, Estonia, Lithuania, Portugal, Romania, Slovakia, Bulgaria, and Poland - with lower payments.



**Figure 9: Direct Payments redistribution using EU flat rate, source: DG AGRI**

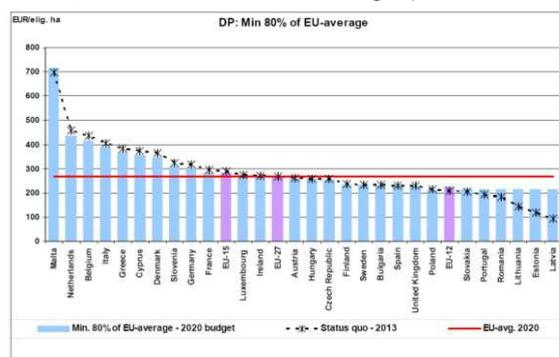
Choosing the option EU flat rate would mean to redistribute a sum of 4,394 million €. While Malta, Belgium, Nederland, Italy, Cyprus and Denmark would remark losses; EU flat rate would produce substantial gains to Latvia, Greece, Lithuania and Romania. This option would be most beneficial for Romania, Poland and Spain; on the other hand Italy, Germany and France would lose the most.

“A flat rate payment across the EU would fail to reflect differences in the economic and environmental situation in the Member States, since a given level of payment does not have the same effect on income and each hectare does not equally contribute to the provision of environmental public goods.” European Commission

Considering, almost 90 % of the land is concentrated in 20 % of the holdings in the EU-25, EU flat rate can not solve the problem of an unequal direct payments distribution between farms. Distribution proposed this way would be a strong rejection of support compensation to new member states and to the old ones.

➤ **pragmatic approach** – Member States are given the EU wide minimum level of per hectare payment based on a share of the EU average.

In the pragmatic approach, the direct payments distribution is solved by dividing it to all Member States at the level at least 80% of the EU average per hectare (figure 10).



**Figure 10: Direct Payments redistribution using min 80% of EU-average, source: DG AGRI**

The amount of redistributed payments would be a sum of 847 million € by this option. Romania, Latvia and Lithuania would remark only positive impacts; France, Germany and Italy would remark the biggest losses in this case.

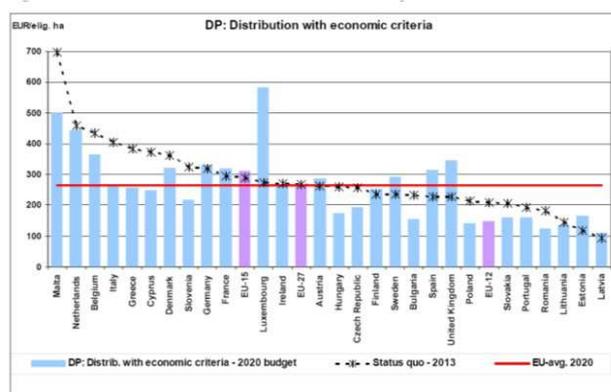
“This option would allow addressing the situation of Member States which are significantly below the EU average while mitigating the impact of redistribution on those above the EU average.” European Commission

This means that, to lift the per hectare payments of Member States to 80 % of the EU average (213 €/ha), it would be needed to cover this cost on a proportional basis by the Member States that are above the EU average → payments to the Member States to 80 % of the EU average would be required by a reduction of their envelopes, while the envelopes of those Member States who belong between 80 % - 100 % would remain unchanged.

□ **the use of objective criteria** - the EU flat rate is adjusted by objective criteria based on economic, physical and/or environmental indicators

“Objective criteria that reflect the dual role of direct payments in providing income support and public goods and would thus ensure a more equitable and efficient use of budgetary resources.” European Commission

The use of objective criteria should ensure a more equitable and efficient use of budgetary resources - higher direct payments/ha would be given to the Member States with higher GDP/capita (expressed in PPS) as well as to the Member States with higher GVA/AWU.



**Figure 11: Direct Payments redistribution using Economic objective criteria, source: DG AGRI**

➤ **combination of a pragmatic approach and objective criteria**

The common agricultural policy is built on two pillars (it's maintaining is supported by the Commission proposal and the European Parliament's position too):

1 <sup>st</sup> pillar: Direct payments and markets	317. 2 billion € (76%)
2 <sup>nd</sup> pillar: Rural development	101. 2 billion € ( 24%)
<b>Total:</b>	<b>418. 4 billion € (100%)</b>

In addition to the CAP budget, another 17.1 billion Euros should be redistributed:

- 5. 1 billion € - Agricultural research and innovation
- 3. 9 billion € - Reserve for crises in the agricultural sector
- 2. 5 billion € - Food safety
- 2. 8 billion € - People in poverty
- 2. 8 billion € - European fund for globalisation adjustment

**Table 3: Comparison of direct payments resources in the actual CAP**

	2007	2008	2009	2010	2011	2012	2013
Financial cap for the EU's part of direct payments	40	50	60	70	80	90	100
Possible national supplementary payment (Slovakia)	30	30	30	30	20	10	0
Total	70	80	90	100	100	100	100

Source: VÚEPP

The new structure of direct payments within the 1<sup>st</sup> pillar of the CAP will be for the first time established - multicomponent structure of direct payments:

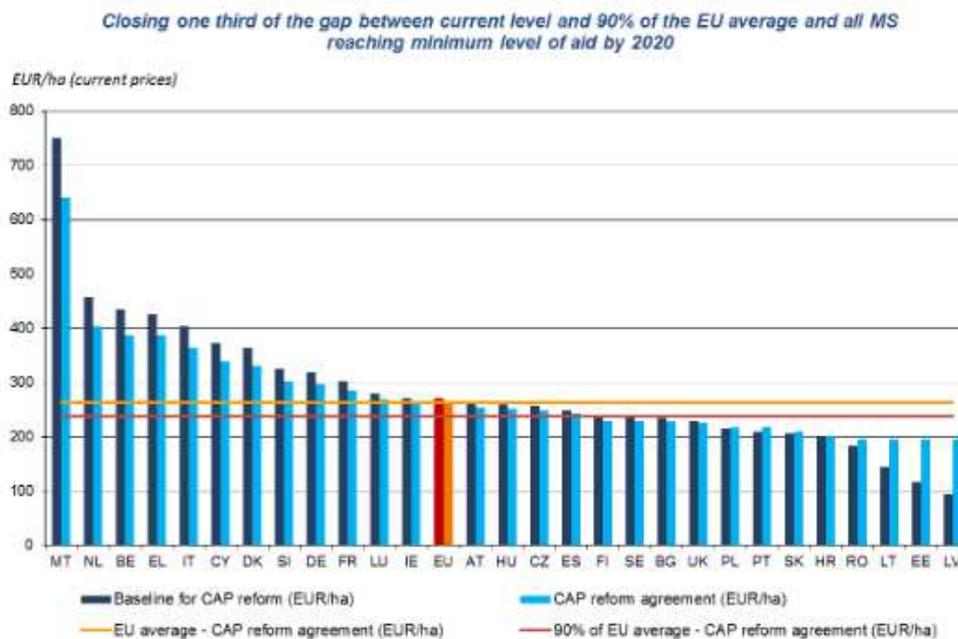
- Basic Payment Scheme (50%, will replace the currently applicable payment SAPS)
- Ecological payment (mandatory, 30%)
- Coupled support (optional, 10%)
- Payment of LFA (optional, 5%)
- Young farmer (mandatory 2%)

The distribution of direct payments among countries and among farmers shall be more balanced, transparent and more equitable:

- *the external convergence* (the reduction in disparities of the level of direct payments between Member States) will reinforce the credibility and legitimacy of the support system at EU level.

- by 2020 the level of direct payments per hectare (currently based on historic parameters in many countries) will be progressively adjusted with the introduction of a minimum national average direct payment per hectare across all Member States.

The changes in the distribution of average national payments per hectare by 2020, in comparison to the status quo ("baseline") are provided in the Figure 11; where the changes in the direct payments are mirrored by *internal convergence* within the Member States, ie. payments will be based on a fairer and more converging per hectare payment at national or regional level.



**Figure 11: Changes in the Distribution of Direct Payments**  
**Source: DG Agriculture and Rural Development**

The European Commission proclaims that the Member States will have further possibilities to rebalance payments with the introduction of the redistributive payment, voluntary capping and reduction of payments, beyond the mandatory cuts which will apply to the Basic Payment above a certain threshold.

The level of support within the EU CAP but also by market conditions significantly influences the behaviour of agricultural farms in agriculture. The impacts of the particular scenarios on the changes of production indicate that Slovak agriculture will approach just slowly the 2008 production level. This will be decisively influenced by the price development. Despite of this, it is evident that the most favourable result can be achieved under the Flat Rate Scenario while the absolute abolition of direct payments (Liberal Scenario) will bring very unfavourable economic consequences with impacts on agricultural production in Slovakia. (Božik, 2011)

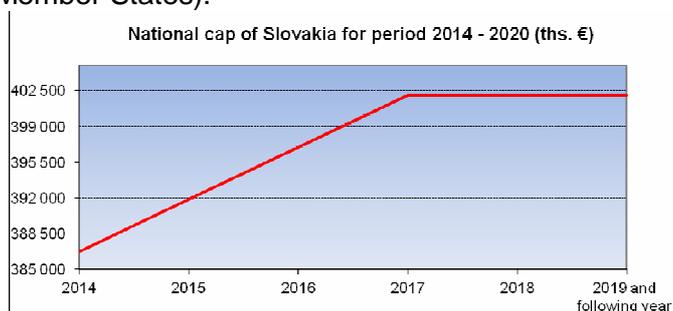
## Capping

The European Commission's intention is to put into practice a cap for subsidies for the largest agricultural companies that receive a disproportionate measure of direct support of incomes from the CAP. Implementation of a progressive capping on payments should start at 150 000 € - the maximum amount of support for a farm for one year would be limited to 300 000 €. This progressive capping would be in force only from moment, when the costs of social security and wages would be deducted from the total sum.

Božík et al. 2011 declares, that the volume of direct payments for the farm exceeding 150 000 € will be reduced as follows:

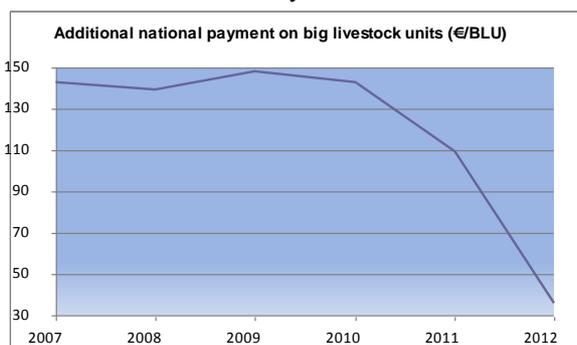
- 150 000 - 200 000 € → reduction by 20 %
- 200 000 - 250 000 € → reduction by 40 %
- 250 000 - 300 000 € → reduction by 70 %
- from 300 000 € → reduction by 100 % , i.e. overlap of payments over 300 000 € should not be paid → 300 000 € is the upper limit payments.

Due to the historical development large farms can be found especially in Slovakia, Czech Republic and East Germany. These farms were excluded from the plan of capping. CAP funding will be provided only to active farmers who are able to demonstrate tangible action. Because the Commission's definition of an active farmer is very broad; support is likely to be given even to those farmers whose annual income from agriculture represents only 5%. 2% of CAP resources should help to entice young people to farming and farmers to 40 years should receive 25% bonus on direct payments during the first five years; and in this case the cap on the size would be unified on 50 ha (no individual based on the average size of farms among the Member States).

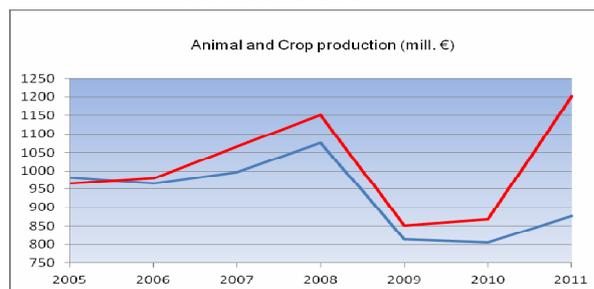


**Figure 12: Capping directions for years 2014 - 2020, source: DG AGRI**

Additional national payment on livestock units (figure 13) represents the support of animal production given to Slovak agriculture from year 2007. Its decreasing character responds to decline in animal production (figure 14). The most enormous drop can be noticed in year 2008, when the animal production decreased by 263.88 million € in 12 months.

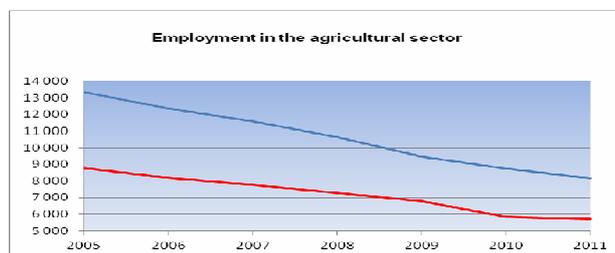


**Figure 13: Additional national payment on big livestock units (€/BLU) 2007-2012, source: ŠÚ SR**



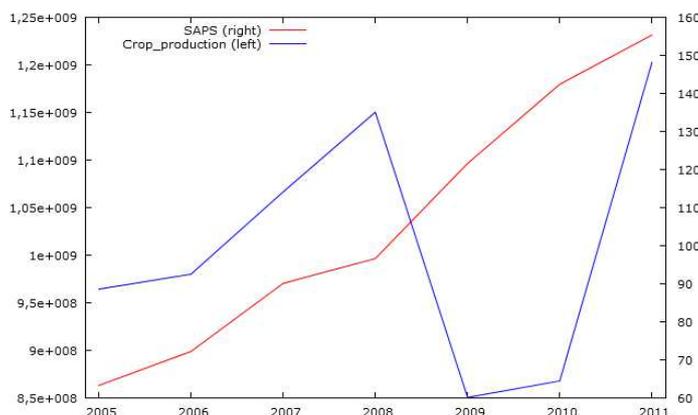
**Figure 14: Animal (blue line) and Crop production (red line), source: ŠÚ SR**

To demonstrate the task of capping as a part of the CAP reform – the downward trend of employees in the animal production has to be remarked. The primary objective of capping is to increase the downward nature of employment in animal production, or at least to maintain its current state (figure 15). This support should help to spread the animal production and ensure the position of animal farms in Slovakia, as well in Czech Republic and Germany.



**Figure 15: Average number of employees in the animal (blue line) and crop production (red line), source: ŠÚ SR**

SAPS (Single Area Payments) are paid to farmers whose minimum size of the cultivated area is 0.3 hectares and the minimum size of the economy overall is 1 ha. These payments proceed from the European Agricultural Guarantee Fund (EAGF). In Slovakia, their progress is continuously growing what helps to keep the volume of crop production in a positive way (figure 16). The average number of employees in the crop production decreases only in year 2008, what can be caused by the financial crisis outbreak. But the overall development of employment in the crop production can be characterized as a growing one due to the efficient influence of SAPS.



**Figure 16: Development of SAPS (€/ha) and crop production (million €), source ŠÚ SR**

## Greening

A short overview of the implications of greening based on the amount of farms and a reduction of direct payments is shown in table 4 – differences in variants between examined years are followed:

- Variant 30% : + 0.39 % of direct payments in 2020
- Variant 20% : + 0.47 % of direct payments in 2020
- Variant 10% : + 0.49 % of direct payments in 2020
- Variant 0 : + 0.55 % of direct payments in 2020

**Table 4: The implications of greening based on the amount of farms and a reduction of direct payments**

Year	Parameter	% of farms in classes					Direct payments	
		150 – 200 (ths. €)	200 - 250 (ths. €)	250 - 300 (ths. €)	300 > (ths. €)	% of farms together	Decreasing (mil. €)	% of reduction compared to the claim
2014	Variant 30%	0.34	0.21	0.17	0.21	0.94	1.24	4.26
	Variant 20%	0.51	0.34	0.17	0.43	1.45	2.2	5.74
	Variant 10%	0.64	0.51	0.3	0.55	2	3.62	7.27
	Variant 0	1.49	0.51	0.34	0.9	3.24	5.57	8.76
2020	Variant 30%	0.3	0.21	0.26	0.21	0.98	1.46	4.65
	Variant 20%	0.6	0.38	0.17	0.47	1.62	2.58	6.21
	Variant 10%	0.85	0.55	0.3	0.68	2.39	4.21	7.76
	Variant 0	1.92	0.55	0.38	1.02	3.88	6.45	9.31

Source: *Impact of the CAP reform on the agricultural organizations in the Slovak Republic*, Semančík M., 2012

The European Commission's suggestion is to make a condition on the allocation of 30% of direct payments based on three *green rules*:

- *Maintaining of the permanent pastures*
- *Diversification* - farmers will have to grow at least three kinds of crops on their arable lands; while one crop can occupy at least 5% and maximum 70% of the total area
- *Maintaining the "ecological landscape"* - at least 7% of the area, other than permanent pastures, must be used on balks, hedges, trees, outfield, the landscape features, biotopes, interference guard bands and forested areas.

Based on the complaints from farmers' organizations and some Member States, the European Parliament decided to remove some small farms from the green rules. An exception should receive even those producers who fulfil the national environmental certification conditions.

The paradox is that the former idea of the European Commission was giving the exceptions to farms that operate in the organic way. Farms with less than 10 hectares of cultivable land will automatically receive an exception; companies owning 10 ha – 30 ha area can apply for this exemption → the exceptions will refer to 82% of European farms.

Slovakia identifies with the Austrian proposal to consider the cultivation of soybeans and legumes as an option in "greening" the 7% of agricultural land. For Europeans, it would be an interesting proposal, because huge amounts of soybeans are imported from the United States. Another reason, why Slovak Ministry of Agriculture agrees with this suggestion is fact that increasing the land intended for growing pulses was a perfect idea especially in dry periods (i.e. year 2012 marked with huge droughts).

**Table 5: Crops of soybeans**

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Harvested area (ha)	10 983	8510	10898	12036	7795	5408	9286	13976	19667	21889
Production (t/ha)	12 210	13511	18964	20553	11029	11379	15379	24045	36922	41832
Total crop (t)	1.11	1.59	1.74	1.71	1.41	2.1	1.66	1.72	1.88	1.91

Source: ŠÚ SR

The pressure on agricultural products' prices will rise as a result of new given criteria of greening. This would cause:

- reduction in the competitiveness of Slovak agricultural products
- increase of food expenditures
- growth of food import
- reduction of potential output growth
- increased costs in crop production
- use of arable land will decrease mainly the lowland regions of Slovakia
- foothill and mountain areas → pressure on increasing the green areas
- acreage of cereals and oilseeds in all areas of production will decline
- the reason for increasing the forage areas will not be the growth in livestock feed consumption, but maximizing of income including the CAP subsidies → growth of green areas on arable land
- in case of a larger volume of direct payments and their tying on the BLU and dairy cows; a significant attenuation of these negative development is likely

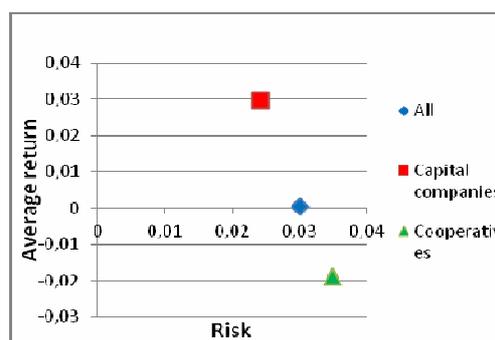
### The riskiness and profitability of Slovak agriculture companies

The substantial changes in agriculture and agribusiness have been ultimately impacting profitability and riskiness in this sector. Two major types of risk in agriculture have been distinguished. Firstly, the business risk, including the production, market, institutional and personal risks, and secondly, the financial risk resulting from different methods of financing the business activities (Hardaker et al. 2004, Huirne et al. 2000). To be able to measure the risk and return of Slovak agribusiness entities from the macroeconomic point of view – a unique set of agricultural entities operating in Slovak Republic is needed.

From the 996 Slovak agriculture companies in the dataset are removed the outliers, which reported the negative value of equity, or achieved more than 100 % average loss and average profit in the four year period. The rest of the companies are allocated in the portfolio, with the individual weights according to the share of equity from the sum of all capital invested into equity. Subsequently, the expected returns, standard deviations, correlation and covariance matrix are constructed, as the necessary steps to measure the portfolio risk.

**Table 6: Risk and return of portfolios**

	All agriculture companies	Capital companies	Cooperatives
Portfolio return	0.04813 %	2.97439 %	- 1.89737 %
Portfolio risk	3.00045 %	2.41439 %	3.49769 %



Source: Own processing

The results show that, if we assume the allocation of all Slovak agriculture companies in one common portfolio, regarding the equity invested in the agribusiness, the risk will be 3.00 % with very low portfolio return less than 0.05 %. Remarkable difference occurred by dividing the companies with respect to their legal form. In the case of portfolio created by the capital companies, the measured risk reached the value 2.4 % with the return

2.9 %. However, much worse results are seen by the form of cooperatives, where the expected negative return -1.9 % refers to the highest risk from these three measurements, almost 3.5 %. Evaluating the results can be assumed that by the decision making of farmers the legal form of capital companies ought to be preferred rather than the cooperatives.

## **Conclusion**

The process of integration into EU brought changes to Slovak agriculture. It was followed by increase of public funds in form of CAP subsidies; that main aim is to support farm income as well as rural development.

To make a right decision in allocation of support, it is necessary to become familiar with its advantages and disadvantages especially in Slovak agricultural conditions:

Direct payments system – the use of objective criteria would ensure a more equitable and efficient use of budgetary resources in comparison to e.g. EU flat rate, where Slovakia is paid with lower direct payments than the other Member States. Objective criteria reflect the dual role of direct payments in providing income support and public goods.

Capping - The primary objective of capping is to increase the downward nature of employment in animal production, or at least to maintain its current state in Member States like Slovakia, Czech Republic or Germany, where the biggest farms are located due to the historical development. In previous years, the animal production has been forgotten regarding to higher payments paid to the crop production. This unbalance could be changed by reform of Common Agriculture Policy.

Greening – opponents of green rules, which should ensure the maintaining of the permanent pastures; diversification and maintaining the "ecological landscape" highlight their possible negative impacts like reduction in the competitiveness of Slovak agricultural products; decrease of potential output growth; increased costs in crop production; etc. But one of its indisputable advantage hides in the opportunity to spread the crop of soybeans and pulses that could be a rewarding alternative of possible farms losses in these increasingly hotter summers.

The study also focused on the measuring and evaluating the risk and return of portfolios, consisting of the Slovak agricultural entities. Remarkable differences have been found, taking into account the legal form of examined companies:

- portfolio made up of limited liability companies:
  - risk = 2.4%
  - return = 2.9%
- portfolio made up of cooperatives:
  - risk = 3.5%
  - return = -1.9%

The legal form "limited liability company" brings higher return with lower riskiness to the Slovak agricultural entities.

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# Internal managerial communication process in small and medium sized businesses<sup>1</sup>

Petr ŘEHOR<sup>2</sup>

## Abstract

Managerial communication is a process of conveying and receiving information between the manager and stakeholders. Efficient setting of communication is important for instigating work productivity, working moral, motivation and loyalty of employees. Managers of SMBs realize that properly established and functional internal communication has a great influence on performance of employees and prosperity of an organization. Process of communication was evaluated by managers of SMBs to be less important as well as not functioning properly. The aim of the article is the analysis of internal managerial communication process within the company in small and medium sized businesses in South Bohemian Region.

## Keywords:

Communication, management, small and medium businesses, SWOT analysis, strategy.

## Introduction

Communication ranks among the most difficult skills that are necessary for efficient execution of managerial functions. Ability of managers and employees, in other words superiors and subordinates, to communicate openly and efficiently belongs to crucial factors of the company success. In small and medium sized businesses (SMBs), communication plays an important role in many ways. It is used for processing information, strengthening interpersonal relations, to motivate employees, to fulfil objectives specified in strategies for their assessment and examination and it is particularly important within human resources management. Without a doubt it is the cornerstone of success of every organization.

Great significance for increasing efficiency of SMBs and optimization of their management represents internal communication for operational decision-making as well as communication for strategic decision-making. Efficient setting of communication is important not only for harmony of all working activities, but also for instigating work productivity, working moral, motivation and loyalty of employees.

The aim of the article is the analysis of internal managerial communication process within the company in small and medium sized businesses in South Bohemian Region.

## What is managerial communication?

Communication is transfer of something: it is transferring or providing specific information (Barker, 2006). Human communication means transfer of ideas, thoughts, feelings and behaviour from one person to another (Narula, 2006). Communication is in its essence very difficult, it is necessary to think it through. There is a following procedure: selection of communication method, clarity of information, creating opportunity for feedback, timing, and selecting who to talk to (Forsyth, 2006). Usual subject of communication is Information (Střížová, 2001). Success of a company is based on knowledge how to handle Information (Mounter, Smith, 2008). The most prevalent form of communication in companies is still vertical communication from top to bottom. This form of communication is mainly intended for

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conveying orders to employees (Mikuláščík, 2003). Communication inside the company is a very important element for its efficient operation. High quality of internal communication brings higher quality of work accomplished and desirable relations in the workplace (Řehoř, 2012 b). Communication inside the company is first of all an instrument for management to influence attitude to work, activity and behaviour of employees (Holá, 2006 a 2011).

Managerial communication is a process of conveying and receiving information between the manager and stakeholders (Řehoř, 2012 a). It concerns exchanging information from top as well as from bottom, via formal and informal channels through which it is possible to reach objectives that manager designate (Zia, 2010). Managerial communication includes all relevant forms and communication channels that the manager can choose for accomplishing his or hers objectives (Brownell, 2010). In practice these communication skills are required: competence in listening and answering, openness and sincerity, inquiry, empathy, negotiation and solving conflicts (More & Irwin, 2000).

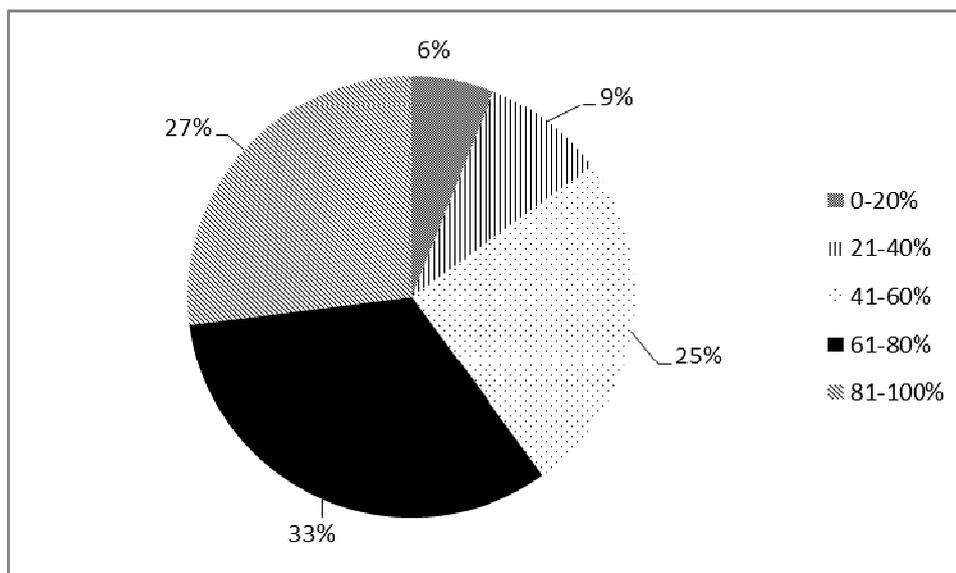
Communication is important for proper functioning of all activities referring to a given organization. It is desirable to constantly improve and perfect it because only thanks to good communication great achievements can be accomplished (Řehoř, 2013). Concerning communication it is important to know how to: solve problems and develop new skills, deal with conflicts, emotions and anger, understand other people, adapt, change and grow (Philips, 2002). Strong communication skill is also to be able to understand expectations of others well and develop mutual trust (Stapleton, 2009). Important factors that categorically contribute to right implementation of communication as well as maintaining communication are: complete and truthful information, trust between managers and employees, healthy and safe working conditions (Spaho, 2010). Trial teams, which prevail in modern organizations nowadays, don't need a superior in a sense of the hierarchical organization. Instead of former supervision comes coaching (Truneček, 2003). Coaching is an activity that encourages constant development of skills of people in the organization (Feldman, 2001). Coaching brings improvement in the workplace. It is necessary to increase efficiency particularly in the workplace (Fleming, Taylor, 2005).

### **Assessment of internal communication process**

The most common process of communication that takes place in a company is from a superior to an employee of lower position for example by way of e-mail, in order to inform about work or task that becomes his or her duty. Managers of SMBs in South Bohemian Region assessed process in internal communication on scale ranging from 0% (the worst) to 100% (the best situation). From the total number of 288 small and medium sized businesses in South Bohemian Region 1/3 evaluated that have satisfactory process of internal communication (61-80%). About 1/4 businesses consider this process to be excellent (81-100%) and about the same number consider it average quality (41-60%). There are businesses (6%) according to picture 1 in which communication in their organizations is assessed as unsatisfactory (0-20%). However companies (more than 60%) that evaluate their communication to be of exceptional quality predominate (more than 60%). Average assessment fluctuates around level 65%. There is therefore a great potential to improve internal communication and thus increase an average level of evaluation.

According to a type of enterprise, process of communication is evaluated to be the best (more than 81%) by businesses engaged in transportation (2/5) and services (1/3). This level is exceeded by 1/4 organizations in other businesses (trade, construction, manufacturing, agriculture). More than 2/5 trade organizations can be found evaluated as satisfactory (61-80%). Unsatisfactory evaluation whose level was lower than 20% occurred in several organizations apart from transport companies (10%).

Process of internal communication starts to be particularly topical for managers in case of expansion of their organizations; number of employees increases and the structure of the organization becomes more complex.



**Pic. 1 Assessment of internal communication process in SMBs in %**

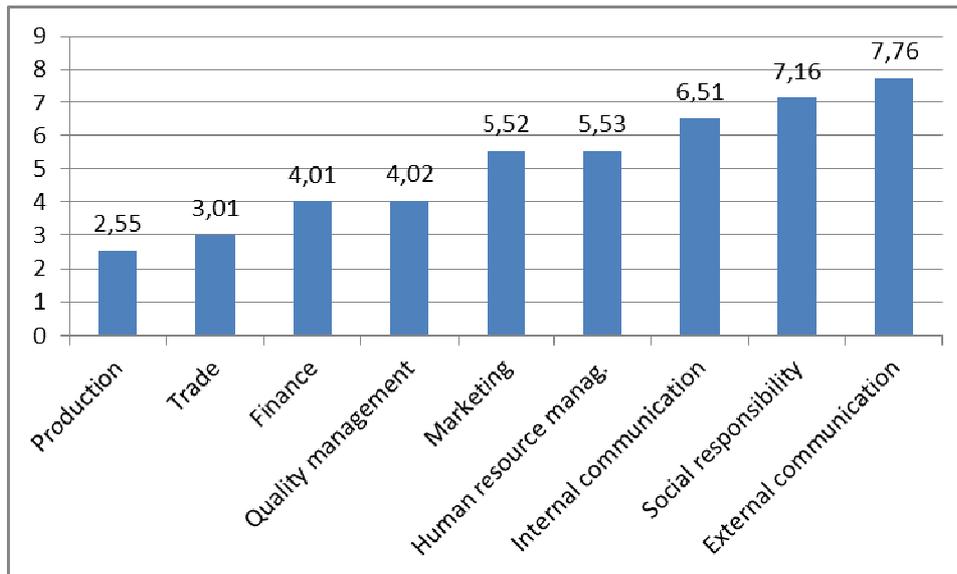
The table 1 shows assessment of internal communication according to the size of business (according to number of employees). About 30% micro (number of employees is to 9) and small sized businesses (number of employees is 10 to 49) claim to have excellent process of communication (more than 81%), medium sized businesses claim approximately 1/5. In small businesses, communication flows instantly, it is conveyed directly from one superior to subordinate employees. There is very quick feedback and we can often encounter informal communication. In medium sized businesses there are many organizational levels, more managers and communication doesn't flow as quickly and efficiently. Particularly during verbal communication, information is filtered or unsatisfactory feedback occurs. Thus employees don't have enough information to accomplish their tasks. Most of small (31%) and medium sized businesses (44%) take care of communication process and they try to bring it to a satisfactory condition (61-80%). There are also businesses whose process is unsatisfactory (15% micro businesses). Creating communication strategy is one of the possibilities for improvement and for increasing satisfaction with internal communication.

**Tab. 1 Assessment of internal communication process according to the size of business in %**

Type of business	0-20 %	21-40 %	41-60 %	61-80 %	81-100 %
Micro	15	4	27	23	31
Small	5	12	23	31	29
Medium	3	6	27	44	20

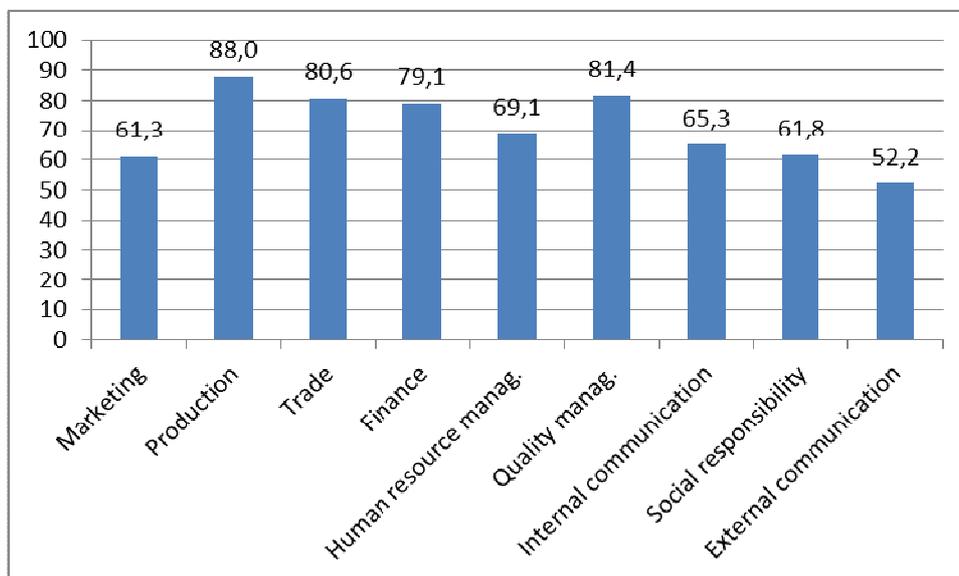
### Assessment of internal communication process according to importance

During this inquiry, the managers of SMBs were provided with 9 significant company processes they were supposed to put in order of importance for the company. Average rank of importance is depicted by the following picture 2. The most important for SMBs in South Bohemian Region is the realm of manufacturing – production (2,6), which is followed by trade, finance and quality management. Process of internal communication ranks behind human resources management (5,5) and it occupies the seventh place (6,5). Managers don't assign such importance to communication when considering organization management.



**Pic. 2 Assessment of internal processes according to importance – average rank**

Managers of SMBs in South Bohemian Region apart from importance of processes evaluated also their function (0% - it does not function, unsatisfactory condition, 100% - maximum satisfaction concerning function, excellent condition). The best result is achieved in manufacturing process (88%) – see picture 3. Internal communication is in 6 place (65%). External communication ranked the worst according to function (52%). Even this outcome expressly indicates that realm of communication is not entirely fulfilled according to ideas of top executives of organizations and that there is a number of possibilities how to make this process more efficient.



**Pic. 3 Assessment of internal processes according to their function in %**

### SWOT analysis and strategy

Within the SWOT analysis, first of all, the managers of SMBs were supposed to specify what their strengths in human resources management were. Most of them (1/5) consider internal communication a very strong realm. It is further followed by these frequently mentioned strengths: advancement and education of employees, good attitude and behaviour within human resources and remuneration.

Among weaknesses was also most frequently included communication with employees. It ranked first according to 15% of organizations. Further in order of importance are, quite similarly as with strengths, advancement, education and remuneration of employees.

Approximately 20% organizations consider the biggest problem to be the selection and recruitment of employees. Communication ranked second, followed by qualification, expertise, advancement and education of employees.

A strategy means a way how managers of organizations want to achieve their objectives. In realm of human resources management surprisingly more than 60% SMBs do not create this strategy. Remaining organizations define a long-term course in this area, only 6% organizations have defined it in writing as well. Organizations can be advised to create communication strategy and communication planning (these include for example counselling, consultation, resolving conflicts, principles of teamwork). Important part is its declaration and subsequent integrated assertion by management. Such communication planning should be updated every year, mainly on the basis of feedback acquired throughout the previous year.

### **Conclusions:**

Process of communication was evaluated by managers of SMBs to be less important as well as not functioning properly. However within the process of human resources management, communication with employees ranked first according to importance and it ranked second when its function was evaluated. Managers of organizations realize that properly established and functional internal communication has a great influence on performance of employees and prosperity of an organization. Employees, who know their place in the organization, know the mission and its contribution. They are more satisfied and more efficient in relation to their work or responsibilities. They can also identify much easier with aims of the organization and they are capable of accepting changes as well. The fundamental aim of communication with employees should be motivation and providing information in order to facilitate execution of their activities associated with work.

As a conclusion a recommendation should be made that every member of any organization should not only share ideas of a company, but also understand why he or she shares them and what they can bring. Possibilities to improve internal communication include introduction of regular consultations not only on management level of the organization but also team consultations between employees. Present age of knowledge is shaped by advancement of modern information and communication technologies. They markedly change the principal role of communication, which is conveying and receiving information, but also a method that is used for realization of such communication process. Managers use electronic communication more. It is faster and with its help they can pass on information to more people at once.

Such type of communication represents only 16% of the total number in South Bohemian Region. Verbal communication significantly prevails (70%). It is therefore necessary to encourage electronic communication more in future, implement information systems in organizations and take advantage of the following quick communication means - e-mail, intranet, internet. It is also important to make a communication plan (strategy) that should declare in writing all important components and tools of communication process. About 40% SMBs in South Bohemian Region have not created such strategy until now.

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# Evaluation investment of electricity generation and heat with exploitation biomass

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## Abstract:

The Slovak Republic imports about 90% of primary energetic sources, and therefore it is essential that these resources were used efficiently. One way of saving imported primary energetic sources, is the use of combustion agricultural and forestry biomass in cogeneration resources. The decision to invest in such structures is the question of well-prepared projects and economic and financial valuation of the project with using a computational model and software for evaluating of investments.

Evaluation investment of electricity generation and heat with exploitation biomass is realized through multi periodic balance model of investment. Model covers a period of 17 years include cost structure estimation, the estimation of production, depreciation, the financing of investment project (equity and loans), repayment scheduling and projected annual income statement, cash flow and the balance sheet. The deterministic assessment of the efficiency of investment project is based on the evaluation of the criteria of Net Present Value – NPV of all the financial flows incurred during the lifetime of the investment project.

Investment project is oriented on preparation new energy source combined heating plant (CHP) 60 MW<sub>e</sub> electric power and heat output of 30 MW<sub>t</sub> with the combustion of solid fuel – wood biomass. Investment costs of energy source are based on expert estimate of completed construction and preparation of feasibility studies in Slovakia or abroad. Financial expenses are based on actual current market price of technological equipment, building construction and installation works. In abstract we mention only relevant economic date. In evaluating the economic and financial analysis are assumes 2 years of construction and 15 years of operation work. The life energy source is considered 30 years. Discount rate - we used 8.15% nominal discount rate as opportunity cost and we used this discount rate for present value analysis. Investments costs - total investment costs: 89 000 000 EUR

here of:

design and engineering work: 8 900 000 EUR

technology section: 49 900 000 EUR

architectural section: 23 200 000 EUR

reserve: 7 000 000 EUR

the financing conditions are specified jointly as 20% financing with own resources and 80% with credits from banks.

Credits - first year: 26.4 mil EUR and the second year: 44.8 mil EUR, interest rate 4.7%

Prices - of proposed technological equipment and prices of buildings are designed according to current price lists and offers of manufacturers and educated guess, prices of products for the next year were specified as follows: price electricity 66.40 EUR/MWhr (average price including the surcharge for electricity produced together with the sold heat), price of heat 16.60 EUR/MWhr

Operating costs - fuel and energy costs, services, staff (labour costs), other operating expenses, depreciation, financial cost, costs of other activities, costs of biomass 40.00 EUR/t.

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The valuation is made upon the conditions of investor with respecting of taxes, way of financing, share of borrowed capital and its price. For the purposes of the investor, there is also made the sensitivity analysis. The calculations were elaborated according to valid legislation. The actual calculations are performed by software EFINA.

On the basis of indicator NPV we can state, that the scenario of the investment plan is not acceptable, the NPV is negative.

Presented model comes out from certain assumptions, which are represented by deterministic parameters based on the best estimates. It is useful and necessary to examine by sensitivity analysis, how changes of individual parameters affect the resulting criteria. A significant change of criteria exposes how the project is sensitive to changes of specific parameters in the other constant values. The program allows you to realize one or two parametric sensitivity analysis.

The possible risk of threat cash flows (CF) was eliminated in case of discounting of real prices about 8.15% (about lost profits). We can see the possible fall of discount coefficient on DCF in range from 0 to 15% influence of discount rate on NPV. Concerning the used realistic (conservative) scenario and discounting of CF in amount of 8.15% is the failure risk of expected results of calculations very low.

The increasing of economically eligible costs always copies by adequate percentage also the heat and electricity prices. The risk, that from this reason, i.e. increasing of the prices of economically eligible costs in single years of evaluated period, would not be reached the assumed profit, we think for irrelevant.

The results of the economic and financial analysis showed, that the return could be successful with financial support, for example non-repayable loan or subsidies on the price of fuel for energy production from renewable sources. It is a serious problem and a decision on the level of government and parliament and grants approval for manufacturer's electricity and heat from renewable sources will be disadvantaged purchasers of solid wood to processing of wood products and enterprises to processing wood pulp and paper, which would be reflected in increased prices for these products. The demand for solid wood and its price would increase.

Combustion wood biomass we recommend exploit, too on the basis of economic and financial analysis, for small sources with an installed capacity to 10 MW<sub>t</sub> for producing and supply only heat for smaller districts and used for burning waste from timber production, wood waste from wood processing plants and harvest fast-growing trees.

### **Key words:**

Combined heating plant, Biomass, Net present value, Sensitivity analysis

### **Introduction**

Slovak Republic imports about 90% of primary energetic sources, and therefore it is essential that these resources were used efficiently. The highest level of fuel efficiency conversion to other forms of energy can be achieved by cogeneration, i.e. combined electricity and heat. One way of saving imported primary energetic sources, is the use of combustion agricultural and forestry biomass in cogeneration resources. The decision to invest in such structures is the question of well-prepared projects and economic and financial valuation of the project with using a computational model and software for evaluating of investments.

### **MATERIAL AND METHODS**

Investment project is oriented on preparation new energy source combined heating plant (CHP) 60 MW<sub>e</sub> electric power and heat output of 30 MW<sub>t</sub> with the combustion of solid fuel – wood biomass. Evaluation investment of electricity generation and heat with exploitation biomass is realized through multi periodic balance model of investment. Model covering a period of 17 years include cost structure estimation, the estimation of production, depreciation, the financing of investment project (equity and loans), repayment scheduling and projected annual income statement, cash flow and the balance sheet. The deterministic assessment of the efficiency of

investment project is based on the evaluation of the criterion of Net Present Value – NPV of all the financial flows incurred during the lifetime of the investment project.

$$NPV = \sum_{t=1}^n \frac{CF_t}{(1+i)^t} - I_0$$

where:  $NPV$  is the net present value  
 $CF_t$  is the net flow of revenues in each year during the duration of the investment  
 $t$  is the time period  
 $n$  is the duration of the investment  
 $I_0$  are initial investment costs

An acceptable investment project, for any entrepreneurial firm, is the project which gives a positive value of expected net present value of future cash flows. This is because all the expenses incurred during the lifetime of the investment project first of all have to cover the incurred costs, secondly, have to provide a normal level of profits (represented by the discount rate) to investor and also should increase the cash flows, which will be reflected in the higher market valuation of the firm. A more detailed description of the net present value methodology can found in Lumby (1996), Repiský (2000).

Investment costs of energy source are based on expert estimate of completed construction and preparation of feasibility studies in Slovakia or abroad. Financial expenses are based on actual current market price of technological equipment, building construction and installation works. Admission financial costs do not consider outage of production energy due to substandard failure - accident on the technological equipment. The actual calculations are performed by software EFINA.

## RESULTS AND DISCUSSION

Enter input data in the calculation, quantification of the computational model is an important phase of multi periodical balance model creation. Condition for obtaining reliable outputs calculation is necessary to the model quantified the real input data, which is assumption of real interpretation outcomes.

**Technological input data:** in a combined heating plant (CHP), is combustion wood biomass in a fluidized steam boilers, producing steam, which drives a steam turbine to generate electricity, steam from the turbine is led by heat exchanger station steam – water, the heating water is supplied to consumers.

- *Fuel management* - in boilers will be burned wood biomass with a calorific value 10 MJ/kg, starting and stabilizing fuel is natural gas. Transport of wood biomass is proposed by the road in closed trucks, in the area of energy source will be constructed the appropriate objects and equipment of fuel management: three hectares dump fuel, biomass unloading equipment from the container, handling equipment at the dump of wood biomass, biomass transportation routes to boilers and equipment for extraction, storage and transport of inert material (sand) into the boilers. Regulating station and natural gas distribution to the boiler will be constructed.
- *Boiler, heat water treatment and condensate and feed water boiler* - in the source of energy will be installed two fluidized boilers, each with a rated steam output of 120t/hr. The boilers will be burnt wood biomass; the proposal is considered a blending of inert material into fuel, to stabilize the fluidized bed in boiler. Steam from the boilers will be conducted by into the steam condensing extraction turbine and a back-up steam pressure reduction stations. Equipment will be installed for the treatment and recovery of condensate, equipment for heat treatment and pumping feed water to boilers.

**Tab. 1 Basic parameters of the boilers**

Parameter	Unit	Value
Steam rated output	t/hr	120
Heat rated output	MW	82.3
Steam output minimum	t/hr	50
Steam pressure at the outlet	MPa	9.42
Steam temperature at the outlet	°C	540
Feed water temperature	°C	225
Boiler efficiency at rated output	%	92
Input power boiler in fuel at rated output	MW	89.5
Wood biomass consumption at rated output	t/hr	63.80
Ash output at rated power	t/hr	6.70

Own calculation

- *Flue gas* - from boilers are connected to the chimney height of 130 m. Before inlet flue gas in the chimney, flue gas will be cleaned in electric flue-dust separators.
- *Ashes* - designed is dry process, ash will be transported to the ash reservoir, after will be remove by trucks over assigned refuse dump to a distance of about 10 km.
- *Steam turbine generator* - is designed turbo generator with steam condensing extraction turbine with 60 MW<sub>e</sub> electric powers. Steam turbine is designed for condensing operation, with one controlled steam extraction and with necessary uncontrolled steam extractions for turbine condensate recovery and thermal treatment of boilers feed water.

**Tab. 2 Basic performance parameters of the turbine and generator electric voltage**

Parameter	Unit	Value
Electric power nominal (the generator terminals)	MW <sub>e</sub>	60
Steam pressure at the inlet	MPa	9.2
Steam temperature at the inlet	°C	535
Rated steam input power (absorption capacity turbine)	t/hr	240
Steam input power minimum	t/hr	80
Steam pressure in the regulated extraction	MPa	0.5
Steam temperature in the controlled extraction	°C	185
Steam flow in the controlled extraction	t/hr	to 55
Steam pressure in the condenser (cooling water at +24 °C)	MPa	0.006
Quantity of cooling water	t/hr	10 600
Nominal turbine speed	1/min	3 000
Voltage of generator	kV	10.5
Frequency	Hz	50

Own calculation

- *Steam condenser cooling circuit* - will be installed technological equipment with forced - draught cooling tower and pumping station turbine condenser cooling water. Ventilator cooling tower is designed for a nominal electrical output of turbine 60 MW<sub>e</sub>, will consist from six cells, diameter of ventilators (in every cell) is 8.0 m. Nominal power of pumping station is 10 600 m<sup>3</sup>/hr, temperature difference of cooling water is about 8°C. The delivery of the cooling tower is a device for parallel purification of the circulating cooling water. The maximum consumption of demineralised water into the cooling circuit (for compensation of losses evaporated and splash) is about 122 t/hr.
- *Heat exchanger station* - will be installed technological equipment the heat exchanger station steam-water and pumping station of heating water with a maximum capacity of 30 MW<sub>t</sub>.

**Tab. 3 Energy and substance balance**

Parameter	Unit	Value
<b>Supply and consumption of energy</b>		
Operating time during the year	hr/year	8 040
Electricity generation	MWh <sub>e</sub> /year	482 400
Own electricity consumption, together	MWh <sub>e</sub> /year	48 240
Supply of electricity to power transmission system	MWh <sub>e</sub> /year	434 160
Supply heat to district heating networks	GJ/year	332 856
Heat production in the boiler	GJ/year	4 766 424
The effectiveness of heat production in the boiler, the average	%	92.0
Consumption of heat in the fuel	GJ/year	5 180 895
Specific consumption of heat produced in the boiler to produce electric energy	kJ/kWhr	10 740
Efficiency of electricity generation	%	33.52
Efficiency of energy production (electricity and heat), together	%	39.95
<b>Consumption of raw materials</b>		
Total consumption of wood biomass	t/year	512 925
Consumption of natural gas	th. m <sup>3</sup> /year	1 500
Consumption of inert material	t/year	51 293
Consumption of decarburized (cooling) water	t/year	558 100
Consumption of demineralised water	t/year	39 637
<b>Production of pollutants and waste</b>		
<b>Emissions to air (the maximum, according the emission limits)</b>		
- solid pollutants	t/year	56
- sulfur dioxide SO <sub>2</sub>	t/year	375
- nitrogen oxides NO <sub>x</sub> (as NO <sub>2</sub> )	t/year	375
- carbon monoxide CO	t/year	468
- carbon dioxide CO <sub>2</sub>	t/year	2 826
<b>Solid waste</b>		
- ashes	t/year	53 857

Own calculation

- *Electrical equipment and electric power outlet* - the electricity energy will be outlet from the electric generator encased conductors through the switch generator circuit breaker and potential block transformer. The block transformer will be placed side by side with the transformer of own consumption at a transformer stand. From the block transformer will be the electricity escorted to substation 110 kV. Supply own electricity consumption is designed by 6.3 kV substations located in the centre of consumption through dry transformers 6.3/0.4/0.231 kV. Large drives are supplied with a voltage of 6 kV. Supply to the appliance will be solved by transforming from the level of 6 kV at the level low voltage distributions from sectional switchboards of 0.4 kV.
- *Automated control system of operating block* - equipment of automatic control will be installed for technological equipment in the main production unit (computer and security system, control and manage own consumption, control panels, control room equipment, cables and cable routes, auxiliary steel structure, additional equipment). Facility will be located in the main production unit (in the control room area).
- *Draft mode of operation of energy source* - intended is an operation source of energy during the year in the electricity regime with a nominal steam output of boiler 120 t/hr (each) and a maximum electrical output of 60 MW<sub>e</sub> at generator terminals. Is considered the supply of heat from power block to external customers (in the district heating system).

Heat supply will be made according to the requirement from regulated steam extraction with steam pressure of 0.5 MPa through the exchange station steam-water. Considered is the average performance of heat exchanger station 11.5 MW<sub>t</sub>. Power electric source is designed so, that it can provide support services for power transmission system. The economic part does not consider the provision of support services. The source of energy will be in operation throughout the year, with the exception of service outage. The planned service outage source of energy is proposed 30 days in the summer months. Turbo-generator equipment requires service outage about two weeks in year and about six weeks of once every six years to overhaul equipment. The source energy will operate 8040 hours per year.

#### **Economic input data:**

- *Ratings period - was made for 17 years. In evaluation the economic and financial analysis are assumes 2 years of construction and 15 years of operation work. The life energy source is considered 30 years.*
- *Discount rate - we used 8.15% nominal discount rate as opportunity cost and we used this discount rate for present value analysis. Nominal discount rate was calculated by software from the percentage of value lost profits 5.0% and from value estimated average inflation in the period of evaluation 3.0%.*
- *Investments costs - total investment costs : 89 000 000 EUR*  
*here of :*  
*design and engineering work : 8 900 000 EUR*  
*technology section : 49 900 000 EUR*  
*architectural section : 23 200 000 EUR*  
*reserve : 7 000 000 EUR*  
*the financing conditions are specified jointly as 20% financing with own resources and 80% with credits from banks.*
- *Credits - first year: 26.4 mil EUR and he second year: 44.8 mil EUR, interest rate 4.7%*
- *Prices - of proposed technological equipment and prices of buildings are designed according to current price lists and offers of manufacturers and educated guess, prices of products for the next year were specified as follows: price electricity 66.40 EUR/MWhr (average price including the surcharge for electricity produced together with the sold heat), price of heat 16.60 EUR/MWhr*
- *Operating costs - fuel and energy costs, services, staff (labour costs), other operating expenses, depreciation, financial cost, costs of other activities, costs of biomass 40.00 EUR/t.*
- *The valuation is made upon the conditions of investor with respecting of taxes, way of financing, share of borrowed capital and its price. For the purposes of the investor is made also the sensitivity analysis. The calculations were elaborated according to valid legislation.*

The most important statement for the deterministic assessment of efficiency of investment intent represent a projected cash flow summary (table 4) - it is a statement that provides information about the movement of cash, that means about the status of funds at the beginning and at the end of the year of their creation and use. On the basis of this statement, is possible to calculate the net present value (NPV).

On the basis of indicator NPV we can state, that the scenario of the investment plan is not acceptable, the NPV is negative.

**Tab. 4 Cash flow**  
Biomass power plant

**CASH FLOW**

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	
<b>FROM OPERATIONAL ACTIVITIES</b>																		
Revenues from Sold Goods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Revenues from Own Production	0	0	34 033 586	34 033 586	34 033 586	34 033 586	34 033 586	34 033 586	34 033 586	34 033 586	34 033 586	34 033 586	34 033 586	34 033 586	34 033 586	34 033 586	34 033 586	
Change of Short-Term Claims	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Costs of Sold Goods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Material and Energy Costs	0	0	21 967 600	21 967 600	21 967 600	21 967 600	21 967 600	21 967 600	21 967 600	21 967 600	21 967 600	21 967 600	21 967 600	21 967 600	21 967 600	21 967 600	21 967 600	
Change of Stocks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Change of Short-Term Liabilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Costs of Services	0	0	704 424	704 424	704 424	704 424	704 424	704 424	704 424	704 424	704 424	704 424	704 424	704 424	704 424	704 424	704 424	
Labour Costs	0	0	822 085	822 085	822 085	822 085	822 085	822 085	822 085	822 085	822 085	822 085	822 085	822 085	822 085	822 085	822 085	
Other Operational Costs	0	0	2 081 970	2 081 970	2 081 970	2 081 970	2 081 970	2 081 970	2 081 970	2 081 970	2 081 970	2 081 970	2 081 970	2 081 970	2 081 970	2 081 970	2 081 970	
Creation and Release Operational Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>CASH FLOW FROM OPERATION</b>	<b>0</b>	<b>0</b>	<b>8 457 507</b>	<b>8 457 507</b>	<b>8 457 507</b>	<b>8 457 507</b>												
<b>FROM FINANCIAL ACTIVITIES</b>																		
Financial Revenues	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Financial Costs	1 240 800	3 346 400	3 123 086	3 111 431	2 831 437	2 538 049	2 230 627	1 908 500	1 570 064	1 217 261	846 681	468 352	77 782	0	0	0	0	
Creation and Release of Financial Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>CASH FLOW FROM FINANCIAL ACTIVITIES</b>	<b>-1 240 800</b>	<b>-3 346 400</b>	<b>-3 123 086</b>	<b>-3 111 431</b>	<b>-2 831 437</b>	<b>-2 538 049</b>	<b>-2 230 627</b>	<b>-1 908 500</b>	<b>-1 570 064</b>	<b>-1 217 261</b>	<b>-846 681</b>	<b>-468 352</b>	<b>-77 782</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>OTHER ACTIVITIES</b>																		
Revenues from Other Activities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Costs of Other Activities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>CASH FLOW FROM OTHER ACTIVITIES</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>Tax</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1 311 130</b>	<b>1 323 161</b>	<b>1 323 161</b>
<b>CASH FLOW FROM OPERATION BEFORE INVESTMENT</b>	<b>-1 240 800</b>	<b>-3 346 400</b>	<b>5 334 411</b>	<b>5 346 075</b>	<b>5 626 070</b>	<b>5 919 457</b>	<b>6 226 879</b>	<b>6 549 007</b>	<b>6 886 543</b>	<b>7 240 225</b>	<b>7 610 826</b>	<b>7 989 154</b>	<b>8 370 734</b>	<b>8 457 507</b>	<b>7 146 377</b>	<b>7 134 345</b>	<b>7 134 345</b>	
<b>FROM INVESTMENT ACTIVITIES</b>																		
Investment to the Property	0	33 000 000	56 000 000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Financial Investment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>CASH FLOW AFTER INVESTMENT</b>	<b>-1 240 800</b>	<b>-36 346 400</b>	<b>-50 665 589</b>	<b>5 346 075</b>	<b>5 626 070</b>	<b>5 919 457</b>	<b>6 226 879</b>	<b>6 549 007</b>	<b>6 886 543</b>	<b>7 240 225</b>	<b>7 610 826</b>	<b>7 989 154</b>	<b>8 370 734</b>	<b>8 457 507</b>	<b>7 146 377</b>	<b>7 134 345</b>	<b>7 134 345</b>	
<b>Change of Long-Term Liabilities</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>Change of Long-Term Claims</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>Change of Own Capital</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>Subsidies</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>Credits and Bonds - usage</b>	<b>26 400 000</b>	<b>44 800 000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>												
<b>Credits and Bonds - repayment</b>	<b>0</b>	<b>0</b>	<b>2 825 604</b>	<b>5 853 340</b>	<b>6 133 343</b>	<b>6 426 751</b>	<b>6 734 153</b>	<b>7 056 290</b>	<b>7 393 816</b>	<b>7 747 490</b>	<b>8 118 100</b>	<b>8 506 428</b>	<b>4 404 608</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>Other resources</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>Creation of Reserve Fund</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>FINAL CASH FLOW</b>	<b>25 159 200</b>	<b>8 453 600</b>	<b>-33 331 178</b>	<b>-307 274</b>	<b>3 075 117</b>	<b>8 457 507</b>	<b>7 146 377</b>	<b>7 134 345</b>										
<b>DISCOUNTED CASH FLOW to 2012</b>	<b>25 159 200</b>	<b>7 816 551</b>	<b>-45 733 029</b>	<b>-401 017</b>	<b>-370 707</b>	<b>-342 854</b>	<b>-317 017</b>	<b>-293 127</b>	<b>-271 038</b>	<b>-250 613</b>	<b>-231 727</b>	<b>-214 266</b>	<b>1 582 500</b>	<b>3 054 200</b>	<b>2 385 242</b>	<b>2 202 705</b>	<b>2 026 713</b>	
<b>DISCOUNTED CUMULATIVE CASH FLOW to 2012</b>	<b>25 159 200</b>	<b>32 075 751</b>	<b>-12 757 278</b>	<b>-13 158 295</b>	<b>-13 529 002</b>	<b>-13 871 046</b>	<b>-14 188 064</b>	<b>-14 482 091</b>	<b>-14 753 129</b>	<b>-15 003 742</b>	<b>-15 235 469</b>	<b>-15 440 734</b>	<b>-13 897 234</b>	<b>-10 843 034</b>	<b>-8 456 791</b>	<b>-6 254 087</b>	<b>-4 217 374</b>	

**Tab. 5 Results cash flow**

Biomass power plant



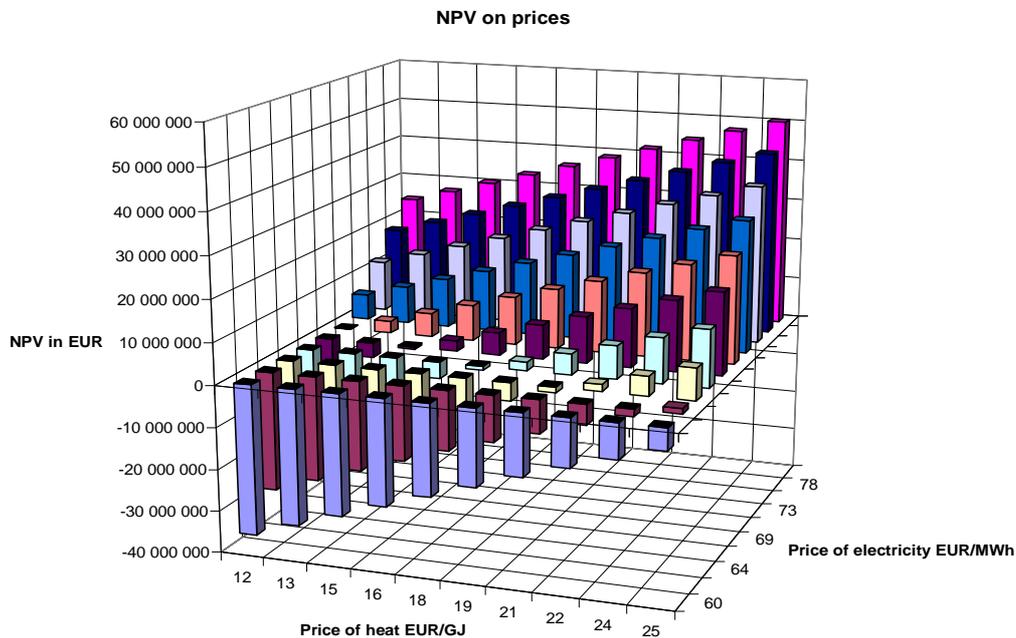
**RESULTS DCF**

Assesed Period	2012 - 2028	
Base Year (for discounting)	2012	
Discount Rate in the First Year	5,0	%
Inflation in the First Year	3	%
Tax Rate in the First Year	19,0	%
Own Money	17 800 000	EUR
Other Capital	71 200 000	EUR
Subsidies	0	EUR
Ratio of Other Capital to Total Investment	80,0	%

Total Discounted Profit	2 500 794	EUR
Average Year Discounted Profit	258 042	EUR
Discounted CF (NPV)	-4 217 374	EUR
Average Annual Discounted CF	-431 793	EUR
Internal Rate of Return	3,67	%
Payback Period (discounted)	not define d	

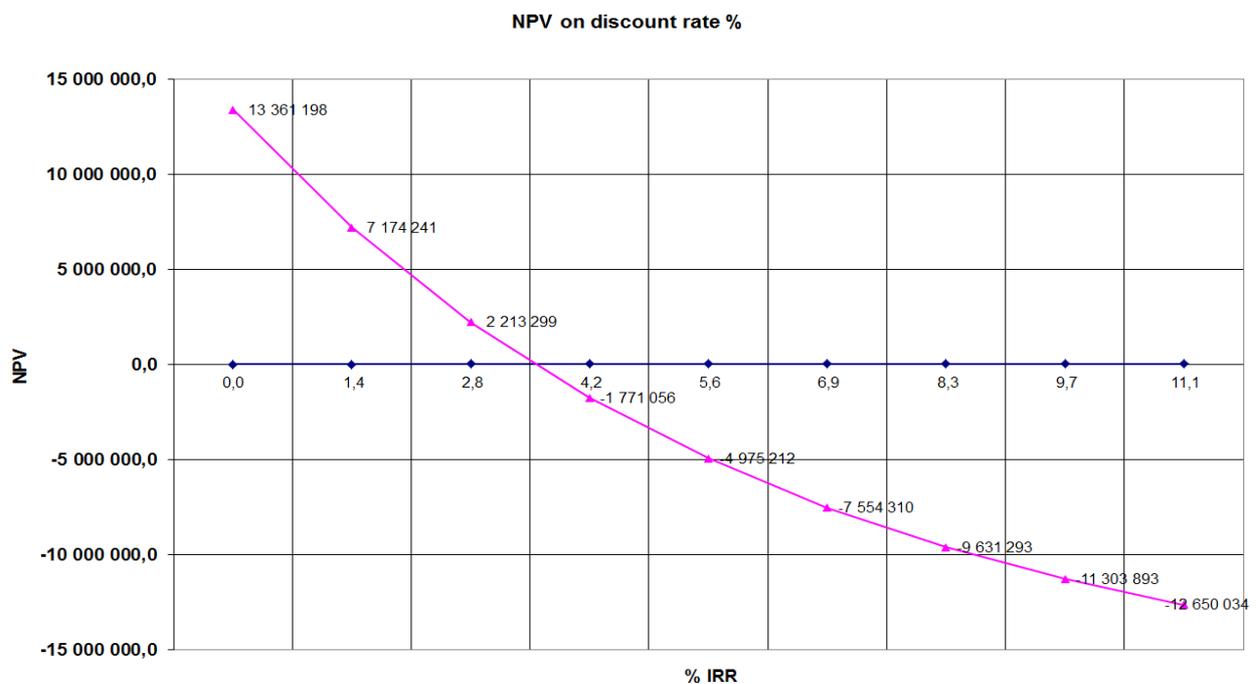
Presented model come out from certain assumptions, which are represented by deterministic parameters on the based of best estimates. It is useful and necessary to examine by sensitive analysis, how changes of individual parameters affect the resulting criteria. A significant change of criteria expose how the project is sensitive to changes of specific parameters in the other constant values. The program allows you to realize one or two parametric sensitivity analysis. In graph 1 we can see the result of two parametric sensitivity analyses - depending on the prices of electricity and heat. We can see the possible fall of discount coefficient on DCF in range from 0 to 15% in the graph 2 influence of discount rate on NPV. Concerning the used realistic scenario (conservative) and discounting of CF in amount of 8.15% is the risk of failure of expected results by calculations very low.

The increasing of economically eligible costs always copies by adequate percentage also the heat and electricity prices. The risk, that from this reason, i.e. increasing of the prices of economically eligible costs in single years of evaluated period, would not be reached the assumed profit, we think for irrelevant.



**Graph 1 Two parametric sensitivity analysis**

The influence of discount rate on NPV from 0% to 15% we can see in graph 2 (one parametric sensitivity analysis).



**Graph 2 Influence of discount rate on NPV from 0% to 15%**

## Conclusions

From view of the discount rate indicates, this is not acceptable investment. In the case of investment in these resources is necessary to review amount of the installed power source.

In addition to disadvantages in terms of return on investment for such a large power source to the combustion of wood biomass is other factors consideration for investment. In practice we have experience that in some cases it is not important what is amount of investment into the energy source, but as stated in the introduction, it is important what is the stability of the fuel base and regular availability of the resources available fuel - wood biomass needed for long-term operation. When consumption of biomass 63, 8 t/hr and annual consumption 512 925 t/year is necessary to have a secure supplier of fuel for a period of about 30 years, with the assumption of relatively stable fuel prices and its transport to the source.

The results of the economic and financial analysis showed, that the return could be successful with financial support, for example non-repayable loan or subsidies on the price of fuel for energy production from renewable sources. It is a serious problem and a decision on the level of government and parliament and grants approval for manufacturer's electricity and heat from renewable sources will be disadvantaged purchasers of wood solid to processing of wood products and enterprises to processing wood pulp and paper, which would be reflected in increased prices for these products. Would increase the demand for wood solid and its price.

Burning of agricultural biomass, mainly straw, in the larger installed capacity of the sources is a topic for a deeper analysis of this fuel availability and use of straw in agricultural production. Studies designed in Slovakia not recommended widespread use of straw burning. Use of straw is suitable for the installed power source to about 5 MW<sub>t</sub> in plants to produce heat only, provided that the operator of source has contracted a secure supply of straw in nearby surroundings, with financial low-cost to transport.

Combustion wood biomass we recommend exploit, too on the basis of economic and financial analysis, for small sources with an installed capacity to 10 MW<sub>t</sub> for producing and supply only heat for smaller districts and used for burning waste from timber production, wood waste from wood processing plants and harvest fast-growing trees.

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# Trends in development of youth unemployment in the Slovak Republic

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Elena HOŠKOVÁ<sup>2</sup>

Iveta ZENTKOVÁ<sup>3</sup>

## Abstract

The Slovak labor market passed a complicated development accompanied by fundamental turning points in employment and unemployment over the last years. Age dimension of long-term unemployment indicates, that distribution of risks of a long-term unemployment has a different intensity of impact on distinct age categories. Higher rate of a long-term unemployment of young people (in comparison with other age categories) is closely related with the process of transition from school to the labor market. The problem which occurs the most is the lack of professional experience or inappropriate field of study which focus is not demanded on the market. Negative development of unemployment is the problem in almost all countries of the European Union, not just in Slovakia.

The main aim of this article is to evaluate the present development of unemployment in Slovakia and to predict the future development of this issue. Unemployment is quantified by development of rate of unemployment which is provided by the Statistical Office of the Slovak Republic and the Ministry of Labour, Social Affairs and Family. Both institutions provides the rate of unemployment based on different methodologies. Partial goal of this article is to discover how is the unemployment influenced by gender. Objects of investigation are young unemployed people who are divided into three age groups: 15-19, 20-24, 25-29. Research is carried out in the period from 1994 to 2013. For the future prediction are used linear regression model, moving average and exponential balancing.

Young people represent one third of overall unemployment. They have more difficult conditions to entry the labour market nowadays. Number of registered unemployed persons to 29 years is still rising. Development of average rate of unemployment of young people in selected age groups follow the development of total average rate of unemployment of citizens of Slovak republic. The average rate of unemployment of young people oscillated in given period around a hundred and fifty percent of its value. The highest rate of youth unemployment occurred in year 2011 when it reached 37,77%. In the same year unemployment in Slovakia was 13,6%, while this rate reached the peak in the year 2001 (19,2%). By analysis of the unemployment rate by gender we discovered that in the age groups 15-19 years and 20-24 years the unemployment rate is higher for men. During 1994-2013 it has a growing trend. In the age group of 25-29 is the higher female unemployment rate with declining trend.

## Key words:

Youth unemployment, unemployment rate, employment, labor market, future trends

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## Introduction, the aim and methods

Slovak economy faces many challenges nowadays. Situation at the labour market is alarming especially because of its long-term imbalance. The paper describes the development of the labour market with regard to the development of the overall economy with which it is closely related. The theoretical part of the paper describes the development of unemployment in Slovakia in the period of 1994-2013. The paper identifies the determinants of its development as well as describes consequential of its impact.

The quantitative part of the paper deals with the trends in development of youth unemployment in the Slovak Republic and forecasting its future development on the basis of data provided by the Statistical Office of the Slovak Republic. To balance the time series is used regression analysis and for forecasting the moving average and exponential balancing were used.

## Regression analysis

The regression analysis was used for balancing of trends in development of unemployment in the Slovak Republic. The paper used linear, power and polynomial functions.<sup>4</sup>

$$\text{Linear function: } y = a + b_1 t \quad 1.1$$

$$\text{Power function: } y = a \cdot t^{b_1} \quad 1.2$$

$$\text{Polynomial function: } y = a + b_1 t + b_2 t^2 \quad 1.3$$

where:

y-unemployment in thousands people

t - artificial variable representing the time period

## Moving average, Exponential balancing

Were used to predict the future development of youth unemployment, taking the random variables into account. The moving average is used to predict values for the forecast of period based on the average value of the variable in a given number of previous periods.<sup>5</sup>

$$F_{t+1} = \frac{A_{t-2} + A_{t-1} + A_t}{3} \quad 1.4$$

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<sup>4</sup><http://office.microsoft.com/sk-sk/excel-help/analyticke-nastroje-statistiky-HP005203873.aspx>

<sup>5</sup><http://office.microsoft.com/sk-sk/excel-help/analyticke-nastroje-statistiky-HP005203873.aspx>

$F_{t+1}$  – unemployment in thousand persons – the predicted value  
 $A_t$  – unemployment - actual value  
 $w_1, w_2$  - Scales

Exponential balancing is used to calculate the predicted values based on the forecast of the previous period, taking the errors of the previous forecast into account.<sup>6</sup>

$$F_{t+1} = w_1 * A_t + (1 - w_1) * F_t \quad 1.5$$

where:

$F_{t+1}$  – unemployment in thousand persons - the predicted value  
 $A_t$  – unemployment - actual value  
 $w_1, w_2$  – Scales

## Key aspects of labour market development in Slovakia

Historical development of the Slovak labour market shows that its basic features are represented by long-term unemployment and employment disparity between regions<sup>7</sup>, the sustainability of existing jobs is declining and the long-term problem is the underemployment of the Roma minority. The difficult situation concerns also young people. They represent a third of the unemployed Slovaks.<sup>8</sup> The current situation is even more negative when we examine the long-term unemployment, which is really high and dangerous from long-term perspective.

At the beginning of the examined period, the unemployment was affected particularly by transformation of the economy and insufficient experience in the development of active labour market policy. In terms of the age structure, young unemployed aged 15-29 represented the largest group in the early 90s. The problem of long-term unemployment appeared in 2004. Due to the payment of social benefits it began a serious burden of the state budget. Unemployment began to decline slightly in 1996. It was caused by government program, which supported public works. Program hired mostly long-term unemployed, but it had just short-term effect.<sup>9</sup>

Despite considerable efforts, unemployment started to grow continuously in 1996. According Székely (2001) the main reason can be found again in the legislation causes and mechanism of providing support to unemployed. The mechanism was set up so that failed to motivate the unemployed to actively seek for job. The phenomenon of work without legitimate contract started to be very common. Another reason for unemployment growth was current state of economy, which was in recession that time.<sup>10</sup> In 1998, the right-wing party started to govern Slovakia. They started extensive reforms, which early increased the number of unemployed, but created the conditions for improving the business environment and attracted many foreign investors, which later decided to enter Slovak market. Unemployment had decreasing trend, which was stopped by the global economic crisis.<sup>11</sup>

In the examined period the unemployment rate reached a peak in 2001. In that year, the Slovak Republic spent only 0.23% of gross domestic product (GDP) on the active labour policies.

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<sup>6</sup>[https://wiki.fiit.stuba.sk/research/seminars/big-data/program/seminar\\_2014\\_04\\_24\\_vyrovnavanie.pdf](https://wiki.fiit.stuba.sk/research/seminars/big-data/program/seminar_2014_04_24_vyrovnavanie.pdf)

<sup>7</sup> Bezák, A. (2001)

<sup>8</sup> Rievajová, E., Pongráczová, E. (n.d.)

<sup>9</sup> Paukovič, V., Holovčáková, L. (2008)

<sup>10</sup> Székely, V. (2001)

<sup>11</sup> Brezovský, J. (2011)

If we subtracted the special state grant intended long-term unemployed, it would be only about 0.058% of GDP. Compared to the other EU member states, in which the Slovakia was trying to get in, it is a small amount. At the same time, most of member states allocated more than 1% of GDP to solve this issue. Along with efforts to gain EU membership (Slovakia enter the EU in 2004), Slovakia began to adopt various measures that were reflected by a reduction in unemployment. Comparing the first quarter of 2003 to the first quarter of 2002, the number of unemployed decreased by 5.1%. The decrease was caused by massive outflow of unemployed. The result was affected also by starting cyclic seasonal effect under the influence of an amendment of the Employment Act. The amendment introduced an obligation to unemployed, who are obligated to contact the Labour Office in order to show the results of job search every 14 days.<sup>12</sup>

In the following years, the Slovak Republic noticed an upturn. Reducing unemployment affected the GDP annual growth rate, Slovak companies output growth and also export. Positive development stopped in the second half of 2008, when the economic boom was stopped by the economic crisis.<sup>13</sup> The global economic crisis has affected the employment almost immediately. With decrease of production came also a reduction in employment. The Slovak government tried to mitigate the situation with the huge amount of intervention measures in the labour market mainly related to job creations, maintaining of employment, increasing of professional skills and promotion of labour mobility. Performance of the economy was already improved in 2010. However the economy was still negatively affected by poor economic development in countries that are major trading partners of the state.<sup>14</sup>

Slovakia belongs to the EU countries with one of the highest unemployment rate also in 2012. While production reached its pre-crisis level already in 2010, this fact was not reflected on the state of unemployment. Positive aspect represented creation of approximately thousand new jobs, but it was just 0.1% growth. Long-term unemployment had 64% share of total employment.<sup>15</sup>

During the examined years, the labour market was characteristic by a high unemployment among young people in age group 20-24. The year 2013 did not bring a big change. According to the Statistical Office, Slovak Republic had 386,000 unemployed young Slovaks.

## **Determinants of Slovak youth unemployment**

Current state of economy does not offer appropriate conditions to enter the labour market to young people. Such situation is undesirable because the demographic curve steadily declining population, therefore the workforce is aging and the integration of young people into labour market is one of the key issues in terms of sustainable economic development of the country. Country does not use the creative potential of young workers, who are characterized by high work efficiency. Young people become a large economic burden of the country instead. Large amount of state budget expenditures is associated with youth unemployment and the duty to support young unemployed by social benefits, retraining and many other actions that are associated with the solution of this serious issue. In addition, the young unemployed do not contribute to the overall economic welfare of the country. Economy suffers by multiple losses because of reduced demand for goods and services, which this group in the case of employment, would have. Economy pays also the price of the taxes that never come to the state budget.

Slovak youth unemployment particularly appears in the age group of 15-19. The main difficulties in job seeking are caused generally by low level of education and lack of work experience. Workers with low education have a problem with the placement on the labour market also later in life. The difference between groups of people without education with primary or lower secondary education and groups with higher and university education is huge. In Slovakia, this difference is around 8%. Despite the increased competitiveness of university educated

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<sup>12</sup> Fedáková, D. (2003)

<sup>13</sup> Ministerstvo of labour, social affairs and family of the Slovak Republic. (2013)

<sup>14</sup> Rievajová, E. (2014)

<sup>15</sup> Ministry of finance of the Slovak Republic. (2013)

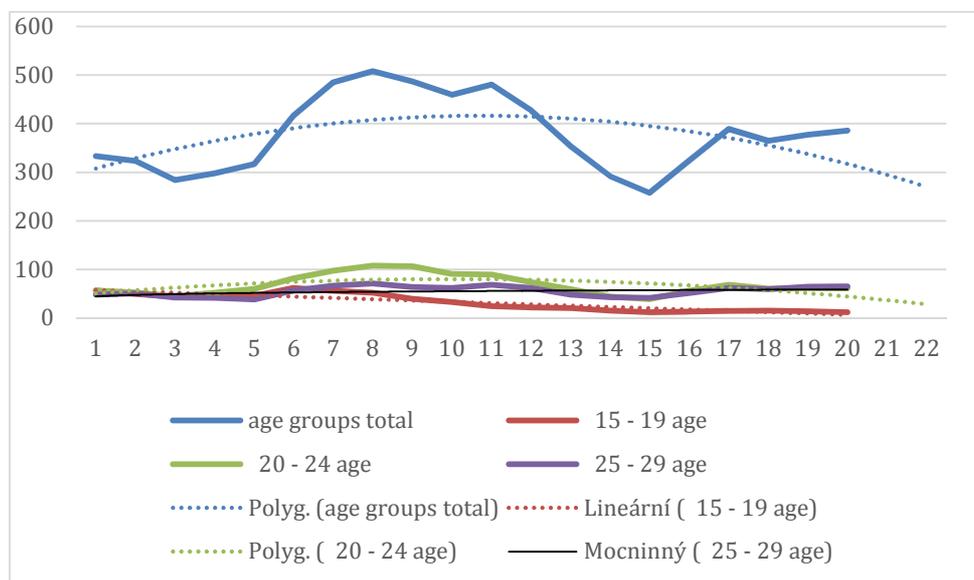
jobseekers a phenomenon of graduate unemployment rise. This trend is directly proportional to the increase in the number of university graduates.<sup>16</sup>

Another reason of high youth unemployment is reduced demand of employers for this group of job seekers. Employers are mostly discouraged due to lack of work experience in addition to the low volatility and loyalty characteristic for young people. Another important aspect that affects the youth unemployment is legislation on the protection of workers. Young people usually have a short-term contract or working on time limited contracts. The long-term contracts or contracts of indefinite duration for young employees are rare. If the employer decides to dismiss is therefore logical that in terms of legislation, it is easier to dismiss younger workers. If employer has to choose between dismissing older worker for whom company already has invested funds, for example in the form of training, compared with younger employees for whom funds have not yet been incurred, company usually leans toward the second option.<sup>17</sup>

The unemployment is further significantly influence by the factors such as GDP development, government policy of the Slovak Republic, the European Union policy and policy of its member states, whereas the EU labour market allows free movement of labour force. Furthermore, youth unemployment is affected by age groups, to which young people belong. Statistical Office of the Slovak Republic divides youth into three categories. Unemployment varies in each of the categories.

### Trends in development of youth unemployment in Slovakia, forecast

The development of unemployment affects each age group differently. According to Statistics Office, the highest value of youth unemployment for all categories totally, appeared in 2001 and the biggest drop in the examined period was recorded in 2008.



**Pic. 1 Development of youth unemployment - males and females**

**Source: Own calculations**

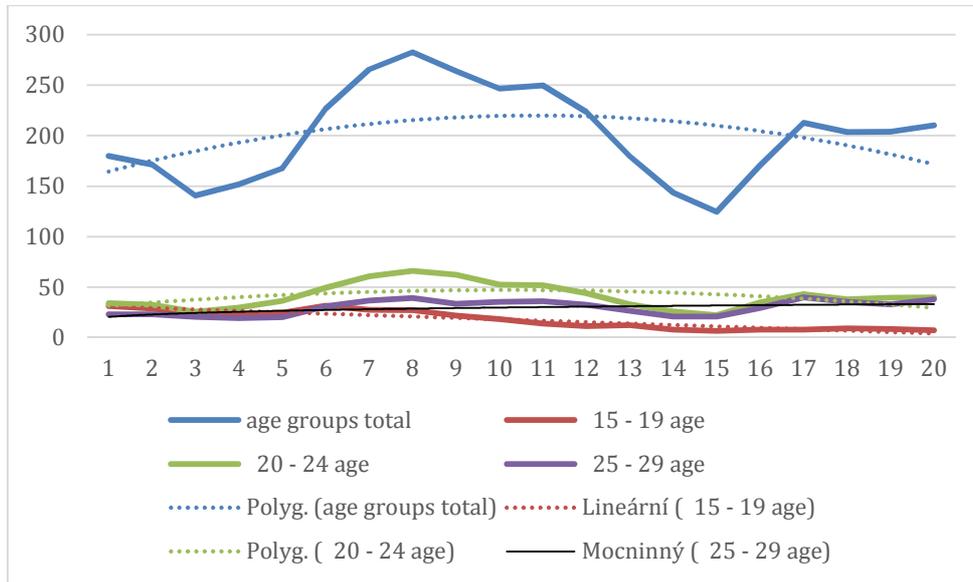
**Note: 1 – 20 represent years 1994 - 2013**

The category of young people in age group 20-24, records the highest affects of unemployment almost the entire examined period. The trend of unemployment for age groups 20-24 and 25-29, has approximately the same tendencies. The overall youth unemployment in the 15-19 age

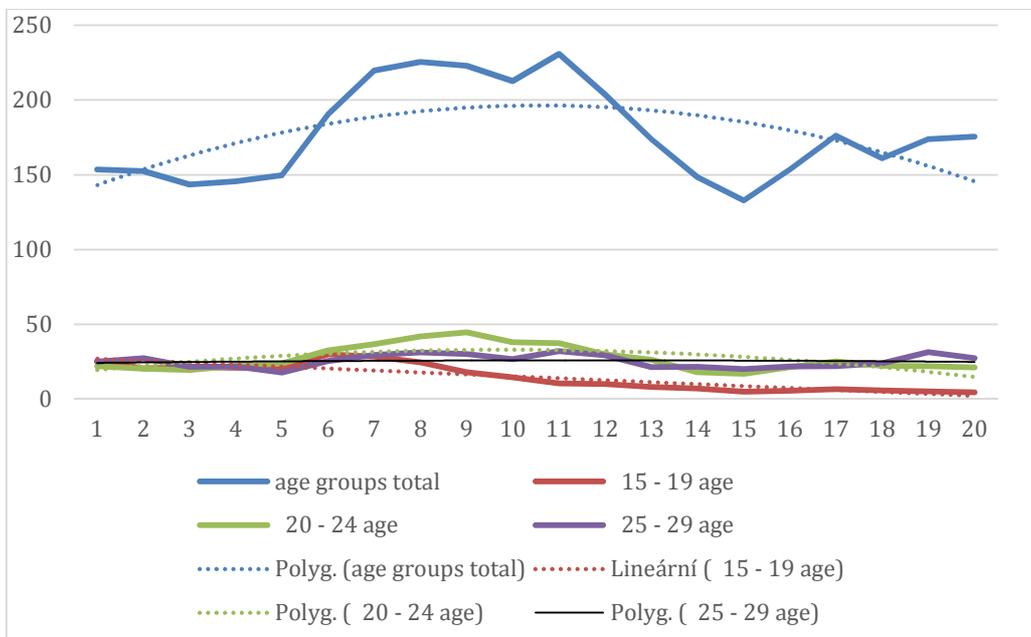
<sup>16</sup> Bartánus, J., Camberová, M. (2013)

<sup>17</sup> Hulmanová, M. (2011)

category began to decrease after 1999, when it reached its maximum. Unemployment of this group recorded minimum in 2008 and a slight increase in the upcoming years. Currently is declining again.



**Pic. 2 Development of youth unemployment - males**  
**Source: Own calculations**  
**Note: 1 – 20 represent years 1994 - 2013**



**Pic. 3 Development of youth unemployment - females**  
**Source: Own calculations**  
**Note: 1 – 20 represent years 1994 - 2013**

The most unemployed males and females were in 2001 and less in 2008. The trends in development of different age groups were similar for both gender groups. While the age groups

over 20 years recorded similar trends in the development, youth unemployment in age group up to 19 began to decline after 1999. The highest male unemployment belongs to age group of 19-24 during the entire period. This was not so for women. Unemployment was highest firstly for the youngest age group, shifted into category of 20-24 for years from 1997 to 2006 and after year 2007 with minimum differences mostly affected the oldest category, 25-29 years. In almost each year Slovak Republic has more male unemployed than female.

**Tab. 1 Youth unemployment in the Slovak Republic, forecast**

Category	Age group	Trend	Adjusted R <sup>2</sup>	Moving average 2014	Exponential balancing 2014
<b>Males and females total</b>	Age groups total	$284,47+24,631t-1,149t^2$	0,21	381,7	383,9
	15 – 19	$y=60,554-2,6928t$	0,81	13	12,5
	20 – 24	$y=44,461+7,758t-0,36t^2$	0,28	61,3	61,1
	25 – 29	$Y=44,543t^{0,093}$	0,15	64,9	65,1
<b>Males</b>	Age groups total	$y=152,89+12,41t-0,57t^2$	0,15	207,1	209,1
	15 – 19	$y=32,268-1,39t$	0,83	8,1	7,8
	20 – 24	$y=28,18+3,75t-0,184t^2$	0,20	39,6	39,7
	25 – 29	$Y=20,53t^{0,163}$	0,27	35,5	37,2
<b>Females</b>	Age groups total	$y=131,57+12,22t-0,58t^2$	0,30	174,7	174,8
	15 – 19	$y=16,31+3,41t-0,17t^2$	0,42	4,9	4,8
	20 – 24	$y=28,29-1,30t$	0,77	21,6	21,4
	25 – 29	$Y=23,89+0,35t-0,015t^2$	0,01	29,4	27,8

**Source: Own calculations**

Due to the development in the time series, the trend in development of youth unemployment was balance by linear, polynomial and power law function. The corrected index of determination ranged from 0.01 to 0.83. The best functions are estimated for trend in youth unemployment in the age group 15-19, males and females total and for males in age group 15-19. Other functions describe only an insignificant part of the variability in the time series of examined variables. Therefore the forecast of the future development on the basis of estimated functions was not realized and forecast take development of the random component by moving average and exponential smoothing into consideration. Predicted values of youth unemployment are reported in the table. The average deviation of forecasted values between methods of estimation is not significant.

Negative development of unemployment continues in the upcoming years, while is not restricted only to the territory of Slovakia, but it is a reality for other European union member states as well. Forecasts indicate negative development also after 2013.<sup>18</sup>

<sup>18</sup> Richterová, L. (2014)

## Conclusions:

Slovak labour market recorded problems with unemployment for several years. Labour market is not able to create sufficient number of jobs and therefore is in imbalance. This situation largely affects young people. Indicators of youth unemployment declare values high over the average. Currently, young unemployed Slovaks represent one third of all unemployed. Unemployment in the Slovak Republic is more structural than cyclical.

Youth unemployment is a major problem for the current economy. So how does it affect individuals, it affects the development of the whole economy. Unemployment represents waste of human capital and financial resources of the state budget and brings a huge threat to the health of society in the long-term perspective. Despite mentioned facts, there are many factors that have negative impact on young people who are willing to enter the labour market and those factors also assist in the development of long-term unemployment. Youth unemployment is mostly caused by huge gap between the success of candidates with different level of education or reduced demand of employers for a group of young job seekers, most often due to lack of work experience. Another negative impact on youth employment is represented by legislation on employee protection, further reluctance to travel for work despite the low barriers due to free movement of workers at the European union labour market.

Employers are constantly complaining about the lack of skills which young people miss. Generally accepted reason we can find at schools that are unable to respond to the demand of the labour market, there are too many schools and they are not rewarded for quality. Students have little experience and information by which they learn how to decide.

Unemployment is developed for different age groups in different ways. Declining with increasing age. Male unemployment do not differ much from the female unemployment in the examined period. Therefore, unemployment affects both gender groups by approximately equal rate. Unemployment maintain high level during the entire examined period. High values are estimated for upcoming years, not only in Slovakia but also in other EU countries. Youth unemployment is reality also in the context of other member states of the European union. However, Slovakia is on the tail of rankings, mainly in terms of long-term youth unemployment. The Slovak Republic is currently ranked in last place.

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# Selected Factors Influencing Enterprise Planning Horizons: Evidence from Slovakia.

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## Abstract

In the paper we evaluated the influence of several factors on the planning horizons of Slovak enterprises. We used binary logistic regression as an evaluation method. The independent variables were the number of employees, enterprises' legal form, share of foreign capital in its capital structure and sector of economy in which the enterprise is operating. The explained variable was the time orientation of enterprises' planning (short-term, mid-term and long-term orientation).

Based on the results we conclude that none of the evaluated variables is statistically significant. However, the results indicate the planning horizons of the enterprises with high share of foreign capital in their ownership structure (over 81%) are long-term oriented (the prevailing legal form is Ltd.). With respect to sector of economy, the planning horizons of enterprises operating in the primary sector are the most complex when compared to other sectors since they are short-term as well as long-term oriented.

## Key words:

Planning, planning horizons, the number of employees, legal form, share of foreign capital, sector of economy, influence.

## Introduction

There are many points of view of enterprise planning. When a new enterprise is being founded the directive planning for a shorter period of time prevails. The long-term plan is preferred in case of the stabilisation of the enterprise and its longer participation on the market. However, since there are costs of planning, entrepreneurs must also be able to assess the value, in order to decide when to plan themselves, when to purchase planning from an expert or a new team member, and when to skip planning altogether (Chwolka and Raith, 2012). Authors from Malaysia (Idar et al 2012) examined on the relationship between strategic planning practices and SMEs performance in Malaysia. It proposed a quantitative analysis in which market orientation and strategic planning practices are key success factors of SMEs. The findings reveal that significant relationships exist between strategic planning practices and performance, and also between market orientation and performance. Research indicates (Das, 1991; Barringer and Bluedorn, 1999; Bradfield et al., 2005; Aldehayyat and Twaissi, 2011) that business executives differ in their orientation towards the future and that these orientations are usually associated with individual preferences for different enterprise planning horizons.

The planning horizons of Slovak enterprises are often short-term oriented partially due to the turbulent development of the business environment ever since 1989 (there were numerous capital amends of Labour Code, there were changes of tax rates and taxing system in general, there is public finance consolidation ongoing, etc.) and partially due to the historical context (the central planning ceased to exist in 1989 and a lot of starting entrepreneurs were lacking experience in planning since they did not need to plan by themselves in the past).

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Therefore, the short-term orientation of planning horizons is a logical outcome. The short-term plan is easier to develop and the number of influences which need to be incorporated is lower. However, the situation was improved after 1998 when the amount of foreign direct investment increased. This transfer of capital is usually accompanied by the transfer of technologies and knowledge. The so-called "knowledge spillover" in the area of planning took form of more long-term oriented planning horizons of Slovak enterprises (these enterprises were usually characterised by the high share of foreign capital in their ownership structure and higher number of employees).

## Data and Methods

Selective survey was used as a method of the data collection. A scaled questionnaire of own construction was used as a tool of data collection. The survey was realised from early autumn 2012 to winter 2013. There were 565 participants - each representing different enterprise.

The main hypothesis relates to the time focus of organisations' planning in relation to the size of organisation and the share of foreign capital in the organisation. We distinguish three types of plans: short-term (up to 1 year), mid-term (1 to 2 years) and long-term (5 to 8 years).

We used binary logistic regression in order to find out whether the organisations develop their plans or not. The dependent variable is the existence of a plan (according to the statement of a respondent that is employed in the company) (I\_10 - plans for 5-8 years, I\_11 -plans for 1-2 years, I\_12 - plans of up to 1 year). The variable is binary (0- no, 1 - yes). Independent variables are: the legal form of the company (LEG\_F; PLC, Ltd., cooperative society, others), the area of organisation's activity (SECTOR; primary, secondary, tertiary, quaternary), the number of the employees in the organisation (NUM\_E; up to 10, 11-50, 50-251, 251 and more), the share of foreign capital in the organisation (SH\_F\_CAP; 0%, up to 40%, 41-80%, more than 80%). In case of the variable SH\_F\_CAP some categories were eliminated (to 20%, and 21-40%, 41-60% and 61-80%) due to the low number of the organisations in these categories. The variables LEG\_F and SECTOR are nominal; the variables NUM\_E and SH\_F\_CAP are ordinal.

## Results

We separately formed the existence of plan for each type of plans (short-term, mid-term and long-term). The referential categories in individual variables are: I\_10, I\_11, I\_12 (1 – yes), NUM\_E ("up to 10 employees"), SECTOR ("primary"), LEG\_F ("PLC"), SH\_F\_CAP („0%“).

### Short-term planning (<1 year)

421 answers from the questionnaires enabled us to determine the fact, whether an enterprise has short-term plans or not with a high level of certainty. In 82% of cases the respondents stated that the organisation they work for has short-term plans.

A detailed analysis of the sample is given in table 1. Just under two-thirds (63%) were drawn from "Ltd.". The sample included 59% organisations with no share of foreign capital and 17% organisations with the share of foreign capital higher than 80%. The majority of organisations (45%) are from the tertiary sector, the quaternary sector has the smallest representation (7%). Considering the number of employees the category of the enterprises with more than 250 employees (20%) has the smallest representation, the other three categories are represented quite equally (26%).

**Table 1: Total sample structure (attitudes towards short-term planning)**

Variable	Value	N	%
SH_F_CAP	0%	246	58.4
	up to 40%	64	15.2
	41%-80%	40	9.5
	more than 80%	71	16.9
SECTOR	primary	81	19.2
	secondary	123	29.2
	tertiary	188	44.7
	quartary	29	6.9
NUM_E	up to 10	113	26.8
	11-50	114	27.1
	51-250	107	25.4
	251 and more	87	20.7
LEG_F	PLC	75	17.8
	Ltd.	263	62.5
	cooperative society	26	6.2
	others	57	13.5

We tried several different models (without interactions, 2-way interactions, (3-way) interactions) in order to determine the relations between the existence of short-term plans and selected factors. The results show that the best model was the one without interactions (all interactions were statistically insignificant ( $p > .05$ )). The results of logistic regression are given in the table no 2.

**Table 2: Logistic regression of LEG\_F, SECTOR, NUM\_E and SH\_F\_CAP on the existence of short-term plans**

Variable	B	S.E.	Wald	df	Sig.	Odds Ratio
LEG_F			4.39	3	0.222	
Ltd.	-0.61	0.34	3.24	1	0.072	0.54
cooperative society	-0.50	0.58	0.73	1	0.392	0.61
others	-0.05	0.49	0.01	1	0.915	0.95
SECTOR			7.1	3	0.071	
secondary	-1.03	0.40	6.64	1	0.010	0.36
tertiary	-0.64	0.36	3.26	1	0.071	0.53
quartary	-0.38	0.61	0.39	1	0.532	0.68
NUM_E			1.16	3	0.762	
11-50	-0.01	0.38	0.00	1	0.969	0.99
51-250	0.34	0.39	0.79	1	0.373	1.41
251 and more	0.12	0.46	0.07	1	0.794	1.13
SH_F_CAP			5.67	3	0.129	
up to 40%	-0.18	0.41	0.19	1	0.660	0.84
41%-80%	-0.60	0.60	1.1	1	0.314	0.55
more than 80%	0.60	0.38	2.50	1	0.114	1.81
Constant	-0.73	0.42	3.1	1	0.083	0.48
Nagelkerke R-square	8.7%					
Chi-square	23.0, df=12, p=.028.					

Notes: The coefficients for LEG\_F are in contrast with the "0%" group. The SECTOR's coefficients are in contrast with the "primary" ones. The coefficients for NUM\_E are in contrast with the "up to 10" group. The coefficients for

*SH\_F\_CAP are in contrast with "0%" group.*

All independent variables explain relatively little (9%) of the variance in the existence of short-term plans of organisations.

There was no significant association between LEG\_F ( $p=.222$ ), NUM\_E ( $p=.762$ ) and the existence of short-term plans. Variables SH\_F\_CAP ( $p=.129$ ) and SECTOR ( $p=.071$ ) were close to significance.

In spite of the insignificance of the variables' impact we will interpret the results of the logistic regression. From the point of view of the organisation's legal form there is 0.54 times less chance (odds ratio - OR) for "Ltd" companies of not having a developed short-term plan in comparison with "PLC" organisations. In comparison with "PLC" there is 0.61 times less chance for a cooperative society of not having a developed short-term plan (we can equally say that there is 1.64 times bigger chance of having a developed short-term plan). Therefore there is the lowest chance for "PLC" of having a developed short-term plan.

There is 0.36 times less chance for the organisation from the secondary sector of not having a developed short-term plan when compared to the organisation from the primary sector. The difference is significant ( $p=0.01$ )

There is 1.13 times bigger chance for bigger organisations (with more than 250 employees) of not having a developed short-term plan when compared to the organisation with the number of employees "up to 10". The difference is even more significant in case of the organisations with the number of employees "51-250" (OR=1.41).

There is 1.81% times bigger chance for the organisations where the percentage representation of foreign capital is more than 80% of not having developed short-term plans when compared to the organisations with zero share of foreign capital. The organisations with the share of foreign capital of "up to 40%" are in a better position. There is 0.84 times less chance (when compared to the organisations with zero share of foreign capital) of not having developed short-term plans.

The organisations with the share of "41-80%" are in the best position. There is 0.55 times less chance (when compared to the organisations with zero share of foreign capital) of not having developed short-term plans.

### **Mid-term plans (1-2 years)**

The structure of the research sample in relation to the attitudes of the respondents to the existence of mid-term plans was similar to the structure of the research sample of short-term plans. 386 answers from the questionnaire enabled us to determine whether the organisation has mid-term plans or not with a high level of certainty. In 84% of cases the respondents stated that the organisation they work for has mid-term plans. A detailed analysis of the sample is given in table 3.

Just (61%) were drawn from "Ltd.". The sample included 60% organisations with no share of foreign capital and 16% organisations with the share of foreign capital higher than 80%. The majority of organisations (43%) is from the tertiary sector, the quaternary sector has the smallest representation (6%). Considering the number of employees there is the majority of the organisations with the number of employees of 11-50 (31%) and the companies with 250 and more employees are the least represented ones.

**Table 3: Total sample structure (attitudes towards mid-term planning)**

Variable	Value	N	%
SH_F_CAP	0%	231	59.8
	up to 40%	51	13.2
	41%-80%	42	10.9
	more than 80%	62	16.1
SECTOR	primary	76	19.7
	secondary	121	31.3
	tertiary	165	42.7
	quartiary	24	6.2
NUM_E	up to 10	96	24.9
	11-50	118	30.6
	51-250	95	24.6
	251 and more	77	19.9
LEG_F	PLC	78	20.2
	Ltd.	234	60.6
	cooperative society	23	6.0
	others	51	13.2

We tried the same models as before (without interactions, 2-way interactions, (3-way interactions) in order to determine the relations between the existence of mid-term plans and selected factors. The results again show that the best model was the one without interactions (all interactions were statistically insignificant ( $p > .05$ )) The results of logistic regression are given in the table no 4.

**Table 4: Logistic regression of LEG\_F, SECTOR, NUM\_E and SH\_F\_CAP on the existence of mid-term plans**

Variable	B	S.E.	Wald	df	Sig.	Odds Ratio
LEG_F			10.14	3	0.044	
Ltd.	0.68	0.42	2.65	1	0.103	1.97
cooperative society	-0.85	1.11	0.58	1	0.448	0.43
others	1.35	0.54	6.18	1	0.013	3.85
SECTOR			1.3	3	0.347	
secondary	0.01	0.44	0.00	1	0.987	1.1
tertiary	0.12	0.42	0.08	1	0.781	1.12
quartiary	-1.35	0.88	2.37	1	0.124	0.26
NUM_E			0.65	3	0.884	
11-50	-0.18	0.38	0.22	1	0.637	0.84
51-250	0.01	0.43	0.00	1	0.978	1.14
251 and more	0.19	0.49	0.15	1	0.701	1.21
SH_F_CAP			1.91	3	0.591	
up to 40%	-0.17	0.45	0.15	1	0.701	0.84
41%-80%	-0.64	0.57	1.1	1	0.263	0.53
more than 80%	-0.55	0.49	1.28	1	0.258	0.58
Constant	-2.07	0.54	14.88	1	0.000	0.13
Nagelkerke R-square	6.3%					
Chi-square	14.5, df=12, p=.271.					

Notes: The coefficients for LEG\_F are in contrast with the "PLC" group. The SECTOR's coefficients are in

*contrast with the "primary" ones. The coefficients for NUM\_E are in contrast with the "up to 10" group. The coefficients for SH\_F\_CAP are in contrast with "0%" group.*

All independent variables explain relatively little (6%) of the variance in the existence of mid-term plans of organisations.

There was no significant association between SH\_F\_CAP ( $p=.591$ ), NUM\_E ( $p=.884$ ) and SECTOR ( $p=.347$ ) and the existence of mid-term plans. The only significant variable is LEG\_F ( $p=.0.044$ )

From the point of view of the organisation's legal form there is the most significant difference between "others" and "PLC". There is 3.85 times bigger chance ( $p=0.013$ ) for "others" of not having developed mid-term plans in comparison with "PLC". There is 1.97 times bigger chance ( $p=0.103$ ) for "Ltd." of not having a developed mid-term plan in comparison to "PLC" organisations. There is 0.43 times less chance for a cooperative society of not having a developed mid-term plan in comparison to "PLC". Therefore there is the lowest chance for "others" of having a developed mid-term plan.

There is 0.22 times less chance for the organisations of the quaternary sector of not having a developed mid-term plan in comparison with the organisation from the primary sector. The chances of not having a developed mid-term plan are bit higher for the organisations from the secondary and tertiary sector (when compared to the primary sector).

It "might" be interesting that there is 1.21 times bigger chance for bigger organisations (with more than 250 employees) of not having a developed mid-term plan when compared to the organisation with the number of employees "up to 10". On the contrary, there is 0.84 times less chance for the organisations with the number of employees "11-50" of not having a developed mid-term plan.

There is 0.53 or 0.58 times less chance for the organisations where the percentage representation of foreign capital is 41-80%, respectively more than 80% of not having developed mid-term plans when compared to the organisations with zero share of foreign capital. There is 0.84% times less chance for the organisations where the percentage representation of foreign capital is "more than 40%" of not having developed mid-term plans when compared to the organisations with zero share of foreign capital.

### **Long-term plans**

308 answers from the questionnaires enabled us to determine the fact, whether the enterprise has short-term plans or not with a high level of certainty (the least of all cases). In 36% of cases the respondents stated that the organisation they work for has long-term plans (it is again the smallest number). A detailed analysis of the sample is given in table 5. Just (61%) were drawn from "Ltd.". The sample included 60% organisations with no share of foreign capital and 15% organisations with the share of foreign capital higher than 80%. The majority of organisations (45%) are from the tertiary sector, the quaternary sector has the smallest representation (6%). Considering the number of employees the category of the enterprises with more than 250 employees (20%) has the smallest representation, the other three categories are represented quite equally (26%).

**Table 5: Total sample structure (attitudes towards long-term plans)**

Variable	Value	N	%
SH_F_CAP	0%	185	60.1
	up to 40%	41	13.3
	41%-80%	35	11.4
	more than 80%	47	15.3
SECTOR	primary	58	18.8
	secondary	96	31.2
	tertiary	137	44.5
	quartary	17	5.5
NUM_E	up to 10	82	26.6
	11-50	85	27.6
	51-250	78	25.3
	251 and more	63	20.5
LEG_F	PLC	58	18.8
	Ltd.	187	60.7
	cooperative society	18	5.8
	others	45	14.6

We tried the same models as before (without interactions, 2-way interactions, (3-way interactions) in order to determine the relations between the existence of mid-term plans and selected factors. The results again show that the best model was the one without interactions even in the case of long-term plans (all interactions were statistically insignificant ( $p > .05$ )).

The results of logistic regression are given in the table no 6.

**Table 6: Logistic regression of LEG\_F, SECTOR, NUM\_E and SH\_F\_CAP on the existence of long-term plans**

Variable	B	S.E.	Wald	df	Sig.	Odds Ratio
LEG_F			21.57	3	<0.001	
Ltd.	1.31	0.33	16.33	1	<0.001	3.72
cooperative society	1.45	0.61	5.68	1	0.017	4.25
others	2.04	0.52	15.48	1	<0.001	7.67
SECTOR			4.9	3	0.179	
secondary	0.55	0.37	2.14	1	0.143	1.73
tertiary	0.52	0.37	2.03	1	0.154	1.68
quartary	-0.44	0.64	0.47	1	0.494	0.65
NUM_E			0.82	3	0.845	

11-50	0.05	0.34	0.02	1	0.896	1.05
51-250	0.3	0.38	0.61	1	0.436	1.35
251 and more	0.3	0.44	0.45	1	0.501	1.34
SH_F_CAP			4.65	3	0.199	
up to 40%	-0.35	0.39	0.82	1	0.366	0.71
41%-80%	0.12	0.47	0.06	1	0.803	1.12
more than 80%	-0.76	0.41	3.39	1	0.065	0.47
Constant	-0.93	0.42	4.86	1	0.028	0.39
Nagelkerke R-square	13.4%					
Chi-square	14.5, df=12, p=.002.					

Notes: The coefficients for LEG\_F are in contrast with the "PLC" group. The SECTOR's coefficients are in contrast with the "primary" ones. The coefficients for NUM\_E are in contrast with the "up to 10" group. The coefficients for SH\_F\_CAP are in contrast with "0%" group.

All independent variables explain relatively little (13%) of the variance in the existence of long-term plans of organisations.

There was no significant association between SH\_F\_CAP ( $p=.119$ ), NUM\_E ( $p=.845$ ) and SECTOR ( $p=.179$ ) and the existence of long-term plans. The only significant variable is LEG\_F ( $p<.0001$ )

From the point of view of the organisation's legal form the most significant difference is between "others" and "PLC". In case of "others" there is 7.67 times bigger chance ( $p<0.001$ ) of not having developed long-term plans in comparison with "PLC". There is 4.25 times bigger chance for a cooperative society of not having a developed long-term plan in comparison to "PLC". There is 3.72 times bigger chance ( $p<0.001$ ) for "Ltd." of not having a developed long-term plan in comparison to "PLC" organisations.

There is 0.65 times less chance for the organisations of the quaternary sector of not having a developed long-term plan in comparison with the organisation from the primary sector. The chances of the organisations from the secondary and tertiary sector of not having a developed mid-term plan on the similar level are 1.73 respectively 1.68 times bigger in comparison with the primary sector.

There is 1.34 times bigger chance for bigger organisations (with more than 250 employees) of not having a developed long-term plan when compared to the organisation with the number of employees "up to 10". It is very similar to the organisations with the number of employees from 50 to 250.

There is 0.47 times less chance for the organisations where the percentage representation of foreign capital is more than 80% of not having developed long-term plans when compared to the organisations with zero share of foreign capital. There is 0.71 times less chance for the organisations with the share of foreign capital of "up to 40%" (when compared to the organisations with zero share of foreign capital) of not having developed long-term plans.

## Conclusion:

The essential Slovak literature dealing with the issue of enterprise planning considers the operative focus of actual planning in Slovak enterprises to be one of its critical points. Therefore, when creating questions we followed from the assumption that long-term planning is the most developed in the organisations with a higher share of foreign capital in their ownership structure. We also assumed that these organisations would be characterized by a higher number of employees (identified with the category of 251 and more). The achieved results do not completely correspond to our assumptions. It is surprising that there

is 1.34 times bigger chance for bigger organisations (with more than 250 employees) of not having a developed long-term plan when compared to the organisation with the number of employees "up to 10". In other words, the probability that a micro-company has developed long-term plans is higher than in case of big companies. This finding can be associated to the total awareness of the respondents about the system of plans in the enterprise they work for. The employee of a micro-company has probably a better and more direct access to the information about the company management than an ordinary employee of a bigger company. Considering what, another interesting data is how the number and the extent of the set changes according to the fact, whether we deal with short-term plans (421 respondents), mid-term plans (386 respondents) and long-term plans (308 respondents). If we consider that each respondent commented on the existence of each type of planning, then it could follow from the foregoing that the respondents (at least some of them) are more likely to think than to know, whether the enterprise they work for has developed short-term plans.

It is also surprising that the share of foreign capital proved to be statistically insignificant (as well as the other selected factors) in case of all three time horizons of plans. In case of the existence of short-term plans (and also mid-term plans to some extent) we expected that the differences between the enterprises with low, respectively high share of foreign capital would not be big. However, in case of long-term plans we assumed the existence of a difference between the above mentioned groups of enterprises. Its absence can be partly explained by the structure of foreign investments (foreign direct investment FDI). Many investment projects are of "temporary" character (the production is moved to the country with the cheapest current working power and the attractive offer of government benefits), so the investor often does not even state any long-term plans in a given plant.

The expected results have naturally some limitations. One of them is the already mentioned limited awareness of the respondents (not all of them work on a management position) in terms of the existence of a particular type of plans as well as in terms of the share of foreign capital in their ownership structure. Quite a low percentage of variability explained by the model by the variables of SH\_C\_CAP, NUM\_E, SECTOR, LEG\_F points to the fact that one or more important parameters have not been included in the model (e.g. the time of organisation's existence). Here we see the scope for further research in the future. This research was financially supported by the Fund to support research and development centre in Faculty of Natural Sciences, Constantine the Philosopher University in Nitra.

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# Application of time management key principles at managers´ work

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## Abstract

Time management, or managing of time, is a scientific part of management dealing with managing of time, so that all the activities are organized in the most effective way and there is a minimum time waste. It is a discipline with a huge potential in the future because nowadays, when managers are given more responsibility, more requests on effectiveness and expertise, it is inevitable to understand the act of time management.

The basic principles of time management of activities are to learn to plan the writing form, the most important tasks should be done as first, to learn how to delegate, omit disturbance and do not have all the day filled with planning. If a manager applies in his job the principles of time management, he should remember the following principles as well: understand the orders of seniors, ask for clear goals and measureable evaluation of work effectiveness, do not accept goals he knows he cannot reach, prepare a time plan to reach the goals, include the subordinates into planning, organize regular meetings to keep the continuity of planning and resources of the organization.

The objective of the paper was to analyze effectiveness of managerial work on the middle level management and to elaborate suggestions for improvement of their activities. To fulfill the objective we had to follow several steps. Firstly, it was important to study the literature necessary for understanding the principals and relationships within time management. Based on this knowledge we elaborated series of questionnaires which were then handed over to the managers on the middle level management in selected set of 25 small and medium sized food processing companies of Košice region.

4 questionnaires were elaborated, each intended on a different area of time management. The first one identified the basic activities of managers and time dedicated to these activities. The second one supplemented this information with the analysis of importance and relevance of certain activities. Based on the results we were able to identify key activities of a manager and recommend which activities are more important, which activities should be delegated which activities should be postponed or simply ignored. The next two questionnaires were intended to analyze the activities which waste the manager's time and do not bring the manager any benefit as for the results of their work. In this case our effort was to identify these activities and subsequently generalize them to be able to elaborate the overall picture of the time waste factors. We also found out that the managers have a positive attitude to their companies what positively influences the corporate culture.

## Keywords:

Time management, manager, time frame, principles, planning, effectiveness, disturbance, time killers.

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## Introduction

Corporate culture is becoming increasingly more and more aggressive in its focus on productivity in the sense of hours worked. More and more people are spending more and more hours on the job, willingly or not. Yet there is plenty of evidence which state that extra hours do not translate directly into increased productivity not least because stress and tiredness dilute effectiveness. The intention here is to show that changing habits and enhancing effectiveness by adopting the right way of working pay dividends. If you do this and achieve your objectives, then maybe the pressure to just „put in more time“ will decrease. (Forsyth, 2013)

Fleming (2011) says that effective time management is closely connected to identification of strategic tasks in a specific way and by a selection of appropriate tools and techniques to fulfill these tasks which are said to be the most basic conditions of time management.

In a managerial activity the effective time management represents the basement of success. The task of the managers is to maximally and rationally use time because from this ability the overall ability to handle managerial profession is dependent.

Effective time management in managerial work means that the manager knows, regulates and organizes his own time and work instead of accepting that the time influences the managers. The manager should also distinguish activities that must be done from those that might be delegated. It also emphasizes the effectiveness of working process as a factor of time saving – a good manager does not allow himself to be overwhelmed by excessive administration and does not create it either.

The organizational time of a manager is divided into three basic types which ensure fulfilling of the three types of tasks. Time for the boss, time spent doing things he would not do if he did not have the boss. It is therefore tasks fulfillment given by the senior. To satisfy the boss takes time but to fight unsatisfied boss takes even more time. Another type is a time for system that is spent by the manager satisfying administrative and other requests of his colleagues and partners. It includes fulfillment of forms, meetings, phone calls etc. The manager pays attention to the tasks that come out from the organizational structure. The third type is time for yourself, which is the most important out of the three. It is divided into time for subordinates and free time which can be used by the manager according to him. It is time dedicated to the tasks the manager wants to do – creativity, news implementation, managing, planning, organizing. Especially this type of type usually vanishes as first and the manager is under pressure and stressed. (Majerčák, 2006)

The managers spent part of their time doing specific tasks on their own. We call this time occupational. Every manager is also obliged to organize activities of a department for which he is responsible. Time which the manager really has is a disposable time. A very skilled manager knows that if he is productive he needs longer operating zones. There is still free time left that the manager can use for self development, self realization or just to relax. It is inevitable to force ourselves to have some free time because omitting it might cause health problems or lower working effectiveness of a manager.

Methods and techniques used by planning and organizing managers own work constitute a significant component of professional competence of manager. Every manager uses in its certain activities - its inherent, personal working technique. However, not every technique is effective. The effective one has (among other things) to allow him to exclude unnecessary work and thus reduce time loss, reduce stress, reconciling work and private life, increase personal productivity, work with greater self-fulfillment. (Šajbidorová, Lušňáková, Hrdá, 2012) The ability to organize working time is individual, it is also dependent on individual specifications of a certain man. Time organization and way of its usage is influenced by the originality of an individual who creates his own strategy of time management. Time organization is therefore adjusted to own needs and abilities of an individual.

Negative impacts of inappropriate managerial time organization or time killers represent wrong acting of managers because they waste time. The included are:

- Inability to determine priorities of tasks solution, inability to distinguish important and urgent,
- Effort to handle all that is coming,
- Executing wrong things,
- Preference of short time goals to long time,
- No review of priorities and goals,
- Absence of real system of time planning, intuitive acting,
- Inability to turn down a new task, or to delegate tasks, effort to do everything alone,
- Inappropriate management of accepted visits connected with inability to shorten or finish the conversation,
- Ineffective communication,
- Inefficient problem solving, quick decisions,
- perfectionism,
- Inefficient self-discipline, mess in writings, or respecting the physiological effectiveness curve, omitting relax,
- Ineffective information selection,
- Useless meetings, inappropriate organizational structure and bad relationships with colleagues on a workplace.

One of the most substantial mistakes is when a manager does more activities at once – multitasking. It has an adverse impact on human psyche – causes a sense of urgency, stress, results in concentration and acting disorder in a long term nature. Multitasking results in slower task fulfillment and increases mistakes within the tasks.

Based on given information we can define the shortcomings of ineffective time organization evaluate as mostly personal individual features reflecting in acting, behavior and relations of a manager within organization, that hinder effective cooperation and task delegation, which creates the sense of managerial activity as well as development of managerial abilities and skills. Negative might also be inefficient education and experience in managerial activities which are connected to adaptation of an individual on managerial functions.

### **Time management of activities**

Time management of activities represents time organization according to the realized managerial activities which are listed according to its percentage share on the whole managerial activity. Time planning spent within individual activities is connected with the work on a specific position as well as with organizational structure of a company.

**Tab.1 Managers' activities**

Categories	Activities
Planning activities – 25% of time	Planning of time and work Planning of conceptual materials Project elaboration including financial budgets
Education - 25% of time	Studies on professional literature, materials, articles, press monitoring and web pages
Organizational activities – 20% of time	Meetings, phone calls, emails Conversation and negotiation Mail conception
Control activities – 15% of time	Assessment of elaborated Professional materials Inspection of workplace Correspondence
Trips and meetings – 10% of time	Meetings and business trips
Relax as a part of job – 5% of time	Relax

Source: Vetráková, Seková, 2004, p. 39

For an effective managerial work it is very important to maintain balance within managing our own time. If the balance of individual activities is not kept, from long time point of view the success and satisfaction of a manager will be unreachable.

The base for a good timetable is ability to identify the most important things, the less important things and absolutely not important things – determining the priorities. We can use the principle of A, B, C and D group division.

A priorities bring a lot of stress because they are urgent and very important, therefore they must be solved immediately. People who pay attention to B priorities spend 60-80% of their time and energy to ensure quality of their life and career growth. Included are activities which are important for a personal and professional life of a manager but do not need to be done the very next day.

C priorities literally fall into manager's life. Urgent visits or phone calls do not have to be essential for the manager than for the other side. The real time killers are D priorities – couple of minutes with a colleague, coffee break, personal phone call, controlling of e-mails etc.

The most valuable we have is time and by the right analysis we can increase effectiveness of its usage. He says that our perception of time changes according to specific changes such as: new technologies, ways of communication and travelling. They remind that the key to effective time management is ability to divide time. That means to manage our time as well as time of our subordinates to some point as well. (Knoblauch, Woltje, 2006)

Information and Communication Technologies (ICT) is an essential part of the work-life for a substantial proportion of managers - significantly reduce the time required to gather information, communications, administration and other processes. On the other hand, they effect restricting of the need for direct interpersonal communication, burdening people with plenty of useless information and caused wasting of time that could be used for more useful activities. Also by using ICT in managerial work pays "good servant but a bad master." (Šajbidorová, Lušňáková, 2013)

A manager should learn to plan their time effectively. Time management is a science that develops itself. New tools of planning are added continuously- diaries or professional calendars, timetables and especially computers, PDA and mobile phones. It is not important where the manager puts or writes the notes. The effective thing is, except the task, to note the priority as well and to estimate how long the task will take. More successful and calmer managers are the ones that can sensibly work with their time.

## **Methodology of the paper**

To be able to fulfill the given objectives we elaborated series of questionnaires which were filled in by the managers of selected companies continuously within their working hours. The research took 4 days. The first questionnaire given to the managers was focused on time identification and the time they dedicate to certain activities. For more simple evaluation we objectified these activities into various groups.

- Travelling – this group does not include travelling to and from work but travelling within working hours. We include travelling to partner companies, to customers,
- Meetings with colleagues, subordinates or seniors,
- Phone calls without the determination of the other side (subordinate, senior, colleague, business partner...),
- Correspondence – we included written, e-mail communication as well as sms texts and faxing,
- Visiting partner companies. In this point there are included all the visits of suppliers, customers, banks, schools and other institutions,
- Administration is one of the basic activities. The task of a manager on this position is to ensure deliver all the documents on time to or from the subordinates or seniors
- Dealing with the colleagues contains all the communication with the colleagues out of meetings. That means, it is discussion about solving problems or procedures how to deal with the given task.
- In point of solving unexpected tasks we included all the tasks which emerged within monitored time period and it was important to solve them. There were tasks which were not planned but it was important to solve them (complaints, late arrivals of documents, etc.).
- In the column of others we included breaks, waiting, lunch and similar situations when the manager within working hours does not exhibit any tasks. In case that the manager had a luncheon meeting, this time is called meeting or meeting with the colleagues.

The second questionnaire was dealing with the importance of individual tasks which were exhibited by the managers in a monitored time period. We elaborated a list of basic activities which represent the nature of work of a manager. Every manager according to their own opinion evaluated the importance of these activities according to evaluation scales of Eisenhower matrix. The third questionnaire focused on time killers of the managers. Time killers are activities or bad habits which do not bring the manager or the company any value, for example inability to delegate or total absence of delegation or inability of a manager to say no. The fourth questionnaire focused on disturbance. We wondered what may disturb the managers, for how long and what medium it includes.

Except the questionnaire we used managed discussion to get the primary data as well. Within elaboration of primary data we used the following methods:

- analysis – within evaluation of gained data,
- comparison- to compare gained data with the theoretical approaches and among the managers,
- deduction and synthesis – within formulation of conclusions and recommendations.

## **Paper results**

### **I. Duration of the activity analysis**

The first questionnaire we dealt with gave us information on activities performed by the managers and time they needed for it. This analysis was realized in two years period. The first problem we had to solve was to analyze working activities. We made a research on working methods and procedures with the aim to identify and generalize basic areas of managerial

work. This step was inevitable to create a questionnaire which dealt with duration of individual activities.

Based on this analysis we identified several types of activities and we monitored time duration dedicated to these activities.

After the completion of the first phase we could move on to determination of time consumption. Work analysis is simply a detailed monitoring of a working day, working process and continuous asking whether it is possible to perform a specific operation in a more effective way than we are doing it now and if it is possible to exclude some operations without consequences.

After analyzing 4 working days which represent average workload of a manager we can sum up several conclusions. We found out that almost all the managers spent most of their time doing administrative work. The content of this group of positions is to present documents on time. The task of a manager is to elaborate documents and hand them over from the subordinates to the seniors in given time. This activity represents approximately 20% of all the activities.

Other timely significant activities are phone calls and solving unexpected tasks. Making phone calls is an important part of managerial work. Thanks to the phone calls they can ensure the immediate exchange of information such as orders, appointment confirmation, communication with the suppliers etc.

In the following working days there are numerous situations which were not expected or planned. For these situations the managers have a specific time of their working day. During the monitored period they dedicated to these activities similar time like to administrative work that means not more than six hours which is 18 % of the overall monitored working time. The content of this group of activities is various and therefore we will not specify it. It included for example claims, visits or problems with ensuring working tasks for subordinates.

Among the tasks that took managers approximately 5 to 10 % of their time there were meetings which are a part of their every day. It is therefore clear that a morning meeting takes approximately half an hour and its content is usually a plan on actual working day and a feedback from the previous days or working tasks. Under the correspondence we understand arrangement and sending the mail, e-mails, faxes and other forms of communication to subordinates, seniors, colleagues and business partners. Visiting partner companies is a very important activity even though it takes approximately half an hour a day. By visiting we mean a personal attendance in organizations ensuring task fulfillment of the company. Dealing with colleagues out of meetings takes managers approximately 40 minutes a day. The sense is a solution of working problems or searching new ways how to solve things out of meetings. The expression others represents activities which are not connected with the work. These are lunch breaks, solving personal problems etc. The smallest part of time is dedicated to travelling.

## **II. Working task significance analysis**

To decide about significance of the tasks we used the Eisenhower principle. The steps were as followed: first we let the managers to elaborate a detailed list of activities which represent their common working day, consequently we thought about these tasks and gave them a certain status according to Eisenhower matrix therefore they had to divide tasks into important and urgent.

To the group of tasks, which are usually urgent as well and important to fulfill the goals, the managers agreed and included activities connected with document circulation and organizing trainings.

According to our findings, out of all activities, performed by the managers on this level, approximately 28% belong to important and urgent. The recommendations of professionals for tasks of this type are clear and unambiguous. We have to deal with these activities responsibly, perform them personally and they must become a priority of our working time table.

The tasks in other two groups, either urgent or important, should be, according to the professionals on the level of 10-20 %. In our research the managers evaluated the share of the tasks which are important to 33 % from all the activities which they perform and a share of

26 % was given to tasks which are from time point of view urgent. The urgency of these tasks is represented by the responsibility of a manager for individual activities and results. The professionals within this type of tasks recommend delegation. Working activities, which are necessary to be performed, and their overall importance is not too big, are likely to be delegated to the subordinates.

As mentioned above, there were approximately 33 % of important but not really urgent activities out of all activities. Within evaluation of this group we recorded the biggest differences within personal evaluation. In general the managers include tasks like consultations on documents. That means dealing with ways of form fulfillment, feedback, objections etc. In spite of the fact that we realize the importance of the correctness of the documentation, the managers marked this point as not urgent because the subordinates have gone through trainings and they should help each other without the help of the manager. If this blows up there is a time for the manager to help. The second part of results in this group represented the tasks that were important but it is not important to solve them continuously because they are not significant until the end of some time period. In this case the recommendations of the professionals say that tasks in his group should be simply postponed and we should wait until time they become not only important but urgent as well.

The last group of the questionnaire was marked as time killers – solving personal things, reading web pages on the internet, etc. The professionals recommend ignoring these. In our case this step would not disrupt the task fulfillment or the overall activity of companies. The tasks the managers put into this group are tasks that should not even occur. Moreover, according to the opinion of some managers, the ignoring in this case does not influence the quality or the activity negatively. It contrary increases independence and creativity of people who are forced to look for own ways of problem solution or to get information from the colleagues and help each other and exchange know-how.

### **III. Time killers analysis**

The result of our research was identification of the most common time killers of the managers on the middle level of company management.

A significantly negative result was found in the overall goal setting by the managers and knowledge of some activities they perform. Not only from the questionnaires but also from the conversation we learnt that the strategy of creation and plan fulfillment is omitted. Partial objectives and strategies are not specified for all the managers. Many of them actively think of strategic and short term goals and tasks and they have an effort to elaborate general processes which are then shared and discussed with the colleagues. They regularly organize meetings with their subordinates where they discuss the relevance of specific activities and about possibilities of how to increase their effectiveness or about suggestions on how to eliminate unimportant tasks. From our point of view we would recommend to continue in the effort but it would be appropriate to organize the meetings more effectively (the participants have limited information about the topics and therefore limited possibilities on how to get ready for a meeting).

Ineffective meetings are sometimes experienced by more than half of the participants rarely three of them take part and often just one of them experiences an ineffective meeting. These results are probably linked to weak formal organization of meetings. During preparation for the meeting the participants have the information about the program, but only a scarce information on topics and questions which are about to be dealt. Based on this, the participants contribute to the discussion not only with their reactions and solutions which emerge right there. We think that in spite of high professionalism of participants it would be appropriate to inform about the discussed questions in more detail.

The questions connected with the ability to say no, disrupting our activity to start up a different activity and question focused on disruption, had a similar explanatory power. We wondered how much the managers are disrupted by the subordinates and seniors and how they can handle it. The results say that speaking of distraction, most managers do not know how to fight

it. If anybody comes to them with a problem they usually stop working on their thing and start caring about their colleague, visit, phone call or written communication.

The question of task delegation is in monitored companies handled well, while only two managers have the feeling that they arrange everything on their own although they deal with things that could be solved even by the subordinates. In other cases it is just rare that the manager would have to solve a specific series of tasks alone without delegation.

The last group of questions in this questionnaire focused on the overall approach and process of the managers within planning their time. We wondered to what extent the managers book their time in their day plan for specific activities and what approach they have to duties and terms. By the evaluation of these questions we found out that most managers do not plan their time on 100% but they leave some reserve on unexpected events.

Most of the managers solve specific tasks right after the last term which can be perceived as a negative phenomenon. Anyway, in a combination with the response on a question, in which we asked whether the managers postpone unpleasant tasks for later (2 often, 3 sometimes, 69 rarely) we find out that negative result does not have to be so negative and we do not have to result in statement that the managers are lazy. After considering both answers we can say that the managers postpone some tasks until the end of a specific term because of higher effectiveness of their job. The professionals say that the tasks which are important but not urgent might be postponed and wait until they become urgent. In the last question we wondered what attitude the managers have to the fourth generation of time development. We wondered to what extent the managers connect their privacy with business, whether they highlight their personal goals, plans, terms in their business calendar, to what extent they adjust their lifestyle to work and vice versa, to what extent their job reflects their personal life. The results showed that within 68 % of managers this connection of privacy, lifestyle and duties is really significant which is positive because we can say that work they do is a part of their lifestyle and we assume that with the attitude like this the quality of their participation on the whole function of the company will be high.

#### **IV. Distraction analysis**

Distraction analysis is the last part of our research. We can say that it is very important to pay attention to this subject because in the vocational literature it is most likely to be omitted. Distraction is recorded in two basic types, personally by visiting and via phone calls. No matter what distraction it is, it always has a negative impact on effectiveness of a manager because during the distraction we do not perceive only the time wasted but afterwards we still need some time to get back to the activity we had been doing. This influence is so significant that one of the main objectives of management is to eliminate the distraction as much as possible. For this kind of elimination it is necessary to first analyze the distraction, it means to find out who distract the manager most and how.

Based on the comparison of the share between the distraction by phone call or any other electronic media and personal visits we are stating an average relation between these two variables. We see that the distraction by a phone call prevails. 62 % of distraction is without a personal contact and 38 % is with the personal contact of a manager and the second person. A phone call or electrical communication in general is one of the most common means of how to save your time but on the other hand it is also the most common way of the distraction. As mentioned in previous analysis our sample of managers makes phone calls approximately almost 1, 5 hours a day. This time can be divided into two parts, the one that was effective and communication was necessary and the one that was, from the manager's point of view, was not effective. The subjects who distract the manager most are his subordinates. This result is not surprising because one of the basic tasks of a manager is to be available with his recommendation and help to subordinates. The second position was held by the clients. We accepted the phone calls distracting only in case that the necessary information was available on the internet or other public resources. 14 % of distraction comes from the subordinates. The content of these phone calls is mostly control of the managers' activity, giving tasks that had

already been given before etc. 12 % of distraction come from colleagues who usually need help with the solution of a specific problem. The rest belongs to the family and others.

We know couple of effective ways of how to minimize the distraction by phone calls. The first possibility is to ignore the ringing. In this case the phone calls are automatically taken by another person for example an assistant or an answering machine. The second possibility how to solve the distraction by a phone call is to pick up and clearly inform about inability to talk and arrange the time of later conversation. The third possibility how to minimize this kind of distraction is to get through the phone call as quickly and effectively as possible. The last specific type of solution is to record the phone calls and then analyzing their content. This method is effective in case that the manager is given too much information from which only a part might become important after some time. This type is important for the manager to eliminate repetitive phone calls in the future and repetitive information.

The last analysis is the analysis of the distraction personally that means visitors. The visitors create approximately one fourth of the whole time of the distraction. The biggest share is created by the subordinates like mentioned above. The content of the visit is usually handing the documents and a feedback or correction. Such a distraction takes approximately forty minutes. The second biggest share is the colleagues. 20% of distracting visits is caused by the presence of the seniors who visit a workplace and control whether unplanned meetings are organized. The rest of percentage share belongs to the family, others and clients.

The basic recommendation to minimize personal distraction is: to publish consulting hours and visiting hours. This way is effective only for internal employees but according to the analysis we see that an essential part of distraction comes from the internal environment. That is why we consider publishing the consulting hours for sufficient. Another way is to publish a time frame of a manager so that every visitor sees when the manager is busy.

## **Conclusions and recommendations**

Based on the study and analysis made in food processing companies of Kosice region we found out that the managers spend most of their day by administration of various documents and reports on their activity, activities of their subordinates and activities of the department for which they are responsible. The second biggest share of time represents solving various unplanned tasks which occur during the day. Behind these activities there is phone call which takes the manager approximately 90 minutes a day. All the above mentioned activities are a key part of the manager's work on the middle level of company management. By the next analysis we found out the importance and relevance of primary and secondary activities. We learnt that there is only 28 % of really important and urgent activities that need to be solved personally and immediately out of all the activities. Within the others we recommend either delegation if they are urgent or postponing until time they become a part of the important.

Within the analysis of time killers we tried to identify the activities at which the managers ineffectively spend their time. We found shortcomings in a short term planning. In this case it is necessary to elaborate generally accepted monthly or weekly plans or even a way of remuneration and sanctions within the realization.

We identified the time waste at meetings and official meetings with the managers and their subordinates. The biggest problem was inefficient informing about the topics and objectives of the meetings. Our recommendation is to focus on a formal preparation of these meetings especially and the content of the invitation cards and rational management of business meetings.

We found even shortcomings in the report on information and their availability. Among our recommendations belongs elaborating personal, clear and easily portable database of information and necessary documents using internal information network of the company available on the internet.

In the area of delegation and way of its realization we did not find any crucial shortcomings. The managers usually delegate some of their duties on the subordinates and unit managers and employees without having recorded mistakes in the quality of delegated tasks.

We dealt with the overall attitude of the managers to increasing the effectiveness of time planning and a relationship coming from the fourth generation of management. We found out that the life style, relationship of a manager to the company and mission coming from this position is very positive. The managers take their position as a part of their life and do not take it only as a source of money which is very positive and simultaneously it is a target of the fourth generation of management.

Within the analysis of distraction we determined basic division of distraction, that is via phone call or personal distraction. By the analysis of received data we found out that approximately three quarters of distraction exist via phone calls and other electrical communicators. We identified several possibilities how to fight the distraction.

As for personal disturbance we identified the most significant group of internal employees, thus colleagues, seniors and subordinates who took part in disturbance by 91 % altogether. Our recommendation to improve the situation was elaborating and publishing time frame or consulting hours which they should respect.

Effective time management starts with clear vision and goals. The effectiveness of using the managers' time potential is an important aspect of function of every company. The ability to control your time is inevitable for the managers on all level of management. The most time is lost because clear goals, plans, priorities and review are missing. The aim of the paper is to find out how to apply using the key principles of time management in managerial work of agricultural and food processing companies in Slovakia. The task is according to the questionnaire find out how the managers on a lower level and a higher level of management handle their working time in real environment – what the organization of their working activities is like, how they handle time limited tasks, what possibilities of time organizing and planning they use. Based on the mentioned time management principles of tasks we recommend the following.

Writing form of planning is effective because of the evidence of operative activities and regular tasks for which it is not enough to use a calendar and it should not take more than 10 minutes a day. It is also inevitable no to be distracted by other activities especially within fulfillment of more important tasks, it is important to focus on the present activity which is important to finish. Especially disturbing might be eliminated by detailed planning and organization of activities. As many disturbing moments are caused by communication means – mobile phones, phone calls, e-mails,...) it is necessary to plan time to arrange the necessary communication (e-mail control twice a day, eliminate phone calls using assistants, ...).

The next principle of effective time organization is defining the time for relax. This one should reflect the individual biorhythm of every human being. In general it is 10 minutes of relax per an hour of work.

The inevitable thing is also the ability to delegate tasks on the workers which significantly influences the effective time usage. The manager should therefore dedicate approximately 20% of his working time on individual work and divide the rest to subordinates according to their abilities.

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# The diversification of municipal infrastructure in Poland

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## Abstract

The article addresses the issues of technical infrastructure spatial diversification in Poland in 2002-2013. Analysed were water supply and sewerage systems, gas grid and road network. Synthetic development measurement by Hellwig was used to assess the overall level of technical infrastructure development. The analysis of individual infrastructure components demonstrated significant differences among regions in Poland. The highest accessibility was observed for water supply systems, whereas the lowest accessibility indicators concerned gas grid. Sewerage system was the element revealing the highest development rate. Concerning the infrastructure, western voivodships and more urbanized regions proved to be the best developed regions of the country. Areas with dominating agricultural function, without large industrial centres or large cities revealed apparently lower accessibility indicators for basic infrastructure components. The beginning of the 21<sup>st</sup> century was the period of considerable progress in the extension of infrastructure in Poland, which was possible owing to the European Union structural funds.

## Keywords:

public finances, community (*gmina*), technical infrastructure, economic development, local development, local government

## Introduction

Technical infrastructure is treated as a set of facilities and investments providing bases for proper functioning and development of national economy, but also ensuring appropriate living conditions for the society and their possible improvement (Sadowy, 1988, p.20). According to the definition suggested by Ginsbert-Gebert (1976) infrastructure is conceived as an “economic category denoting a material basis connected with a given area and serving widely understood needs of production and consumption”. In both concepts a serviceable character of the infrastructure towards the other subjects of socio-economic life is clearly visible. It constitutes a specific basis enabling an efficient and effective functioning of the national economy entities, and therefore the crux of its existence is best visible in the perspective of the people and economic entities using it. Infrastructure greatly determines the quality of everyday life of individual households, but also the functioning and potential development of entrepreneurship (Wojewodziec and Musiał 2003, p.11).

Municipal infrastructure constitutes the part of technical infrastructure whose development and extension are conducted by the local government units at the basic level, i.e. communities (*gminy*). Municipal infrastructure is composed of a system of technical devices providing basic services crucial for the functioning of the economy and society (Lemer 1999). The services it provides may alleviate or liquidate the results of contemporary ecological hazards not only in large city agglomerations, but also in rural areas. Creating and development of infrastructure in rural areas in Poland should be therefore regarded as a priority due to the different way of their development than in the post-industrial countries (Radwan and Paluch 2008 p.170).

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## Objective and methods

The main objective of the paper is an evaluation of the equipment of the local government units in basic municipal infrastructure facilities. Changes which occurred in this respect at the beginning of the 21<sup>st</sup> century were indicated as an additional objective.

Conducted analyses focused on the network facilities, such as water supply and sewerage system and gas grid. The analysis was supplemented by the public road network density. The time span of the analysis covered the period of 12 years from 2002 to 2013, whereas the territory of Poland was presented by voivodships (NTS-2) for calculation and presentation of data.

Relative indicators showing the percentage of people with an access to the determined component of the infrastructure (water supply and sewerage system or gas grid) were used for an assessment of territorial units equipment in technical infrastructure facilities. Regarding the transport infrastructure, an indicator of road network density per 100km<sup>2</sup> of the area was used.

The method of Hellwig synthetic development measure (Nowak 1990, p.143) was used to construct an aggregated indicator and conduct the overall assessment of the level of municipal infrastructure facilities development. This is a method allowing to present in a synthetic way the information contained in respective diagnostic features. The observation matrix  $X$  composed of  $n$  lines (objects) and  $k$  columns (diagnostic features) is transformed into standardized variable matrix  $Z$  according to the following formula:

$$z_{ij} = \frac{x_{ij} - \bar{x}_j}{s_j}, \quad i = 1, \dots, n, \quad j = 1, \dots, k,$$

$$\text{where } \bar{x}_j = \frac{\sum_{i=1}^n x_{ij}}{n}, \quad s_j = \sqrt{\frac{1}{n} \sum_{i=1}^n (x_{ij} - \bar{x}_j)^2}.$$

On the basis of standardized variables a model of development is established, which is the object with the following coordinates:  $z_{01}; z_{02}; \dots; z_{0k}$ ,

where  $z_{0j} = \max_i \{z_{ij}\}$  for variables which are stimulants,

$z_{0j} = \min_i \{z_{ij}\}$  for variables which are destimulants.

A stimulant is a variable whose higher value denotes a better situation of the object in relation to the investigated phenomenon, whereas a destimulant is a variable whose lower value denotes a more advantageous situation of an object.

Subsequently, a distance from the model is established for each object:

$$d_i = \sqrt{\sum_{j=1}^k (z_{ij} - z_{0j})^2}.$$

The lower (calculated for each object) value of  $d_i$  coefficient, the higher the level of its development. On the basis of  $d_i$  values assumed by a synthetic variable, an aggregated development measure is computed for individual objects according to the following formula:

$$z_i = 1 - \frac{d_i}{d_0},$$

where  $d_0 = \bar{d} + 2s_d$ ,

whereas  $\bar{d}$ ,  $s_d$  denote, respectively arithmetic mean and standard deviation of previously computed distances from the model:

$$\bar{d} = \frac{1}{n} \sum_{i=1}^n d_i, \quad s_d = \sqrt{\frac{1}{n} \sum_{i=1}^n (d_i - \bar{d})^2}.$$

The measure is a normalised quantity and assumes the values within the [0;1] interval. The higher the measure value, the better the situation of the analysed object.

## **Importance of infrastructure for the local development**

The importance of infrastructure for the local development appears in economic discussions mainly in the context of the theory of enterprises location. Infrastructure management is an obvious factor of local development, whereas particularly attractive investment locations are these which possess well developed and efficient technical infrastructure network (Parysek 2001, p.105). The effect of infrastructure on economic development is also regarded in the category of reducing fixed costs of businesses' operation. Following this statement, the attractiveness of a given region depends on fixed costs which must be incurred to start an enterprise in that area. Territorial units may shape decisions regarding the localisation of enterprise, in the first place through the amount of infrastructure facilities in this area and then use it as an important asset in the presentation of own investment offer and persuading entrepreneurs to place their investment in this area (Egger and Falkinger, 2006,p. 1995).

Apart from the direct input of infrastructure components in the functioning of economic entities, also the indirect effect is important, which in economics occurs as external effects. Contemporary indirect effects are usually treated as more important than the direct contribution to the volume and structure of the national product, which is particularly emphasized in new models of economic growth. It has been indicated that, in a longer perspective, external effects created by the infrastructure may lead to the acceleration of the economic growth rate. One of such effects is a diffusion of innovations and the phenomenon of dissemination of higher productivity impulses (so called spillover effects) created in the research and development sector (Rosik, 2006.p.7-8).

The analyses mentioned above demonstrate a serious importance of infrastructure for initiating and dynamization of local development processes. It should be also emphasized that infrastructural facilities are a measure of civilizational progress, which to some extent determines the level of economic development of countries or regions. A relationship may be perceived indicating that "the level of infrastructure development is connected with the level of the country economic development as a feedback. Economic development creates a demand for the services of infrastructure and contributes to its development.

At the same, developing infrastructure through the external effects creates conditions for the development of productive branches of the economy" (Sadowy, 1995, p.81).

Under conditions of decentralized state model and empowerment of the local government, the issues connected with functioning of networks and infrastructural facilities are the concern of local administration units, which through determining the rules of shaping the policy of infrastructure development initiate the conditions for stimulating economic activity in a given area.

## **Assessment of the level of basic technical infrastructure elements development**

One of the main tasks of technical infrastructure is localization function reflected mainly in the shaping of settlement network and production facilities distribution (Sadowy, 2006, p.102). Therefore, for entrepreneurs, the level of municipal infrastructure facilities development is an important factor in making localisation decisions. Analysed were basic components of technical infrastructure limited to those, whose expansion is the responsibility of communities (*gminas*).

**Table 1. The share of inhabitants using water supply system in the total population number in Poland in 2002-2013 (%)**

Voivodship	Percentage of people using water supply system											
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Dolnośląskie	90.3	90.5	90.6	90.9	91.0	91.1	91.3	91.4	91.5	91.6	91.9	92.1
Kujawsko-pomorskie	89.2	89.3	89.5	89.8	90.0	90.3	90.5	90.6	90.8	90.9	91.1	91.2
Lubelskie	77.1	77.6	78.4	78.8	79.2	79.8	80.2	80.8	81.1	81.5	81.7	81.9
Lubuskie	86.9	87.5	87.9	88.2	88.4	88.7	89.1	89.2	89.4	89.6	89.7	89.9
Łódzkie	88.0	88.2	88.5	88.8	89.0	89.2	89.4	89.5	89.6	89.7	89.9	89.9
Małopolskie	70.5	70.8	71.4	73.5	73.8	74.2	74.7	75.3	75.7	76.0	76.3	76.4
Mazowieckie	77.6	78.5	79.2	80.4	81.0	81.9	82.7	83.1	83.5	84.0	84.2	84.5
Opolskie	94.1	94.2	94.3	94.3	94.4	94.4	94.4	94.5	94.5	94.5	94.6	94.6
Podkarpackie	72.4	73.2	73.7	74.0	74.4	74.8	75.2	75.5	75.7	75.9	76.1	76.7
Podlaskie	84.8	85.2	85.7	86.2	86.7	87.0	87.2	87.4	87.6	87.9	88.0	88.2
Pomorskie	91.2	91.3	91.5	91.8	91.8	91.9	92.4	92.6	92.7	92.8	93.0	93.1
Śląskie	92.6	92.7	92.8	93.0	93.1	93.2	93.3	93.3	93.3	93.4	93.6	93.6
Świętokrzyskie	79.6	80.4	81.1	81.8	82.4	82.8	83.2	83.5	83.9	84.3	84.6	84.8
Warmińsko-mazurskie	86.4	86.7	87.0	87.9	88.0	88.3	88.5	88.7	88.9	89.1	89.3	89.4
Wielkopolskie	91.2	91.3	91.5	91.7	91.9	92.0	92.3	92.4	92.5	92.6	93.0	93.1
Zachodniopomorskie	92.7	92.2	92.9	93.0	93.1	93.1	93.2	93.3	93.3	93.4	93.6	93.7
<b>Poland</b>	<b>84.8</b>	<b>85.1</b>	<b>85.5</b>	<b>86.1</b>	<b>86.4</b>	<b>86.7</b>	<b>87.0</b>	<b>87.3</b>	<b>87.4</b>	<b>87.6</b>	<b>87.9</b>	<b>88.0</b>

Source: Own studies on the basis of BDL CSP data.

The level of saturation with water supply systems each year was the highest among all investigated network facilities (Tab.1). However, some differences occurred between the voivodships (variation coefficient 8.8%), which assumed the highest value in the first year of the analysis (2002) and were diminishing in time. However, the changes were not serious enough to cause shifts in the classification of regions. The areas poorly equipped in this component of the infrastructure in 2002 (Małopolskie, Podkarpackie and Lubelskie), remained on the lowest ranking positions also in 2013. The three leaders of the compilation (Opolskie, Zachodniopomorskie and Śląskie) did not change their position for some time.

An average level of household connections to water supply systems for the whole country increased from 84.4% in 2002 to 88% in 2014, which indicated the rate on the level of 103.77%. It should be emphasized that in each voivodship increase in this indicator value was observed, nevertheless the rate of progress was diversified. The regions where the increase in this indicator was the highest (Małopolskie, Mazowieckie, Lubelskie and Świętokrzyskie) were also among the most poorly equipped areas at the beginning of the analysis, whereas the lowest rate of progress was registered for: Opolskie, Zachodniopomorskie and Śląskie voivodships, i.e. for the regions where the population demands for water supply were best satisfied. In conclusion it may be stated that water supply system investments were realized mainly in the areas where the needs in this respect were the greatest, which from the perspective of the local government investment policy deserves a positive opinion.

Extension of water supply systems usually leads to higher water consumption by households, which in result implies the increase in generated municipal sewage leading to the environmental burden (Satoła 2013, p.109). In order to limit the negative environmental impact it is necessary to solve the problem of municipal sewage disposal and treatment.

**Table 2. The share of inhabitants using sewerage system in the total population number of Poland in 2002-2013 (%)**

Voivodship	Percentage of persons using sewerage system											
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Dolnośląskie	64.8	65.2	65.7	66.1	66.4	66.9	67.5	67.8	68.1	69.3	70.1	70.8
Kujawsko-pomorskie	59.2	59.9	60.6	61.4	62.0	62.5	63.1	63.9	64.3	65.2	65.6	66.1
Lubelskie	43.0	43.5	44.3	44.9	45.4	45.9	46.2	46.6	47.2	48.5	49.3	49.7
Lubuskie	58.9	59.6	60.4	61.1	61.8	62.1	62.4	62.8	63.3	64.4	64.9	65.5
Łódzkie	55.0	55.4	56.5	57.4	57.8	58.1	58.4	58.6	58.8	59.8	60.4	60.9
Małopolskie	45.7	46.5	47.6	48.8	49.6	50.1	51.1	51.9	52.7	54.5	55.1	56.0
Mazowieckie	55.5	56.2	56.9	57.8	58.6	59.4	60.1	60.9	61.5	63.1	63.7	64.7
Opolskie	50.1	51.4	52.1	53.6	54.3	55.4	58.4	58.7	59.2	60.8	61.8	63.3
Podkarpackie	44.5	46.9	48.8	50.4	51.3	52.2	53.8	54.9	56.9	60.7	61.5	62.6
Podlaskie	55.3	56.0	56.9	57.8	58.4	58.9	59.5	60.0	60.0	61.0	61.5	62.1
Pomorskie	71.3	72.1	72.7	73.1	73.5	73.8	74.6	74.9	75.4	76.5	77.2	77.9
Śląskie	65.5	65.9	66.5	67.3	67.7	68.1	68.4	68.6	69.0	70.1	70.9	71.5
Świętokrzyskie	41.1	42.0	43.0	44.5	45.5	46.1	46.4	46.7	47.4	50.0	51.5	52.5
Warmińsko-mazurskie	62.1	62.9	63.7	64.4	64.6	65.0	65.4	65.7	65.8	66.8	67.7	68.3
Wielkopolskie	54.7	55.5	56.6	58.0	58.6	59.2	59.7	60.4	61.0	62.6	63.9	64.6
Zachodniopomorskie	72.1	72.1	73.0	73.3	73.6	73.9	74.2	74.5	74.8	76.0	77.0	77.5
<b>Polska</b>	<b>56,7</b>	<b>57,4</b>	<b>58,3</b>	<b>59,2</b>	<b>59,8</b>	<b>60,3</b>	<b>61,0</b>	<b>61,5</b>	<b>62,0</b>	<b>63,5</b>	<b>64,3</b>	<b>65,1</b>

Source: Own studies on the basis of BDL CSP data.

As results from the analysis, the level of sewerage system development does not keep pace with water supply system development (Tab.2). In the scale of the whole country the percentage of households connected to the sewerage systems increased from 56.7% in 2002 to 65.1% in 2013. Despite a considerable progress in this area, the distance between the equipment with water supply and sewerage system in the scale of the whole country still exceeds 20 p.p. However, a higher growth rate of sewerage system than water supply system (114.81% versus 103.77%) should be assessed positively. The growth rate of the share of people served by sewerage system revealed a strong regional diversification (variation coefficient 17.1%). The highest growth was registered in Podkarpackie (by 40.67%) and Świętokrzyskie (by 27.74%), whereas the lowest in Zachodniopomorskie region (by 7.49%) and Śląskie (by 9.16%).

From the perspective of environmental benefits, the fact that investments in improving the access to sewerage infrastructure were made at the fastest rate in the areas with a clear deficit of these facilities in 2002, deserves a positive assessment. On the other hand, the lowest growth rate characteristic for the voivodships best equipped in this infrastructural component at the start of the analysis, cannot be justified by the disproportions between the accessibility of sewerage versus water supply system, which remained there on almost the same level over the whole 12-year period.

Another analysed element of technical infrastructure was gas grid, which is a specific kind of network infrastructure, since it was constructed usually with direct involvement of the local government, whereas its exploitation is the task of the entity supplying gas to the final customers. Unlike water supply and sewerage systems, where water supply and sewage disposal is the responsibility of organisational units financially dependent on the local government, the gas supplier is a private enterprise, operating on a commercial basis.

**Table 3. The share of inhabitants using gas grid in the total population number of Poland 2002-2013 (%)**

Voivodship	Percentage of persons using gas grid											
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Dolnośląskie	63.2	65.2	63.1	62.8	62.8	62.5	62.4	63.1	62.8	62.7	61.8	61.7
Kujawsko-pomorskie	44.9	45.3	45.2	45.0	44.8	44.9	44.7	44.8	44.7	44.4	45.0	44.8
Lubelskie	36.2	36.2	36.4	36.5	38.1	38.1	38.2	39.0	39.2	39.4	39.8	40.1
Lubuskie	49.9	50.3	50.2	50.0	50.4	50.4	50.4	52.5	52.6	52.6	52.3	52.3
Łódzkie	40.0	39.7	39.7	39.5	39.6	39.4	39.2	39.7	39.3	39.3	39.7	39.8
Małopolskie	65.1	68.3	62.9	63.0	63.0	63.1	62.8	63.3	63.1	63.2	63.0	62.8
Mazowieckie	54.2	59.1	54.0	53.5	53.6	53.5	54.2	54.9	54.6	54.5	53.5	53.7
Opolskie	40.8	41.5	41.4	41.4	41.3	41.3	41.2	41.5	41.6	41.6	42.0	42.0
Podkarpackie	71.7	73.9	69.6	69.7	69.8	69.8	69.9	71.8	71.9	71.8	72.6	72.6
Podlaskie	25.8	27.5	26.1	26.2	26.4	26.5	26.5	27.1	26.9	27.0	27.7	28.1
Pomorskie	53.2	57.0	53.1	52.7	52.1	51.6	50.8	51.1	50.9	50.8	49.9	49.2
Śląskie	62.5	65.2	61.7	61.6	61.7	61.7	61.5	61.6	61.4	61.3	62.6	62.5
Świętokrzyskie	35.9	35.8	35.7	35.6	35.6	36.2	36.1	36.5	36.5	36.5	36.5	36.6
Warmińsko-mazurskie	44.6	45.3	45.1	44.8	44.5	44.2	43.9	44.0	43.5	43.3	43.1	42.8
Wielkopolskie	44.6	44.6	44.6	44.4	44.5	44.3	44.1	47.7	47.9	48.1	47.6	47.5
Zachodniopomorskie	57.4	61.2	58.7	58.7	58.7	58.7	58.4	60.7	60.8	60.8	59.7	59.6
<b>Polska</b>	<b>52.2</b>	<b>54.2</b>	<b>51.8</b>	<b>51.7</b>	<b>51.8</b>	<b>51.7</b>	<b>51.7</b>	<b>52.6</b>	<b>52.5</b>	<b>52.5</b>	<b>52.4</b>	<b>52.4</b>

Source: Own studies on the basis of BDL CSP data.

Gas grid accessibility during the whole analysed period was the lowest among the three assessed network facilities, moreover almost no perceptible growth was observed in this case (Tab.3). 52.4% of the population of Poland had access to gas grid in 2013 and the indicator increased during 12 years only by 0.2 percent point. No major changes in this respect were due to two factors. The first is a relatively easily accessible, in view of logistics and finances, way to satisfy the needs for gas fuel (gas cylinder) and the second results from a disadvantageous relationship between the costs of the transmission infrastructure extension and possible customers' benefits.

A considerable spatial diversification is apparent (var. coeff. 25.3%) of households' equipment in gas grid. In this respect Podkarpackie and Malopolskie voivodships proved the best. The causes might be the density of main transmission networks in a given area. Among other voivodships with a relatively high accessibility indicator were those characterised by high urbanisation indicator (Śląskie, Dolnośląskie and Zachodniopomorskie).

Another element of technical infrastructure with crucial importance for the inhabitants, since it makes possible fast travelling, is road network. In this case we used an indicator showing the public road network density per area unit (Tab.4). Although it is not a measure best showing the road infrastructure accessibility (see Rakowska 2011, p.5237), it was used because of a limited access to appropriate data bases.

**Table 4. Density of hard surfaced road network in Poland in 2002-2013 (km/100 km<sup>2</sup> land area)**

Voivodship	Road network density (km/100 km <sup>2</sup> )											
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Dolnośląskie	92.2	90.7	91.5	90.7	91.2	91.6	91.5	91.9	92.4	94.4	94.6	94.5
Kujawsko-pomorskie	77.9	75.7	76.7	78.5	78.9	80.1	81.3	84.3	87.0	89.6	91.7	92.9
Lubelskie	71.2	71.2	71.4	72.3	72.7	73.7	74.9	78.0	80.5	84.9	82.4	84.5
Lubuskie	55.9	56.3	57.1	57.6	57.8	59.2	58.2	58.5	58.4	59.2	59.5	60.6
Łódzkie	88.3	89.0	89.6	90.5	92.2	93.4	94.5	99.6	102.4	108.5	105.3	106.3
Małopolskie	143.9	141.7	143.3	144.3	145.4	147.3	149.0	147.8	155.8	157.8	159.2	158.9
Mazowieckie	80.3	78.5	81.0	83.1	84.5	86.0	87.2	92.7	94.8	97.3	98.5	99.5
Opolskie	87.7	90.4	90.5	88.8	88.9	89.2	89.3	90.4	91.5	90.0	90.4	90.3
Podkarpackie	78.6	77.6	77.4	78.6	79.2	80.2	80.9	82.2	84.1	84.9	87.6	89.1
Podlaskie	53.5	52.9	53.8	54.6	54.6	55.7	56.3	58.7	59.4	61.0	61.4	62.2
Pomorskie	62.3	61.9	63.3	62.9	63.2	64.1	64.6	64.9	66.8	67.7	68.7	70.2
Śląskie	162.8	161.9	163.8	163.7	163.9	163.9	164.5	170.6	172.4	179.6	173.2	188.0
Świętokrzyskie	95.8	100.1	103.6	103.2	104.1	105.6	107.1	111.0	111.6	114.7	116.2	115.1
Warmińsko-mazurskie	53.5	50.5	50.8	51.1	50.6	51.0	51.0	51.4	52.3	53.3	53.3	54.1
Wielkopolskie	80.6	81.8	83.2	84.2	85.1	86.5	87.9	89.7	90.3	91.2	91.8	93.2
Zachodniopomorskie	56.8	56.9	56.6	55.6	55.8	57.3	57.5	59.0	59.2	59.2	59.6	59.8
<b>Poland</b>	<b>80.0</b>	<b>79.6</b>	<b>80.6</b>	<b>81.2</b>	<b>81.7</b>	<b>82.8</b>	<b>83.5</b>	<b>85.8</b>	<b>87.6</b>	<b>89.7</b>	<b>89.8</b>	<b>91.2</b>

Source: Own studies on the basis of BDL CSP data.

Average density of public hard surfaced road network in Poland increased from 80km/100km<sup>2</sup> in 2002 to 91.2 km/100km<sup>2</sup> in 2013, which denoted a 14% increase. The highest indicators characterized strongly urbanized and industrialized regions with high population density (Śląskie voivodship) and the areas with traditionally dispersed development, particularly in rural areas (Małopolskie, Świętokrzyskie). This situation implies high maintenance and road operation costs in these regions, which may pose a serious financial problem for their governing public entities.

The lowest road network density characterizes the voivodships of the northern Poland (Warmińsko-Mazurskie and Zachodniopomorskie), i.e. on one hand the regions of a relatively low level of industrialization and on the other quite advantageous (for conditions of Poland) agrarian structure. The second feature in spatial management denotes potential for meeting transport needs using lower road length. A considerable diversification of road network density (var. coef. 36.6%) cannot be unanimously interpreted as an evidence of considerable spatial disproportions in the access to the transport network. The conditions presented above, better explain a high diversification of this indicator than its absolute values.

### **Synthetic assessment of the development level of selected technical infrastructure components in Poland**

In order to make an attempt at an assessment of basic components of technical infrastructure (discussed earlier), computations were conducted using a synthetic development measure method by Hellwig. The level of infrastructure development is a multidimensional concept constituting a resultant of many elements. The collective results of these computations were presented in Table 5.

**Table 5. Diversification of synthetic indicators of technical infrastructure development in Poland in 2002-2013 according to development measure method by Hellwig**

Voivodship	Value of synthetic infrastructure development measure by Hellwig											
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Dolnośląskie	0.592	0.587	0.588	0.582	0.583	0.582	0.580	0.560	0.559	0.551	0.561	0.532
Kujawsko-pomorskie	0.396	0.387	0.394	0.399	0.396	0.399	0.399	0.390	0.395	0.386	0.397	0.381
Lubelskie	0.112	0.103	0.102	0.093	0.097	0.095	0.088	0.088	0.086	0.083	0.077	0.079
Lubuskie	0.327	0.327	0.337	0.336	0.339	0.341	0.334	0.326	0.327	0.320	0.321	0.312
Łódzkie	0.362	0.359	0.362	0.362	0.362	0.358	0.352	0.347	0.340	0.339	0.331	0.321
Małopolskie	0.325	0.309	0.304	0.321	0.317	0.312	0.311	0.312	0.310	0.307	0.306	0.311
Mazowieckie	0.346	0.354	0.351	0.360	0.368	0.379	0.390	0.396	0.400	0.401	0.402	0.396
Opolskie	0.339	0.355	0.353	0.351	0.347	0.349	0.366	0.350	0.348	0.333	0.339	0.333
Podkarpackie	0.220	0.226	0.229	0.226	0.227	0.227	0.234	0.232	0.243	0.254	0.271	0.276
Podlaskie	0.119	0.136	0.118	0.120	0.118	0.117	0.115	0.112	0.106	0.103	0.102	0.104
Pomorskie	0.426	0.435	0.433	0.428	0.425	0.423	0.421	0.401	0.410	0.404	0.406	0.389
Śląskie	0.837	0.848	0.841	0.843	0.842	0.841	0.832	0.815	0.807	0.805	0.809	0.810
Świętokrzyskie	0.173	0.180	0.183	0.183	0.184	0.187	0.177	0.169	0.161	0.169	0.177	0.178
Warmińsko-mazurskie	0.299	0.287	0.292	0.293	0.286	0.282	0.277	0.260	0.259	0.254	0.253	0.244
Wielkopolskie	0.379	0.381	0.391	0.396	0.397	0.398	0.396	0.409	0.409	0.403	0.409	0.396
Zachodniopomorskie	0.421	0.428	0.427	0.421	0.422	0.427	0.427	0.422	0.427	0.418	0.424	0.405

Source: Own studies on the basis of BDL CSP data.

Values of synthetic measure of technical infrastructure development computed by means of Hellwig method point to a quite substantial diversification on a regional scale in Poland. The region where the aggregated indicator of technical infrastructure development value was the highest in each of 12 analysed years was Śląskie voivodship. The high position of this region was affected by the fact that in each individual ranking of voivodships (single diagnostic feature – water supply and sewerage systems, gas grid or road network density), Śląskie voivodship placed on positions between one and three. At this point it should be emphasized that such position of the Śląskie voivodship resulted both from its historical conditions and economic profile based on industrial traditions. Similar factors determined also the second position of Dolnośląskie voivodship in the ranking, however the distance between these two regions measured by Hellwig synthetic development measure should be noticed. In case of Dolnośląskie voivodship, its location close to the border with Germany and Czech Republic proved important, as well as relatively good road connections with Germany, almost from the beginning of the system transformation in Poland.

The lowest synthetic level of technical infrastructure development was characteristic for the regions of eastern Poland. As demonstrated by the investigations, localisation of the regions and associated elements of historical heritage, as well as previous and present socio-economic profile significantly affect the state of infrastructure. It should be noted that the feedback which occurs in this respect, meaning that on one hand development of the population's economic activity determined an improvement of infrastructure state on the territory inhabited by the population, on the other a better equipment in technical infrastructure favours development of different forms of the inhabitants' business activities and attracts external investors.

Dynamic analysis of changes of synthetic indicator of technical infrastructure development leads to a conclusion about a considerable inertia of the phenomenon. Analysis of the regions' ranking based on measure by Hellwig proves that in individual years no significant changes occurred in the position of individual voivodships. However, some slight changes were

perceivable for the regions on positions in the middle, particularly in 2006-2010, but at the beginning and by the end of the analysed period, positions of the regions remained practically unchanged.

## Conclusion

Networks and facilities of technical infrastructure determine the level of technical equipment of territorial units, delimiting their localisation attractiveness regarding both living conditions and operational costs of business activities. From the economic point of view, for public entities responsible for its maintenance, infrastructure generates high costs of production and subsequent operation. Associating these two viewpoints points to a highly important issue of technical infrastructure development.

The level of basic municipal infrastructure facilities accessibility improved during the analysed 2002-2013 period. The best progress was noted in extension of sewerage network, which was connected with a big infrastructural gap in this area at the beginning of the research period. A significant progress occurred also in the accessibility of road infrastructure, in this case mainly owing to utilization of the European Union structural funds. The lowest growth characterized water supply system and gas grid due to relatively highest level of needs satisfaction noted at the beginning of the analysis and resulting absence of necessity for considerable investments in developing these networks.

The factor most diversifying the degree of infrastructural equipment of Polish regions is their location. Western voivodships are characterized by on average better infrastructure accessibility than regions located in the east or south-east of the country. Another key factor is also a character of socio-economic structures of the region determining the share of individual economic sectors (agriculture, industry or services) in GDP generation and employment. The areas with low level of industrialization and urbanization and relatively strongly dependent on agriculture are characterized by a poorer infrastructure than the regions with dominating function of services or industry. If the situation persists, large area may be doomed to long-lasting exclusion not only regarding the infrastructure, but also the socio-economic development. Stagnation and economic regress may happen in these areas, as well as depopulation in result of migration processes.

Technical infrastructure facilities serve local communities, therefore the rate of changes which occur in these communities will also determine the adjustments in the sphere of infrastructure. Intensification of economic activities, urbanization and metropolisation processes will put pressure on the improvement of the infrastructure quality in these areas. An opposite phenomenon may occur in areas whose economy is lagging behind, since the costs of technical infrastructure extension may prove beyond financial possibilities of the territorial government units operating in that area. Moreover, depopulation processes occurring in these area may question the justifiability of high costs incurred by the development of technical infrastructure.

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# Infestation by *Aceria tulipae* (Keifer) (Acari:Eriophyidae), Economy and Marketing of Growing Garlic in Regional Agricultural Areas

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## Abstract

The intensity of garlic infestation by dry bulb mite *Aceria tulipae* (Keifer, 1938) was observed on different garlic varieties in central Moravia. The aim of this study was to determine infestation of different garlic varieties during storage in the winter period 2011–2012. Current studies on 11 garlic varieties from the Centre of the Region Haná at an altitude of 210 m showed high abundance of *Aceria tulipae* on 10 varieties. Bolting garlic varieties (Bzenecky Mutant VF, Sochi 25, Tiraspol, Zailijskij) were highly infested, non-bolting varieties (Czerga, SIR 10 new breeding, Gjirokaster) were infested weakly or not at all (Kelcyre). The highest abundance of mite was found out in semi-bolting garlic variety (Plovdiv Rogosh) with total number up to 1500 individuals in one clove. Significant differences in infestation between external and internal part of the clove were observed in 4 of 11 evaluated varieties. Root segment was significantly the most infested part of the clove. The most resistant kinds to mite infestation were the Kelcyre, Gjirokaster and SIR 10 new breeding varieties. The highest mite introduction to inside cloves was observed in the Plovdiv Rogosh variety. The choice of suitable varieties can significantly eliminate occurrence of *A. tulipae* and their infestation. In the recent years, Czech growers have produced only about 700 tons of the crop yearly. The areas concentrated on garlic planting have been changed in a significant way.

## Keywords:

abundance, clove, garlic variety, infestation, pest, plant protection

## Introduction

The availability of garlic globally depends on its largest producer of China. In the last three years, the harvest of garlic was with average yield in China. In 2013, the estimated annual production of garlic rose of up to 30%, which is caused by the expansion of the cultivation areas. The garlic cultivation has an increasing trend in California. Its production takes approximately 90% in the total production of garlic in the USA. In 2012, the harvest was slightly below the average level. In 2013, higher harvest was estimated because of favourable weather conditions and the expanding areas of about 800 ha. The cultivated area of garlic was 8,480 ha in Argentina in 2012. It was the lowest one in the last 17 years. This decrease was of 46% compared to the previous year 2011, when the garlic area was of 15,876 ha which has been the highest area since 2013. The garlic cultivation is concentrated in the Mendoza region, of which 70% of production is exported. The largest consumer of Argentine garlic is Brazil, in which it directs 76% of all Argentine exports. The competition is negatively reflected from China

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providing garlic for better prices. Then approximately 15% of Argentine production of garlic to the EU countries is imported. The customers coming from Spain (6%), France (5%), the Netherlands (2%) and Italy (2%). The export to the United States exceeds in total exports by 2%. The area for growing garlic in Chile is rather small one in comparison with the garlic cultivation areas of large producing countries. The cultivated areas were extended to 1,463 ha during 2007 – 2011. In 2012, it decreased to 1,322 ha. In spite of this fact, Chile is regarded as the exporter of garlic in the world market. In Mexico, the garlic was grown on 5,421 ha in 2013. There was a slight decrease from the previous year. Nevertheless, the yield of garlic was higher and the total harvest reached almost 60,000 in 2013 which was by up 10% more than last year. In Spain in Andalusia, the areas of cultivated garlic in 2013 increased over the previous year by 15% to 5,522 ha according to the official information. The harvest is estimated at 56,378 tons that is the increase more than 15% per year. In the region of Castilla-La Mancha, which is the most important area for Spanish production of garlic, the cultivated area increased by 6% than in the previous year when the garlic was grown on 16,900 ha. Garlic is a popular vegetable kind for its high content of vitamins, enzymes and bactericidal effect. It is frequently attacked on a relatively broad spectrum of pathogens and pests during vegetation and storage. *Aceria tulipae* (Keifer, 1938) is known as the main pest on garlic in all production areas all around the world. It thrives on the plants during the growing season and in cloves during storage condition. The subject of the study was to evaluate the abundance of mites namely *Aceria tulipae* in 11 garlic varieties during storage condition.

## Materials and Methods

The garlic varieties analysed in the present experiment were taken from the Centre of the Region Haná for Biotechnological and Agricultural Research, Department of Genetic Resources for Vegetables, Medicinal and Special Plants, Crop Research Institute in Olomouc. The review with geographic origin of evaluated varieties is given in table I. As shown in table 1, six varieties (Bzenecky Mutant VF, Sochi 24\1, Sochi 25, Tiraspol, Dushanbiskij 125 and Zailijskij) belong to bolting garlics, four varieties (Czerga, SIR 10new breeding, Gjirokaster and Kelcyre) are non-bolting and the only one Plovdiv-Rogosh is semi-bolting one. The cloves of each variety were taken by camera Canon EOS 50D (figs 9–19). The garlic started to be planted in the field conditions of Crop Research Institute in Olomouc-Holice at an altitude of 210 m in the autumn time, 14th and 15th October 2010. The soil was prepared by usual procedures. The manual cleaning of weeds was made during all vegetative period. The insecticide chlorpyrifos-methyl (0.125% Reldan 40 EC) was used for the pest control on 3rd and 4th March 2011 and it was repeated in the course of 14 days again. The harvest time was from 28th – 30th June and from 1st – 3rd July. The harvest was made manually. Garlic bulbs were cleaned and stems were cut to a length of 10 cm. Then they were put in storage room. The harvesting plants were dried in a special room at 20°C with suitable air circulation for 30 days. After 150 days of storage at 15°C and 80% relative humidity mite infestation started to be done. At the beginning the plants were divided into three main morphological groups according to the ability to produce the scape: the first group with the scape (bolting), the second part without the scape (non-bolting garlic) and the third part presents semi-bolting one. The last morphological type has bulbils in the different parts of the pseudostem. According to MacLeod (2007) and Wahba et al. (1984) all garlic varieties were kept in chamber at 4°C to prevent further development of mite cycles. This temperature also slows down migration activity of mites which is necessary for the assessment of mites. From each variety five samples were evaluated. Seven cloves were assessed from each sample. External packagings were carefully removed using laboratory pincette and scalpel. Immediately after taking out from the chamber the mites were counted on the outside and inside of the clove (fig. 8). Each clove was cut longitudinally, perpendicular to the surface. Subsequently, it was done counting mites on cut surface around the root (root segment), central part (central segment) and stem (peak segment). Mites were counted using microscope Olympus SZX9. The abundance of mites was carried out by one responsible person to avoid error. The results were processed using analysis of variance followed by Tukey testing, statistics 8 (figs 1–7).

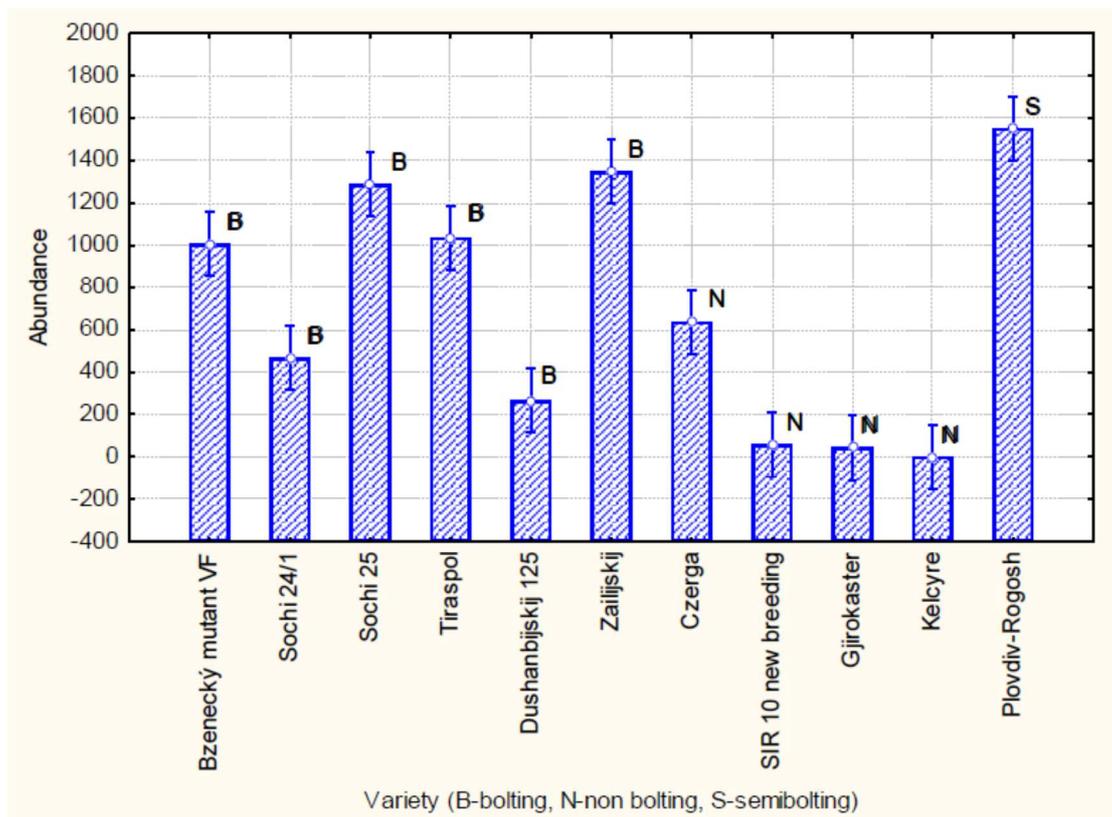
**Tab. 1 The set of garlic varieties**

Type	Name	Country of origin	Figure
bolting	Bzenecky Mutant VF	Czech Republic	9
bolting	Sochi 24\1	Russia	10
bolting	Sochi 25	Russia	11
bolting	Tiraspol	Moldova	12
bolting	Dushanbijskij 125	Tajikistan	13
bolting	Zailijskij	Tajikistan	14
non-bolting	Czerga	Soviet Union	15
non-bolting	SIR 10 new breeding	Soviet Union	16
non-bolting	Gjirokaster	Albania	17
non-bolting	Kelcyre	Albania	18
semi-bolting	Plovdiv-Rogosh	Bulgaria	19

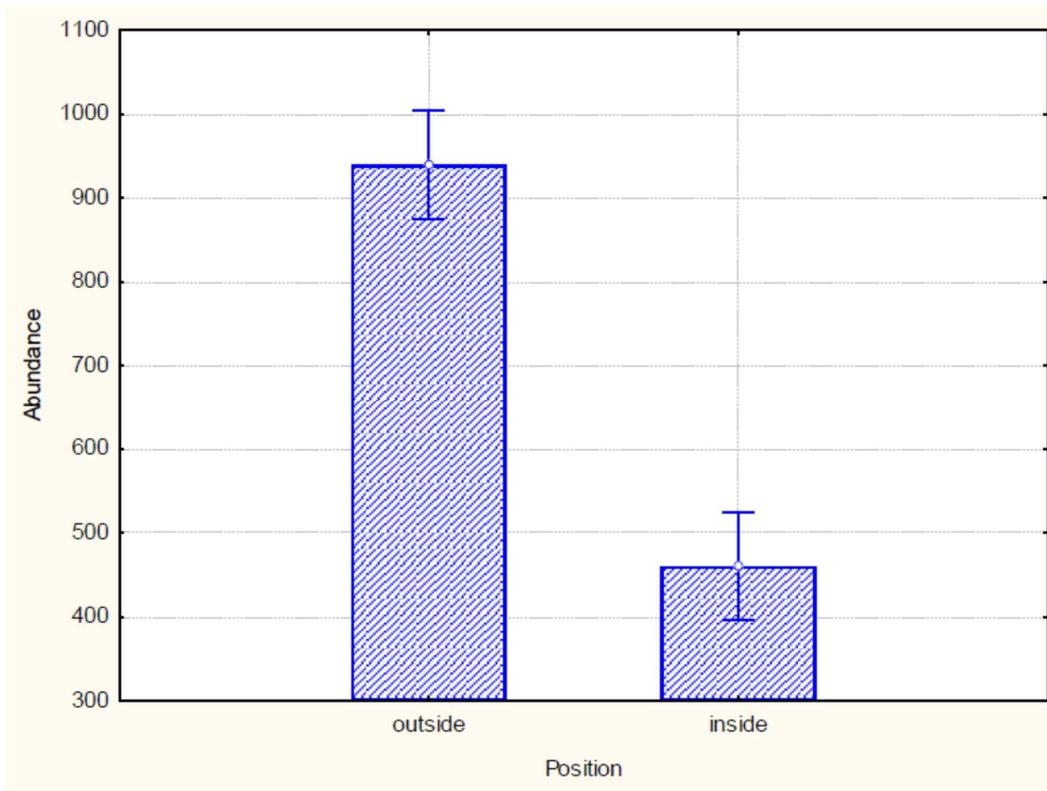
## Results and Discussion

The mite *Aceria tulipae* was detected in 10 of 11 evaluated varieties. Bolting garlic varieties (Bzenecky Mutant VF, Sochi 25, Tiraspol, Zailijskij) were highly infested by mite (fig.1). Non-bolting garlic varieties (Czerga, SIR 10 new breeding, Gjirokaster) were mite infested weakly or not at all (Kelcyre) (fig. 1). The highest abundance of mite was in semi-bolting garlic variety (Plovdiv Rogosh) with total number up to 1,500 individuals in a clove (fig. 1). In 4 of 11 varieties were observed significant differences in infestation between external and internal part of the clove (fig. 2). The differences were no significant for the other varieties. The biggest difference was observed in the varieties: Sochi 25, Zailijskij and Tiraspol between internal and external part of clove (fig. 3). For all varieties infestation was higher outside clove except the Kelcyre variety (fig. 3). Occurrence of mites on clove was not homogeneous. Significantly root segment was the most infested part of the clove (fig. 4). The lowest occurrence of mites was in the middle segment (fig. 4). The variability of occurrence was not as significant as in the evaluation of the whole set of outside and inside cloves (fig.5). Significant differences in the occurrence were observed on a single clove segment only in the varieties Zailiskij and Plovdiv Rogosh. Generally, occurrence of mites on all segments of the clove was lower inside than on the outside part of clove (fig. 6). The root segment was the most attacked by mites and the central segment was the least attacked (fig. 6). The biggest difference between the level of infestation outside and inside the clove was observed in the root segment (fig. 6). Fig. 7 shows that the most resistant kinds to mite infestation were the Kelcyre, Gjirokaster and SIR 10 new breeding varieties. In these varieties, occurrence of mites was zero or very low. On the contrary, high infestation on the inside clove showed the varieties Zailiskij, Sochi 25 and Tiraspol (fig. 7). These varieties have originated in eastern Eurasian countries. The average to higher values were observed in the Czech Bzenecky Mutant VF variety. The highest mite introduction to inside cloves was observed in the Plovdiv Rogosh variety. The highest mite infestation was in the direction from root in all infested varieties. Scalopi et al. (1971) evaluated 5 garlic varieties and observed similar damage. They coined a new term, "whip-tailed" leaves, to describe this damage. In our research, we observed similar symptoms above mentioned on the leaves during vegetation. We can also confirm drying of bulb tissue during storage condition. Our experiments proved that the choice of suitable varieties can significantly eliminate occurrence of mites and their infestation. From this viewpoint the Kelcyre variety seems to be the best one, which was inert to the infestation. The resistance of this variety is probably caused by the formation of compact bulbs. The individual cloves are protected by close fitting packagings. These packagings prevent the entry of pests on the outside or inside part of the clove. On the other

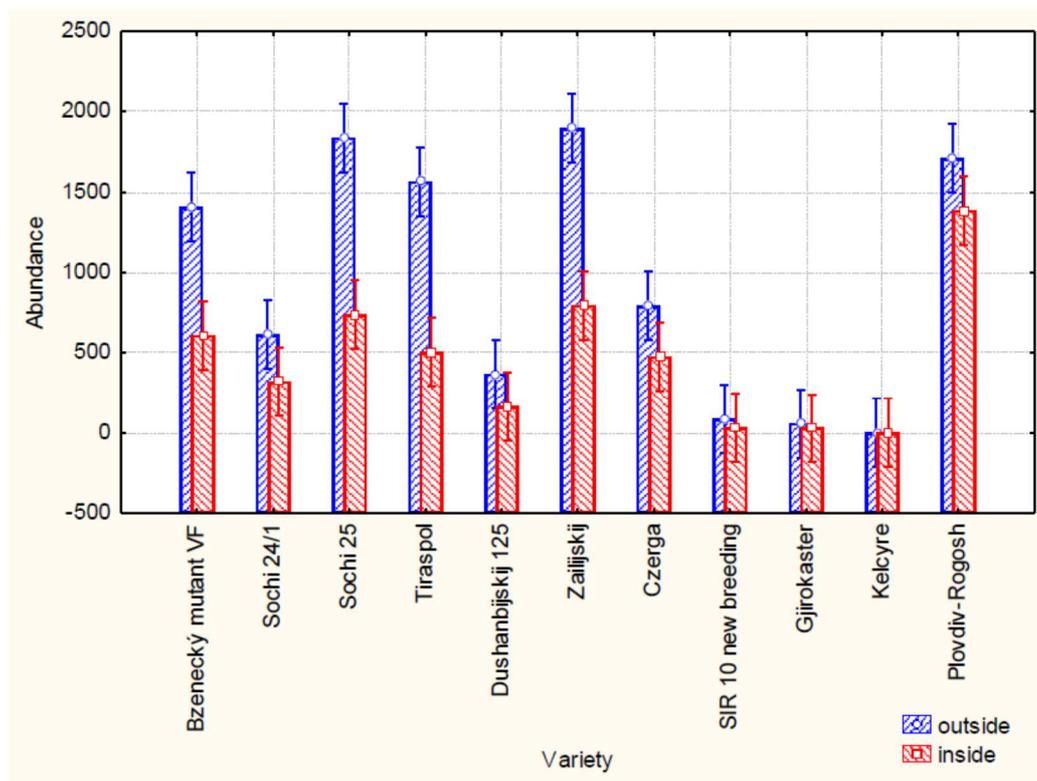
hand, the Zailiskij and Plovdiv Rogosh varieties are less suitable for storage. Possible solutions of resistance of some varieties are very limited. MacLeod (2007) mentions the development of *A. tulipae*, some individuals can survive in condition at  $-25^{\circ}\text{C}$ . Such cold tolerance does not allow the use of refrigeration as a control method because garlic bulbs do not withstand temperature below  $-4^{\circ}\text{C}$ . Wahba et al. (1984) discusses about cool temperatures that prevent population growth during the winter although eggs, nymphs and adults are able to survive in the bulbs for extended periods either in storage or in bulbs left in the soil during winter. Although hosts are only grown outdoors, this pest could establish in the protected environments of *Allium* storage facilities. MacLeod (2007) recommends before planting hot water treatment of bulbs ( $55^{\circ}\text{C}$  for 10–20 min, or  $60^{\circ}\text{C}$  for 10–15 min). This treatment can reduce mite populations, but such temperatures also reduce bulb germination. Soaking garlic for 24 hours in 2% soap (not detergent) and 2% mineral oil has been reported to provide good mite control. Therefore *Aceria tulipae* requires high humidity to thrive, so following harvest, infestations can be controlled with the normal drying process prior to bulb storage. Measures to prevent the movement of infested bulbs, soil or foliage between growing sites and storage facilities would inhibit spread. Thus, a moderate cold only postpones problems, because it stops population development, but not their survival. Understanding ecological and genetic aspects of eriophyid invasions could help to defuse mitigation measures and management strategies. Knowledge of host specificity and adaptation to new host plants of eriophyid species could be useful in risk evaluation and in guiding the adoption of control measures (Michalska et al., 2009).



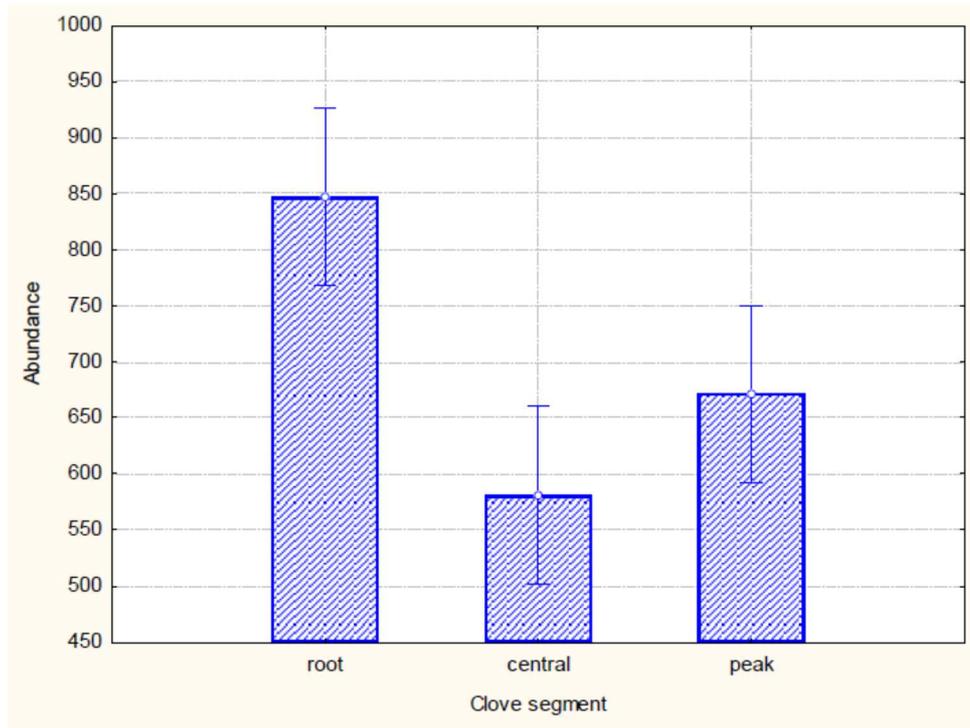
**Pic. 1** The total number of *Aceria tulipae* on clove in each variety



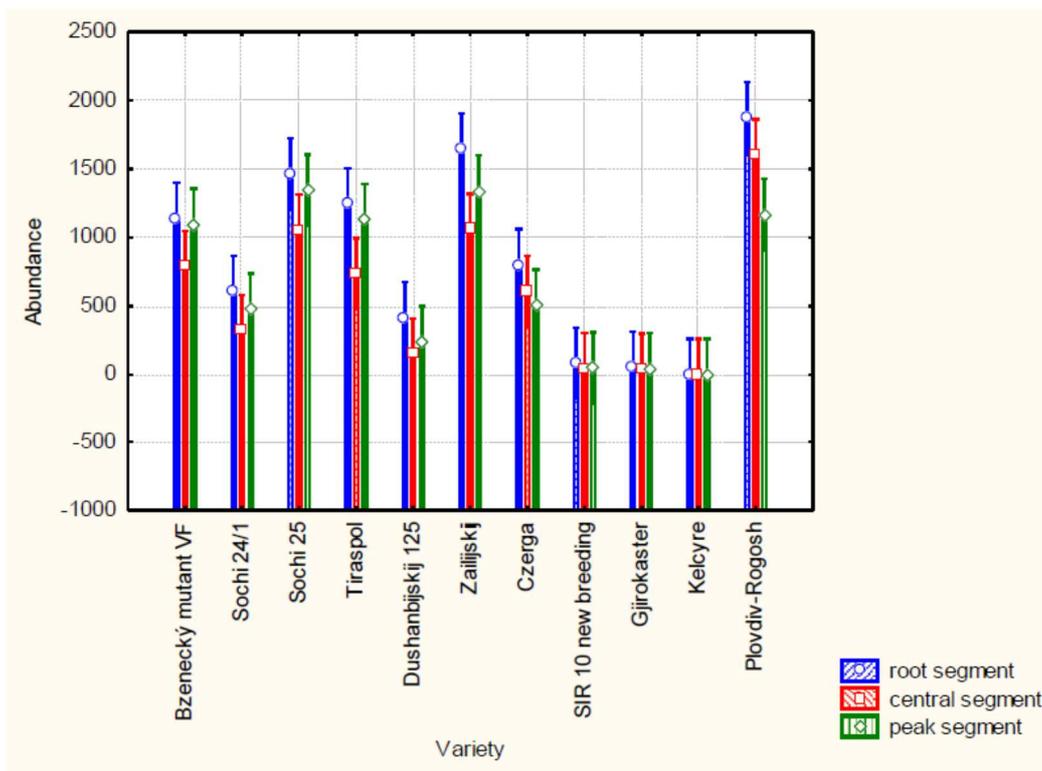
**Pic. 2** The abundance of *Aceria tulipae* inside and outside clove



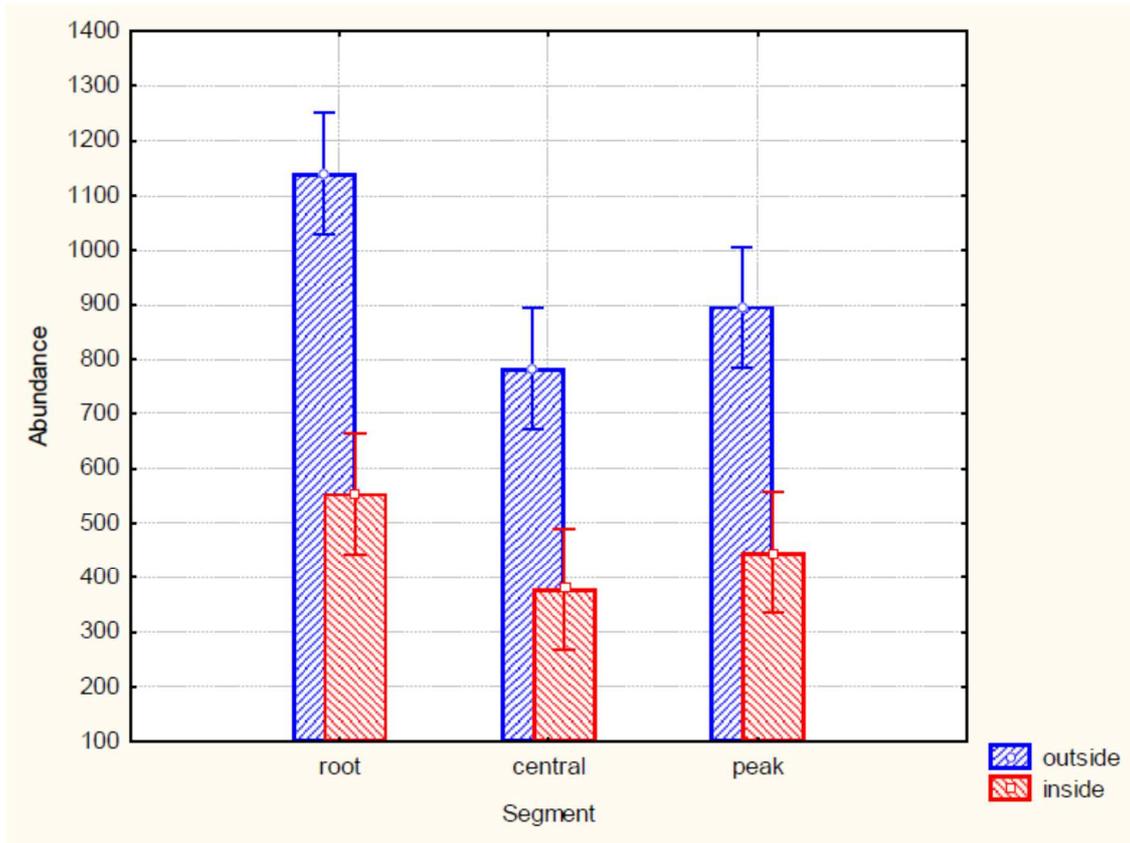
**Pic. 3** The occurrence of *Aceria tulipae* inside and outside clove of each variety



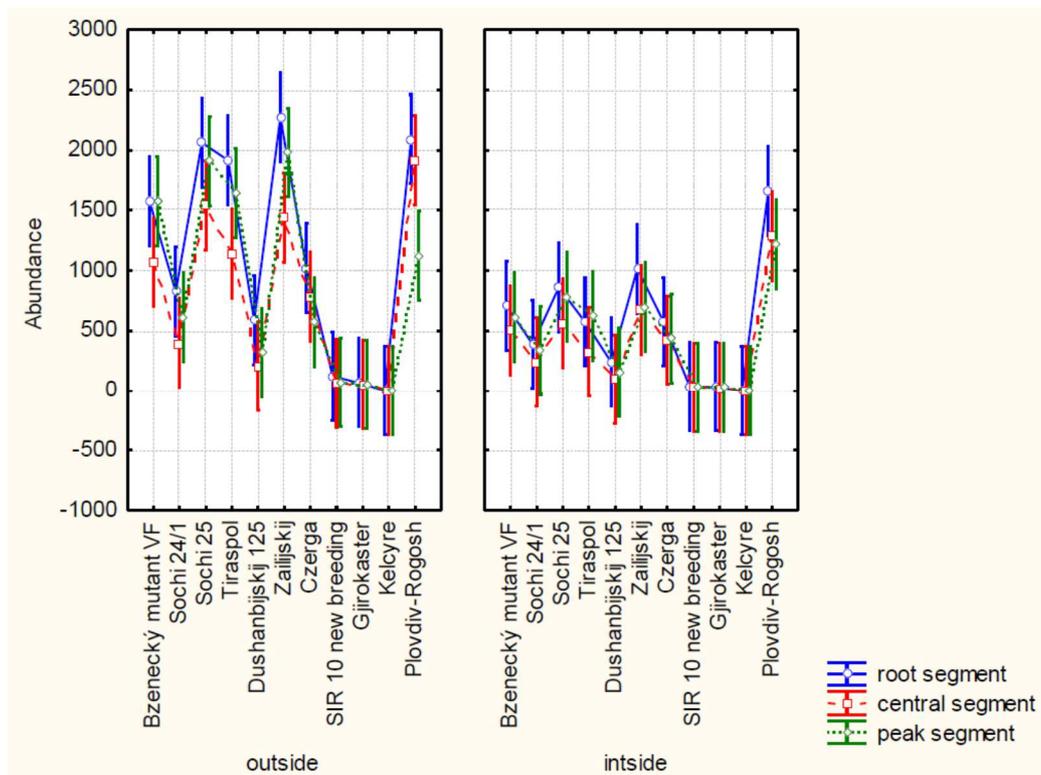
**Pic. 4 Distribution of *Aceria tulipae* on clove**



**Pic. 5 The occurrence of *Aceria tulipae* on segments of the varieties**



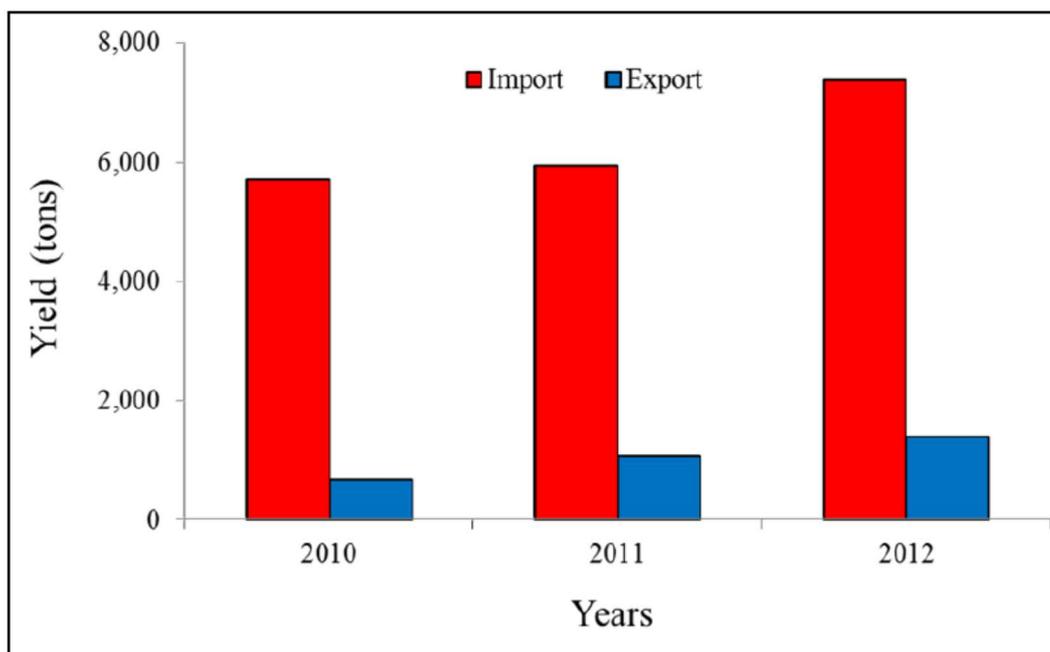
**Pic. 6** The occurrence of *Aceria tulipae* on inside and outside individual segment cloves



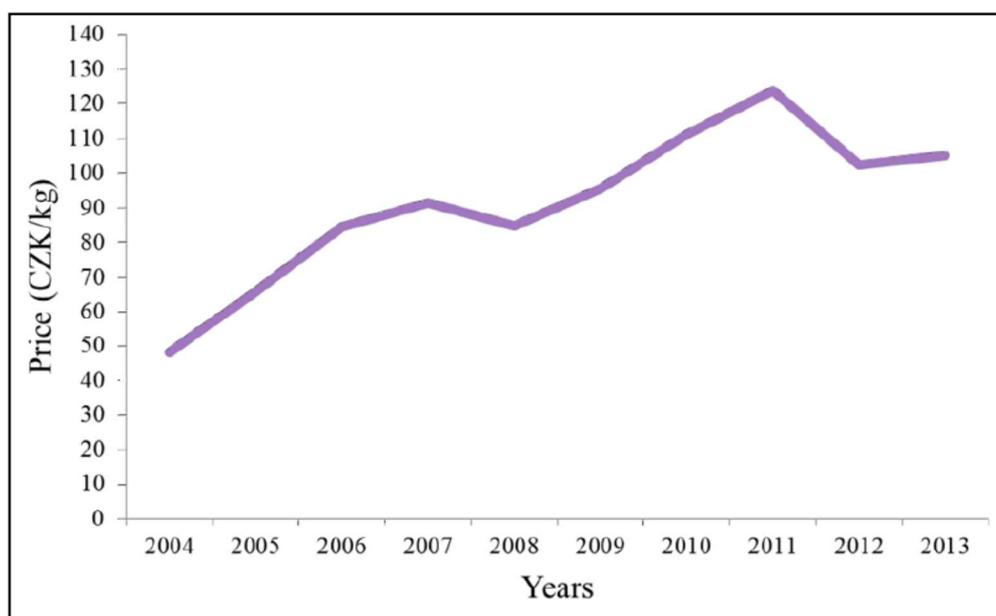
**Pic. 7** The occurrence of *Aceria tulipae* (interaction among variety x segment x position)

## Economy of Growing Garlic in the CR

In 2010, 1,457 tons of garlic was harvested. In 2011, the number was 1,530 tons and in 2012, it was 1,272 tons of garlic. The average yield per ha was 5.06 tons in 2010. In 2011, it was 5.28 tons and in 2012, it was 3.54 tons of garlic. As it can be seen in Fig. 8, the import exceeded in 2010 – 2012. Garlic was imported in 2010 in the amount 5,705 tons in 2010 and in 2011, it was 5,950 tons and in 2012, it was 7,372 tons. The amount of exported garlic was 679 tons in 2010, and in 2011, it was 1,055 tons and in 2012, it was 1,388 tons. In 2010, the price per tuna was 95,000 CZK, in 2011, it was 140,000 CZK and in 2012, it was 160,000 CZK. The average consumer price was 111.13 CZK per kg in 2010 and it was 123.82 CZK per kg in 2011. In 2012, the average consumer price was 102.3 CZK per kg. The price development is shown in Fig. 9 between 2005 and 2013 (CSO, 2013).



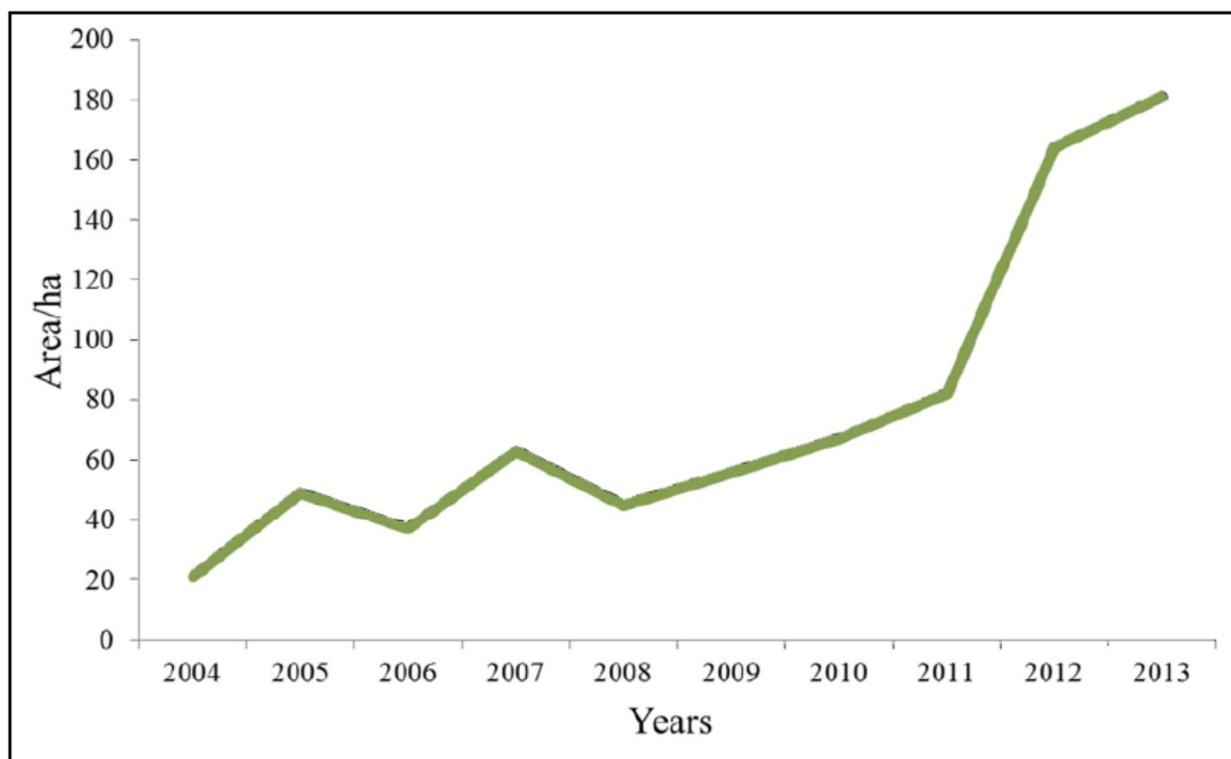
**Pic. 8 Comparison between import and export from 2010 to 2012 (CSO, 2013)**



**Pic. 9 Price development from 2004 to 2013 (CSO, 2013)**

## Marketing of Growing Garlic

Presently, the majority of garlic is marketed as a fresh product delivered to markets throughout the year. According to the report CSO 2013, the market prices are fluctuating according to the current market demand. Some producers conclude contracts with processing industries to which their commodity is supplied. Garlic grown in our country, in terms of active substances, is of much higher quality than the imported one. The imported 4,000 tons of garlic are taken in the Czech Republic mostly from China, the Netherlands and Spain every year. Chinese garlic has come to our country about a year after harvest. Chemical treatment to retain its shelf life is overused. The average annual consumption of garlic per capita is about 0.8 kg in the CR. The consumption of garlic in the CR is around 7,000 – 8,000 tons annually. In the recent years, Czech growers have produced only about 700 tons of the crop yearly. The areas concentrated on garlic planting have been changed in a significant way. In 50th years, there was about 1,200 ha (1,205 ha in 1958), in 60th years decreased in half (637 ha in 1961), the 90th years increased to about 1,500 ha (1,514 ha in 1995 – 1999), after 2000 has not exceeded about 70 ha. In 2004, the total area was only 21 ha. Next year in 2005, it was doubled with 49 ha. Then in 2006, it was decreased in 37 ha. The area development can be seen in Fig. 10. The slow increase has occurred since 2010: in 2010, it was about 67 ha, in 2011, it was about 82 ha and in 2012, it was about 164 ha. Czech growing areas have doubled thanks to its growing demand for garlic. There is also the increase of garlic pests with the expansion of garlic cultivation areas. In 2013, professional growers have harvested from 181 ha 732 tons of garlic according to the Czech Statistical Office (CSO) which gives an average yield of 4.05 tons per ha. Including last year's income of private growing, the total of 1,792 tons by the CSO was estimated. Private and professional growers planted garlic on 368 ha by the CSO.



*Pic 10 Areas of growing garlic in the Czech Republic from 2004 to 2013 (CSO, 2013)*

## Conclusions

Current studies on 11 garlic varieties from the Centre of the Region Haná at an altitude of 210 m showed high abundance of *Aceria tulipae* on 10 of them. The aim of this study was to determine infestation of different garlic varieties during storage. Bolting garlic varieties (Bzenecky Mutant VF, Sochi 25, Tiraspol, Zailijskij) were highly infested. Non-bolting garlic varieties (Czerga, SIR 10 new breeding, Gjirokaster) were infested weakly or not at all (Kelcyre). The highest abundance of mite was in semi-bolting garlic variety (Plovdiv Rogosh) with total number up to 1500 individuals in one bulb. In 4 of 11 evaluated varieties were observed significant difference in infestation between external and internal part of the clove. Significantly root segment was the most infested part of the clove. The most resistant kind to mite infestation were the Kelcyre, Gjirokaster and SIR 10 new breeding varieties. The highest mite introduction to inside cloves was observed in the Plovdiv Rogosh variety. The highest mite infestation was proved in the direction from root in all infested varieties. The choice of suitable varieties can significantly eliminate occurrence of *A. tulipae* and their infestation. The resistance of varieties is probably caused by the formation of compact bulbs. Hot water treatment of bulbs before planting (55°C for 10–20 min, or 60°C for 10–15 min) can reduce mite populations, but also reduce bulb germination. Soaking garlic for 24 hours in 2% soap (not detergent) and 2% mineral oil has been reported to provide suitable mite control. Infestation can be controlled with the normal drying process prior to bulb storage. Measures to prevent the movement of infested bulbs, soil or foliage between growing sites and storage facilities would inhibit spreading. The assessment, suitability of varieties are considered in the specific economic characteristics: yield and resistance to pests and pathogens. The average annual consumption of garlic per capita is about 0.8 kg in the CR. The consumption of garlic in the CR is around 7,000 – 8,000 tons annually. In the recent years, Czech growers have produced only about 700 tons of the crop yearly. The areas concentrated on garlic planting have been changed in a significant way. In 50th years, there was about 1,200 ha (1,205 ha in 1958), in 60th years decreased in half (637 ha in 1961), the 90th years increased to about 1,500 ha (1,514 ha in 1995 – 1999), after 2000 has not exceeded about 70 ha. In 2004, the total area was only 21 ha. Next year in 2005, it was doubled with 49 ha. Then in 2006, it was decreased in 37 ha.

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# Selected Economic and Managerial Aspects of Beer Production in Slovakia with Focus on Microbreweries

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## Abstract

Paper is oriented on evaluation of brewing industry focused on market, consumption and production changes and their economic impact on value added, employment and government revenues. Ambition of this paper is to show trends in development of beer industry in Slovakia, which leads to establish new microbreweries. Paper is focused on the importance of beer contribution to the economy of Slovakia. Increasing of beer leads to higher value added, helps to make more opportunity for jobs and leads to higher government revenues. Slovak brewing industry has changed in last decades. Market is characterized by higher concentration as a result of globalisation. More than 80% of consumption in Slovakia comes from 2 large international companies – Heineken Slovakia (owned by Heineken Corporation) and Pivovary Topvar (owned by SAB Corporation). Microbreweries cover only about 4% of the total market share. Beer consumption was on level 94 litres per capita (annually) in 2002 but strongly has fallen to the level 73 in 2011. In years 2012 and 2013 small increasing was achieved to level 75 litres. New innovative methods and formulas (like Radlers, no-alcoholic beers, premium beers) helped to stop decreasing of beer production. Beer production could have positive impact on economic development of the country. Value added was on level 222 millions Euros in 2012 and increased by 16.2% compared to year 2010 because of higher total volume of production. In total, the employment impact from the production and sale of beer in Slovakia was 19612 jobs in 2012 what is 6.5% increasing compared to year 2010. Results are based on data of The Brewers of Europe and Slovak Beer and Malt Association. To recognize more motives for establishing microbreweries the interviews were held with founders of Slovak microbreweries.

## Keywords:

Beer production, beer consumption, microbreweries, value added, employment, tax revenues.

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## Introduction

The production of beer in Slovakia has a long history dating back to 8th century. The oldest brewery is situated in Vyhne. The first association of beer producers was established in 1450 in Bardejov, a town in Eastern Slovakia. In middle age the beer was produced almost in every town and village. This changed in 19th century when due to the so-called beer tax, a lot of towns ceased to produce beer. In Slovakia there were 40 breweries at the beginning of 20th century, mostly microbreweries. They all faced two significant disadvantages – the necessity to import basic ingredients as well as strong competition from Czech Republic and Hungary. After World War II the private breweries were transformed into three companies fully owned by state. The rising beer consumption allowed establishing other breweries (Topoľčany, Hurbanovo) in 1960s.

Nowadays the globalization is strongly influencing the companies and the beer market. Old traditional breweries companies finished their activities and were acquired or closed by multinational brewing companies. The biggest breweries like Corgoň, Zlatý Bažant, Martiner and Gemer were bought by Heineken Corporation and Šariš, Topvar were bought by South African Breweries Corporation. Other smaller breweries like Stein, Steiger, Popper tried to be as a competitors (only with Slovak capital) on market for few years. But they were not to be able to compete with large corporations and then stopped business or founded new partners abroad. Therefore the market is characterized by higher concentration. More than 80% of consumption in Slovakia comes from 2 large international companies – Heineken Slovakia (owned by Heineken Corporation) and Pivovary Topvar (owned by SAB Corporation).

The microbreweries cover only about 4% of the total market share. Microbreweries build own brands with specific taste. They try to compensate high costs for high prices. In 2008 there were only 6 active microbreweries produced own brands but nowadays there are at least 33 microbreweries operating in this business. In spite of the crisis people demand high quality beer with specific taste (mostly with higher price) more than beer produced by big international companies (called “Eurobeer”). It is also one of the reasons why people spent more money on beer market. In 2008 total consumer spending was 585 million Euros but in 2012 it was more than 620 million Euro what means 6% increasing.

However, there are more significant changes of the brewing industry (apart from the establishing of microbreweries). Firstly, beer consumption decreased and nowadays shows stagnation. Beer consumption was on level 94 (annually) in 2002 but has strongly fallen to 73 litres per capita in 2011. In years 2012 and 2013 small increasing was achieved to level 75 litres. Total consumption decreased by 15% in year 2012 compared to year 2003 and it is on level 4.1 million hectolitres. Fall of consumption was caused because of higher preference of substitutes (wine consumption increased by 9.7% in 2012 compared year 2008) and trends of healthy living style (water consumption increased a lot). Secondly, some technological changes in the beer production occurred. New innovative methods and formulas (like Radlers, no-alcoholic beers, premium beers) helped to stop decreasing of beer production. Beer production deeply reduced in by 34% in Slovakia in year 2010 compared to 2003 but in next 2 years we can see 3% increasing. Thirdly, beer production could have positive impact on economic development of the country. It helps to create higher value added. Value added was on level 222 millions Euros in 2012 and increased by 16.2% compared to year 2010 because of higher total volume of production. In it was 3.11 million hectolitres in 2010 and 3.21 in 2012 what means 61 Euros value added per hectolitre in 2010 was increased to 69 Euros in 2012). Higher beer production in 2012 increased also number of jobs opportunities (direct in brewing companies and indirect in retail, hospitality and supply sector) connected to beer production. In total, the employment impact from the production and sale of beer in Slovakia was 19612 jobs in 2012 what is 6.5% increasing compared to year 2010. Total government revenues (consist of excise duties, VAT and income tax) increased by 8.1% in year 2012 (total government revenues were on level 228 million Euro) compared to year 2010 (total government revenues were on level 211 million Euro) when the beer production was lower by 3%. We can conclude that higher beer production in last years has positive impact on economy through value added, employment and government revenues.

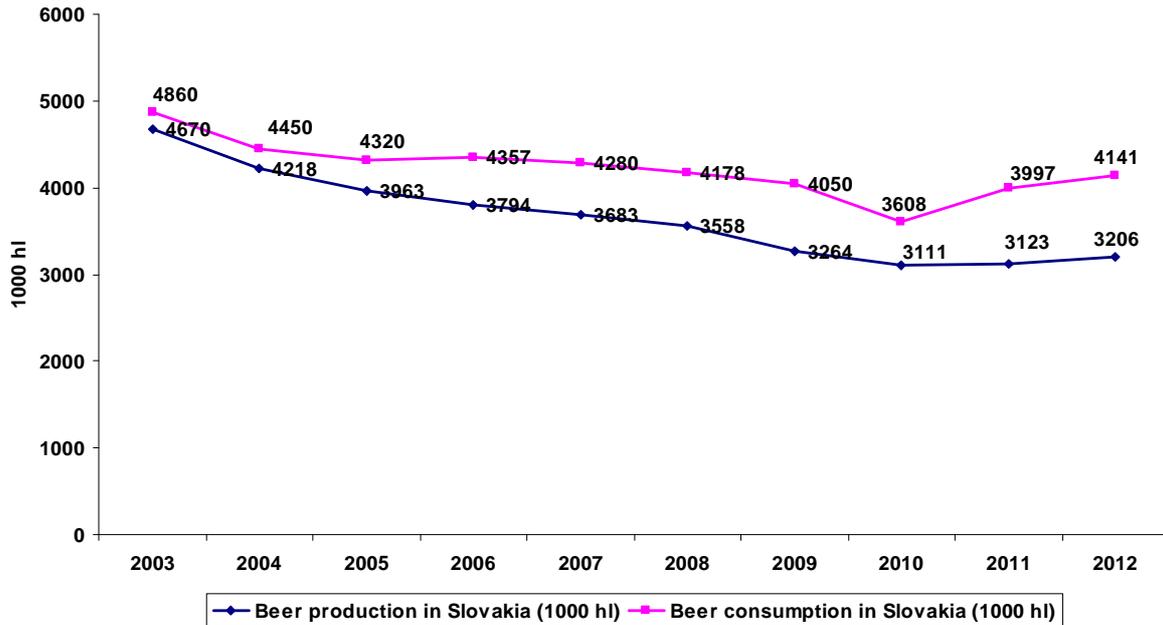
The world beer market is also characterized by big concentration and globalization. Between 1950 and 2000 the four-firm producer-concentration ratio for beer increased from 22 to 95 in the United States and biggest player on the market reached more than 50%. In Germany, concentration has risen, but the four-firm concentration ratio was smaller in 2000 (about 29%) than one-firm ratio in United States (Adams, W. J., 2011). Expansion of brewing companies happens mostly through mergers and acquisition and brewing licences for in-country production of foreign beers than actual trade of beer (Colen, L. & Swinnen, J. 2011). Also in beer countries we can see that beer consumption declines. Alternative alcoholic drinks, in particular wine, became more readily available in traditional beer countries. Consumption of beer declined with consumers switching to other beverages because of increased choice and higher incomes. The growing domination of increasingly standardized beer produced by fewer brewing companies has led to a counter-movement. People started to show a renewed interest in specialty beers (like porter, pale ales, bitters and stout) (Poelmans, E. & Swinnen, J. 2011). It is a reason why new microbreweries were founded on the region basis. Foundation of microbreweries is obviously striking in countries called "Beer drinking nations" like Germany, Belgium, Czech Republic and Britain (Colen, L. & Swinnen, J. 2011). The evolution of microbreweries has been accompanied by an expansion in the import sector as well. Microbreweries are small in size and produce beer that is more in keeping with the brewing traditions of Europe and comes in a variety of styles (Tremblay, C. H. & Tremblay, V. J. 2011).

The results are based on data from The Brewers of Europe and Slovak Beer and Malt Association. To recognize more incentives for establishing microbreweries the interviews with founders of Slovak microbreweries were held. Method of linear trend of production development was used.

### **Beer production and consumption development in Slovakia, price and consumers spending**

The brewing industry has changed a lot in many areas in last years. Firstly, beer production highly decreased and shows stagnation nowadays (see picture 1). Total production of beer in Slovakia was more than 4.6 million hectolitres in 2003, decreased by 33% in 2010 and then slowly increased to the level 3.2 million hectolitres in 2012. The curve of beer consumption has similar trend as beer production. Total beer consumption reached level 4.8 million hectolitres in 2003 and then had fallen by 26% in 2010. After this period we registered small increasing to the level 4.1 million hectolitres in 2012. As we can see in each year beer consumption in Slovakia is higher than domestic production because of big import of foreign brands of beer.

Consumption of beer per capita is good indicator for countries comparison. In years 2000-2006 Slovakia belonged to the top 15 countries with highest beer consumption per capita in the world. In Slovakia this indicator has fallen by 13.3% in whole searched period. Main reasons of this fall are connected with higher price of beer (because VAT increased), with healthier life style (consumers started to prefer water and mineral water) and preferences of consumers (people started to prefer wine than beer – wine consumption increased by 10% in last years). As we can see in table 1 there is continuously falling until 2011. Boost of the consumption in 2012 was caused by the introduction of innovative products such as mixed beer drinks (called Radlers).



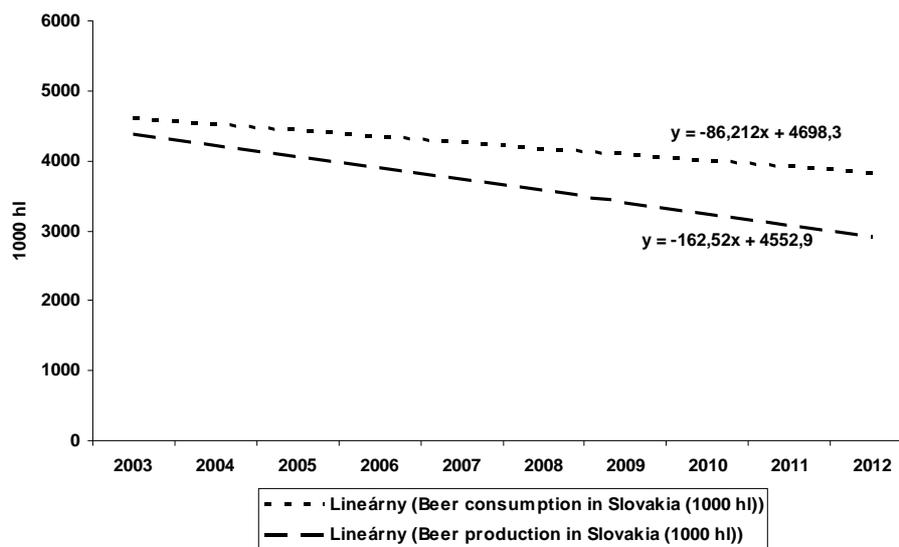
**Pic. 1 Beer production and consumption development in Slovakia**  
 (Source: The brewers of Europe. Beer statistics 2012)

In observed period (2003-2012) beer production and consumption trends are falling. Beer production is characterized by linear equation  $y = -162.52x + 4552.9$  and beer consumption is characterized by linear equation  $y = -86.212x + 4698.3$ . Difference between these trends escalates and it should create opportunity for new entities on beer market. People wanted to have other possibilities of quality beer as an alternative to Eurobeers produced by multinational corporations in Slovakia. It is a main reason why some businessmen started to brew own beers in pubs and created own microbreweries.

**Tab. 1 Consumption of beer (per capita) in Slovakia**

	2003	2004	2005	2006	2007	Index 12/03
Consumption per capita (l)	90	82,4	80	80,7	79,3	
	2008	2009	2010	2011	2012	86,7%
Consumption per capita (l)	77,4	75	78	72,9	78	

(Source: The brewers of Europe. Beer statistics 2012)



**Pic. 2 Beer production and consumption trends in Slovakia**  
(Source: Own proceeding)

Price of beer is important indicator of the market. There is a big difference between on trade and off trade price of beer. Average consumer price per 1 litre on trade increased by 13%, but off trade price decreased by 3.6% in last years. There are two main factors caused higher price in on trade. The first is raw materials prices increasing and the second is high level of excise duty ratio. It is one of some reasons that influenced structure of consumption into 40% on trade : 60% off trade. People changed preferences and buy beer more often in supermarkets than before. Using of PET bottles grew a lot and this could be an indicator of higher consumer convenience.

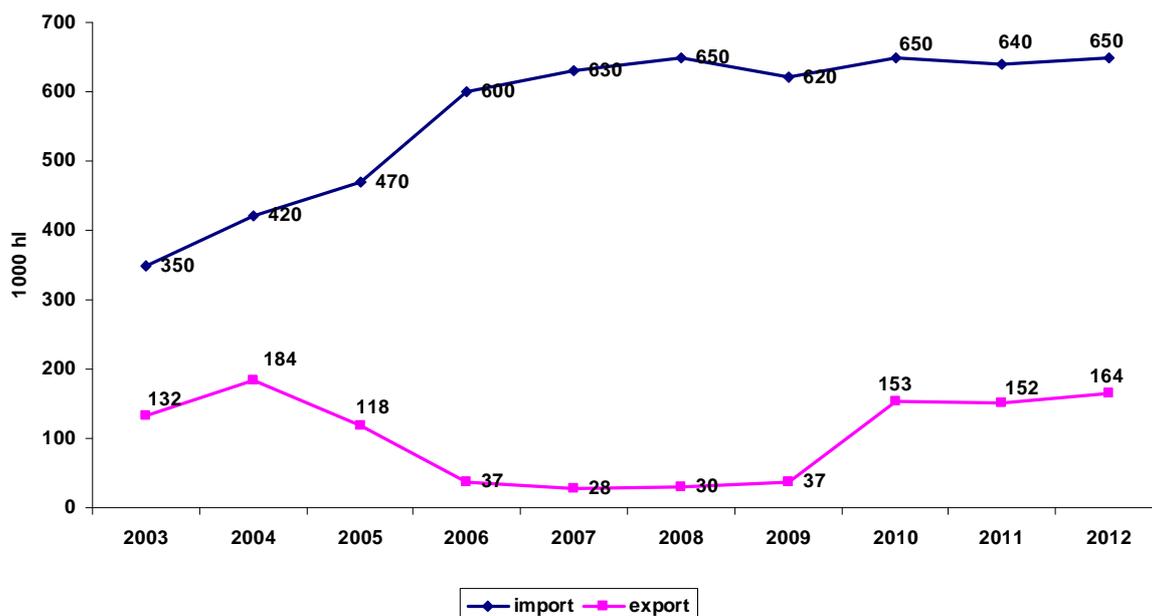
**Tab. 2 Price of beer and consumer spending**

	2008	2009	2010	2011	2012	Index 12/08
total consumer spending (in million Euro)	585	599	606	674	620	105,98%
average consumer price in on-trade (1 l, including taxes, in Euro)	1,82	1,9	2,1	2	2,06	113,19%
average consumer price in off-trade (1 l, including taxes, in Euro)	1,12	1,2	1,4	1,06	1,08	96,43%

(Source: The contribution made by beer to the European economy)

### Import and export of beer in Slovakia

Although Slovakia was known as a country of quality beer, import of foreign beer is much higher than volume of exported beer. Slovakian brands are mostly exported to V4 countries, but also to Romania, Austria, Germany and Russia. Import of foreign beer increased by 85% in searched period and reached the volume 0.65 million hectolitres. On the other size export of beer also increased very slowly by 24% to the level of 0.164 million hectolitres. Balance gap between export and import increased by 124%. We assume that it is also the reason of customer preferences because they prefer quality beer.



**Pic. 3 Import and export of beer in Slovakia**  
 (Source: *The brewers of Europe. Beer statistics 2012*)

### Microbreweries in Slovakia

There are more than 30 breweries operating in sector nowadays. Since 2008, the total number increased by 130%. The main reason for this escalation is was opportunity for entities to enter the market and open new small breweries or brew pubs. Number of microbreweries was 7 in 2008. During next five years other 19 microbreweries were established, usually on the place where there was the beer brewed in the past and therefore the tradition of breweing existed. New breweries operate now f.e. in Nitra (Trogar), Martin (Victoria), Trnava (Sessler), Banská Bystrica (Perla), Stupava (Stupavar), Prievaly (Sandorf), Bratislava (Richtar Jakub, Mestiansky pivovar), Košice (Golem). There is also still opportunity for other new microbreweries because demand for premium and specialty beer became stronger and mainly microbreweries can focus on quality and specialties.

**Tab. 3 Numbers of breweries in Slovakia**

	2008	2009	2010	2011	2012	Index 12/08
Breweries (including microbreweries)	13	15	19	25	30	230,8%
Microbreweries	7	9	14	20	26	371,4%

(Source: *The Slovak Beer and Malt Association*)

There was an association of small independent Slovak breweries (ASISB) founded in 2009. It was founded by 4 independent Slovak breweries: Banskobystrický Brewery, Kaltenecker Brewery (Rožňava), Golem Brewery, (Košice) and Perla Brewery (Banská Bystrica). Until 2014 the ASIB was joined by another 11 independent breweries. Growing in power the ASIB is recognized by the legal authorities. It is nowadays being invited to discuss the prepared legislative acts connected to beer production and its taxation. The ASISB's agenda is to achieve the reworking of actual tax system (lower or no taxes for homebrewers; more tax level according to production etc.).

In 2012 the ASISB started the initiative „Beer Militia“. The initiative is built upon five principles:

1. The initiative is opened for every microbrewery willing to take part (upon condition of its independence on international capital).
2. The “protected” beers should be produced by traditional technologies using the finest natural ingredients.
3. The main objective is to achieve fair market conditions and bigger tax differentiation for small independent Slovak breweries.
4. The initiative protects Slovak breweries which were able to remain independent and which saved their own identity.
5. The initiative welcomes in its ranks any organisation who genuinely cares for the one hundred percent Slovak beer.

The initiative actually associates 16 microbreweries and brewpubs. The founders expect the number to be rising in the near future. The dynamics of microbreweries foundation is very positive with 3-5 new breweries founded every year. There are expectations the number of microbreweries will reach 60-80 in 2020.

### **Importance of beer production for economy of Slovakia**

There are many reasons why Slovak economy is influenced by beer production. Firstly, beer sector is helps to create jobs opportunities directly and also indirectly in retail, hospitality and supply sector. Secondly, beer production has positive impact on value added and government revenues. Thirdly, new microbreweries offering services such a beer spa or beer excursion can spread tourist interest of some region. As shown in table 4 decreasing of beer production led to the biggest decreasing of jobs opportunities (directly and indirectly), value added and total government revenues.

**Tab. 4 Selected indicators of beer economy**

	2008	2010	2012	Index 12/08
Total number of jobs	20800	16500	17600	84,62%
Value-added (million Euro)	234	191	222	94,87%
Government revenues (million Euro)	216	211	228	105,56%
Excise duties (mil Euro)	58	56	56	96,55%
VAT (on-trade sector - million Euro)	49	48	57	116,33%
VAT (off-trade sector - million Euro)	46	48	46	100,00%
Income tax, payroll tax and social security revenues (brewing companies - million Euro)	7	8	9	128,57%
Income tax, payroll tax and social security revenues (other sectors - million Euro)	56	51	60	107,14%

**(Source: The contribution made by beer to the European economy)**

Contribution of the brewing industry to the Slovak economy is expressed in value-added which decreased by more than 5% as an impact of beer production stagnation. The same situation is it also in jobs opportunities that decreased by 16% in searched period.

## Conclusions

The brewing of beer has a long tradition in the Slovak Republic. As a result of the close proximity to the Czech Republic as well as the mutual history, beer is one of the most favourite drinks in Slovakia. In the past there were many small regional breweries. The political and economic development in the second half of the 20<sup>th</sup> century led to the centralisation in the industry. After the short period in the 90ties, when the centralisation receded a little bit, the industry is centralised once again, this time it is a result of the globalisation.

There is a trend of decreasing beer consumption (in some regions the wine is being preferred to beer) followed by the decreasing beer production (which is compensated by the higher import). One of the reasons resulting in lower consumption (apart from the obvious economic reasons related to price) is the likeness of the beers sold under different brands even if the owner is the same. It is a usual policy implemented by Both Heineken and SAB-Miller. The customers' choices were limited.

This emerging market opportunity was used by entrepreneurs who started to produce special beers in the independent breweries all around the Slovak Republic. The majority of these entrepreneurs has two things in common: they like beer and they diversified to brewing from another type of business. Nowadays there are more than 30 microbreweries and brewpubs in Slovakia. Interesting thing is they do not regard each other as competition rather more as partners. The close cooperation taking form of serving different independent beer brands under one roof or exchange of experience (or even downright exchange of know-how) is very common.

From the economic point of view the beer brewing is very attractive (there are supporting program schemes emerging among EU funds, the investment pay-back period in some cases is less than 4 years etc.). Based on these facts we expect the number of microbreweries to increase in the near future.

## Acknowledgement

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# The new VET Professionals - Entrepreneurship Trainers for VET

Tímea ŠEBEN ZAŤKOVÁ<sup>1</sup>

## Abstract

Vocational education and training has in recent years gained important role in the European social and political agenda. Today's and tomorrow's demands for a highly skilled workforce for the European economy are new and demanding challenges for the teacher and training community. New skills and competencies are needed for success and those skills should be a component part of education. This study deals with VET teacher preparation in Slovakia and describes partial results of ENTANGLE (Entrepreneurship Trainers for VET: A Novel Generation Learning approach) project. This project has been funded with support from the European Commission and is funded by the Lifelong Learning Programme Leonardo da Vinci - Transfer of Innovation. The project has an innovative practical approach to stimulating entrepreneurship among students in VET institutions by providing their teachers with the tools and materials to educate inspire and motivate their students to be able to start a career as an entrepreneur. This project is carried out in six European Countries: Spain, Netherlands, Cyprus, Belgium, Lithuania and Slovakia. Entangle consortium is composed of seven partners from six European Union countries among them is Faculty of economics and management of Slovak University of Agriculture in Nitra Slovakia. In the study are described theoretical background of the project and the qualitative analysis of the pilot test of the methodology developed in the project in the form of country report. FEM SUA in Nitra organised a piloting workshop at the end of May. Project presentation and its activities was aimed at university teachers. The group of teachers consisted of young teachers and scientists from different faculties of the university. Teachers were interested in the project; they highlighted the need of the entrepreneurship education and appreciated this initiative. To conclude the results we can say that there are many similarities in VET teacher preparation between partner countries of the project despite there are also some differences. But the common aim is to improve quality of vocational education for the future social and economic prosperity of the countries. Majority of the participants expressed their interest to adapt the material in their teaching life as a guide encouraging their students being entrepreneurs in the near future. They also stated positive shift in their entrepreneurship teaching skills development. The project aims at reaching the biggest number of VET teachers possible and start a lively discussion with them on entrepreneurship teaching and policies in the EU. We hope this aim is to be achieved in a short time period. VET students who finish their studies are usually expected to continue their education elsewhere or start a job. Some former students however start up their own firm. Most teachers are unaware of this next step a student takes after graduation. Relations between teachers and world of work should be improved.

## Key ords:

Entrepreneurship, VET teachers, teacher preparation, business model canvas.

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## Introduction

New skills and competencies are needed for success in a contemporary world and those skills should be a component part of education. Entrepreneurial abilities are important to succeed in an ever changing and increasingly competitive global marketplace. Entrepreneurial spirit is characterized by innovation and risk-taking, and should be developed as an essential part of the key competencies in vocational education as the capacity and willingness to develop, organize and manage a business venture along with any of its risks in order to make a profit. Although a focus on key competences can be seen in the 2007 LLL strategy, a new LLL strategy adopted in 2011 highlighted their importance again with the criticism that the earlier strategy covered this issue “only at low level” and did not develop “the method of their acquisition”. The Action plan to the 2011 LLL strategy indicated in its Measure 4.2 creating a multimedia platform in support of autonomous improvement of key competences by means of learning opportunities provided by this platform. The following key competences are explicitly stressed: communication in foreign languages, digital competence, social and civic competences and entrepreneurship. (CEDEFOP, 2012, p. 34) As seen from the strategy, we can highlight the entrepreneurship among the competences needed to develop in educational systems with regard to our project. To achieve quality education is needed also focus on teacher development. Authors Cort, Härkönen, Volmari (2004) point to some of the skills and knowledge teachers need to acquire and teacher training to provide. These include:

- new pedagogical skills in line with the learner centered approach of modern pedagogical theory ('pedagogical update') and on-the-job learning techniques now being offered to trainees;
- up-to-date 'vocational' skills related to modern technologies and work practices ('vocational update');
- awareness of the needs of business and employers;
- skills for team working and networking;
- Managerial, organizational and communications skills.

Nowadays, many European countries indicate high unemployment among young people. Unemployment hits elderly and young people extraordinarily hard as their employability is perceived as lower compared to other age groups by employers. Employers prefer experienced middle age workers who are again available at the market due the crisis and therefore young and elderly people are even more disadvantaged. (ENTANGLE, summary country reports, 2013, p. 8) European countries have some similarities and differences as well. Each country has the own economic and political development, but many of them, as was said earlier, have the same actual problem – high level youth unemployment rate. This phenomenon is intensified especially after 2008, when the economic crisis began and continues to this day. “Current economic crisis is considered a truly profound crisis“. (Ambrózy, 2010, p. 7)

As different parts of the world are experiencing dramatic changes from economic fluctuations, government revolutions, technological innovations, and generational transitions, there is arising a new role of VET in sustaining entrepreneurship and economic development. Quality education is increasingly important for individual countries since it is one of the key factors for economic competitiveness in the global knowledge-based economy. The system of vocational education contributes to social and economic development. Pressure on continuous changes in vocational education will continue. The basic pillar VET trainings is clearly reducing youth unemployment. Entrepreneurship is option how to overcome the contemporary situation; it is a necessary condition for economic growth and development. Modern states converge in treating entrepreneurship as a key economic resource. But entrepreneurship is especially important in the period of structural change and changing global division of labor. Entrepreneurship according to the current demands is important part of education and especially of vocational education. There is a common need to develop and update VET-teachers' qualifications and competences in the EU. There are many reasons, for example: globalization meaning that industries and services need new abilities to meet competition

inside and outside the EU; the population in the EU is ageing; the changing vocational qualifications; the pool of unskilled or semi-skilled labor and their willingness to learn new skills are challenging.

## **Methods and procedures**

The goal of the paper is to provide description of the system of VET teacher preparation in Slovakia and describe partial results of ENTANGLE project (Entrepreneurship Trainers for VET: A Novel Generation Learning approach) in which the author participates as a partner of international consortium. This Project is carried out in six European Countries: Spain, Netherlands, Cyprus, Belgium, Lithuania and Slovakia. Entangle consortium is composed of seven partners from six European Union countries among them is Faculty of Economics and Management of Slovak University of Agriculture in Nitra Slovakia.

In the paper are described theoretical background of the project and the qualitative analysis of the pilot test of the methodology developed in the project. The project has an innovative practical approach to stimulating entrepreneurship among students in VET institutions by providing their teachers with the tools and materials to educate inspire and motivate their students to be able to pursue a career as an entrepreneur. The ENTANGLE project addresses entrepreneurship in (Secondary) Vocational Education institutes. The project aims at reaching the biggest number of VET teachers possible and start a lively discussion with them on entrepreneurship teaching and policies in the EU.

A review and analysis of relevant text documents and a qualitative methodology is employed. All partners wrote a country report, which includes general information about the country and about the target group and a qualitative analysis of the pilot test of the methodology developed in the project in the form of a summary of questionnaires from the VET teachers and students. In this paper are summarized the results of Slovakian partner.

## **Key points of educational system in Slovakia**

The Slovak education system features a high share of secondary VET graduates and a low share of early school leavers. Many secondary VET school graduates enter universities that dramatically expanded in number of institutions as well as students. Bachelor studies aimed at entering the labor market are however rare and students massively progress to master studies. Post-secondary studies offered by secondary VET schools leading to higher professional level of education (ISCED 5B), although originally highly valued by the labor market, has been weakening, in particular in comparison to university studies boom. Initially, only universities were recognized by legislation as higher education institutions, which hampered development of a non-university segment of tertiary education. (CEDEFOP, 2012) Compulsory education in Slovakia is 10 years and takes the longest to end of the school year in which child reaches 16 years of age. The tenth year of compulsory education pupils take to attend the high school. After completion of basic school, students, typically at the age of 15, make their choice of secondary school. They can decide for vocational education at secondary specialized schools, for conservatory or for grammar school. Tertiary education is provided by universities. Continuing education includes further professional education, not only to schools and educational institutions but also enterprises to workplaces, as well as civic education and interest. The further education takes place in institutions of further education in the form of various short-term and long-term educational activities: seminars, training programs, courses, part-time studies in secondary schools and universities, complementary, extension, special, or retraining studies. At present, besides secondary schools and higher education institutions nearly 300 various educational establishments provide the further education in Slovakia. The further education is accredited on the basis of the Accreditation Commission of the Ministry of Education for the Further Education. The accreditation is conditional on the relevant professional educational orientation of the institution, project submitted by this institution, which must meet all requirements, appropriate educational documentation of the educational activity,

qualified staffing and the appropriate material and technical facilities of this institution. The accreditation is granted for five years. Graduates from accredited further education courses are issued certificates by the respective educational institution, which are valid on the whole territory of Slovakia. The expenditures for the further education are covered mainly by participants themselves and partially from the funds of employers, from special-purpose subsidies, from the budget of the Centre of Labour (only for accredited retraining education), from budgets of local self-administration, from contributions by foundations and from other sources.

Despite strong progress in reforming VET since 2008 in Slovakia two weak points have remained unaddressed and must be therefore permanently stressed:

- Low investment in education causes lower quality of equipment and low attractiveness of IVET for young professionals to become teachers or trainers. Thus, even best shaped qualification documents are insufficient provided a quality training staff is not available.
- Low investment in VET research and labor market analyses hampers understanding of labor market needs. Data on transition of graduates into work and national employers' surveys are the most urgently missing tools to identify skills needs and skill gaps at workplace level. (CEDEFOP, 2012, p. 40)

### **VET teachers and trainers in Slovakia**

The changing nature of the VET practitioner and the constant evolution of the VET sector itself poses challenges to those involved in the many forms of VET teacher preparation in Slovakia. The quality and attention to learning and teaching integral to the professional development of these VET trainee teachers impacts on how they in turn will work with their own students. A range of models are employed to train VET teachers. UNESCO (2001) recommended that vocational teachers should be of the same status as other teachers, and that their preparation for teaching should be over three years.

Access to the teachers' qualification is generally regulated by and subject to the control of a ministerial authority. In almost all EU countries, to qualify as a teacher of vocational training, it is necessary to have a higher education degree followed by teacher training regulated at national level. In some cases the higher education degree can be replaced by a nationally recognized vocational qualification. In most countries the qualifications required of trainers or workplace instructors have not been formally defined. Neither do there appear to be any specific training paths to become a trainer of continuing training in a company or in a training organization. (Cort P., Härkönen A., Volmari K, 2004, p. 23) Teachers contrast with workplace trainers and instructors. While national regulations impose (varying) requirements on staff involved in initial vocational training, there is no formal definition of the qualifications or formal training required to take part in continuing training. The same situation is in Slovakia.

There are traditionally three categories of VET school teachers officially recognized by the education sector legislation: teachers of general subjects, teachers of vocational subjects and teachers of practical training. The latter category of teachers is involved in practical lessons at school, e.g., in laboratories and practical lessons connected to workplaces specified within curricula and aimed at applying theoretical knowledge gained during theoretical subjects. Although VET in Slovakia is dominantly school-based, in some cases practical training is offered outside the school. Based on an agreement between a school and a company, practical training can be provided directly by the company in its own premises and by its own staff, but under the supervision of the school. These professionals are often called instructors to differentiate between them and trainers from schools.

Teacher training is traditionally offered by universities. VET teachers, who are university graduates from other than teacher study programs look for receiving full teacher qualification by completing complementary pedagogical studies aimed at acquiring of pedagogical competence. The majority of teachers of vocational subjects in Slovakia achieved their teacher qualification by completing complementary pedagogical studies. Act No. 317/2009 Coll. on pedagogical staff and professional staff introduced the credit system for standards driven continuing training. Accreditation of continuing training programs is carried out by Accreditation

Council for Continuing Training of Pedagogical and Professional Staff established in November 2009 as an advisory body to MŠVVŠ. The law also specifies personal and qualification prerequisites concerning all categories of pedagogical and professional staff for four career levels representing a career path: beginner, independent worker, worker with the first and the second attestation.

Secondary school teachers of specific subjects are trained at various university faculties according to their field of study in teacher study programs. The course lasts for five years and leads to a state final examination. It is offered by: Faculties of Arts, Humanities, Natural Sciences, Physical Education and Sports, and Faculties of Education. Graduates of Technical Universities, Universities of Economics and of the University of Agriculture who wish to teach the subjects of their field of study at secondary school level can follow pedagogical training in accredited Complementary pedagogical study program at the university. For example at Slovak University of Agriculture since 1964 students from different faculties have been trained and acquired the qualification of "Teachers" which gives them the chance to progress in the field of agricultural education and training. This qualification also gives the opportunity of the students of SUA to advance in the area of pedagogy.

Complementary pedagogical studies for teachers of vocational subjects are organized according to the law. Applicants have to be MSc graduates (e.g. of agriculture, forestry, horticulture or similar specializations) it is organized mostly as a 4 semester combined study finished by final exam and it is possible to study also concurrently with corresponding MSc course at university (parallel study). Graduates obtain pedagogical qualification for teaching respective vocational subjects at secondary schools. The study program of Complementary pedagogical studies is at least 200 lessons and lasts maximum 36 months, it is divided to 3 modules: pedagogical-psychological, module of special didactics, educational practice and module in field specialization.

## Results

Teachers and trainers in VET require two distinct sets of skills. They need *pedagogical skills and vocational skills* and knowledge. In the past, VET teachers acquired their pedagogical and vocational skills at the beginning of their careers. Today this is no longer possible. National VET systems are in continuous change. Educational theory suggests innovative teaching methods, some involving the use of technology. And the workplace is changing faster still, both in terms both of technology and working practices. In this situation, it is essential that teachers should permanently *update* their pedagogical and vocational skills. Entangle project has the aim to equip teachers with tools helping to develop their skills in order to teach their students entrepreneurship and to develop their entrepreneurial abilities.

These partial results were achieved in the Work Package 2 of the Entangle Project that is solved by Entangle consortium, composed of seven partners from six European Union countries. The consortium consists of training material and methodology developers, business training and support organizations, VET organizations, universities that train future VET teachers and the EU-wide network association of VET providers (Fundación Maimona - Spain, First Elements Euroconsultants Ltd. – Cyprus, EfVET – European Forum of technical and Vocational Education and Training, *European Leadership Institute* – ELIN - Lithuania, CETEI-under Joan XXIII Foundation - Spain, Faculty of Economics and Management – Slovak University of Agriculture in Nitra - Slovakia).

The aim of the project is to equip VET teachers to teach students the emerging skills of entrepreneurship with a focus on the (start-up) micro enterprise. VET students who finish their studies are usually expected to continue their education elsewhere or start a job. Some former students however start up their own firm. Most teachers are unaware of this next step a student takes after graduation. Relations between teachers and world of work should be improved, especially the relations between VET teachers and former VET students of (start-up) micro firms. By applying the results of this project in VET institutes:

- 1) teachers gain insight to competences that are required for the entrepreneurs of today and tomorrow,

- 2) teachers can involve entrepreneurs (former students) in the classroom and together address the students of today, and
- 3) teachers can better interest, support and educate VET students to pursue a career as an entrepreneur.

The ENTANGLE project entered in 2013 its second year of activity and thus started to take shape. In the last year, partners have been conducted a research in their countries to determine the current situation of entrepreneurship teaching in vocational education. This included the collection of background information on education systems, curricula, and conducting interviews with both VET teachers and students to get fresh information right from the work floor. A series of materials were then analyzed in depth to determine the best way to use them developing the ENTANGLE Training Materials. Those were the following: the VIPIA training tool – which is a training package for would-be entrepreneurs, the BDF Methodology, additional materials provided by partners and the conclusions of the brainstorming sessions. As a result, a map on how to use the materials has been developed using the basis of the BMC model which is a tool used to analyze business model or to plan a business model innovation. (Newsletter #2, 2014, p. 1) In the last steps VET teachers in all partners' countries have tested the course in order to provide partners with suggestions to make it usable in different contexts. A draft of the course for teachers was discussed during the project meetings. The main reference for that is the model that is supported by ICT and pedagogical tools. How to integrate ICT and modern tool in education describe Hostovecký and Štubňa (2012, p.139-141), they recommended innovative technical education at the primary schools by 3D science teaching. Classes using dynamic images and integrated advanced 3D technology. The proof of the significance of innovative elements mentioned are the conclusions of the research, presented in the paper. Beneficial to practice in our country can become concrete proposals for the application of 3D technologies in the learning process. In addition, we offer suggestions for teachers and guidance on how to avoid potential obstacles in the implementation of technology in science teaching.

The consortium was able to monitor the situation of entrepreneurship practices and entrepreneurial teaching in the partners countries. Qualitative research used a questionnaire broadly distributed in VET institutes and collected the opinions of teachers and students. The survey results highlighted a great difference among (and sometimes even within) partners' countries. In particular as regards:

- Law facilities in order to create an enterprise.
- Entrepreneurial approach.
- Different levels of government help for developing business.
- Influence of the education system in boosting the entrepreneurial spirit.

However, lacks of the system and the wishes perceived by teachers and students had quite of lot of surprising similarities. The following quotations are an example of that: (T=teacher; S=student). (Newsletter #2, 2014, p. 2)

*Do you think that knowledge of the VET lectors is helpful for starting business?*

T-ES1: Yes, but teachers need more training on this issue.

T-ES2: Yes, but only if the teacher has been directly related to business creation, or if he/she has worked in a company.

T-LT1: Yes, but most of schools lack human resources thus entrepreneurship must be delivered by teachers who are not active in this field.

S-LT2: Yes, but teachers who teach entrepreneurship usually have never had a business themselves

S-CY1: Teachers certainly contribute to the start –up of an enterprise because their knowledge and this experience help a lot.

T-SK1: Yes, but there is lack of entrepreneurship education contained in our curriculum during the study.

Sometimes teachers think instead that the responsibility is more on students:

T-ES3: Yes, we transmit them the knowledge. But students do not have either the maturity or the intention necessary to start a business.

To sum up the answers we can say that entrepreneurship is often not offered as part of the VET curricula, but even with it is, there's not enough practical orientation to the labor market.

A very positive result for the ENTANGLE consortium is represented by many proposals done by teachers, which are in the direction of the project outcomes and objectives.

T-ES6: It is necessary to introduce units related with entrepreneurship in the training programs.

T-ES3: It is necessary to train VET teachers in entrepreneurship, especially to those teachers from areas that are not directly related to the business world.

T-ES4: It is necessary to increase the hours devoted to training entrepreneurship, so this way in the near future entrepreneurial culture would be considered as an important part of education.

T-LT3: Entrepreneurship being the secondary occupation means no time for making engaging classes, a comprehensive portal with tips & tricks would help a lot.

T-NL1: It would be great to have materials that lead up to constructing a true practical final result, like a business model

In general, teachers would like to acquire the knowledge about specific content about business models, ICT tools and pedagogy; instead students' expectations are to improve soft skills and to receive more concrete ideas.

## Results from piloting

In the project were developed tools for entrepreneurship skills development. Online platform was developed consisting of 10 modules with the evaluation quizzes at the end of each module. The piloting activities ranged from a face to face presentation of the project in a half day workshop followed by full online program. Workshop was organized in Slovak language and piloting of ENTANGLE final product – online learning system - was run in English. The pilot test was developed following the instructions of "R11 Pilot Testing Methodology document" (2014).

Piloting scenario was as follows:

- Workshop: Organization of a workshop and obtaining feedback.
- Online: Participants of the workshop and new ones learned individually online and gave feedback.

The direct target group of the project is entrepreneurship teachers in VET. Nevertheless, the target group can be diverse in terms of occupation as entrepreneurship teachers. ENTANGLE consortium agreed about the following target sub-groups to be relevant in the pilot phase: 1. Teachers in lifelong learning, 2. University teachers, 3. Future teachers.

Pilot group in Slovakia was just one group of university teachers at Slovak University of Agriculture in Nitra. SUA is the unique and only university in Slovakia preparing specialists for different fields of Agriculture and engineering. University has a strong tradition of working in collaboration with business and industry in the region and playing an active role in economic regeneration. Mission of university teachers at SUA is through teaching and research programs to equip graduates with the necessary education and skills to make a significant contribution to the economy and to society as a whole.

University teachers in the pilot were from different faculties of the university, teaching different specialized subjects. Aged between 24 – 40 years with various teaching and entrepreneurship experience (from those who have no experience in entrepreneurship teaching up to experienced entrepreneurship trainers).

Pilot group involved in face to face workshop (18 participants: 8 male, 10 female) were university teachers from Faculty of Economics and Management (6), Faculty of Biotechnology

and Food Sciences (3), Faculty of Engineering (3), Faculty of Agrobiological and Food Resources (4), Faculty of European Studies and Regional Development (1), Horticulture and Landscape Engineering Faculty (1). According to the registration template for the workshop only 2 of the participants are entrepreneurship trainers at university, the rest have different field specialization. One of the participants has experience in running own business- organizing summer children's camps. All of the participants identified their competencies in delivering entrepreneurship trainings at the lowest degree from the scale 1-10.

Pilot group involved in online testing (10 participants: 2 male, 8 female) consisted of 6 participants the same as in workshop and 4 new ones. Participants were university teachers mainly from the Faculty of Economics and Management (8) and 2 from Faculty of Biotechnology and Food Sciences. Only one of them had experience in running own business- organizing summer children's camps. Among the participants only 2 of them are entrepreneurship trainers at university, the rest teach different subjects but somehow related to entrepreneurship. All of the participants identified their competencies in delivering entrepreneurship trainings at the lowest degree from the scale 1-10.

## Workshop

Workshop was attended by 18 participants and it was also a promotional tool for piloting the online platform, it was organized on 28<sup>th</sup> of May 2014 and there was left 2 weeks' time for piloting ENTANGLE online platform. The duration of the workshop was a half day event consisting of: Introduction of participants and introduction of the trainer; Presentation of ENTANGLE (project idea, Entangle Project web, explanation of the aim and goals of the project, results of need analysis in the country, final products, invitation to continue pilot online after the workshop); Defining the business idea; Dividing participants into groups and Making business canvas model in groups, Presentation of canvas to the other groups, answering questions, discussions, improvements; Feedback from the trainer, Feedback from participants and Filling the questionnaires.

Feedback on the workshop:

Workshop was in the form of face to face event where participants were presented with project and its results. According to answers of participants from Workshop Evaluation template we calculated the average number to each question from the questionnaire. No one from the respondents wrote further comments into the questionnaire or answered the open questions. Criteria were measured in the scale from 1-10. (1 = very bad ... 5 = average ...10 = excellent)

**Tab. 1 Workshop Evaluation results at SUA**

<b>Question</b>	<b>Average from answers in scale 1-10</b>
Overall satisfaction on the ENTANGLE Workshop	7,4
Competencies in entrepreneurship trainings after finishing ENTANGLE workshop	5,8
How ENTANGLE workshop meet your personal expectations	6,7
Chances to apply ENTANGLE tools in teaching entrepreneurship	6,1
How holistic was ENTANGLE approach to entrepreneurship training	7,3
How practical was ENTANGLE approach	7,2
How engaging entrepreneurship lessons could be if ENTANGLE tools were applied in the classroom	7,6

How well ENTANGLE relates to business world	7,2
Organization of the workshop: Information distributed prior and during the workshop (relevance, quality, usefulness, etc.)	7,6
Organization of the workshop (venue, transportation, inventory, coffee breaks)	7,7
Work (agenda, topics, presentations, timing, work methods)	7,4
Communication between participants (clarity, fluency, ability to speak to the topic, appropriate timing)	8,4
Trainer (knowledge on the topic)	6,5
Trainer (didactical knowledge, abilities to manage audience and discussions, abilities to motivate the group)	8,05

According to data gained from questionnaires, we can conclude, that results are relatively positive due to the numbers that are above average evaluations and closer to the upper score from the scale. We can see some weaknesses, but we hope they can be improved in the future.

### Online Platform

Online platform was filled in by 10 participants. 6 Participants testing online platform were the same as the ones attending the workshop and the rest (4 participants) were new ones. Piloting started on 28<sup>th</sup> of May 2014 when the workshop was run and students were invited to test the ENTANGLE online platform, new participants were invited via e-mail. Questionnaires on Online platform evaluation were collected via e-mail.

Feedback on online testing:

According to the answers of participants from Online Platform Evaluation template we calculated the average number to each question from the questionnaire. No one from the respondents wrote further comments into the questionnaire.

**Tab. 2 Online Platform Evaluation results at SUA**

<b>Question</b>	<b>Average from answers in scale 1-10</b>
Overall satisfaction on the ENTANGLE online course	7,5
Competencies in entrepreneurship trainings after finishing ENTANGLE course	5,9
How ENTANGLE meet your personal expectations	6,8
Chances to apply ENTANGLE tools in teaching entrepreneurship	6,3
How holistic was ENTANGLE approach to entrepreneurship training	7,4
How practical was ENTANGLE approach	7,3

How engaging entrepreneurship lessons could be if ENTANGLE tools were applied in the classroom	7,7
How well ENTANGLE relates to business world	7,3
ENTANGLE platform in terms of functionality, accessibility, easiness to use	7,5
The scope of additional materials provided	7,2
Possibilities to expand ENTANGLE platform in the future	6,7

Online platform evaluation results were similar to results from workshop. Overall evaluation is satisfactory, because the average numbers are positioned in the upper section of the scale.

### **Conclusions:**

Problems encountered:

First problem encountered during piloting was lack of motivation of teachers to participate in pilot. Because of the wide variety of teachers' specializations, it was difficult to motivate them to attend entrepreneurship education. Despite of the fact that some of the pilot group were teachers specialized in economics and management, they were not much interested in entrepreneurship. On the other hand, university teachers appreciated the need of the entrepreneurship education but stated that they have lack of time to promote entrepreneurship among their students because they work in different fields of science and have to teach extensive content of various subjects during the semester. Workshop and online testing were optional for teachers and lead to no certificate Nor to new qualification. Attendance in such type of education could be increased by developing the tools of teachers' motivation e. g. setting the institutional criteria for further education, accrediting this type of education, etc. In our case at SUA, the pilot was a part of course in Higher education pedagogy for the staff. But this is only optional course and the attendance is based on the own interest of the university teachers in their self-development. Entrepreneurship education can be more easily introduced in lifelong learning of teachers at lower levels of education (primary, secondary) where they can through accredited courses by Ministry of Education of Slovak republic obtain credits for increasing their qualification.

Another problem encountered during the pilot was filling in the online platform by workshop participants and return of questionnaires. It was difficult to motivate all of them to learn the platform, we had to find another 4 participants beside those involved in Face to face workshop to evaluate the online platform.

Some of the participants involved in online testing had problems with the online quiz, they could not see the results even they filled it in (this was just technical problem, which can be easily solved in the future).

Conclusions from the opinions of participants:

- According to the opinions of the pilot group, workshop was a good place to exchange good ideas and to have inspirational discussions on entrepreneurship.
- University teachers appreciated methods of group work used in the face to face workshop.
- For some of the participants was entrepreneurship education inspirational because majority of them stated the lack of own entrepreneurship skills at the beginning of the workshop.

- From the point of trainer the methodology used in the workshop is a very good kick off for starting to explain entrepreneurship and develop a VET student business project.
- The aim of ENTANGLE platform is to support teachers with knowledge and tools to run entrepreneurship classes and participants of the pilot group stated that this aim was achieved.

#### Summary for VET teacher:

In most countries, students attend VET courses to get certified. In some countries do not give a certificate. In most countries, programs VET courses on entrepreneurship, but must also provide that the labor market is asking for, that such courses technical orientation. The level and quality of VET teachers is mean and basically sufficient. Students feel that they lack practical business experience. Can anyone advise them to start a business, who had never been taken. This is a key question. On the other hand, echoed the opinion that the legal theorist, follows more rules, laws and the possibility to get the money to start a business, so it is actually beneficial to the student. VET teachers are generally helpful, but too theoretical. Socio-economic situation is almost identical in all partner countries. After the crisis began in 2008, a similar situation occurs, unemployment is increasing. (ENTANGLE Consortium, 2013, p. 20)

#### Summary for VET student:

Students are attending VET courses for various reasons. For example, in Spain there sending their family. Getting the course is easier than getting into college. In the Netherlands, are considered the course to be very practical. Students are satisfied with the programs and many of them would also like to start a business. Problem is that they do not know in what way they would like to do business. At this point it is necessary to reflect on the justification study to start a business. Potential student should know what he wanted to do a VET institution would have only had to show the way how to do it. It should not just be studying killer time. Their expectations are reasonable sometimes a bit exaggerated. Improve your softskills, getting business ideas making money. (ENTANGLE Consortium, 2013, p. 24)

To conclude the results we can say that there are many similarities between partners countries of the project despite there are also some differences. But the common aim is to improve quality of vocational education for the future social and economic prosperity of the countries. Methodology developed by ENTANGLE consortium can be useful tool to help teachers in educational practice in all countries of European Union, not even those involved in pilot. In Slovakia we can recommend it as useful source for future teachers in their pregradual education, as well as tool for pedagogical and vocational skills update for teachers in further learning.

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<http://www.entangleforvet.eu/gb/2/project>

# Subsidies and profitability of Slovak farms<sup>1</sup>

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## Abstract

Slovakia's accession to the European Union had an impact on the entire economy, especially on agriculture. It was followed by increase of public funds in form of CAP subsidies. Their main aim is to support farm income as well as rural development. The aim of this paper is to analyze the impact of the CAP on the economy of farms based on an analysis of a dataset of agricultural farms operating in Slovak regions. Our analysis was based on the database of Ministry of Agriculture and Rural development for agricultural farms over the period 2009-2012. The database contained individual data including balance sheets and income statements for each farm. For our analysis, data were selected according to the 8 Slovak regions. Administratively, Slovakia is divided into 8 sections (regions), which correspond roughly to the areas surrounding the eight largest cities, and are named after them. Each of these administrative units consists of several districts, approximately on the scale of counties. Slovakia is perceived as a leader among the European countries due to its size of farms. Despite of a high concentration of farms - up to 90% of the utilized agricultural land is farmed by large farms - the Slovak agriculture is considerably less productive. The Slovak agricultural farms in our sample displayed low profitability measured by profit per hectare. The farms in "LFA" regions have better profitability, because they gain higher subsidies per hectare and their production is less demanding on costs and are less dependent on sales. On the other hand after integration into EU in 2004 the majority of farms generate profit. Increase in subsidies was followed by lower ability to generate profit without subsidies. Based on our analysis we conclude that farms in Slovakia are, by achieving their individual target – profit, dependent on CAP with increasing tendency. In terms of food self-sufficiency, should the state endeavour that the ability of farms to outreach profit is pegged to market success and not only to public resources eligible regardless of market output.

## Keywords:

Common Agricultural Policy, Subsidies, Profitability, Influence, Agriculture

## Introduction

Slovakia's accession to the European Union had an impact on the entire economy, especially on agriculture, representing the integration basis in Europe. The independent Slovak agricultural policy was abolished after entering the EU and it was needed to adopt the unified

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1/0912/14 “Common Agricultural Policy from 2014 to 2020 and its impact on the financial situation of farms in Slovak Republic”

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agricultural policy, which represents a set of economic, institutional, legislative, and policy instruments to ensure a homogenous market.

The EU Common Agricultural Policy (CAP) has, since 1992, undergone enormous change. The instruments of price support have, for most commodities, been replaced progressively with direct payments that distort prices and trade much less (Ramniceanu I., Ackrill R. 2007).

Decoupling subsidies from production resulted in changes in the structure of farms. Surveys (Lobley M., Butler, A. 2010) show that larger dairy and arable businesses are likely to expand still further, while smaller livestock farms are the most likely to see a change in occupancy following the retirement of the existing principal farmer. A change in farm activities under decoupling is often questioned. Some studies (Tranter, R.B. et al, 2007) conclude that only the minority of farmers 30% would alter their mix of farm activities. Furthermore, less than 30% would idle any land under decoupling. Of those who would adopt a new activity, the most popular choices were forestry, woodland and non-food crops.

The number of farms in the EU-27 gradually decreased and their average acreage increased. A similar trend was also in Slovakia. Cooperatives and capital companies dominated in the Slovak agriculture. They cultivate 90% of agricultural land, while in the EU-15 is dominated by individuals (family farms).

Profitability in the Slovak agriculture after 2004 period is deep below the average EU-27 countries, as well as the support to agriculture calculated in Euros per hectare of agricultural land. Slovakia is at low level with the amount of total agricultural output per hectare of agricultural land. Not only it lags behind the average EU-27 (against which it achieves only half of the value), but also keeps behind the Czech Republic, Hungary and Poland, i.e. states which Slovakia joined the EU with.

When analysing the impact of risk of agricultural farms on their profitability, studies show that the lower level of risk, the lower level of profitability of farms may occur (Piterková et al. 2013). The effort of farms is to increase the efficiency of business, which is inextricably connected with achieving the lowest possible cost per unit of output. The low costs represent an important competitive advantage for a farm. (Váryová et al.2012) As confirmed by the results of research in quality management by authors Savov et al. (2013) the Malcolm Baldrige National Quality Award criteria significantly contribute to improve the productivity and efficiency of all business processes.

In connection with the proposed reform of the current Common Agricultural Policy for period 2014-2020, the direct support should be split more equally between the Member States, namely by reducing the link to historical data and by taking into account the overall context of the EU budget. All Member States with direct subsidies below 90% of the EU average should reduce the difference between their current level and this level by one third. This convergence should finance proportionally all Member States with direct payments above the EU average. The discussion about the future multiannual financial framework for the period commencing in 2021, should be focused on the objectives of complete convergence through the equal distribution of subsidies across the EU.

## **Data and Methodology**

Our analysis was based on the database of Ministry of Agriculture and Rural development for agricultural farms over the period 2009-2012. The database contained individual data including balance sheets and income statements for each farm. For our analysis, data were selected according to the 8 Slovak regions. Administratively, Slovakia is divided into 8 sections (regions), which correspond roughly to the areas surrounding the eight largest cities, and are named after them (Figure 1).



**Figure 1: Slovakia map**

Source: <http://www.dreamstime.com/stock-image-vector-slovakia-map-image6219521>

Each of these administrative units consists of several districts, approximately on the scale of counties. Table 1 shows the number of farms included in the database according to the regions and years.

**Table 1: Number of farms in Slovak Regions in the analysis**

Regions	2009	2010	2011	2012	Total
1 – Bratislava Region	78	72	79	83	312
2 – Trnava Region	231	221	237	249	938
3 – Trenčín Region	100	100	107	109	416
4 – Nitra Region	260	242	247	263	1012
5 – Žilina Region	125	109	115	126	475
6 – Banská Bystrica Region	195	182	211	228	816
7 – Prešov Region	201	199	201	222	823
8 – Košice Region	189	174	199	195	757
<b>Total</b>	<b>1379</b>	<b>1299</b>	<b>1396</b>	<b>1475</b>	<b>5549</b>

Source: Database of Ministry of agriculture and rural development, author's calculations

Unlike in old EU Member states the majority of UAA is cultivated by large farms with more than 1000 hectares per farm. In Table 2, there can be observed the structure of Total equity and liabilities in Slovak farms according to regions. Agricultural farms in 2012 had more capital per hectare in comparison to year 2009.

**Table 2: Equity and liabilities side of balance sheet of Slovak agricultural farms according regions (in €/ha)**

Nate	Year/Region	1	2	3	4	5	6	7	8
Total Equity and Liabilities	2009	3471	3402	2431	2711	1984	1868	1742	1787
	2010	4037	3416	2511	2691	1968	2085	1700	1772
	2011	4103	3469	2634	2786	2002	2082	1707	1878
	2012	4342	3520	2410	2834	1900	2038	1751	1989
Equity	2009	1380	1555	1335	1348	1210	733	879	763
	2010	1757	1589	1392	1347	1197	782	856	782
	2011	1786	1647	1389	1407	1146	754	852	810
	2012	1881	1662	1264	1434	1069	778	809	853
Liabilities	2009	1702	1610	918	1159	569	950	675	835
	2010	1877	1549	894	1157	543	1099	649	801
	2011	1908	1581	1058	1215	636	1138	661	866
	2012	2041	1645	958	1238	622	1036	764	934
Accruals	2009	389	237	177	202	206	186	185	188
	2010	404	277	224	187	228	204	195	189
	2011	409	241	187	165	220	190	194	202
	2012	420	214	188	162	209	224	178	202

Source: Database of Ministry of agriculture and rural development, author's calculations,

Regions: 1 – Bratislava, 2 – Trnava, 3 – Trenčín, 4 – Nitra, 5 – Žilina,

6 – Banská Bystrica, 7 – Prešov, 8 - Košice

By comparing regions in total capital (equity and liabilities) in Bratislava regions, it increased from 3471 €/ha in year 2009 to 4037 €/ha in 2012 (+16%); from 3471 €/ha in year 2009 to 4037 €/ha in 2012 (+16%). The value of Total equity and liabilities was the highest in Bratislava regions.

On the Equity and Liability side of the Balance sheet the ratio between equity and liabilities is changing in favour of liabilities and accruals. As of companies, in the whole observed period, the debt burden is at 27,6 % (in Žilina region in 2010) to 54,7 % (in Banská Bystrica in 2011). Generally farms in Žilina region have higher proportion of equity compared to others regions.

To analyze the impact of European integration on agriculture we focused on 4 ratios:

- Subsidies per hectare
- Profit per hectare
- Subsidies to Sales ratio

- Profit without subsidies per hectare

To describe the development of presented ratios in the whole dataset we used descriptive statistics median, upper quartile and lower quartile.

## Results and Discussion

Agriculture in all European countries is supported by public funds in form of subsidies. The total amount of subsidies received by agricultural farms in Slovakia increased after 2004 after CAP introduction in 2004. The majority of subsidies in our period (2009-2012) were linked to Single Area Payment Scheme (SAPS). It allows a single annual payment to be made to farmers on the basis of the area of the farm. A large difference between regions, years and quartiles can be observed in the analyse (table 3).

**Table 3: Subsidies per hectare in Slovak agriculture regions in 2009-2012 (€/ha)**

Year	Subsidies/ha	Region							
		1	2	3	4	5	6	7	8
2009	Percentile 25	152,6	159,2	259,2	159,0	315,9	234,0	280,6	204,4
	Median	220,2	264,4	316,2	213,3	383,0	305,5	358,5	255,9
	Percentile 75	354,6	363,6	409,2	286,0	427,5	393,9	413,9	346,7
2010	Percentile 25	145,1	167,2	256,1	153,1	346,7	260,2	278,6	203,9
	Median	238,3	245,2	333,0	200,1	408,1	307,8	336,4	250,8
	Percentile 75	401,8	324,1	414,3	265,1	452,3	399,6	399,3	348,5
2011	Percentile 25	155,4	156,6	213,2	156,1	291,3	220,6	262,1	201,3
	Median	228,9	241,0	290,1	207,1	357,0	284,8	309,7	238,2
	Percentile 75	288,4	306,9	354,9	256,9	399,0	345,6	358,6	303,5
2012	Percentile 25	174,5	177,1	232,0	174,7	282,4	235,5	251,6	208,2
	Median	217,5	239,4	277,4	197,2	317,4	274,7	287,3	230,2
	Percentile 75	312,9	306,3	327,2	250,4	372,2	330,7	342,6	293,8

Source: Database of Ministry of agriculture and rural development, author's calculations

Regions: 1 – Bratislava, 2 – Trnava, 3 – Trenčín, 4 – Nitra, 5 – Žilina,

6 – Banská Bystrica, 7 – Prešov, 8 - Košice

By comparing the regions we can observe, that in each year farms in regions, which have no good conditions for agricultural (3, 5, 6, 7), have conceded more subsidies per hectare, compared to regions with better production areas (table 4, medians). The reason is, that the win subsidies for “Less Favoured Areas” (LFA). In areas designed as “less-favoured”, agricultural production or activity is more difficult because of natural handicaps, e.g. difficult climatic conditions, steep slopes in mountain areas, etc. Due to the handicap to farming there is significant risk of agricultural land abandonment and thus a possibility of loss of biodiversity,

desertification, forest fires and the loss of highly valuable rural landscape. To mitigate these risks, the “LFA” payment scheme is an important tool, implemented by all the Member States it is not a compulsory measure ([www.ec.europa.eu](http://www.ec.europa.eu)).

Of course, within different regions are relatively large differences, which are confirmed by the values of the lower and upper quartile.

The profitability in agriculture depends on weather and climate conditions and during the observed 4 years was negative. Adverse weather conditions in 2009 resulted in very low profitability in the majority of agricultural farms (table 4, profit/ha in 2009 lower quartile and median).

**Table 4: Profit per hectare in Slovak agriculture regions in 2009-2012 (€/ha)**

Year	Profit/ha	Region							
		1	2	3	4	5	6	7	8
2009	Percentile 25	-252,4	-236,1	-192,9	-223,6	-59,5	-46,0	-11,0	-63,7
	Median	-70,9	-60,2	-7,9	-23,3	6,2	3,7	9,4	3,4
	Percentile 75	54,7	17,3	21,0	19,9	22,2	45,7	43,1	35,1
2010	Percentile 25	-92,9	-52,2	-77,4	-19,4	-28,3	-43,5	0,2	-59,4
	Median	46,2	11,8	8,4	16,8	6,5	9,2	8,7	5,5
	Percentile 75	126,9	68,4	45,1	82,4	26,0	57,5	30,6	32,1
2011	Percentile 25	7,2	16,2	-74,3	17,0	-75,5	-5,9	-19,8	-4,6
	Median	78,2	77,9	14,3	90,0	3,0	16,1	7,3	18,3
	Percentile 75	190,3	211,6	82,1	224,8	19,8	65,6	27,2	59,8
2012	Percentile 25	-151,4	-63,8	-95,6	1,9	-54,6	-3,6	1,0	5,2
	Median	9,7	22,2	10,4	34,2	1,9	12,9	11,2	39,0
	Percentile 75	80,5	97,2	89,2	130,9	15,0	67,2	34,5	121,4

Source: Database of Ministry of agriculture and rural development, author's calculations

Regions: 1 – Bratislava, 2 – Trnava, 3 – Trenčín, 4 – Nitra, 5 – Žilina,

6 – Banská Bystrica, 7 – Prešov, 8 - Košice

The farms in “LFA” regions have better profitability. The influence of market factors is lower, because their production is less demanding on costs; they are less dependent on sale and they obtain higher subsidies per hectare. This situation can be seen in table 6, which contains the calculation of the ratio between Subsidies and Sales. Higher number represents 3 situations:

- Higher subsidies per hectare
- Lower sales per hectare
- Higher subsidies with lower sales per hectare.

Therefore we can believe that the business is less risky (in profitability) in regions with “LFA” subsidies.

**Table 5: Subsidies/Sales in Slovak agriculture regions in 2009-2012**

Year	Subsidies/Sales	Region							
		1	2	3	4	5	6	7	8
2009	Percentile 25	0,0	0,1	0,3	0,2	0,6	0,4	0,6	0,3
	Median	0,2	0,3	0,5	0,3	0,9	0,8	1,0	0,6
	Percentile 75	0,4	0,4	0,7	0,4	1,5	1,4	1,9	1,1
2010	Percentile 25	0,1	0,1	0,2	0,1	0,6	0,3	0,6	0,3
	Median	0,2	0,2	0,4	0,2	1,0	0,8	1,0	0,6
	Percentile 75	0,4	0,3	0,6	0,3	1,7	1,3	2,1	1,3
2011	Percentile 25	0,1	0,1	0,2	0,1	0,5	0,2	0,4	0,2
	Median	0,2	0,2	0,3	0,2	0,8	0,5	0,7	0,4
	Percentile 75	0,3	0,2	0,5	0,2	1,3	1,3	1,8	0,8
2012	Percentile 25	0,1	0,1	0,1	0,1	0,4	0,2	0,3	0,2
	Median	0,2	0,2	0,3	0,2	0,7	0,5	0,7	0,3
	Percentile 75	0,3	0,3	0,5	0,3	1,2	1,2	1,8	0,7

Source: Database of Ministry of agriculture and rural development, author's calculations

Regions: 1 – Bratislava, 2 – Trnava, 3 – Trenčín, 4 – Nitra, 5 – Žilina,

6 – Banská Bystrica, 7 – Prešov, 8 - Košice

Farms generate loss from the market production and the loss is increasing in years after CAP implementation. During the same period the proportion of subsidies on agricultural production in form of sales increases. Therefore the majority of farms in Slovak agriculture rely on subsidies and they are less motivated to produce agricultural production for the market and this could have a negative impact on food sovereignty of the Slovak Republic.

An opposite trend can be observed in 2010-2012 (Table 5), which we consider to be an improvement of the situation.

The ability to generate profit without subsidies is in all regions extreme bad (Table 6). In all years, all regions and all quartile farms generate loss without subsidies. The one exemption are farms in Nitra region, in year 2011, but only in higher quartile (Percentile 75). Subsidies represent stable income without risk for each farm.

**Table 6: Profit without subsidies per hectare in Slovak agriculture regions  
in 2009-2012 (€/ha)**

Year	Profit-Subsidies/ha	Region							
		1	2	3	4	5	6	7	8
2009	Percentile 25	-502,5	-554,0	-525,1	-469,4	-483,3	-424,1	-414,6	-388,5
	Median	-387,6	-361,4	-401,6	-306,9	-389,9	-315,8	-353,2	-286,0
	Percentile 75	-210,5	-177,3	-276,5	-177,9	-332,2	-215,6	-260,2	-182,4
2010	Percentile 25	-324,2	-377,2	-448,0	-294,2	-481,3	-434,3	-399,3	-386,9
	Median	-203,5	-242,1	-360,4	-188,1	-396,7	-317,2	-326,2	-276,7
	Percentile 75	-72,4	-132,5	-255,1	-89,6	-321,0	-233,9	-266,0	-194,6
2011	Percentile 25	-315,1	-245,1	-395,2	-205,6	-457,2	-359,9	-390,9	-342,7
	Median	-152,6	-142,0	-271,7	-104,8	-376,5	-271,1	-310,6	-223,1
	Percentile 75	-16,4	-0,8	-145,0	45,5	-286,5	-166,7	-249,0	-146,2
2012	Percentile 25	-391,0	-360,7	-407,4	-243,2	-437,5	-359,6	-356,8	-280,8
	Median	-241,5	-199,8	-264,8	-170,8	-333,4	-266,2	-279,8	-180,2
	Percentile 75	-116,5	-77,3	-155,5	-46,1	-270,1	-205,9	-232,8	-69,7

Source: Database of Ministry of agriculture and rural development, author's calculations

Regions: 1 – Bratislava, 2 – Trnava, 3 – Trenčín, 4 – Nitra, 5 – Žilina,

6 – Banská Bystrica, 7 – Prešov, 8 - Košice

## Conclusion

The process of integration into EU brought changes to Slovak agriculture. It was followed by increase of public funds in form of CAP subsidies. Their main aim is to support farm income as well as rural development. The Slovak agricultural farms in our sample displayed low profitability measured by profit per hectare. The farms in "LFA" regions have better profitability, because they gain higher subsidies per hectare and their production is less demanding on costs and are less dependent on sales. On the other hand after integration into EU in 2004 the majority of farms generate profit.

Increase in subsidies was followed by lower ability to generate profit without subsidies. Agriculture in Slovak Republic is not able to cover cost by revenues without public support. An opposite trend can be observed in 2010-2012 (Table 6), which we consider to be an improvement of the situation. This applies to all 8 regions. Of course, in all indicators are differences between companies within different regions, as confirmed by the differences in the lower and upper quartile.

In terms of food self-sufficiency, should the state endeavour that the ability of farms to outreach profit is pegged to market success and not only to public resources eligible regardless of market output.

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# Competition of Companies in International Tourism Sector in the Czech Republic

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## Abstract

The aim of the paper is to describe the behaviour of firms in international tourism sector using the model of monopolistic competition. In the sectors where increasing returns to scale apply, it is valid that both heterogeneity of the goods the country produces and the extent of their production are influenced by the market size. The analysis has shown validity of the model for the hotel industry; increasing the number of tourists and decreasing prices caused by an increase of the number of firms in the sector.

## Keywords:

company, hotels, monopolistic competition, returns to scale, tourism

## Introduction

As soon as a company reaches monopolistic position in a given sector, we can talk about imperfect competition. It is a situation, in which one producer influences the price of goods he is selling. It is not a price determination completely of his own choice, but rather an influence in certain limits. The extent of monopolistic position then determines also the extent of freedom in price decision making. Two basic assumptions hold in the environment of imperfect competition:

- Producer is able to influence the process of a product on goods and services market, or the price of a factor on factor market.
- Product is identifiable (differentiated).

To the reasons for imperfect competition origins belong:

- Economies of scale
- Barriers of entry in form of legal restrictions (patents, legislation)
- Differentiation of product
- Possession of an important production factor by one person (company)
- Interventions of countries/states into the market mechanism

The impact of international firms in the tourism sector may be characterized within the imperfect competition theory as oligopoly or as monopolistic competition. A frequent form of structure of the tourism sector (for example: hotel chains) is an oligopoly, i.e. several competing firms, each of which is big enough to be able to differentiate the prices of its production, but at the same time too small to fix the prices in the sector. The price policy within the oligopoly can be characterized by mutual dependence. The firms fix the prices of their production both with regard to the assumed consumers' behaviour and with regard to the assumed competitors' behaviour. Analysis of such behaviour is complicated. Analysis of

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the firms' behaviour in another imperfectly competitive structure, which is also often common, namely in the monopolistic competition, is much easier.

The aim of the paper is to describe the behaviour of firms in tourism sector using model of monopolistic competition, which is using optimization of the number of firms in the sector and its characteristics, best corresponding to the needs of international trade.

A lot of various models are used for monopolistic competition analysis. Bogliacino and Rampa summarize the basic approaches of the economic theory to this issue in their article (2010): "A satisfactory picture should be grounded on some essential building blocks. The first one is uncertainty: the very novelty of goods (ideas, technologies, behaviours, etc.) implies that agents must act using conjectures over some unknown feature, as in standard Bayesian approaches (Young, 2005). The second block is heterogeneity: individual models are necessarily different at the outset, since they summarize personal conjectures, previous learning and priori ideas (Cowan and Jonard, 2003, 2004; Lopez, Pintado and Watts, 2006). The third block is interaction: the learning activity on the part of agents exploits past observations, stemming mainly from other agents' choices. Interaction thus shapes the overall process, making it path dependent. Coupling all this with some degree of non-linearity might finally allow for multiple equilibriums, and hence non-uniqueness of outcomes (lock-in: see Aoki and Yoshikawa 2002; Young 2007)."

## **Materials and Methods**

The basic method used in the processing of the paper was the method of economic mathematical modeling. The following model of monopolistic competition is an example of this method. In addition to this basic method we used the method of description for the characterization of the tourism industry in the Czech Republic and the method of changes in individual indicators of tourism. For better understanding of changes in these indicators we show their development in the form of tables with percentage comparison and often in the form of graphs.

"The monopolistic competition includes some of the features of perfect competition and monopoly. Often there are many firms in the market, for which the entrance to (and the exit from) the sector is free, if they can compete by the deepened differentiation of their product or services" (Soukup, Šrédli, 2011). We have used in this article the model making use of optimization of the number of firms in the sector, the characteristics of which correspond best to the international trade needs. There are two key assumptions for monopolistic competition in the sector. It is differentiation of the product and the assumption that each firm considers the competitors' price as given. The firm manufactures and sells the more the higher the demand in the sector is and the higher the competitors' prices are. It manufactures and sells the less the higher the number of firms in the sector is and the higher its price is. The model is based on the article "Monopolistic Competition in the International Trade of Agricultural Products" (Soukup et al, 2014) and the article "External Economies of Scale of Companies Doing Business in Congress and Business Tourism in the Czech Republic" (Rodonaia et al, 2013).

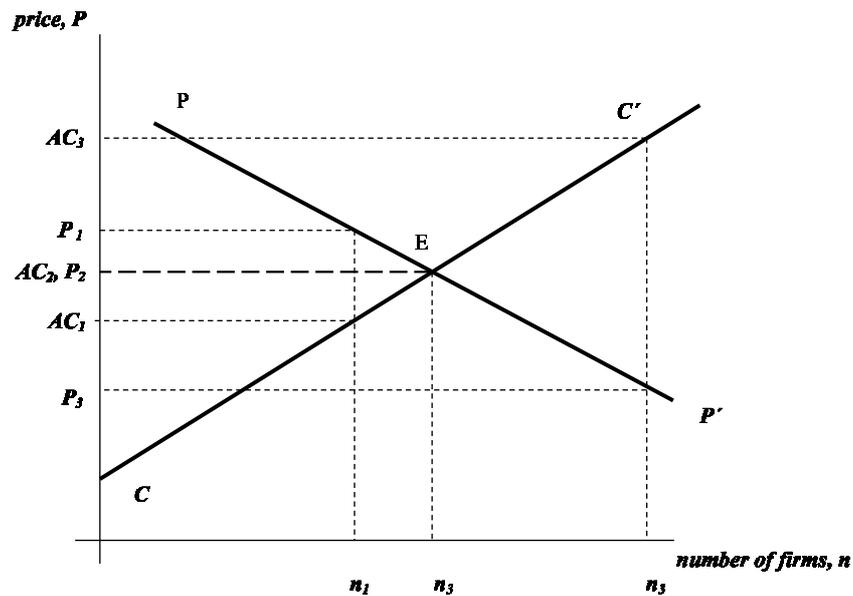
## **The model of monopolistic competition in sector**

This article analyses the situation when a company doing business in tourism enters international trade. The impacts of this entry on creation of optimal number of firms in the sector, of equilibrium quantity and equilibrium price in the given sector are discussed as well.

Average costs (AC) depend on the number of firms in the tourism sector ( $n$ ). We assume, according to Krugman (2006), that all firms in the sector are symmetric; it means that the demand and cost curves are the same for all firms in spite of the fact that they produce and sell differentiated products. If the individual firms are symmetric, it is easy to find out the sector's status. If we assume symmetry of the firm models, under equilibrium they shall sell for the same price, which means that each firm's share in the production and sale of goods is  $1/n$  of the total sale volume in the sector.

At the same time, we know that the average costs are inversely proportional to the number of products manufactured by the firm. The more firms there are in the sector, the higher the average costs are, since each firm produces less.

The situation in the tourism sector may be expressed graphically with two curves: growing  $CC'$  and falling  $PP'$ .  $CC'$  curve expresses the relation among the number of the firms in the tourism sector, the sale volumes and the average costs.  $PP'$  curve expresses the relation among the number of the firms in the tourism sector and the price. The equilibrium state is thus situated in their intersection point, in point E, which corresponds to the number of firms in the tourism sector  $n_2$  (see Pic. 1). In case of this number of firms, the profit in the tourism sector is zero (we have in mind the economic profit). If there are  $n_2$  firms in tourism sector, then the price maximizing the profit is  $P_2$ .



**Pic. 1 Equilibrium of the tourism sector under monopolistic competition  
(Krugman, 2006)**

The total firm's costs may be expressed by the relation

$$TC = \beta q + \alpha \quad (1)$$

For the average costs, it results there of

$$AC = \beta + \frac{\alpha}{q} \quad (2)$$

where  $\alpha, \beta$  are coefficients of the cost function.

$$q = \frac{\bar{q}}{n} \quad (3)$$

where  $\bar{q}$  is the number of products in the tourism sector,  $n$  is the number of firms,  $q$  is the number of one firm's products. By means of connecting these two relations we shall receive:

$$AC = \beta + \frac{\alpha}{\frac{\bar{q}}{n}} \cdot n \quad (4)$$

The price, for which a typical firm sells its goods or services, depends also on the number of firms in the tourism sector. The more firms there are, the stronger the competition shall be among them and the lower the price shall be. In Pic. 2 this is shown by the relation

$$P = \beta + \frac{f}{n} \quad (5)$$

where  $f$  expresses intensity of this competition.

The intersection point of both curves corresponds to the average costs AC2. It means that in a long period of time the number of firms in the tourism sector shall approach  $n_2$ , E thus represents the long-term equilibrium point. If the number of firms  $n_1$  was smaller than  $n_2$ , then the price of a piece of goods the firm offers would be  $P_1$  while the average costs would be only AC1 and the firms would thus achieve monopoly profit, which would attract other firms to enter into this sector, and their number, i.e.  $n_1$  would start increasing. In the same way - to the contrary - if the number of firms  $n_3$  was higher than  $n_2$ , the price  $P_3$  would be lower than the average costs AC3, the firms would thus lose interest and leave this sector, and the number of firms in this tourism sector would thus decrease. The economic profit is

$$\pi = \frac{\sqrt{\alpha \cdot f \cdot \bar{q}}}{n} - \alpha \quad (6)$$

$$\pi_1 > 0, \pi_2 = 0, \pi_3 < 0. \quad (7)$$

If  $AC = P_2$ , it must be valid in point E:

$$\beta + \frac{\alpha}{n} \cdot n = \beta + \frac{f}{n} \quad (8)$$

$$\frac{\alpha}{q} \cdot n_2 = \frac{f}{n_2} \quad (9)$$

$$\alpha \cdot n_2^2 = f \cdot \bar{q} \quad (10)$$

$$n_2 = \sqrt{\frac{f \cdot \bar{q}}{\alpha}} \quad (11)$$

It is possible to deduce from it:

$$q_2 = \sqrt{\frac{\alpha \cdot \bar{q}}{f}} \quad (12)$$

$$P_2 = \beta + \sqrt{\frac{\alpha \cdot f}{\bar{q}}} \quad (13)$$

Herewith also the quantity of the products of one firm and the equilibrium price of the final goods are determined.

### Firm's involvement in international tourism sector

Let's assume now that a firm under monopolistic competition enters international tourism sector. Increased market size allows each of the firms to produce more and to have lower average costs. Therefore, curve AC1 shall shift to AC2 in Pic. 2. At the same time, growth in the number of firms and product differentiation occur under the fall of the price of each of the products from  $P_1$  to  $P_2$ .

Growth of the total sale volumes shall decrease the average costs under any given quantity of firms  $n$ . The reason lies in the fact that if the market grows under the same number of firms, the extent of sale per one firm shall grow and the average costs of one company shall fall.

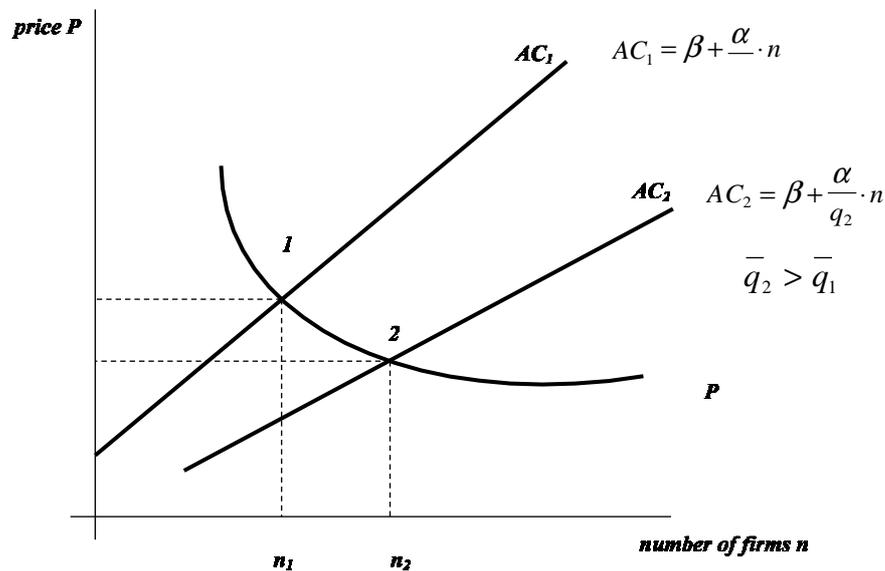
If we thus compare two markets, where one has higher extent of sale than the other one, AC2 curve of the bigger market shall lie below AC1 curve of the smaller market. Meanwhile, the other curve P, expressing the relation between the price for one product and the number of firms, shall not change (see Pic. 2).

In our model, the international tourism sector influence is expressed by an increase in the magnitude  $q$  and a decrease in the inclination of AC

$$n_2 = \sqrt{\frac{f \cdot \bar{q}_2}{\alpha}} > n_1 = \sqrt{\frac{f \cdot \bar{q}_1}{\alpha}} \quad (14)$$

$$q_2 = \sqrt{\frac{\alpha \cdot \bar{q}_2}{f}} > q_1 = \sqrt{\frac{\alpha \cdot \bar{q}_1}{f}} \quad (15)$$

$$P_2 = \beta + \sqrt{\frac{\alpha \cdot f}{\bar{q}_2}} < P_1 = \beta + \sqrt{\frac{\alpha \cdot f}{\bar{q}_1}} \quad (16)$$



**Pic. 2 Extension of the market size in the tourism sector (shifting of AC curve)  
(Krugman, 2006)**

The average cost function shows us the long-term consequences of increased market extent. Originally, the equilibrium was achieved in point 1 under price  $P_1$  and the quantity of firms was  $n_1$ . Increased market extent shifts AC curve more to the right bottom and the new equilibrium is achieved in point 2. The number of firms increased from  $n_1$  to  $n_2$  and the price fell from  $P_1$  to  $P_2$ .

Our model assumes that production costs are the same in both countries that trade with each other and that the trade does not require any costs. These assumptions express the fact that even if we know that the integrated market shall support higher number of firms, we cannot say where these will be located. These are the sectors with monopolistic competition where a great number of firms produce differentiated goods.

Similar conclusions have been achieved also by Feenstra and Kee (2010): "We conclude that export variety in the monopolistic competition model with heterogeneous firms is quite effective at accounting for the time-series variation in productivity, but not the large absolute differences in productivity between countries."

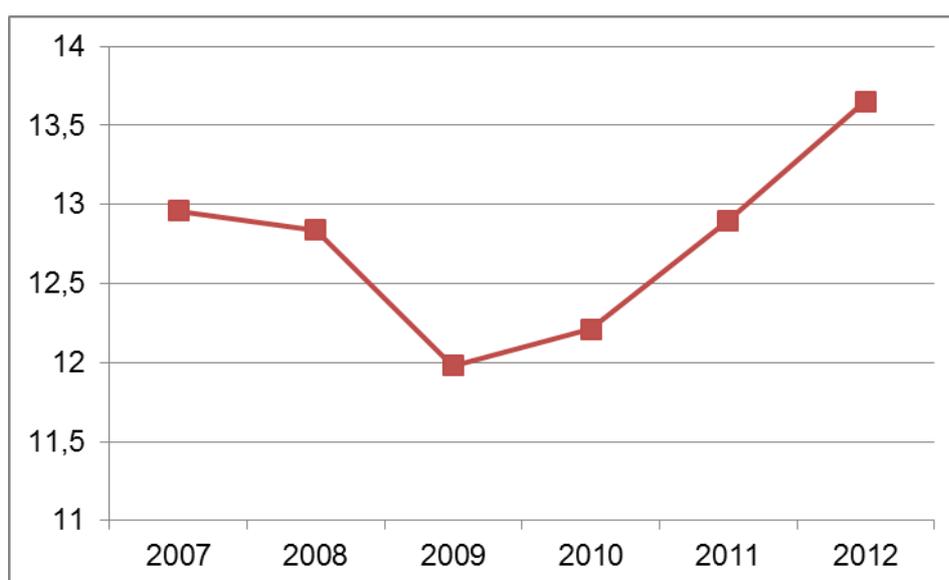
## Results and Discussion

### Tourist industry in the Czech Republic in the period 2007 – 2012

Tourist industry is one of a few sectors in Czech economy that show positive trend thanks to the increase of the number of foreign tourists in this sector. Tourism sector reached record results in 2012 and further growth is expected in following years. The number of guests in Czech accommodation facilities exceeded 13 million in 2012 for the first time; more Czech guests as well as foreigners arrived. 13.6 million guests visited hotels and other tourist facilities, that is 6 % more year-on-year. This boundary of 13 million was not passed even during the time of boom in 2007. This is shown in Table 1 (see also Pic. 3).

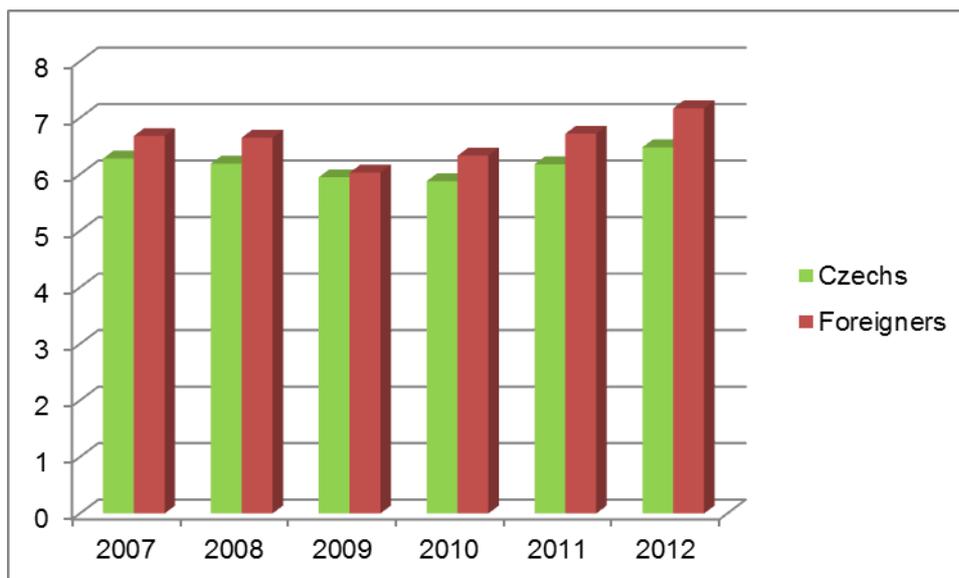
**Tab. 1 Guests in Czech accommodation facilities (in mil. persons) (CSO, 2013)**

Year	Czechs	Foreigners	Altogether	Annual change in %
2007	6.28	6.68	12.96	...
2008	6.19	6.65	12.84	-0.9
2009	5.95	6.03	11.98	-6.7
2010	5.88	6.33	12.21	+1.9
2011	6.18	6.72	12.9	+5.7
2012	6.48	7.17	13.65	+5.8



**Pic. 3 Guests altogether in Czech accommodation facilities (in mil. persons) (CSO, 2013)**

Picture 4 shows faster growth of the number of foreigners as compared to local guests in accommodation facilities in the Czech Republic, which has become evident since 2009.



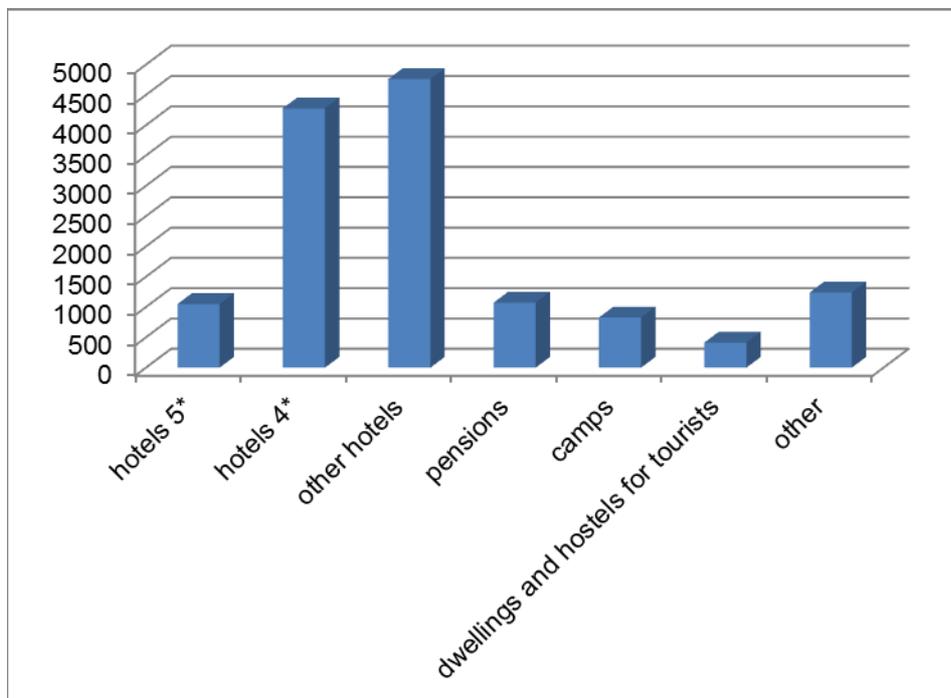
**Pic. 4 Guests in Czech accommodation facilities (in mil. persons) (CSO, 2013)**

Both domestic and foreign tourists contributed to the record in 2012, but foreigners represent majority and their proportion is still increasing. Almost 7.2 million of them arrived, that is 7 % more compared to 2011, and the boundary of 7 million was exceeded for the first time ever. Especially arrivals from Russia drove this trend; statisticians recorded a growth by one-fourth in this aspect. Russia is, according to hotel network EuroAgentur, a key market – any negative change there would be felt very radically by hotel owners. Russian citizens moved in the rankings of nationalities in Czech hotels from ninth place in 2006 to second place in 2012. Their numbers almost tripled during that time. First place is traditionally occupied by Germans – their numbers increased only slightly in 2012. The ranking of nationalities at the same time illustrates quite well the economic situation in respective home countries. Spaniards dropped to the end of first ten, also the numbers of French and Greek visitors, whose economies are in a long-term recession, decreased. On the other hand, unexpectedly high numbers of Americans and Brits have returned. This is shown in Table 1. The Chinese are also worth mentioning. Several years ago, they were almost ignored by the statisticians, but over 145 000 of them arrived to the Czech Republic in 2012. Exactly the Chinese, along with the Russians, are very popular with businesspeople in tourist industry, thanks to their hobby of high spending (Šindelář, 2013).

**Tab. 2 Guests in Czech accommodation facilities (in mil. persons) (CSO, 2013)**

	Nationality	Number (Annual change 2012/2011 in %)
1.	Germany	1418 (+2.3)
2.	Russian	698 (+24.9)
3.	Slovakia	383 (+11.3)
4.	Poland	371 (+0.1)
5.	USA	367 (+16.6)
6.	Italy	354 (+4.7)
7.	Great Britain	347 (+5.8)
8.	France	276 (-2.7)
9.	Austria	204 (+9.7)

10.	Spain	202 (-10.7)
Altogether		7170 (+6.8)



**Pic. 5 Accommodation by category in 2012 (number of guests in mil.) (CSO, 2013)**

Picture 5 introduces numbers of guests according to individual accommodation categories. It is clear that the most often used hotel types by guests are four star or lower category hotels.

Besides number of guests, information about the number of spent nights is also very important to hotel owners. This number is not increasing so quickly; it grew by 3.5 % in 2012, which confirms a long-term trend of shortening the stays. Nevertheless, the largest number of overnight stays since 2007 was recorded in 2012 – 39.6 million. According to a survey by company called KPMG, the average price per room in Czech accommodation facilities was further decreasing during 2011. Hoteliers in this year succeeded in selling a room for 1076 CZK on average, which is almost 100 CZK less than in 2010 and 400 CZK less than in 2009.

And most importantly, hoteliers have recently been able to increase prices. According to KPMG agency average revenue per room was 785 crowns in last summer, while the year before it was only 700 crowns.

A very important indicator RevPAR, which is profit per one available room, decreased to 620 CZK in 2011. In 2009, it was still 760 CZK. Low prices lured more guests to hotels, occupancy rate of hotels increased by 4 points to 56 %. However, the length of visit was getting shorter in a long-term trend.

Current indicators in hotel segment are notably lower when compared to the period 2004-2007. The drop started in 2009, so this sector is going through several years of joyless results. The problems in hotel business will not end this year either. For customers, on the contrary, the development can be positive: prices will continue to oscillate in their lower limits.

### **Tourism in the Czech Republic in 2013**

The first part of 2013 was successful from the touristic point of view. About 2.6 million guests found accommodation in Czech hotels, guest houses and camps during the first

quarter of the year. That was 3.2 % more year-on-year. The number of overnight stays increased as well in these primarily monopolistic firms of hotel industry. The number of nights spent by tourists in the Czech Republic increased by 2.5 % to 7.8 million. Foreign guests contributed more to this increase; their overnight stays grew by 4.2 % compared to the same time period in 2012. The number of overnight stays of Czech tourists increased by 0.8 %. Average duration of a guest's visit was 3 nights; Czech people were accommodated on average for 2.9 nights, foreigners for 3,1 nights (ČTK, 2014).

The number of overnight stays of foreigners grew year-on-year faster than their number itself. The prolonging of the average time of visit is a little unusual; rather the opposite trend was detected in the last years. In this case, the faster growth of overnight stay was clearly linked to increasing interest of Russian tourists. In the first half-year of 2013, Czech people travelled a bit less and they often skipped a trip associated with overnight stay in a hotel.

The Czech country stayed an attractive destination for foreign tourists despite the floods in June. A record-breaking 3,3 million foreign guests arrived during the first term of 2013, that is 1,4 % more year-on-year. Although the “big water” slowed down incoming tourism in the second quarter of a year, it did not reverse the growing trend. According to estimates of the state agency Czech Tourism, up to 7,3 million foreign clients should visit Czech hotels during the entire year, which would mean overcoming year 2012 record by 140 000 (Šindelář, 2013).

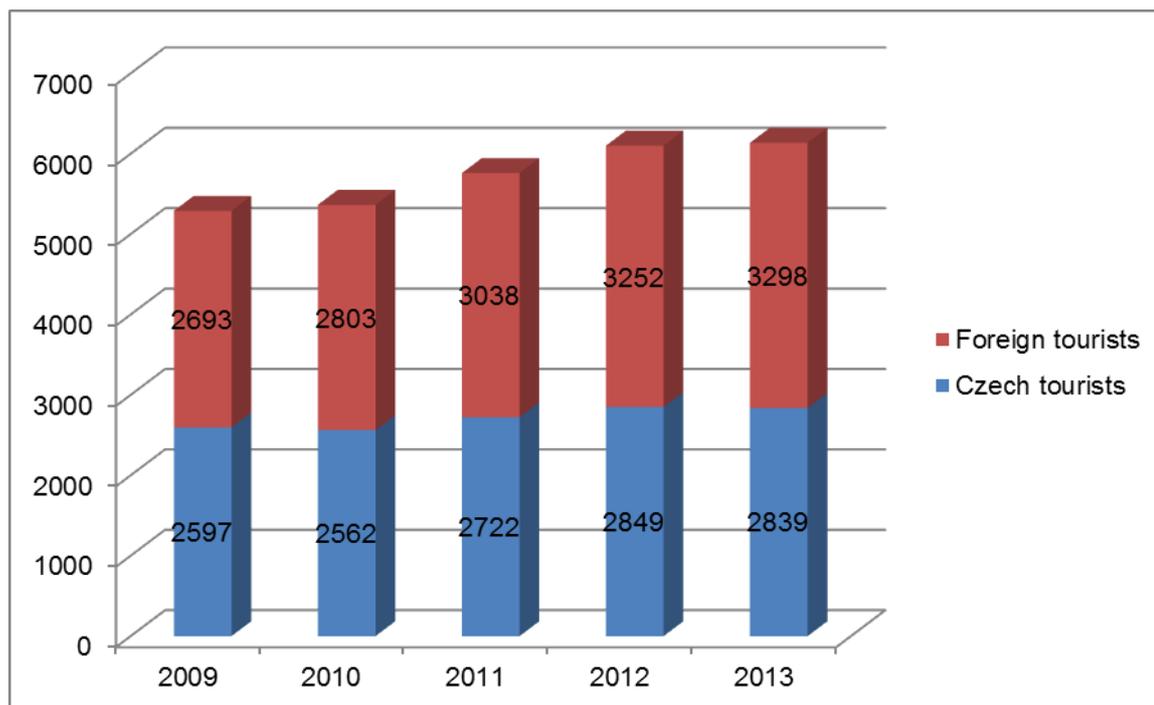
The number of overnight stays is also important for hotel managers. It increased in incoming tourism with about the same speed as the number of guests, which would mean good news: that the time of stay is no longer getting shorter. Rather than by floods, arrivals from foreign countries are influenced by economic situation in the given country. Spaniards dropped out of the top ten, when 13 % less of them arrived in the first half-year compared to year 2012. Similar trend was detected by statisticians for Italians or Frenchmen. Fewer Germans visited as well, which can be besides other things contributed to the floods. Demand was, on the other hand, increasing in the east; more tourists came from Russia, Poland, Slovakia, and also from eastern Asia, especially from China.

Czech tourists slowed down in the second half-year 2013 and often skipped trips associated with overnight stay. While during the first quarter of a year 2013 the number of Czech guests was still increasing, an exceptional downswing appeared in the second quarter. The result is that Czech people spent during the first half-year 2013 330 000 nights less in domestic hotels compared to a year ago, which represents a decrease by 9 % (Šindelář, 2013).

We can see three groups of reasons behind: June floods, cost-saving measures in families and therefore shorter stays, and also big caution of seniors, who usually travel during off-season.

**Tab. 3: Guests in accommodation facilities in 1st half-year of 2013 (CSO, 2013)**

		number (in thousands)	year-on-year change (%)
1.	Germany	633	-2.9
2.	Russia	370	10.2
3.	Poland	189	4.6
4.	Slovakia	179	3.6
5.	Italy	167	-7.8
6.	Great Britain	163	2.3
7.	USA	158	0



**Pic. 6 Guests in accommodation facilities in the Czech Republic in the 1<sup>st</sup> half-year (in thousands) (CSO, 2013)**

The most important aspect is that hotel managers are lately successful in increasing prices. Hoteliers and agency Czech-Tourism predict a growth in tourist indicators in 2014.

### **The Comparison of the Development of Tourism in the Czech Republic between the first half of 2013 and the first half of 2014**

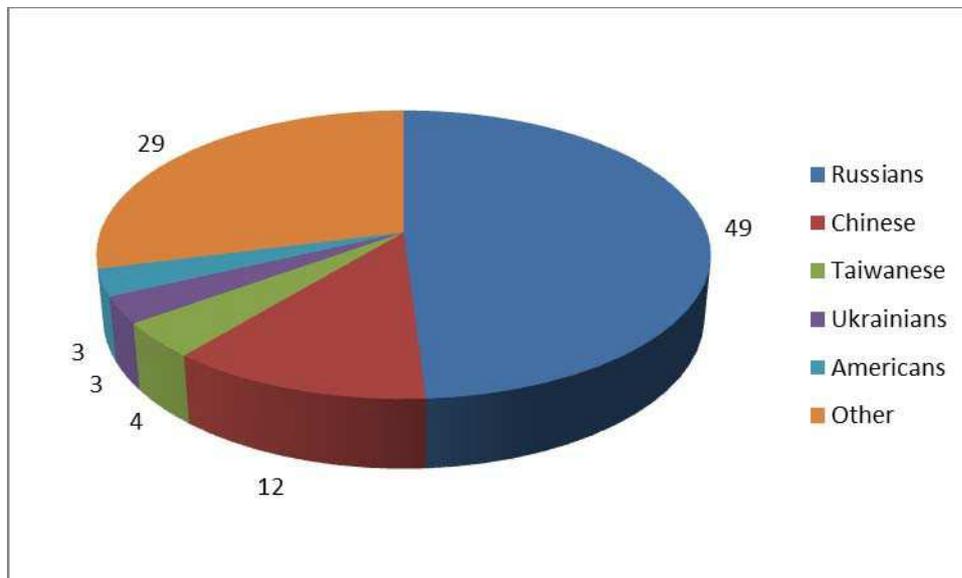
The data from the Czech Statistical Office for the January to June 2014 proves lamentation of hoteliers over the loss of Russian tourists in current year. The data also showed that a situation of the incoming tourism to the Czech Republic is not a tragedy. The Czech countries are again attractive for the Germans and there is also a significant increase of Polish, Slovak and Austrian tourists. The number of Chinese and South Korean tourists for the first time overcame the number of Spanish tourists whose numbers are considerably decreasing for a long time. 80 000 guests came to the Czech Republic from both Asian countries, which represented about one-fifth increase. Members of both nations are one of the most popular guests in Prague because they like to spend much. The introduction of direct flight between Seoul and Prague in 2013 undoubtedly contributed to increase of the number of Asian tourists. Korean tourists use Prague as a gateway to other European locations.

A total of 3.6 million foreign tourists came to the Czech Republic over the first six months of 2014. This is nearly three percent increase in comparison with the last year and represents a new record. The number of nights that foreigners in Czech hotels spent slightly increased to 10.2 million. The lower exchange rate of Czech crown considerably contributed to this fact but great weather also helped.

Polish or German tourists are replacing vanishing Russian tourists. But hoteliers who focus closely on Russian clients do not have a reason to celebrate. It's a significant problem, because travel agencies are bankrupting one after another in Russia. The decrease of Russian tourists will be more evident in the rest of the year because old reservations expire. Hoteliers are therefore trying to negotiate with the Chinese, but they still cannot replace the Russians. Czech tourists also do not make hoteliers happy because Czech tourists have reduced their routes inland.

**Tab. 4: Tourists in Czech hotels, H1 2014 (CSO, 2014)**

Nationality	Number (in thousands)	Annual change (%)
Czech	3247	-1.5
German	717	5.7
Russian	368	-6.3
Slovak	226	10.5
Polish	217	6.5
Italian	180	0.8
British	173	1.8
American	173	1.2
French	130	-7.1
<b>Foreigners (sum)</b>	<b>36292.7</b>	



**Pic. 7 The proportion of foreigners in the expenses in the Czech Republic (%) - the first half of 2014 (Global Blue, 2014)**

#### **The Development of the Number of Russian Tourists in the Czech Republic**

According to the data from the Czech Statistical Office, while in the previous three years (2010-2012) there were annual increase 20% of Russian tourists who visited the Czech Republic, in 2013 growth pace of their arrivals decreased to 9.4% which represented 759 thousand people (CSO, 2014).

While in 2003, 125,000 Russians arrived to the Czech Republic, in 2013 it was 759,000. The highest annual growth was recorded in 2011, when the number of Russian tourists increased by 34.7%. The Arab Spring greatly contributed to this event, because security situation in popular seaside destinations of Tunisia and Egypt deteriorated.

**Tab. 5: The Development of the number of Russian tourists in the Czech Republic (CSO, Mag Consulting, 2014)**

Year	Number of tourists (in thousands)	Annual change (%)
2003	125	10.50

2004	164	31.20
2005	186	13.41
2006	240	29.03
2007	322	34.17
2008	418	29.81
2009	327	-21.77
2010	415	26.91
2011	559	34.70
2012	694	24.15
2013	759	9.37
2014*	650	-14.36

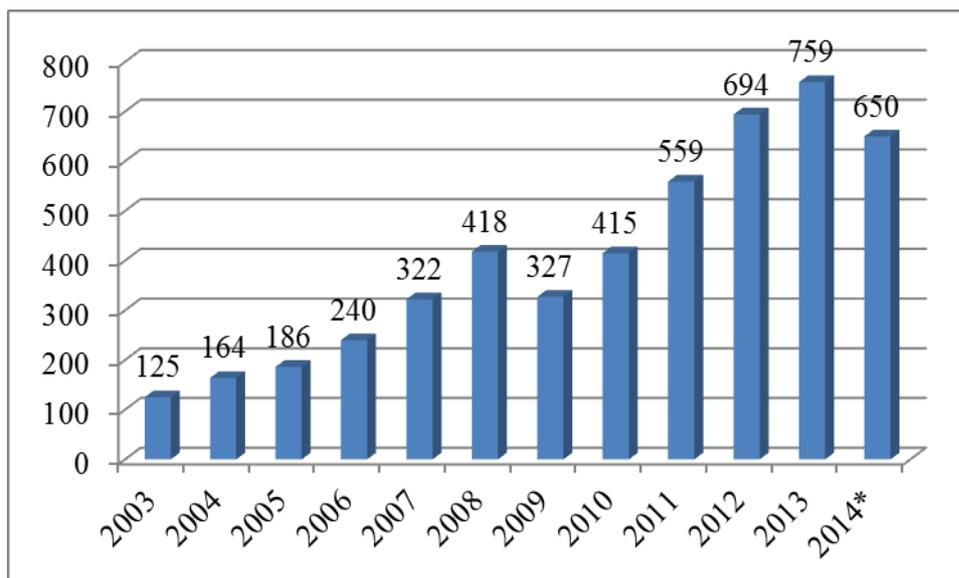
\* - estimation

The Russian tourists represent the second largest visitor group of tourists in the country after German tourists. Given the stagnating or slightly declining number of German tourists in the last ten years, the Russians have become a key group which was forming the growth of tourism in the Czech Republic in the last decade. Tourism between the Czech Republic and the Russian Federation is supported by a number of direct air links between Prague and Russian cities (ČTK, 2013).

The results of the current survey of analyst firm Mag Consulting among Russian tour operators suggest that the inflow of Russian guests to the Czech Republic will significantly drop this year. The survey shows about 15% decrease of Russian tourists coming to the Czech Republic, which is representing a decrease of more than a hundred thousand people. Travel agencies and hotels recorded an annual decrease of about a quarter of tourists from Russia in the second quarter of 2014. The outflow of lucrative Russian clientele comes after five years, when the number of guests from the East rose sharply. This is due to the decrease of the exchange rate of the ruble against the euro, which makes up 25% annually. This is the reason why traveling to the Czech Republic is more expensive for the Russians. The Russian currency fell to a historic low due to the annexation of the Crimea and the fighting in the east of Ukraine. According to the Russian Union of Travel Industry visas are also causing the problem. The decline in visits of Russian tourists to the Czech Republic will adversely affect the results of a number of local hotels and restaurants.

The willingness of Russians to travel to the West decreases with increasing distance from Europe. While travel agencies in St. Petersburg recorded a two percent drop in demand for Czech countries, in Moscow it is five percent, and in cities further east it is twenty percent or more. The key for domestic tourism are the May holidays during which Russians collectively set off into the world (Šindelář, 2014a).

Czech Airlines also do not have encouraging news for Czech hoteliers. They are registering lower interest in flights from Russia to the Czech Republic in comparison with the last year and this is the reason behind the lower number of additional flights between Prague and Russian destinations that Czech Airlines plan this year.



**Fig. 8 The Development of the Number of Russian Tourists in the Czech Republic in the years 2003-2014 (in thous.) (CSO, Mag Consulting, 2014) \* - estimation**

### The Development of the number of Chinese tourists in the Czech Republic

There is a growing trend of the number of arrivals of Chinese tourists to the Czech Republic in the last period. While in 2005 12,000 visitors from China came to the Czech capital, the last year it was around 100,000. In 2013, 164,000 Chinese tourists accommodated in Czech hotels, this represents an annual increase of 12%. According to the agency CzechTourism 193,000 Chinese tourist would arrive to the Czech Republic this year; it is a fifth more than the last year. Tourists from China replace American tourists and even the loss of Russian tourists. In addition, Chinese tourists usually come from wealthier sections of society, so their average individual spending is already greater than the spending of Russians. The average duration of stay of Chinese tourists is three days and their daily spend is around 1,500 CZK. They buy brand and luxury goods on which there are imposed high tariffs in China.



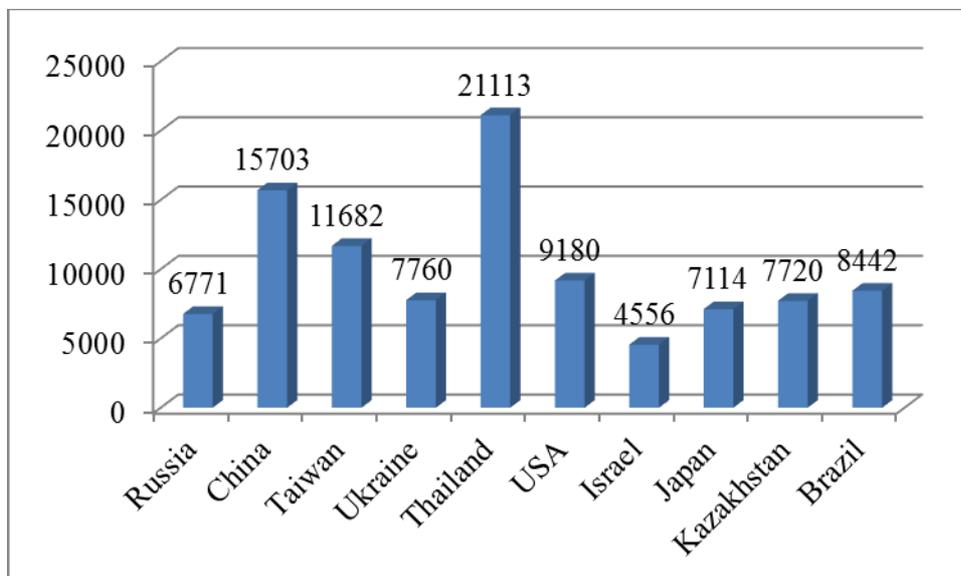
**Fig. 9 The amount of spending by the Chinese tourists in the Czech Republic (in thous. CZK per person) (Global Blue, 2014)**

State agency CzechTourism estimates that sales of Chinese tourists in the Czech Republic exceed two billion CZK this year. Although it is only three percent of total tourist spending, it is a significant growth. Costs of Chinese visitors in the Czech Republic were almost zero until recently. The Chinese tourists had a 12% share on total expenses of foreign tourists from countries outside the European Union. Currently dealt introduction of direct air link between China and Prague with Czech subsidy of 38 million CZK would contribute to facilitate the travel of Chinese tourists to the Czech Republic. Prague Airport is currently negotiating with Chinese airlines Hainan, China Eastern, China Southern. According to the Ministry of Transport of the Czech Republic the most promising seems the link to Shanghai.

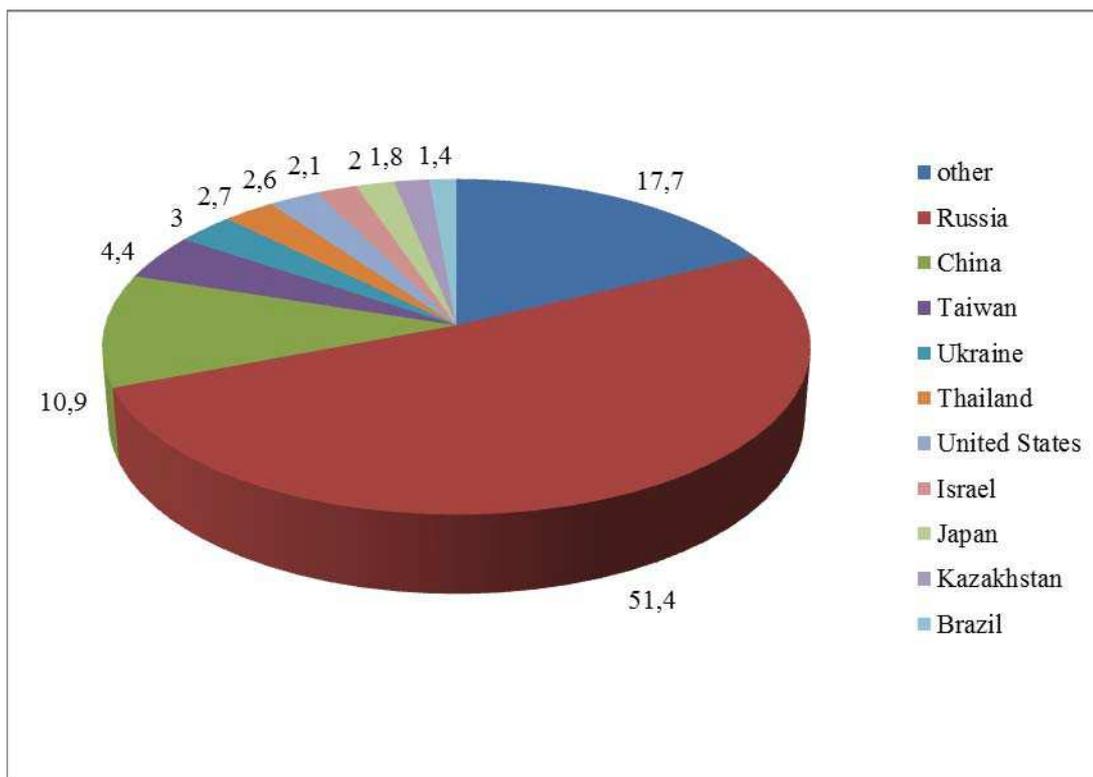
The number of tourists coming to Prague doubled since 2000. And tourism is the main reason why Prague is among the top ten most attractive cities for retail brands in Europe. Pařížská street, the most luxurious shopping street in central Europe, more and more lives from Asian tourists, Chinese people in particular. The most optimistic estimates say that 30 percent of customers of this Prague shopping street comes from China and it will rise more. The increase in the number of Chinese tourists is huge and many shops in Pařížská street are hiring Chinese-speaking salesmen. Also selected domestic stores are starting to accept payment cards Chinese UnionPay. A competition announced by the Ministry of Foreign Affairs for choosing intermediary of better available visas to the Czech Republic contributes to the increase in the number of Chinese tourists (CzechTourism, 2014).

### Spending of tourists from countries outside the EU in the Czech Republic

In 2013 foreign visitors from non-EU countries spent on their purchases at stores in the Czech Republic by 7.6% more than in the previous year. Tourists from Russia made 51.4% share at these spending. However, as it was said, 14% decrease of Russian tourists is expected in 2014. Foreigners frequently buy fashionable clothes and glass, which represent  $\frac{3}{4}$  purchases. These data were provided by Global Blue Company, which intermediates VAT refunds for tourists from countries outside the European Union.



**Pic. 10 The average spending by foreigners from countries outside the EU in the Czech Republic in 2013 (in CZK) (Global Blue, 2014)**



**Pic. 11 Share of nations outside the EU on the expenses of tourists in the Czech Republic in 2013 (%) (Global Blue, 2014)**

### The Development of Accommodation Facilities for Tourists

The market for tourist accommodation in the Czech Republic is gradually shrinking. According to the data from the Czech Statistical Office there were cancelled 6000 beds in 2013; it is more than one percent of the total capacity. Looking at individual categories of accommodation four-star hotels currently keep the best position. Four-star hotels managed to attract nearly 2.2 million guests in the first half of 2014; it is by four percent more than a year ago. Five-star hotels also recorded an increase in number of guests, while cheap lodging houses and hostels continue to lose guests. Camps welcomed about three percent more guests because of the nice weather (123,000); however, their joy cannot last long because last year's floods set a very low base. The loss of guests is at the expense of lower category of hotels and hostels; guest houses suffered the most; in the last year they abolished two thousand beds.

But even bigger and luxurious hotels reduce their offer. Unlike hostels, luxurious hotels do not close completely, but reduce the number of rooms and beds. Annual use of rooms is now around 40%. For accommodation it is economically better to cancel a few rooms than subsidize empty rooms that guests do not occupy. Hoteliers also gradually convert multiple rooms to popular double or single room.

**Tab. 6: The capacity of accommodation facilities in the Czech Republic (CSO,2014)**

	2012	2013
accommodation facility	10 057	9970
rooms (in thous.)	217	215
beds (in thous.)	560	554

The situation in the Czech Republic differs from region to region. The most notable are three popular areas: Prague, Southern Bohemia and Olomouc. They are partly beyond the generally declining trend. The Olomouc Region was the only region in the CR in which there was an increase in number hostels, rooms and beds in the last year. There is an apparent paradox in Prague and South Bohemia: the number of hotels is increasing, but the number of bed is decreasing. Large hotels do not close, but limit their capacity and reconstruct rooms. Hotels significantly reduced prices during the economic crisis and now they cannot return to the original level of prices; this is the reason behind pushing lodging houses out of the market. Especially in big cities it is relatively easy to reconstruct a little crowded hotel or lodging house to other kind of business, such as long-term rental apartments or offices (Šindelář, 2014b).

CSO has comparable data for only two years because they have changed the methodology. But according to them, the trend of decreasing capacity is long-term. For example, in Prague, statisticians recorded over 90,000 beds, which is significantly higher value than in comparable Vienna. There are 68,000 beds available for tourists and occupancy exceeds 70%; in Prague it is not even sixty percent (CSO, 2014).

## **Results of analysis**

The above mentioned economic results of the touristic and hotel industry demonstrate validity of the given model regarding behavior of monopolistic firms on international markets with hotel services. While number of guests is stagnant, we see a decrease in implemented prices during growth of average costs per one day of accommodation, all that with extending offer of services (growing number of hotels, respectively increase of bed capacity). On the other hand, however, with higher number of hotel guests, a growth in prices of accommodation was detected in the last period as a result of lower number of hotels, because some of them ceased to exist. Therefore, stays are currently being sold for higher prices (per one night). The situation in hotel sector is at the moment complicated by long- lasting economic crisis, which becomes evident in savings of companies' spending intended for organizing and participation in conferences. At the same time, consumers have limited their spending on tourism, which increased the pressure on prices for hotel services.

## **Conclusion**

The assumption for application of the monopolistic competition model in international trade area is the idea that trade increases the market size. In the sectors where increasing returns to scale apply it is valid that both heterogeneity of the goods the country produces and the extent of their production are influenced by market size. Countries carry on trade among each other and thus create integrated global market that is bigger than any national market. By doing so, the countries get rid of their limitations. Each of them can specialize in production of a narrower spectrum of goods than if it were not for international trade, it can also purchase the goods it cannot manufacture itself from other countries. Thus each country can extend the spectrum of goods available to its consumers. The result is that international trade offers additional opportunities of mutual benefits, namely also in cases where the countries do not differ in their sources and technologies. Let's suppose there are two countries and each of them has a market extent approximately for one million accommodated guests on average. When carrying on trade with each other, they may create combined market of two million accommodated guests. In this combined market, greater possibility of choice is achieved; more types of meals are produced under lower average costs compared to the situation, in which the national markets would be separated.

The firms' behaviour in the monopolistic competition may be very heterogeneous and cannot be covered in a single model. The mentioned analysis describes the impacts of the firms entering international trade.

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# A background of forests functions as a part of ecosystem services systems

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## Abstract

The article presents a brief description of background of forest function position within ecosystem services systems. The content focuses primarily on defining the linkages between economic and environmental approaches. Functions of forests are located in the general system of ecosystem services. Evaluation of functions of forests is structured from an ecosystem basis through the Forest Management to the social utilization. The article is very brief and general introduction into problematic of forest functions as a part of ecosystem services. But it shows possibilities of another development of this topic – at first – connection of forestry specific into systems like TEEB, CICES etc. and –at second – process of public utilization and management of forest functions

## Keywords:

Ecosystem services, forest function, non-wood timber product, non-timber forest product, Millennium ecosystem assessment, TEEB, CICES

## Introduction

Currently there are internationally applied primarily three similar conceptual platforms valuation of ecosystem services, based on the synthesis of environmental capabilities of ecosystems in the landscape, societal demands on these abilities and economic expression of these capabilities and requirements:

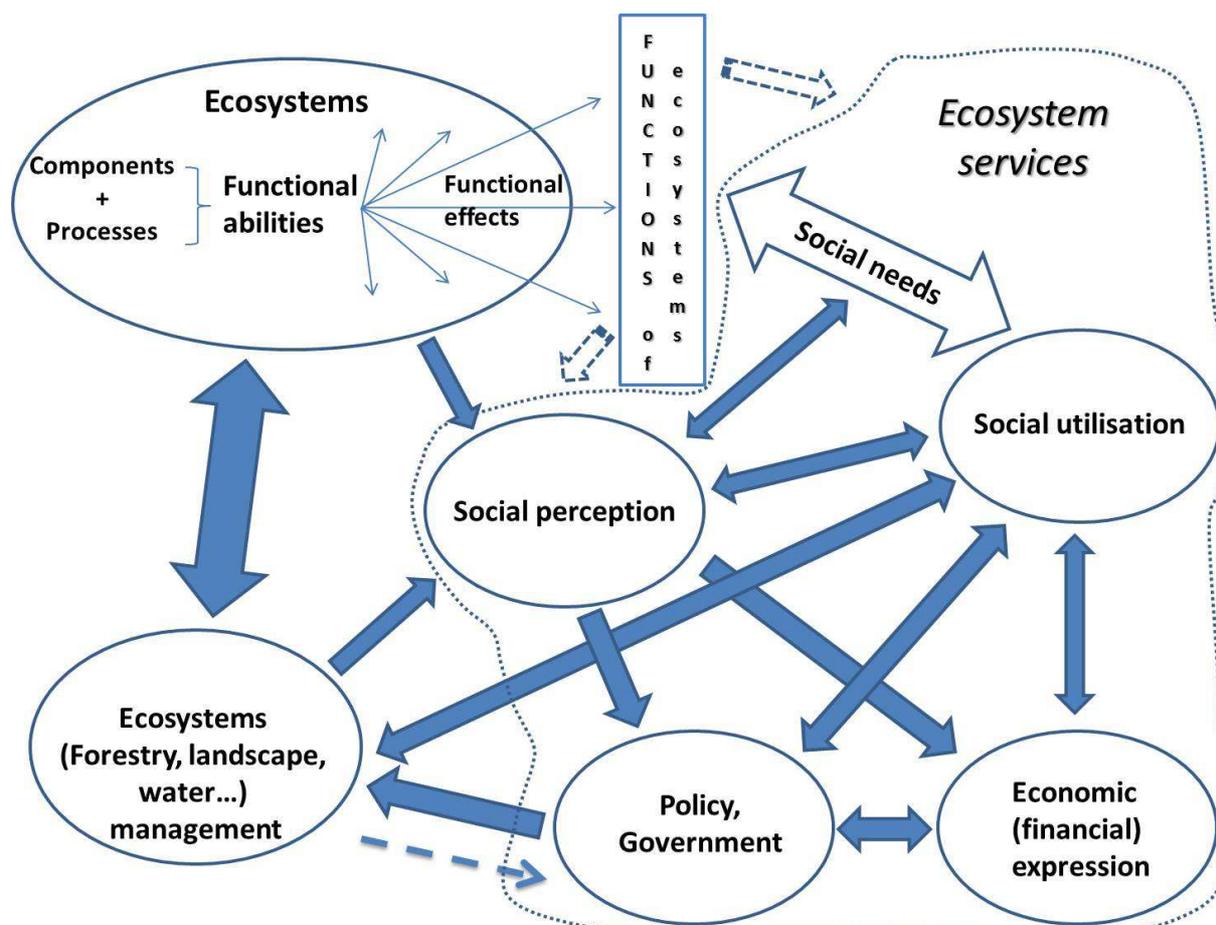
- MEA (also referred to as MA) - Millennium Ecosystem Assessment, presenting the basic classification categories of ecosystem services and the possibility of quantifying. The MEA is a fundamental basis for another ecosystem services describing systems
- TEEB - The Economics of Ecosystems and Biodiversity - a global initiative solving the growing cost of restoring the damaged natural environment and ecosystem degradation by expression of their economic value
- CICES - The Common International Classification of Ecosystem Services - Platform of the European Environment Agency (EEA), which focuses on the development of evaluation criteria and indicators for classification of ecosystem services.

Evaluation of the scientific platform TEEB (The Economics of Ecosystems and Biodiversity) is based primarily on the impact of biodiversity on ecosystem production. The set of indicators TEEB is divided into categories according to the type of measurement (biodiversity, quality, condition, influences, production, regulatory and cultural services) (TEEB 2010).

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**Fig. 2. Position of forest ecosystem functions within system of ecosystem services, social needs and utilization and policy and management decision-making**

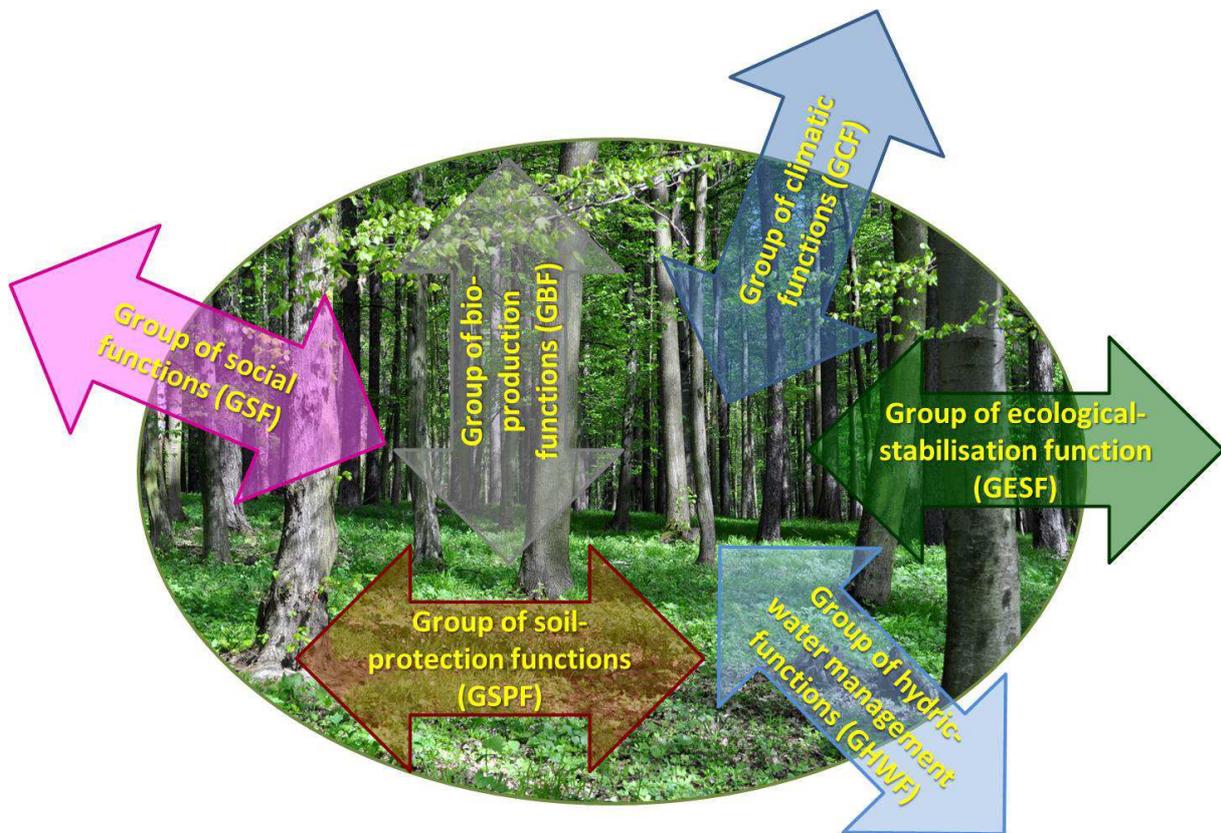
### Forest functions and sustainable development

Forest functions are naturally associated with the principle of sustainable development (management), as evidenced for example by another research on multifunctional management of mountain forests "Sustainable Forest Management and Certification" or "Mountain Multifunctional Forest Management" in the project LIFE (Pollini and Tosi, 2000 in Špaček 2004). Management of forests gradually changed over several previous decades: agricultural results characterized primarily by wood production level were gradually replaced by the development of multi-functional management models in order to maintain and support other needs. The importance of individual and social interests increased while close to nature forest management principles developed that were both consistent, but often also opposed to social interests. The result is an adaptation of traditional forest management with the aim of technical development, increasing the cost effectiveness and respecting the typical structure of forests and sustainable forest which performs for example the protective, productive and recreational functions.

According to Vyskot, Schneider, Lampartová (2013), works and documents dealing with forest functions and their evaluation can be divided into three essential categories:

- Work proclaiming the necessity or appropriateness of assessing forests and the need for modification of forest farming practices and management and principles of dealing with the forests for the benefit of their various functions.
- Economic evaluation methods and models based on the financial expressions of values and needs of forest functions.

- The parameter and multi-criteria evaluation procedures of forests functions and the forest functions management, dealing with the importance of the function or directly the very essence of the ecosystem functions.



**Fig. 3 One of possibilities of forest function structuring. The arrows show main trend of inner or inter-ecosystems effects of functions.**

Heuveloop (1994) in Newton (1995) state that sustainable management preserves the natural plasticity and diversity of life that allows forests to continuously develop and provide human society benefits from their environmental, economic, social and cultural functions. Upton and Bass (1995) in Newton (1995) assume that the principles of sustainable development are given the following assumptions :

- Environmental sustainability – allows ecosystems to promote the health of organisms and their productivity, adaptability and the ability of autoregulation. This requires that the forest management is based on respecting natural processes.
- Social sustainability – reflects the relationship between development and social norms: an activity is socially sustainable if it adapts to social norms or unless it exceed the tolerance framework of social change.
- Economic sustainability – it is assumed that benefits of a group (groups) are always greater than the costs incurred and some form of equivalent capital is transferable to future generations.

From the perspective of sustainable development there is an interesting overview of important global initiatives respecting the different sustainability factors (Table 1).

**Tab. 1 Comparison of the representation of the dominant global initiatives in terms of various preferred sustainability factors**

Initiative	Forest productivity	Regenerative capabilities (processes)	Protecting biodiversity	Ecological service	Cultural and social influences	Institutional mechanisms	Economic sustainability
FSC	**	*	***	***	***	***	**
CSD	*	*	**	**	*	*	*
ITTO	***	**	*	***	*	***	*
HELSINKI	*	**	***	**	**	***	*
IIED	***	*	**	**	**	***	*
MONTREAL	***	***	***	***	***	***	**
SA	***	**	***	***	***	**	***
LEI	***	**	**	**	***	*	***
CCFM	**	***	***	***	***	**	**
ITW	***	*	*	**	**	***	**
DBB	*	**	**	**	***	***	**
RA	***	**	***	**	***	**	**

Source: WCMC / IUCN SSC in Newton (1995). Legend: The importance of the factors: \* - low, \*\* - medium, \*\*\* - high.

### **Economic approaches to evaluation functions of forests**

Economic approaches to evaluation functions of forests are widespread and often dealt with in detail. The reason is their relative simplicity (no deeper analysis of complex natural links and processes is required) and long-term knowledge of economic laws and regulations. Their expansion is also determined by their frequent use as argumentation materials to promote environmental concerns and multifunctional forest management.

Since this is methodical procedure with minimal direct link to the multifunctional forest management, for clarity, only a recent example. This is the work presented at the annual meeting MEDFOREX in Spain (Solsona, April 2004) "Valuation and distribution of non market benefits in the Tunisian forests" (Daly-Hassen and Mansoura 2004 in Šapček, 2004). The authors presented the approaches to the benefits of forests in Tunis in the last 6 years. The work though containing quite standard, world-renowned and used approaches and procedures, also provides interesting information especially in terms of social interests and preferences. The authors define the following groups of non-market benefits from the forest:

- Private benefits (especially grazing).
- Public benefits (recreation, water protection, carbon stocks, protection of biodiversity, etc.).

Daly-Hassen and Mansoura (2004) use for assessment of non-market benefits economic methods of cost, substitution methods and willingness to pay. Due to the extent of this work it is neither possible nor effective to convey the different approaches differentiated according to the individual functions (benefits). An interesting outcome of this work is the evaluation of social preferences, which clearly illustrates the incompleteness of evaluation methods of forest functions, based on the principle: the demand → function → benefit. Quantification and differentiation of social demand can never substitute the fact that all (thereinafter) ways of

forest use are subject to specific and clearly defined ecosystem patterns and processes, and therefore all directly affect the ecosystem.

### **Forest functions as a base for ecosystem services evaluation**

The current international trends in the evaluation of ecosystem services represent a synthesis of three primary and two additive (but no less important steps). The first step is identification (and possibly quantification) of functional abilities of ecosystems to be a source of benefits to human society. The second step involves the analysis and interpretation of social needs and requirements with respect to the functions of ecosystems and their transformation to ecosystem services. The third step is economic (resp. financial) valuation of ecosystem services, benefits or goods in relation to social utilization of functional abilities and effects of ecosystems. This system completes intentionally influencing ecosystem production through farming (agriculture, water, forestry, hunting ...) and the decision making process at the political level.

Evaluation of forest ecosystem functions brings a number of complications. Above, it requires measurements or calculations of the forest ecosystem properties file. This may be ineffective (uneconomical, inefficient and time consuming) from a practical viewpoint. Therefore, it is necessary to seek and to simplify the system, particularly the use of indicators, which will not only determine the function of forests, but also indicate the status of other processes and components.

Various authors have developed a system of criteria and indicators to quantify the ability of forest ecosystems to produce functional effects. E.g. Maes et al. (2011) combine this evaluation with an indication of environmentally sustainable forest management. They defined the 157 potential indicators based on the analysis of literary sources from which the expert panel identified a set of 33 quantifiable. This includes eg. Leaf area index, the natural diversity of vegetation, pH, surface natural regeneration, health status of vegetation, number storeys, the frequency distribution of thicknesses and more.

Functions of forests as an ecosystem basis definition of ecosystem services is a significant part of the public interest in forests and environmental sustainability and potential for regional development. To determine their quantification builds social needs and preferences (defining benefits for society) and their economic terms (pricing).

Slee (2005) emphasizes the intrinsic value of natural forests and their biodiversity as a heritage of humanity. Their aesthetic and recreational value is essential. Systematic coherence functions of forests and ecosystem benefits for the society brings overview study the valuation of ecosystem services of forests in Great Britain. General tree species composition of forests - deciduous, coniferous and mixed - is the basic unit for evaluation. Each of these groups is further divided into near-natural and plantation. Ecosystem services are divided into groups in accordance with the Millennium Ecosystem Assessment (2005) for providing, regulating, cultural and supporting. They are divided into individual resulting ecosystem services such as food production, wood production, species diversity, hygiene of climate etc. (Coll. 2011).



**Fig. 4 Schematic chain of groups of activities from forest function to forest management**

The ecosystem approach to evaluating forest functions currently gaining its importance. The necessity to the extent possible the exact values of the influence of forest ecosystems generally increases with global climate change. Whether it is the effects of forest ecosystems on the hydrological cycle or soil-protection function of forests. E.g., the social need to quantify the ability of forests to fix carbon comes out partly from the policy of the Kyoto Protocol, partly from pure practical need to reduce the amount of CO<sub>2</sub> in the atmosphere. Forest ecosystems functioning as carbon stocks is a world wide topic. The aim of these activities is to analyze the linkage and the development of forest carbon stocks and subsequent financial statement with the possibility of comparison of other functional effects. An example is the project CzechKarbo. Many authors, such as Saaty (1990), Podrázský (1996), Janouš, Pokorný, Brossaud, Marek (2000), Laitat, Lebègue, Perrin, Pissart, Sheridan (2003) study the fixation of carbon in forest ecosystems in terms of the principles of multi-functional forest.

## Conclusions:

Forest functions are essential part of ecosystem services systems. They form an ecological potential for fulfil of social needs. Ecosystem evaluation of forest functions is a fundamental and detailed part for management and decision-making policy. On the other hand, a connection between evaluating methodologies of forest and e.g. meadow or water ecosystems is missing (or is too simplified). Thus, current goals of forest functions evaluating systems are:

- to determine indicators for forest ecosystems evaluation, which are similarly usable to another ecosystem types (in corresponding detail)
- to highlight importance of forest functions for whole ecosystem service evaluation process. Recent general systems like TEEB, CICES or ESI provide space for that within ecosystem base and potential for social utilisation.

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# The enterprise social network: a psycho-social approach to human resource management?

Jana ŠKOLUDOVA<sup>1</sup>

## Abstract

The psycho-social approach to human resource management has developed historically out of the school of human relations. It encompasses demands on the personality of the managing workers, methods of communication, managing relationships between employees across organizational structure and methods of motivating workers to attain company goals. This report focuses on the enterprise social network and the opportunities for managers to use it as a psycho-social approach to human resource management within an organization. The report includes a brief historical outline of the development of psycho-social approaches, including a comparison of the selected theories focusing on modern trends. The goal of this report is to analyze and compare existing research/studies focused on enterprise social networks from the perspective of the psycho-social approach in human resource management and to answer the proposed research question. The report's methodology has been conducted on the basis of comparative qualitative research, empirical generalization and interpretation of the results of the research/studies. Included in the article is a discussion of the problematic of the importance of employees and the selected motivational theories.

## Keywords:

Enterprise social network, psycho-social approach, organization, human resources, IT management.

## The psycho-social approach to management

In practice, the psycho-social approach affects the overall management of an organization, including quality management. (Ehigie, Akpan, 2005; Armstrong, 2007) In the 1940's and 1970's, various trends developed with origins in classic management. Their common trait is the attempt to determine a person's role within a company. In contrast to Taylorism, however, it does not look on a person as "behaving economically" but as a social creature. This theory arises from the conviction that people are the most valuable capital a company can have. They emphasize the importance of the human factor, the significant role of individuals and the identification of individuals with the organization's goals. Representatives of this trend focus on the workers' personal interests, their influences and the influences of the working and social environment. (Vodáček, 2013; Koubek, 1995; Mládková, 2009) Together with unmanaged working conditions and wages, rapid technological changes at the beginning of the century caused increasingly greater fluctuation and a decline in productivity. The employer's attention began to focus on the worker, their needs and their motives. (Lebeda, 2003; Mládková, 2009)

The psycho-social approach was applied to management between the 1940's and 1970's when various currents of opinion were developed in theory and practice. (Cimbálníková, 2009) To a certain degree, the given approach derives from the base of findings in Elton Mayo's "school of human relations". (Vodáček, 2013) It deals with a view of man that is different from Taylorism's mechanical approach. It focuses on the managerial functions of worker selection and placement and then, in particular, on their management. The worker's boss can more

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easily understand the forces of people's behavior, their motivation and stimulation or the development of their initiatives and activities while simultaneously obtaining a recommendation as to how to set these forces in motion. (Cimbálníková, 2009) This approach came to the conclusion that the fundamental role in social systems belongs to man, who – unlike a machine – has specific feelings, interests, opinions and preconceptions, all of which influence the behavior of the given individual. Interpersonal relationships are another fundamental element, because the influence of the group on human behavior is considerable. (Vodáček, 2013)

### **The development of the psycho-social approach to the present**

In community-based economic development from the 1970's to the end of the 20th century, it is possible to record a range of features which projected into management, e. g., that the role of agriculture, the steel industry and the heavy equipment industry receded and was replaced by fields utilizing a high degree of knowledge. Further along in economic development, a disruption of the continuity and stability of development came into effect. For a whole range of goods, there has been the development not only of a need to balance supply with demand but also of a persistent dominance of supply over demand. Another trait is emphasis on the importance of preserving the environment in connection with a company's development. (Veber, 2011; Bělohávek, 2006; Bělohávek, 2001)

Organizations' management undertook the question of restructuring when the given structure of their products and services was appropriate. Next followed management's decision as to whether production expenditure would also pursue quantitative development in the future or whether it would put emphasis on qualitative parameters and indicators. The oil crisis of the 1970's was the preface to a period of instability. This period brought about new terms such as instability, elasticity and flexibility in decision making, readiness, adaptability to change and innovation. In the business environment, supply exceeded demand, which meant the end of an era of a producer market that determined which products were to be produced, their price and quality, and when they were to be put on the market. (Veber, 2011; Bělohávek, 2001)

Even today supply exceeds demand. The customer is becoming the determining factor on the market and companies are looking for new approaches to acquire and retain customers as well as to build long-term relationships with them. Companies are aware that, for a successful business, it is not sufficient to satisfy the demands of the customer, but also to make the customer happy. (Veber, 2011; Vodáček, 2013) At the beginning of the 1980's, M. E. Porter, T. Peters and R. Waterman influenced the field of strategic management by generalizing findings acquired through the analysis of well-managed American companies. (Vodáček, 2013)

Attributes such as tradition, good planning systems and well implemented practices of market research do not suffice in today's economic world to create a successful business. Realities other than those of 50 – or even 10 – years ago have become decisive. The growing influence of information, communication and modern transportation systems has resulted in decreasing time and distances when the limiting factor ceases to be the available delivery of goods over long distances. Current communication across countries can take place practically in real time. The influence of communication and delivery systems has been supported by the trends of the world economy and globalization. Traditional factors, e. g., land, mineral resources and the ownership of tangible goods, have lost importance for companies, whereas knowledge, know-how, information, invention and innovation are gaining in importance. (Lang, 2007; Tureckiová, 2004; Dvořáková, 2007)

P. F. Drucker defined managerial functions by using the five following activities: defining goals, the organization of work activities, motivating and communicating, measuring and evaluating and the growth of the workers' professional level. From the perspective of human capital, Sveiby's model of intellectual capital distinguishes three levels. The first level is human capital, which is presented as people's proficiency, capability, and experience.

Structural capital is the next level, and it is identified as a registered patent, pattern or purchased license. This field is the subject of accounting and there is a good survey of this subject. The third and last level is customer capital, and it encompasses everything that brings about good relationships with commercial partners, such as customer loyalty and user trust in the company brand. (Kathryn 1998; Kociánová, 2004; Kreitner, 2007)

Modern opinions developed approximately from the 1950's to 1970's. This was not one unified trend established on communal principles. The main connection between these opinions was the attempt to find a universal principle to explain any type of organizational activity as well as the belief that it is possible to explain the running of an organization in rational terms. It is in these opinions that we find a range of the most varied subsequent approaches. (Bedrnová, 2007; Crainer, 2000; Lang, 2007)

## **Methodology**

The goal of this report is to analyze and compare previously conducted research/studies focused on enterprise social networks from the perspective of the psycho-social approach to management in organizations and to answer the proposed research question. The methodology is conducted on the basis of qualitative comparison of the existing research/studies as well as further empirical generalization and interpretation of the existing results.

The following research question has been established:

Whether an HR manager can use an enterprise social network as a tool within the psycho-social approach to management.

The research question will be answered on the basis of comparing existing research/studies focused on the enterprise social network from the perspective of the psycho-social approach to management.

## **The enterprise social network: the psycho-social approach within an organization**

Because of concerns about ensuring the safety of data and protecting information, a number of companies have converted from using online social networks to exclusively using internal social networks. (Kaplanová, 2011) The enterprise social network encompasses information and business documents shared and disseminated in real time exclusively between members of a work team or other people who are part of the given company. (CIO Business World) Enterprise social networks have undergone their development technically and over time. (Miskell, 1996)

A number of authors have tried to define enterprise social networks and have defined this term similarly. The common thinking is to include the use of services from standard external social networks to generate "visibility" and cooperation within the enterprise. The author of this report defines enterprise social networks in the following way: "Enterprise social networks use enterprise social software that offers additional social media and platforms for company cooperation; discussion; sharing know-how, knowledge and documents; receiving feedback in real time; assisting in building intracompany collective intelligence; and deepening relationships, cohesiveness and engagement in the organization as a whole."

Utilizing the psycho-social approach in the form of an enterprise social network can increase the quality and interaction of working relationships. The quality of working relationships makes up a framework for significantly influencing the organization's prosperity

and attainment of its goals. Correct, harmonious, satisfying and friendly working and interpersonal relationships make for a productive climate, which has a positive influence on individual, collective and company-wide performance. It results in bringing individual interests into harmony with the organization's goals. (Shih, 2010)

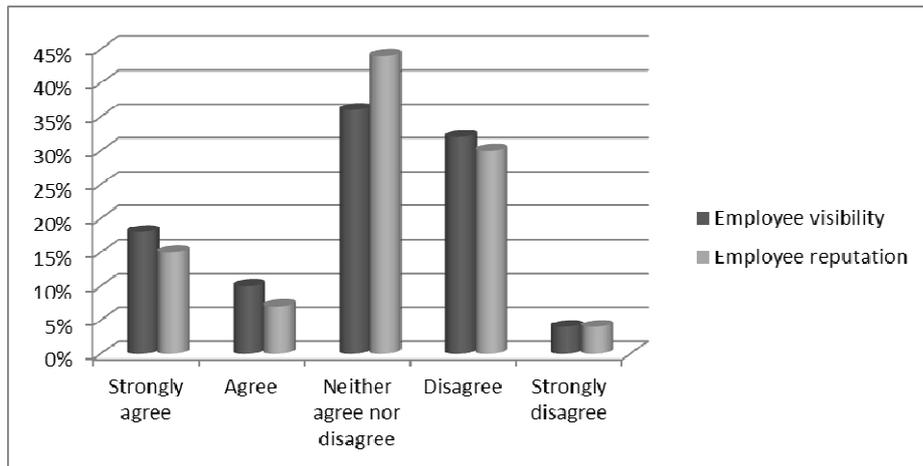
Modern management of human resources emphasizes the need to create workloads and positions according to the capabilities and preferences of each worker while respecting personal individuality. The result of people's education and personality is that workers are increasingly more diverse. It is necessary to substitute precisely defined jobs with a flexible system of perceived roles that has more freely defined profiles. The difference in comparison with traditional management is also the need to introduce a maximum amount of elements to increase the worker's motivation. The supervising worker/manager is required to ensure motivating leadership for the worker and to continually provide feedback about their work performance. These principles are the starting point for a new approach to work performance and its evaluation. (Koubek, 1995) Therefore, information and information technology represent an increasingly significant role in managing a business, and it is apparent that we cannot avoid this trend even in the field of human resource management.

Implementing a social network within a large company enables new ways of communication between employees by encouraging them to share personal and professional information within a safe company intranet. Successful enterprises use internal social networks to build stronger ties with their co-workers and reach out to employees that they have not previously met. The advantage of this is the option of connecting on a personal level with co-workers, advancing careers together with the company's advancement, and providing internal campaigns for their company projects. (Dimicco, Millen, 2008)

Increasingly more organizations are experimenting with internal social media as a platform for wider cooperation. Nonetheless, because of time pressures, employees at a workplace hesitate to participate, and they offer relatively fewer contributions. The level of participation varies from group to group and branch to branch. A year-long empirical study of internal engagement in social media was conducted at a large technical company. (Effects of feedback and peer pressure on contributions to enterprise social media, Brzozowski, Sandholm, Hogg, 2009). The authors analyzed observation of the impact of feedback from managers to employees from the perspective of motivation. It was found that feedback in the form of additional commentary highly corresponds to users' subsequent participation.

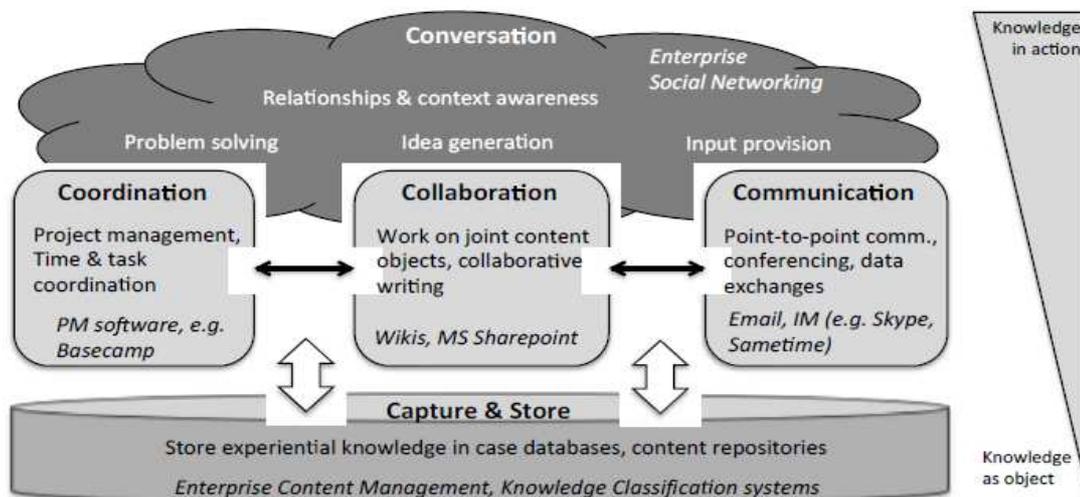
IBM workers studied the detection of professional vs. personal interaction within the framework of the enterprise social network. (Detecting professional versus personal closeness using an enterprise social network site, Wu, DiMicco, Millen, 2010). The authors analyzed behavior on a company social network and determined which models of interaction signalize closeness between colleagues. Regression analysis indicates that employees' behavior on social networks reveals information about professional and personal closeness. While certain factors are predictive of general closeness (e. g., recommending content), other factors signalize that employees experience personal but not professional closeness with their colleagues (e. g., mutual commentary on the profile). This analysis contributes to the understanding that, no matter what methods are used, enterprise social networks mirror behavior within the framework of "relationship multiplexity" in the workplace.

The following research results deal with the question of the advantages of enterprise social networks and the opinion of employees as to how they influence their perceptions. (Using latent topics to enhance search and recommendation in Enterprise Social Software, Christigis, Mentzas, Apostolou, 2012) From Figure 1 it is clear that, thanks to the implemented enterprise social network, employees began to be more "visible" among employees and management (28%) within the organization, and it even increased their reputation (22%).



**Pic. 1 The advantages of the enterprise social network from the employees' perspective**

The presented case study investigates the developing knowledge of work procedures on the Yammer ESN platform in the Deloitte company in Australia. (Enterprise social networking in knowledge-intensive work practices: a case study in a professional service firm, Riemer, Scifleet, 2012) The authors of this case study conducted analysis of communication data. From the results, it was found that, in the case of Deloitte, the Yammer enterprise social network provides a space for innovative ideas and a medium for relationship-building conversation, among other benefits. Figure 2 graphically illustrates a 5-C model of the location of ESN among information and communication technologies for supporting knowledge-intensive work, where the basic factors of the Yammer enterprise social network are coordination, cooperation and communication. These factors are mutually interconnected and correlate tightly with each other.



**Pic 2 The 5-C model: placing ESN among established concepts and ICT for supporting knowledge-intensive work**

Microsoft published research in collaboration with the company Ipsos on a sample of 4,787 employees across Europe. (Microsoft survey on enterprise social use and perceptions, Ipsos, 2013). The survey was aimed at enterprise social networks and their perception by employees. Table 1 organizes the answers to the question by percent and according to the respondents' gender and age as well as overall response. Communication takes place between employees across the organization's structure at an overall rate of 68%. Employees consider the implemented social network as supporting initiative connected with work at a rate of 31%. Respondents believe (37% overall) that their manager understands the added value provided by social tools with the goal of improving cooperation among employees, but that they still underestimate that benefit (34% overall).

**Tab. 1 Enterprise social use and perceptions**

	Gender			Age			
	Total	Male	Female	18-24	25-34	35-44	45+
Communication with colleagues	68%	66%	71%	69%	69%	67%	69%
Promoting a work-related initiative	31%	30%	33%	36%	35%	31%	27%
My supervisor understands the value of providing social tools in order to improve employee collaboration.	37%	38%	37%	50%	41%	36%	33%
My manager underestimates the benefit of social tools in the workplace.	34%	35%	32%	40%	40%	34%	26%

Comparison, empirical generalization and interpretation of the final results were conducted on the basis of the research/studies listed above.

**Tab. 2 Comparison of the research/studies conducted**

Research/study	Year the research was conducted	Method used	Result of the research problematic of using enterprise social networks from the perspective of the psycho-social approach to human resource management.
1	2009	Study	High correlation between the motivations of managers towards employees and the number of contributions added.
2	2010	Study	ESN reveals interaction in relationship multiplexity in the workplace
3	2012	Questionnaire	28% increased visibility of employees in the organization 22% increased employee reputation
4	2012	Study	ESN – a medium for relationship-building conversation
5	2013	Questionnaire	31% support for initiation at work 37% of managers understand the added value of utilizing ESN

As the research/studies focusing on the problematic of utilizing enterprise social networks from the perspective of the psycho-social approach in management show in Table 2, they help to answer the proposed research question. It was confirmed that HR managers can use an enterprise social network as a tool for psycho-social management. Utilizing enterprise social networks can increase employee motivation and engagement across organizational structure. Another benefit for psycho-social management is the revelation of relationship multiplexity in the workplace, which helps determine behavioral patterns and informal organizational structure within the enterprise. Moreover, employees can achieve better visibility in the organization among colleagues and the management, which is necessary for determining the scope of employee engagement and initiative. Employees can also express their questions, ideas and reminders for improving the product, work process or work atmosphere, which contributes to

constant improvement. The last advantage listed is using enterprise social networks as a medium for building relationships through conversation, which contributes to teamwork and a friendly company atmosphere. It is also necessary to mention that study no. 5 points to insufficient use by managers of all applications of the enterprise social network. For this reason, it is evident that managers still do not have comprehensive supporting information for using the given enterprise social network effectively.

## Discussion

The school of human relations significantly influenced organization theory and pointed to the influence of social and socio-psychological factors on an organization's efficiency. However, it had minimal influence on business practice, because scientific management and attempts to rationalize and streamline production have consistently dominated in the past.

A significant role is played by psycho-social approaches that build on the work of psychologists and sociologists who analyze human behavior, needs, and motivation. Understanding company employees as social creatures (prioritizing life, work and recognition) is among the basic starting points. The results indicate that a definite work autonomy and active creative work gratify an individual; on the other hand, they reject formal disciplinary and bureaucratic ties. Another result is marked attention to achieving increased managerial motivation of employees.

In the year 1924, Mary P. Follett (1868 -1933), the second woman in the field of management psychology, created Creative Experience, which has been accredited with precedence for the main thoughts of the school of human relations. In her work, she dealt with the problems of power, authority, responsibility, workers' participation in management and conflict resolution within an organization. Follett viewed the primary function of management as creating a situation where people willingly contribute to activities on their own. She emphasized that managers must learn from their own experiences and systematically observe, record and apply them to the overall situation. She understood a manager to be a person responsible for reconciling the contributions of individual specialists in the organization so that each contributed effectively on behalf of the whole. (Kociánová, 2004) Questions connected to treatment of employees came to the forefront of the top supervising workers' attention.

D. McClelland (1917 – 1998), famous for his motivational theories (the need achievement theory), advocated the opinion that a performance-oriented activity begins within a person with the need to achieve a certain goal and is accompanied by the anticipation of success or failure. The author characterized exterior barriers or personal deficiencies for achieving the goal which, similar to success or failure, could lead to a positive or negative personal state of mind. D. McClelland is the author of the quote: *"Human motivation should be understood correctly. It helps us to find exactly what we want, what our goal is, so that we can stop pursuing things which are uninteresting for us. Understanding motivation opens opportunities for self development if we apply motivational principles to achieving life goals."* (Bělohávek, 1996)

## Conclusions

Each for-profit or nonprofit organization needs management and the choice of a theoretical approach and style of management depends, among other things, on disparate factors. Psychological and social factors in management have a fundamental influence on the functioning of a given organization. It is also necessary to investigate relationships in informal groups and to look for methods to resolve problematic relationships on group and personal levels. (Vágner. 2004) Managers can draw on findings from the school of "human relations" and the work of psychologists and sociologists who analyze human behavior, needs and motivations. (Blažek, 2011)

The approaches documented above emphasize the significance of informal ties and indirect methods of management. It is not possible to understand the corporate collective as having homogenous interests, but it is possible – on the basis of knowledge of individual groups' goals, interests and needs – to channel their integration into the management's interests. It is necessary to pay considerable attention to motivation. (Forsyth, 2009) These theories come out of the hierarchy of needs, the two-factor theory of motivation and a range of other motivational theories. Revealing employees' motivational needs and preferences is an indispensable condition for appropriately influencing the behavior of employees at work.

Psycho-social approaches derive from the conviction that people are the most valuable capital a company can manage. They have become the starting point for modern human resource management, and their contributions are valued today, i. e., proper, more effective motivation as opposed to the more demanding improvement of work conditions. Objections concern overestimating the significance of groups and marginalizing aspects other than socio-psychological ones. (Blažek, 2011) Other reservations concern excessive emphasis on harmonious relations and underestimating the progressive function of conflict.

The influence of psychology and management on all levels is fundamental for the healthy development of a company and its future. Guided psychological and social work with employees on the basis of effective use of the enterprise social network influences work performance and satisfaction, lowers fluctuation and creates a stable and healthy collective. It is essential for human resource management to follow the latest theories of management, including integrating and accepting opinions from authors of traditional theories.

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# Global terrorism: its causes and consequences

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## Abstract

This paper addresses the issue of global terrorism. It discusses definitions of terrorism, introduces basic typologies of terrorism, and focuses on the group dynamics of terrorist groups. Terrorism is a form of organized, systematic and calculated violence, which is typically directed against uninvolved people and their property, with subsequent media coverage of attacks, in which the perpetrators communicate their demands and define their goals. Fear, then controls public opinion, helping them to achieve their political, religious and ideological objectives. The secondary, psychological dimensions of a terrorist act are more important than its primary effect, because the main aim is to terrorize civilians, police officers, and government authorities; hence, the provocation of insecurity, and the causing of tension and doubt, which is intended to distract officials from a responsible and reliable performance of their duties and responsibilities.

A substantial part of the paper is devoted to the causes, conditions, motives (rational, psychological, cultural) and effects of terrorism (fear, uncertainty in financial markets, restrictions placed on personal freedom, etc.). Global terrorism, affects the social, economic and psychological experience of individuals and social groups, and is therefore discussed. Global terrorism is considered to be the fourth wave of terrorism, and is associated with the phenomenon of globalization. It is characterized by a decentralized organizational structure and a very loose ideological vision.

On the basis of the methods employed in a terrorist act, terrorism may be classified as either (1) conventional terrorism or (2) modern terrorism, also now known as new global terrorism. Even opponents of the division of terrorism into old and new, agree on several features that have characterized terrorism in recent years; these include attacks on city centers, large numbers of casualties, intent to have economic impact, kidnapping for extortion, and stronger links with organized crime. Certainly, the consequences of terrorism are well known: victims and injuries, material damage, international instability, economic losses (such as declines in stock markets, declines in the price of oil and other commodities, safety measures, etc.), uncertainty and tension.

The paper discusses the influence of the media (television, internet) and its portrayal of global terrorism. Information for this contribution was derived from a review of various sources on the psychosocial aspects of terrorism, including peer-reviewed articles, books and book chapters, news items, reports, and personal communications with terrorism experts in the Czech Republic.

## Keywords:

Global terrorism, fear, globalization, expert survey, terrorist acts, causes, consequences.

## Introduction

“After September 11, 2001, terrorism has become a hot issue in world politics. A terrorist war is very different from a conventional war between two nations. A conventional war is intense and concentrated. It has battle lines, battlefields and the combatants are trained military professionals fighting against one another. It has a beginning, a middle and an end. A

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terrorist war, on the other hand, consists of random acts of violence against civilians where they live and work. The goal of terrorism depends on the terrorists. Some objectives are: 1) to coerce a group of people, such as a government, into granting certain demands, 2) to extract revenge for a perceived wrong.” (Moten and Islam, 2006, p. 401)

In the wake of September 11, 2011, terrorism as a phenomenon was catapulted to the top of the media agenda. Consequently, in recent years it has received daily media attention. Terrorist acts are committed alarmingly often, with growing intensity, and targeting a large number of mostly innocent victims. Pictures of death, and feelings of fear, anxiety and insecurity, are conveyed through the media, impacting the well-being of hundreds of thousands of uninvolved people, and influencing public opinion (cf. Mareš 2005; Laqueur 2006; Eichler 2009). This paper discusses the basic notions associated with terrorism, examines the causes and consequences of global terrorism, and, in its concluding section, presents the opinions of Czech security experts who were approached and completed a survey.

Contemporary terrorism has many forms, appears in various geographical and cultural contexts, and employs a wide range of methods and tactical as well as strategic approaches. Hence, the paper will also focus on the various typologies of terrorism that were proposed, and which materially affected the survey.

The basic objective of this paper is to discuss the definitions, typologies, causes, and consequences of global terrorism, as well as to introduce the opinions of Czech security experts concerning potential terrorist attacks on Czech territory.

## **A definition of terrorism?**

One of the most important tasks in the study of terrorism – and one that remains unfulfilled – is to precisely define the phenomenon examined. Notions of terrorism appear in various contexts:

- Academic (in scholarly literature);
- Official (in official documents);
- Legal (in laws, international treaties, and other legal places where legal norms are set out);
- General (as used by the general public, the media, etc.) – (Mareš 2005: 16)

Although it might seem at the first glance that the definition of a phenomenon that is so often mentioned in international politics should pose no particular issues, the opposite is the case. Delineating the potential circles in which perpetrators are considered to commit terrorist acts has continued to prove a challenge since the very first efforts to define terrorism. In other words, there is no consensus as to what groups should be considered as terrorists. Many developing nations would like to exclude groups linked with the national liberation movements from the circle of perpetrators, arguing that these groups pursue a right to national self-determination. The opponents of this view state that even noble ends cannot justify the use of despicable means, such as attacks on civilians (Závěšický and Rojčík, 2006, p. 8). Lachkar (2013, p. 80) articulated the well-known thesis that “one person’s terrorist is someone else’s freedom fighter.” Wojciechowski (2007) argued that there is no simple, universal, generally acceptable and applicable definition of terrorism.

As there is no internationally recognized definition, states, associations of states, state security services and authorities, etc. employ their own definitions. Moreover, certain definitions change according to the circumstances and the experiences of the state or institution in question. Nevertheless, most definitions contain several common elements: violence, intimidation, a political context, and extortion (Tesař, 2007, p. 199-200).

Despite significant disagreements and plentiful discussion, most authors would agree with their efforts to find a suitable and generally valid definition that “terrorism involves the use or threat of use of violence as a means to achieve a certain effect in the political sphere.” (Střítecký, 2006, p. 93) Taylor (2010) pointed out that the problem with defining terrorism is

partially due to the phenomenon being socially and politically constructed, which precludes a deeper behavioral analysis of it.

According to criminologists, the characteristic features of terrorist incidents are as follows: *arbitrariness* (terrorists do not act in accordance with the rules of war, are insidious, do not recognize neutrality, and their targets and victims are used vicariously, to constitute a medium by means of which the terrorists express their political message); *planning* (terrorist acts are very carefully planned as to the time and place of attack); *group action* (terrorists form organized groups, which often include the traits of a criminal conspiracy); and *longevity* (organizations survive, though often latently, for a long time) (Kuchta, Válková et al., 2005, p. 500).

Terrorism is neither a philosophy nor a movement, but a method. Although instances could be found where terrorist methods have been used to pursue objectives that most liberals would deem correct, this does not mean that such use of terrorism would be morally justifiable. An act of terrorism always violates the fundamental rights of innocent civilians. Paradoxically, despite a rapid increase in the number of attacks committed by contemporary terrorists, their methods have been remarkably unsuccessful at achieving the perpetrators' strategic goals (Wilkinson, 2007, p. 72).

The basic strategy of terrorism has been to provoke media interest and fear among the general public, who are typically shocked by the apparent randomness of victims, place, and timing of attacks. Feelings of fear, danger, and insecurity are reinforced by the element of surprise, the unpredictability of the terrorist act, and the contingency of the situation (cf. Smolík 2006).

According to Crenshaw (1981), the term "terrorism" is sometimes used in a problematic fashion, and this can be a fundamental impediment to serious analyses of the phenomenon. The term is often used polemically and rhetorically, as a pejorative designation of opponents, rather than for a serious description of their behavior. In this way, opponents are de-legitimized, and the labeling theory can be invoked in the analyses of such rhetorical strategies (Cottam et al. 2004; Lachkar 2013).

In 1983, A. Schmid described 109 different academics' definitions of terrorism, supporting the argument that every scholar works with their own definition, and that terrorism must be understood as a heterogeneous phenomenon (see Schmid, 1983).

Despite these issues with the fundamental definition of the phenomenon, one can broadly characterize terrorism as based on organized, systematic and purposeful violence, usually targeting uninvolved people and their property. Moreover, that it seeks media coverage of the attack, and publicly defines its objectives and voices its demands. The fear that grips public opinion helps terrorism achieve its political, religious, and ideological goals (see Crenshaw 2004; Mareš 2005).

Eichler (2009, p. 174-175) provided the following list of terrorism's basic characteristics:

- The goal of every terrorist attack is to enforce a change in internal, foreign, or even global policy.
- Terrorists almost never know the identity of the people for whom they set up their deadly traps. These people are simply in the wrong place at the wrong time.
- Although terrorists exact their revenge on the hated occupiers or dictators, they kill people who have done nothing whatsoever wrong.
- Terrorism is not about a one-off killing of a hated tyrant or occupier, but about repeated killings, whose aim is to attract attention and insure the fulfillment of terrorists' demands.
- Terrorists always attack unarmed people who cannot defend themselves.

Unlike military units, terrorist groups attack without declaring war and prepare their strikes in strict secrecy, which is typical of conspiratorial communities. It is very difficult to uncover, let alone foil these preparations. The states affected find themselves under attack and

blackmailed. Public opinion is often taken by surprise, leading to shock and paralysis. The terrorists capture public opinion, creating an atmosphere of fear, destabilizing the state and enforcing domestic policy change (Eichler, 2009, p. 159-160).

The chief aims of terrorist attacks are the following:

- To attract, the world's attention through the media;
- To create an atmosphere of fear;
- To destabilize the state(s);
- To enforce a change in its/their domestic or even foreign policy (see Eichler 2006, p.151).

Terrorist groups typically employ indirect strategies. As a rule, they avoid frontal combat, preferring insidious and unexpected attacks. They hit society where it is at its most sensitive and vulnerable. Thus, they achieve something that is almost impossible in a normal war: they completely circumvent their victim's strongest points of defense. With few personnel and a small outlay, they can achieve great destructive effect with enormous psychological impact (Eichler, 2009, p. 160; cf. Pařízková, 2005, p. 48).

Acts of terrorism can also be viewed as a means of communication. By attacking a target (the random victims), the sender of the message (the terrorist organization) seeks to convey a message to those who decide the policies of the attacked state(s) (Eichler, 2009, p. 161).

## **Typologies of terrorism**

Some social scientists and security analysts have focused on the typologies of terrorism. Terrorism can be variously divided, for example, into individual and group terrorism according to the number of terrorists involved; it is then possible to distinguish various types of groups, from hierarchical ones organized into a pyramid, to cells with a single leadership, to loose networks of individual cells without a unified leadership (Mareš 2005, p. 39).

Another division focuses on terrorism's relationship to state territory. Although very common, this classification has its own share of issues, and distinguishes between:

- Domestic terrorism; and
- International or global terrorism.

Domestic terrorism is exclusively linked with the territory of a particular state, whereas international terrorism contains an "international element" (Mareš 2005, p. 37).

It is possible to distinguish, according to the means used, between conventional terrorism, which employs firearms, flammables, explosives, etc., and unconventional terrorism, which deploys weapons of mass destruction, such as chemical and biological weapons (cf. Cigánik and Jaššová 2006, p. 109).

Taking the respected classification of terrorism proposed by Post (2004) as a starting point, political sub-state (subversive) terrorism can be divided into several types:

- Social-revolutionary;
- Extreme-right;
- Extreme-left;
- National-separatist;
- Religious fundamentalist;
- Single-issue terrorism (for instance, animal-rights or anti-abortion terrorism).

According to scale, it is possible to consider micro-terrorism (low attack intensity), meso-terrorism (substantial damage to property and loss of life in the dozens at most) and macro-terrorism (attacks significantly damaging the socio-economic stability of the state or region in question, and loss of life running into the hundreds).

In terms of target choice, terrorism can be divided into selective, partially selective, and non-selective. In terms of the characteristics of the target, one might consider terrorism as targeting travel (such as attacks on airplanes, trains, and ships), the energy industry (for example, attacks on pipelines and power plants) and in cyberspace (Mareš, 2011, p. 118). In today's information society, attacks on cyberspace in particular can be expected to happen much more frequently (cf. Hábová, 2014).

Cyberterrorism can be defined as the misuse of computer technologies against people or property, with the aim of creating fear, or for blackmail and extortion of concessions. It can mean targeting government institutions or civilians, and acts of cyberterrorism might be motivated by political, social, economic, or other goals of the perpetrators. Targets considered at the greatest risk include airports, gas pipelines, electricity networks, communication systems, water reservoirs, great industrial agglomerations, and army control systems (Brzybohatý et al., 2001, p. 12-13).

Some experts also distinguish between "old" and "new" terrorism. Although this is not universally accepted, even those who dispute this distinction agree that the terrorism of recent years has had several characteristic traits. We can describe these as: (1) a trend towards large-scale bomb attacks in city centers; (2) a trend towards attacks causing many casualties; (3) a trend towards attacks that have an impact on national economies (such as attacks on financial and business centers or on important sectors of the national economies, such as the tourism industry); (4) increasing use of kidnapping in some areas to extort private individuals and companies, and also governments; and (5) there is now a much stronger connection between international terrorism and organized crime (see Střítecký, 2006 for more detail).

## **Global terrorism and globalization**

Globalization is, above all, a spontaneous, uncontrolled process that involves not only the expansion of communication, contacts, and trade across the world; but also implies a transfer of social, political and legal power to global organizations. To a certain degree, it mutually integrates some societies into a higher, global entity, yet, there is no unequivocal definition of globalization, and a comprehensive theoretical reflection upon it is likewise lacking (Mezřický, 2003, p. 10). Global organizations have no specific jurisdiction, and are governed by no particular territorial laws. Whether they are transnational organizations, international courts, or supranational legislative bodies, they represent a new kind of threat to sovereignty that has brought a lasting, albeit local, peace to our planet. In this context, globalized terrorism poses a particularly grave danger (see Scruton, 2007 for more detail).

The rise of global terrorism is generally dated to September 11, 2001. "Much of what happened on and after 9/11 was possible only within a context of globalization. A terrorist organization used porous borders to move money and people across the globe, struck targets a world away from the land wherein most of the terrorists' grievances were said to have been experienced, used global telecommunications to plan and coordinate its attack, chose vehicles epitomizing global travel to carry out the attack, and utilized global satellite media to tell its story and that of the daring escape of its leader to a worldwide audience." (Grigsby, 2012, p. 274)

It is also worth noting that since September 11, 2001, the term "terrorism" has been given various adjectives and prefixes, such as new, global, ultra-, hyper-, etc. What is certain is that since the 1960s and 1970s, terrorism has changed its character, partly in consequence of the ongoing march of globalization (cf. Smolík, 2014).

Terrorist networks, which are global in character, are currently active throughout the world. Their aim is to deal a heavy blow to those who are driving the globalization process. Global terrorists strive to inflict multiple casualties, and to cause a psychological impact extending beyond state boundaries and influencing public opinion in not just one country, but in a broader area, possibly even worldwide. When they strike against a particular state, they are not

exacting revenge on that state's domestic policy, but rather for its foreign policy, applied in various parts of the world (see Eichler 2009).

Immediately after the September 11, 2001, terrorist attacks on the USA, the United Nations' Security Council unanimously adopted resolution no. 1373, which, among other measures, binds all member states to charge, with a crime, those states or individuals abetting terrorist activities, and to deny financial support and asylum to terrorists (Řehák, Foltin and Stojar 2008: 93).

In terms of international relations, Security Council resolution no. 1566 (2004) was particularly important. It emphasized that *global terrorism is one of the most serious threats to peace and security worldwide* and also that it endangers the social and economic development in all countries, and the world's stability and prosperity (cf. Eichler 2006, Prachař 2014).

Global terrorism today is connected with "Islamist" or "jihadist" terrorism; specifically, with the Al-Qaeda network, which was founded back in 1988. Due to the measures taken against it in the aftermath of 9/11, the network became loose, and today has both global and regional structures (see Mareš, 2011). It must be observed that the radical Islamist current is only one of the many branches of Islam. However, thanks in no small measure to the media, the opinions and activities of these radicals are given considerable attention and seriously reflected upon, not least in connection with calls made to carry out jihad, and apply Sharia, in Europe (see Reeber, 2006).

The aim of these terrorist groups is to disturb the world order as we know it; that is the system that binds together Western civilization. Individual states are not the prime target of such terrorist attacks. It is true that individual states are attacked; yet the main target is the Western way of life, its civilization and values. Arguably, then, the goal of such terrorism is not to bring down the government of one country, but to destroy a way of life (cf. Dodman, 2006).

It is characteristic of contemporary terrorism that to achieve its aims it needs a substantial influx of money, regular supplies of weapons, and variously placed hideaways for its adherents, which lends a global character to many terrorist organizations. Whereas, in the past it was true that terrorists wanted more spectators than victims, nowadays things are not so clear-cut. Obviously, there are terrorists today who would be willing to use weapons of mass destruction. Furthermore, they present an "asymmetric threat", in that they can cause massive damage with a comparatively small outlay (Závěšický and Rojčík, 2006, p. 11).

In justifying their objectives, terrorists exploit the contradictions and dark sides of globalization, as they manifest themselves on three basic levels: cultural, economic, and religious. In cultural terms, they explain their struggle as a necessity dictated by their interest in preserving traditional values and customs; this is done in the face of the ever-strengthening waves of Western secularism, materialism, hedonism and multiculturalism. In economic terms, they point to unequal development. The economic periphery of the globalized world, constituted by developing – and in particular, Islamic – countries, is much worse off than the center, that is, the West. In religious terms, they explain contemporary jihad as a necessary response on the part of the Muslim world to alleged spiritual repression by the West, which exports into the Islamic world its moral decay, eroding values.

Another important characteristic of global terrorism is its versatile use of new technological amenities brought about by globalization: the Internet, mobile phone networks, digital communications systems conveying encrypted messages, reports, and orders (Eichler, 2009, p. 177-178).

Similar to the global networks of multi-national corporations, global terrorist networks employ the structures on which globalization thrives. These networks are bound to no particular territory; they are mobile, and as the events of recent months show, they can strike anywhere. The means that keep them alive can also be dispersed without limitation. Although attempts have been made to curtail organizations, which allegedly do, or might support terrorism, there

is no reliable way to distinguish “terrorist money” from “peaceful” – unless, that is, the global financial transfers as such were to stop (Císař, 2003, p. 351).

Global terrorist networks have regional branches focused on activities in their regions. Most often, these are formerly independent regional organizations that have integrated themselves into a worldwide network, and cooperate with various, especially Islamist, groups (Mareš, 2011, p. 125). Interestingly, Scruton (2007) argued that the globalization of the Al-Qaeda network demonstrates that these radical Muslims are themselves a product of the globalization process, as Western civilization has allowed them to travel around the world, spreading their message.

## **Causes and consequences of global terrorism**

The causes of global terrorism can be sought in the fact that fundamental social and global conflicts exist, stemming from social, racial, national, religious and ethnic identities, which in fact often combine and reinforce one another. The group interests of these “collective identities” are not effectively satisfied, and so are, in many cases, the fundamental cause of global terrorism (cf. Mareš, 2005). In this respect, the clash between the rich North and the poor South is often referenced: the economic and social backwardness of the South causes the dissatisfaction of its peoples (cf. Řehák, Foltin and Stojar 2008).

At the level of individuals or small social groups, basic human needs might not be being met; for instance, sustenance and sense of security. Incompatible ideological and religious truths, which are often reinforced by national and ethnic identities also create problems. Also significant are the particular deeds of individual states or organizations (such as USA, NATO, UN, or EU) in international politics, where long-term conflict situations arise that are not then satisfactorily resolved. Further causes include the processes of modernization in traditional societies; issues arising from urbanization; and, in certain groups, subjectively perceived feelings of frustration.

Resistance movements struggling against armed forces occupying particular territories might also give rise to terrorist organizations (cf. Řehák, Foltin and Stojar 2008).

Describing the consequences of terrorist acts is a challenge, as they are fairly difficult to measure. Impacts of terrorism can be felt in:

- State structures;

- The economy;

- Human psychology;

- Infrastructure; and

- The environment (Řehák, Foltin and Stojar, 2008, p. 80).

It is possible to calculate the direct losses caused to public property by terrorist attacks, but it is much more difficult to calculate the indirect losses to the economy, encompassing loss of trust in financial markets (especially when large terrorist attacks occur), decreases in the stock prices of strategic companies, the decline in to in a particular region, and growing expenditure on security measures, etc. Besides the economic indicators, there are also psychological impacts, both on individuals and society.

The consequences of terrorism can be very significant and are dependent on the intensity and scope of terrorist acts, and their impact on the general public (Mareš, 2005, p. 48). In general, it is possible to state that the more significant a terrorist act, the greater the psychological repercussions felt by the general public (phobias, psychological problems, etc.). A terrorist act of a greater magnitude also means increased media focus, which in turns allows greater communication between the terrorists and the public.

In this sense, terrorism can be considered an extremely acute form of psychological warfare, whose effects are conditioned and compounded by media interest (Brzybohatý et al., 2001, p. 4). We might also consider the direct casualties of a terrorist act, or even environmental damage, etc. However, the basic objective of terrorism is to change the public's

view on certain issues, such as those connected with international politics, ideology, religion, collective identities, etc.

One consequence of terrorism is that the general (or a particular) public calls for an effective counter-terrorism policy, whether it be directed against repressive or subversive terrorism. Repressive terrorism can be countered either, by internal resistance, or external intervention. Across the various fields of politics, both state and non-state agencies deploy diverse measures against subversive terrorism (Mareš, 2005, p. 49-50).

### **Survey among the experts in the Czech security community**

When evaluating the present situation in Europe, the Czech Republic appears so far to be a country where terrorism does not present a serious security issue. Terrorism tends to be viewed in the country through a prism of international politics, or in connection with the country's engagement in structures such as NATO and EU. As in other countries, the attack of September 11, 2011 was a milestone in the Czech understanding of terrorism.

Since 9/11, the issue of terrorism has been discussed not only by the experts, but also by the majority of Czech citizens. Until September 11, 2011, there were no indications that members of international terrorist organizations were openly carrying out activities within Czech Republic territory. Since that date, however, the situation has changed substantially, and it is possible to infer based on intelligence service information, that international terrorism is certainly becoming a threat even in this hitherto relatively calm region (Brzybovatý et al. 2001, p. 24).

Police intervention by the Department for Uncovering Organized Crime on April 25, 2014, in a Prague mosque also partially testifies to the activities of Muslim radicals in the Czech Republic. The reason for police action was radical literature, and allegedly, illegally held firearms. Fears among the Czech public share similarities with those in many other European countries. The former chief of the defense intelligence, Andor Šándor, who "considers the blending of militants from the countries of origin into some segments of the Western European Muslim population to be the greatest risk", confirmed this (Prachař, 2014, p. 17).

Given that terrorism in the Czech Republic is an issue that is of interest both to law enforcement agencies and the security community, an expert survey was carried out for this study. Seventeen respondents were interviewed from the Czech security community. The five women and twelve men approached are security experts, and their institutional affiliations include the Police Presidium, the University of Defence, the Ministry of the Interior, the National Security Authority, Institute for Criminology and Social Prevention etc.

This brief survey focused on two main questions:

Do you expect a terrorist attack to take place in the Czech Republic within the next five years?

What type of terrorism would you expect to be responsible?

11 of the 18 respondents answered the first question in the negative. Thus, the majority of respondents do not fear that a terrorist attack will occur in the country within the next five years. Pečínka (2014) added: "so far there has been no terrorist attack in the Czech Republic, hence it is unclear how the integrated rescue system would deal with such a situation." Expert answers to the second question varied, however two or three opinions prevailed. The first suggested that a terrorist attack might be committed by Islamists (six respondents). The second most common answer envisaged a scenario in which the extreme right would perpetrate an attack and the Romani minority would be the victims (five respondents). The third answer was that an individual would be behind a potential terrorist attack (four respondents suggested that a psychopathological form of terrorism, committed by a lonely and psychologically disturbed individual was most likely). Obviously, in order to generalize, a

broader survey would be desirable; this was merely a probe. Indubitably, it goes without saying that terrorist attacks are extremely difficult to predict.

## Conclusions

This paper focused on the phenomenon of terrorism. It has presented the issues providing an exact definition of what terrorism is, discussed selected typologies, and outlined its relationship with the process of globalization, as well as the causes and consequences of global terrorism.

Global terrorism is not a short-term, but rather a medium-term, if not a long-term issue. It is primarily directed against the symbols of contemporary Western cosmopolitanism and its successes. It seeks to demonstrate its power in areas with high concentrations of people, where thorough security measures are very difficult to employ. The death and injury of large numbers of civilian victims are, and will probably continue to be, a particularly grieving aspect of global terrorism (see Eichler, 2009, p. 211-212).

Terrorism has witnessed a spectacular rise in the early twenty-first century, and it continues to be very active in many areas (Pakistan, the Indian sub-continent, South-East Asia, the Middle East, the Caucasus, etc.). Counter-terrorist policy has been successful in that the number of attacks carried out in European countries has decreased substantially; this is certainly a consequence of the counter-terrorist measure implemented since the attacks in New York, Madrid and London (cf. Mareš, 2011). The Czech Republic has been fortunate not to be targeted by a terrorist attack to date, and the survey of Czech security experts, presented in the last section of the paper, canvassed their opinions regarding the likelihood of an attack in the near future. Most respondents do not predict that an attack will take place within the next five years. However, if an attack were to occur, it would be most likely to be committed by a radical Islamist organization, the extreme right, or a "lone wolf," according to the experts approached.

Although the Czech security community considers global terrorism seriously, the impact of a potential terrorist act in the Czech Republic on public psychology, the economy, law-enforcement agencies, etc., are impossible to estimate.

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# Brazilian consumer protection in the international ecommerce and gaps in the legal system

Arnaldo SOBRINHO DE MORAIS NETO<sup>1</sup>

## Abstract

The evolution of new technologies has driven the setup of the information revolution or network society, the result of restructuring experienced by the world in the late 80s and 90s of the twentieth century revolution. The citizen as a recipient of rights had to be more prevalent, resulting in an ideal of achieving a level of dignified life through free markets, with developments in the economic order and consumerist thematics. This study focused on investigating the evolution of trade, the legal protection offered by the State under the Federal Brazilian Constitution and in the Brazilian Code of Consumer Protection, and the analysis of international legal instruments, notably in establishing consumer relationships transnational. We conclude that there is legal protection in consumer relations at the national level, though there is a legal gap in the international protection system.

## Keywords:

Consumer relations; international trade; legal system gaps.

## INTRODUCTION

The postmodern world experiences of changing technologies of the past twenty years, which added to the record of facts with socioeconomic impact leads us to what is called the information society or network society. Much more than changes in society, there is ongoing, a number of changes in the relationships that are established between people and businesses, with undeniable reflections on concepts and fundamentals of law and especially in the economy; cover by applying rules necessary for the regulation of international trade.

The search for common rules that ensure legal certainty in international commercial trade is not a new fact, however, the dynamics of the events after World War II, led to the acceleration of this process, culminating consequently, the creation of international organizations that regulate many spheres of social life, including trade and buy, with significant changes in the consumerist sphere.

We experimented so in little more than six decades, the reorganization of economic systems, their zones of influence, deep changes that led to a global desire for peace and development. Not only desire one or two states, but new standard of consumption. The emergence of a new consumer and therefore new consumer relations that take place on a global scale.

The dimension of this "new world", the great advancements made by the internet - undeniable translate into benefits for many people and organizations, transforming personal interactions in a global network, a true "Third Great Revolution", in order to change the system education practices, interaction, fun and especially trade, advancing every day and passes to challenge new frontiers, advancing thus in e-commerce and new relationships between consumers and suppliers of products and services.

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In this sense, it is natural to envision, from the realization of business on a global scale the emergence of conflicts. Discussions of possible solutions to the problems posed are relevant, mainly because there is an increasing trend in the number of users on the Internet to conclude purchase agreements, among other business transactions, imagine being obvious, the need to investigate the possibility of legal solution to these conflicts.

The aim of this paper is to investigate the relevant points about the history, evolution and fundamentals of international trade, regulation and especially the emergence of new frontiers to challenge the consumer law in an overview of international trade. Another focus is the detailed analysis of the protection offered by the State to the consumer in this scenario of changes in business practices that are effected much by cyberspace (nationally and internationally), transforming into Transnational consumer relations that need protection.

It is necessary to recognize the growth of international trade, as well as the need for analysis of potential conflicts arising from the conclusion of electronic contracts in these consumer relations. The indicatives of possible solutions to these conflicts, based on the many legal instruments of international character are discussed giving opportunity to the understanding of a global effort to build a new regulatory framework to protect consumers who buy goods and services in international trade.

## **EVOLUTION AND REGULATION OF INTERNATIONAL TRADE**

The relationship between state, economy, social life and development leads to one of the key issues in the study of Law and Social Sciences and Economics. Central theme in disciplines such as State Theory, Political Science, Political Economy and Constitutional Law: setting a goal or purpose of the state is a complex issue. For most theorists - Azambuja (2008, p.147-148), (2002, p. 112), Dallari (2003, p.91-92) and Carvalho (2008, p.76), among others, the purpose of the State is the common good and, in the view of Kiyoshi Harada (2008, p.21), this would be "[...] an ideal that promotes well-being and leads to a model of society, which allows the full development of human potential." Ideal situation would still like to reduce or end poverty.

According to Sachs (2005, p.51) "The end of poverty in this sense is not only an end to extreme suffering, but also the beginning of economic progress, hope and security that follows development." This has been a material fact not only in the configuration of modern states, but an event that dates back to the history of civilizations in the ancient world (ENCINAS, 1999, p.13).

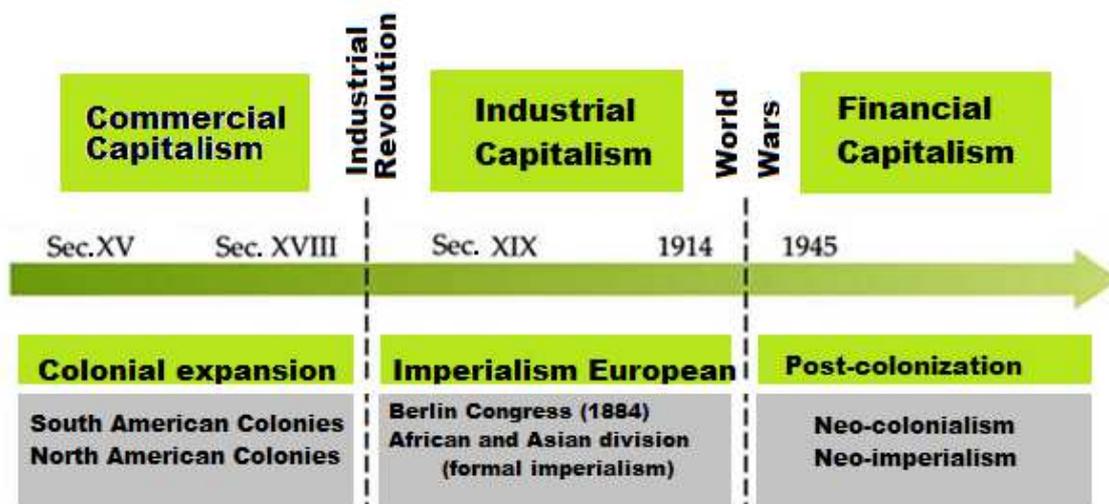
Without wishing to proceed a historical approach to this theme, looking at the fundamentals of large economic systems (capitalism vs. socialism), which pursued, in its way, the "common good", there is the idea that this duality only exist as "abstract models or ideal types" (TAVARES, 2011, p. 33-34) (which were collapsing) Tavares asks, "If after the occurred changes in the former Soviet there would be space and interest in keeping the discussion or conceptual bipolarity, apparently already surpassed by reality." (TAVARES, 2011, p. 41).

The image below summarizes these expansion moments of capitalism, without the need to speak too much about the topic<sup>2</sup>

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<sup>2</sup> <http://www.cocemsuacasa.com.br/ebook/pages/363.htm>

**Pic. 1 Capitalism expansion**



Source: <http://www.cocemsuacasa.com.br/ebook/pages/363.htm>

Thus, breaking this ideological debate, the collapse of the planned economy in the CCCP meant much more than the emergence of other States. The events that followed, especially the fall of the Berlin Wall as Friedman points out (FRIEDMAN, 2007, p.66), has resurrected a sense of hope and freedom, as if all these forces had been imprisoned by World War II and the Cold War, had been released with its end, providing new dimension of freedom to flourish trade previously unimaginable.

Regardless of the historical denomination - Capitalism commercial, industrial or financial, the effort of nations always turned to the establishment of minimum requirements for a development standard and pursuit of new business partners, which, as a rule, expanded upon relationships trade between nations, through the exchange of goods and services. This picture, put in a timeline, shows a very recent process of establishing international regulation for the flow of foreign trade.

Although it is possible to register the establishment of bilateral trade agreements, at the time prior to the twentieth century, it is from the first decade of the last century that begins the attempt to establish a multilateral institution to regulate commercial practices among nations. The need to implement this measure, so peculiar, can be found by motivating facts that led to the Great Depression (1929 crisis), World Wars I and II and all subsequent events.

The establishment of a new "world order" in the post-Cold War sparked a wave of optimism and consequently a rearrangement of geopolitical forces in the world. These facts have as consequences: (1) reduction of distrust and suspicion that had prevented friendly relations and cooperation between the Eastern bloc and the Western bloc; (2) States which succeeded the Soviet Union (Russia and others States) started to accept and respect some basic principles of international law; (3) Degree of unprecedented agreement in the visions of the five permanent members of the UN Security Council, a convergence in views, making the performance of its functions more effectively.

Thus, the implementation of "[...] the multilateral trading system was regulated after the Second World War" (BARRAL, 2007, p.25), especially with plans to create in the Bretton Woods meeting international organizations, such as the International Monetary Fund (IMF), the World Bank, the International Bank for Reconstruction and Development and the International Trade Organization - ITO (never worked).

According to Barral (2007, p.33):

The ITO has never come into force. What has been achieved at the time, the use of a protocol of provisional application, was to enforce the second and third parts of the Havana Charter. These two parts formed the General Agreement on Tariffs and Trade (General Agreement on Tariffs and Trade - GATT). So, which came into force in 1948 was lame and provisional structure, which lacked the mainstay - the international organization - who wanted to create, with an improve of political scenarios.

Having past nearly half a century, after deep changes, reconfiguration of global spaces and rounds of agreements aiming at improvement of the GATT and the achievement of a multilateral body regulator that effectively bring together all states, it was in 1995, with the Marrakesh Agreement, the implementation of the World Trade – WTO. The WTO has been completed with the Uruguay Round, the most important "international organization dealing with the global rules of trade between nations, ensuring that trade flows are realized, predictably and freely as possible, with a level playing field for all its members."

## TRADE AND TRANSNATIONAL CONSUMER RELATIONS

The Federal Brazilian Constitution, to proclaim the free trade within the political and legal framework that established the referred Charter, as Economic Constitution clearly sets the parameters for the free exercise of commercial activities, based on the values of human labor and especially seeking a decent life for all citizens. However, achieving this goal operates, as envisaged in the Constitution, from the principles set out in art. 170<sup>3</sup>, among which there is the prediction of consumer protection.

Brazilian parliamentary when drafting the Federal Constitution (article. 5th, XXXII) they include the commandment that the State shall provide the consumer did reconcile fundamental human rights in consumer relations, with the postulates of economic order, especially related to art. 170 and following, whose improvement was accomplished with the full edition of the Code of Consumer Protection - Law No. 8078/90 in the Brazilian legal system.

Was assigned to the State the responsibility for the regulation of possible abuses arising from economic activity, "to reconcile the foundation of free enterprise and the principle of free competition with consumer protection and the reduction of social inequalities, in accordance with the dictates of social justice [...]"<sup>4</sup> (BRAZIL, 2011, p. 154) thus promoting the balance between private interest and the public interest.

The establishment of a system of consumer protection assumes, for logical reasons, the existence of full commercial activity where consumers and merchants interact, exchanging and practicing the trade, typical activities of free market economies. There is therefore need to formulate basic outlines on domestic trade, international trade and transnational markets.

Thus, to Werneck (2014, p 22.), the "National Trade is the set of activities purchase and sale of goods and services where the seller and buyer are located in the same country." Already international trade, seller and bought are located in different countries. For other

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<sup>3</sup> Art. 170 The economic order based on the value of human work and on free trade, is to ensure all dignified existence, according to the dictates of social justice, on the following bases:

<sup>4</sup> I - national sovereignty;

II - private property;

III - social function of

property; IV - free

competition;

V - consumer protection;

[...]

perspective, the effects of globalization and technological revolution made strongly flourish denominated trade and consumption, transnational relations and may mercantile flow manifest itself thus in more than one country.

The expression of these initial parameters are relevant in order to determine who is a consumer, provider and consumer relationship, as well as what is considered a product and service operation of buying and selling that is not operating in a private transaction. The Code of Consumer Brazilian in its Articles 2 and 3, fixed key concepts, especially guiding the celebration of possible contracts or even the execution of a purchase, see:

Art. 2 Consumer is any individual or legal entity that acquires or uses a product or service as the final buyer. Single paragraph. Equates to consumer collectivity of people, even if indeterminate, there is intervening in consumer relations.

Art. 3 Supplier is any individual or legal entity, public or private, national or foreign, as well as depersonalized entities that develop production activity, assembly, creation, construction, processing, import, export, distribution or marketing of products or provision of services.

Thus we have the configuration of the consumer relationship, as an essential element to get state appropriate legal protection. To Enfing (2011, p.55), has as consumer relationship: "the legal relationship between consumer (s) and supplier (s) having as object the product and or service delivery, according to conceptualizations Code of Consumer Brazilian ." Presents a clear understanding of who qualifies as a consumer, be it physical or legal person.

Is necessary to register the historical moment in which they were conceived the protective frameworks for consumer protection or contained in the Constitution or in national legislation, especially the Code of Consumer Protection, was not considered development of commercial practices related to new technologies, although other forms of trade and sales are very common. In fact the events recorded in the transition from the 80s to the 90s and subsequent years the end of the twentieth century, would experience the initial steps of the great technological revolution - the information age.

Thus, this approach is taken in a historical and social context in which the business practices over the internet - the e-commerce is registering strong growth in Brazil, as the web site e-bit (EBIT, 2014) says, in a preliminary statement released in January 2014, the e-commerce:

[...] Moved \$ 28.8 billion in 2013, growing nominally 28% compared to 2012, when sales reached R \$ 22.5 billion. Despite inflation and economic slowdown, the result beat expectations, indicating a growth rate of 25%.

Based on the information presented, which represent only a fraction of what is actually recorded, we have the record of significant sums made through electronic commerce. If this pontificates, so as teaches Canut (2007, p.163) that "there is full implementation of the Code of Consumer Brazilian electronic consumer contracts."

In this sense, the recent developments in computing and telecommunications has generated significant impact on society and the economy. The increasing availability of small and affordable personal computers has helped make the world without borders. As computers are becoming much smaller and more economical (low cost), mobile devices – smartphones are increasingly portable and turning into pocket computers, accompanying the user anywhere, thus enabling consumer relations without borders.

Understanding the phenomenon of Globalization on view Paesani (2007, p.5) "is not a new process, indicating the concept of internationalization of relations between people,

between states and public and private organizations." The interaction between people reached unprecedented process of exchange and without borders. Similarly this revolution provided by the Technological Revolution has been able to leverage corporate actions, thus making regional companies in transnational companies.

But the exposed idea to evidence the economic character of the internet and global markets, must be tempered in the face of the impacts caused by the cultural, social and political integration. In the understanding of Friedman (2007, p.98) the Globalization:

"[...] Create a global playing field, mediated by the web, which enables various forms of collaboration (ie, the sharing of knowledge and work) in real time, regardless of geography, distance, or in the near future to same language. "

So, established the parameters on the essential elements of trade, consumer and supplier, as well as the postulates of consumer relations, there is the need to understand the connection between the environment of global markets and transnational relations of consumption. These relations began to be realized when there was the improvement and provision of secure channels for electronic signing of contracts of purchase and sale. It is characteristic of this type of business relationship in cyberspace, the buyer may be in Brazil, manufacturing the product in China and the seller in the United States, thus characterizing relations of transnational consumption.

## **BRAZILIAN LEGAL SYSTEM AND PROTECTION CONSUMER IN E-COMMERCE**

Undeniable understanding of the relevance of the Brazilian Code of Consumer Protection in consumer relations. Not only the given legal protection, but mainly by the protective role of instances arising as PROCON - Administrative support to consumers, the police of consumer protection and also the special courts consumer. All instances aims to provide appropriate channels for protection and repair the damage.

This legal protection therefore presents a fully stabilized in the national legislation (Brazil). Still, here comes the challenge of protection to be pursued in the face of new technologies, especially electronic contracts in consumer relations or transnational e-commerce.

Thus, for Grasses (2006, p. 67):

In essence the electronic contract not mischaracterizes in any way that compose the idea of contract as the main source of the law of obligations, only its shape is different, and is required in freeing her to analyze their nature.

Strictly speaking, establishing the relationship of consumption in domestic - if consumer and supplier (product or service) transact in Brazil, there will be full implementation of the contract in light of Brazilian legislation and rules, configuring any of the circumstances of addiction as stated at art. 12 of the Code of Consumer Protection, will be the full responsibility of the seller, regardless of fault, whether domestic or foreign.

According to art. 93, the Brazilian Consumer Protection Code, we have:

Art. Except in 93. jurisdiction of the Federal Court is competent to cause local justice:

I - in the court of the place where the damage occurred or when the local level should occur;

II - in the court of the Capital of the State or the Federal District, the damage to national or regional level, applying the rules of the Code of Civil Procedure in cases of concurrent jurisdiction.

Thus, there is no doubt about the legal protection of the consumer is established by the protection of Brazilian jurisdiction, except in the cases of "choice of private jurisdiction, which under the law 9307/1996 is exercised by courts and arbitration courts" as Andrade says (2006, p. 453).

## **CONSUMER PROTECTION IN INTERNATIONAL E-COMMERC AND INCOMPLETENESS OF THE LEGAL SYSTEM**

The design of a network society (Castells, Cardoso, 2005), substantially characterized the societies of the twenty-first century, increasingly connected to the internet, online in cyberspace. The effects are compelling in the buying and selling processes, making the E-commerce one of the states in this part of the agenda that the WTO strategy. Social and commercial relations established are increasingly present, generating therefore financial exchange, knowledge production and interaction between people. Another north, however, possible conflicts on a transnational scale.

The changes indicated by this new (e-commerce) scenario therefore also has modified the legal dimension of the instruments used to regulate these new situations, with a view to ensure the minimum of legal certainty in achieving business and international business transactions, especially in relationships of consumption.

In this sense, in order to illustrate the potential of e-commerce, is projected for 2014, involving the business e-commerce in Brazil that should reach more than R\$ 30 billion reais (e-bit, 2014):

For 2014, the E-bit provides a nominal growth of 20%. We will have a period of more challenges, but we hope that the e-commerce end the year with a turnover of £34.6 billion. The World Cup warm the sale of sporting goods and televisions large proportions with fine screen, Guasti bet.

One must consider, however, that the figures suggest growth year on year retail purchases nationwide, were not computed international transactions due to the great difficulty of control with respect to the flow of purchases and sales through the sales channels available the various sales sites and online auctions.

It is known, however, that there is a natural tendency that even large contracts of international purchase and sale, not just retail store, online take effect, however, may arise conflicts of jurisdiction when there is doubt about which laws apply.

Large companies such as the Google Inc., Facebook, eBay, and Amazon.com Alibaba.com, among others, maintains channels of marketing products through their websites; however, suggest as a channel for resolving disputes, a kind of "arbitration or mediation of online conflict", not a judicial level. But if the parties wish unfulfilled demand lead to a court asks itself: that justice will be applied?

The question is relevant because, as the conflict may involve different jurisdictions. One of the contracting parties involved in the dispute can be found in the USA, a second in India and a third in Brazil, therefore, different countries and different jurisdictions, which may lead therefore to the consumer in good faith from transacting Brazil, considerable damage.

Thus, there would be difficulties to compel a foreign trader to repair damage to a domestic consumer.

In this sense, lapidate the Marques' lesson (2001, p.3):

In fact, consumer law has an international vocation, and in any other sector of private law models and foreign and supranational inspiration so present. In theory, consumers should not be harmed, either in terms of safety, quality, warranty or access to justice only because acquires products or uses service from another parent or supplied by a company headquartered abroad. In theory, the tourist consumer, the traveler, one who acquires goods and services in another country should be able to count on a minimum to protect their interests, as well as that of watching advertising manufacturer located in another country, decides to hire the distance or by means electronics. Finally, there was a substantial change in the structure of the market, also globalization of private consumer relations, 16 which brings to light the failures of mercado<sup>17</sup> and limits of the concept of "sovereignty" of the consumer in today's market. Its position is becoming weaker or more vulnerable and the imbalance of consumer relations is intrinsic, necessitating effective guidance and positive intervention of states and international organizations legitimized to do so.

The national laws, the Code of Civil Procedure provides opportunities, through the provisions of Art. 88 and Art. 90th, what action if international demand for the proposed action is in Brazil or before a foreign court. However, the jurisdiction of the Brazilian courts is reinforced by the provisions of Art. 101, I of the Brazilian Consumer Protection Code, which authorizes the Brazilian consumer to engage in national territory, the foreign supplier.

But the Law of Standards Introduction to the Brazilian law, in its art. 9, § 2 indicates how the applicable law of the country in which the proposer live the obligation, which would imply the application of foreign law - the country of the supplier; however, we have the application of the Consumer Protection Code (Art.17), viewed as matter of public policy (away from the application of foreign law), even in the case of international agreement.

In Brazil the practical effects of judicial decisions, even if the foreign supplier is convicted by the Brazilian courts to compensate a Brazilian consumer, the sentence shall be effective only in the foreign country after observing the requirements of foreign law for its internalization.

It should be noted that the Brazilian judge can not determine the seizure of property without authorization from the foreign country. Thus, the claims against foreign suppliers are very expensive, requiring a lot of effectiveness, since there is no uniform rule, treaty or convention to effectively protect consumers in consumer relations in international e-commerce.

Became evident thus pertinent questions such as: What legislation effectively applied to solve the demand? There would be a gap in the legal system, as advocated Bobbio (1995, p.115)? Or the question should be seen as an empty space to be filled by the judge space, as advocated Kelsen<sup>5</sup> (1998, p.263), for whom the possible existence of gaps in the legal system would be a mere fiction.

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<sup>5</sup> To Kelsen "The previously mentioned authorization to order a sanction which has not been provided by a preexisting general norm is often given to the courts indirectly, by way of a fiction. It is the fiction that the legal order

In this sense, knowing is the possibility of concluding "electronic contracts", especially those related to e-commerce, we must check for compliance of provisions in the legal instruments of international scope that can offer specific protection.

In summary, an international outlook, we have the following instruments under consideration: 1 United Nations Convention on Contracts for the International Sale of Goods - CISG, effective in 2014 - (Vienna Convention 1980) - regulation only of rules for trade international, not covering the consumer; 2 Rome Convention, 1980 (and only limited treatment in the European Union); 3. Mexico Convention, 1994 (OAS) - Inter-American Convention on the Law Applicable to International Contracts - does not cover consumers relations; 4 New York Convention, 1958 - the recognition and enforcement of foreign arbitral awards will apply; 5 United Nations Convention on the Use of Electronic Communications in International Contracts, 2005 (entered into force only in three countries -Honduras, Dominican Republic and Singapore), complements the Vienna Convention.

Situations not covered by the Vienna Convention, especially in cases of electronic contracts on international consumers relationship when the parties are in different countries could be under protection of the United Nations Convention on the Use of Electronic Communications in International Contracts, 2005, but it is a very recent international instrument that has the signature of 13 States Parties, and validity in three, but the Brazil is not a signatory this Convention.

In this sense, with the accession of Brazil to the United Nations Convention on Contracts for the International Sale of Goods (CISG / Vienna Convention), provides dispute resolution on international contracts, including electronic contracts as detailed in the above provisions, by setting important tool to facilitate legal certainty in a globalized economy scenario, but not presents solution to disputes that may result in consumers transnational relations.

To Bobbio (., 1995, p 116) a legal system has three important characteristics: unity, consistency and completeness. A legal system is incomplete when there are gaps and where there are gaps in the law, there will be problems to consolidate the law in its fullness. This is what occurs with the problem of lack of uniform international rules to regulate consumer relations arising from international contracts in e-commerce.

## **CONCLUSION**

International trade accounted for (and still is) one of the major driving forces behind the world development. A look at the past shows how the evolution of societies has always maintained close correlation with the mode of humanity interact and connect with overcoming obstacles in order to discover new worlds and establish new trade routes since the Phoenicians, Arabs, Portuguese and Dutch to large current traders.

The search for stability in international trade relations was, similarly, point of great controversy. Only after the Second World War, with the bitter lessons abstracted the conflict, it was possible to understand the need for establishment of supranational bodies, so redounding, the creation of international organizations like the UN, IMF, IBRD, and the area trade, the establishment of the General Agreement on Tariffs and Trade (GATT).

The obscurity of the Cold War came to be mitigated in the late twentieth century with the ramifications from Berlin and the disintegration of the communist world, thereby creating

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*has a gap, - meaning that prevailing law cannot be applied to a concrete case because there is no general norm which refers to this case. The idea is that it is locally impossible to apply the actually valid law to a concrete case because the necessary premise is missing."*

the conditions for all the feeling of entrapment was released. The balance were profound changes in the balance of power and the establishment of new scenarios for the world, fueled especially with the Revolution of Information Technology trade.

In this context of globalization of markets, there was improvement of the legal system in order to provide more effective protection to people when conducting a business transaction - consumer relationship, enabling media prevent possible abuse, as established from the Constitutional text and regulated the postulates of the Code of Consumer Protection.

There is thus a record of strong growth in consumer relationships that migrated from the "real world", made feasible for commercial transactions by the internet, with record growth year by year, deserving, however, a closer look at the conclusion of contracts electronics and, as a result of these, possible damage and/or prejudice to consumers when making purchases on the international trade.

In this approach, however, aimed to focus the discussion of possible settlement of disputes or conflicts in the formalization of contracts that take place over the internet, called international or transnational relations of consumption "electronic procurement", emphasizing that, from the record of growth of such negotiations, there is a risk of an increase in conflicts in consumer relations.

In the other direction, it was possible to glimpse the impossibility of giving effect to judicial decisions whose scope to compel foreign supplier to honor commitment entered into with national consumer, especially the small consumer who, attracted by aggressive marketing campaigns, cannot obtain a solution of the dispute rapid and less expensive way possible, leaving enjoying fully, the product or service purchased.

There is therefore a gap in international law to regulate or standardize rules on the protection policy of consumer protection law in the international scene, making it necessary to adopt common rules of private international law, in order to build a legal instrument internationally in order to protect the right of consumers conducting commercial transactions through internet, celebrating electronic contracts.

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# Competitiveness of regions based on comparative advantage

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## Abstract

In a globalizing economy, the concept of competitiveness applied on a regional level has become frequently discussed issue. Variables of competitiveness can be divided into inputs, which represent comparative advantages of regions, and into outputs, which represent final competitiveness. The main objective of the paper is the multidimensional evaluation of competitiveness of selected EU regions according to their comparative advantages. The basic concept of regional competitiveness and comparative advantage is explained in the theoretical part of the paper. The second part is focused on the reduction of inputs' dimension and on a creation of new immeasurable factors of comparative advantages by using factor analysis. In the last part a multivariate classification of regions is realised based on created factors of comparative advantages through cluster analysis. Data for analysis are obtained from informative database of Eurostat. Compiled database contains a wide range of variables, which cover not only economic, but also social, demographic, technological and research fields. 16 variables, standing on the side of inputs. Analyses are made for year 2010, using software Statgraphics, SAS and GIS. We are focusing on comparison of 84 regions of Central European countries according their comparative advantages (8 Czech regions, 30 German regions, 7 Hungarian regions, 9 Austrian regions, 16 Poland regions, 8 Romanian regions, 2 Slovenian regions and 4 Slovak regions). In term of comparative advantages of regions, the most important factor is "The quality of human potential". This factor is created mainly from Gross fixed capital formation, Total intramural R&D expenditure, Total R&D personnel, Total R&D researchers, Human resources in science and technology, Population aged 25-64 with tertiary education attainment. According to results, the most effective way how to improve comparative advantages of regions is to invest more funds in research, science and technology and higher education. On the base of multivariate classification of selected regions, the significant differences between regions are found. Great differences are especially between capital regions and other regions of Slovak Republic, Czech Republic and Romania. The most competitive regions according comparative advantages are German regions, situated in cluster "The best labour market and the highest innovative potential". 6 Romanian regions, situated in cluster "The lowest quality of human capital, the worst demography and the highest employment in agriculture, forestry and fishing" are least competitive.

## Keywords

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regional competitiveness, inputs, comparative advantage, multivariate classification

## **Introduction**

The term “competitiveness” has become popular, not only within academic circles, but also in political circles. While the competitiveness of firms is a clear defined notion, competitiveness applied on the macroeconomic level hasn't got uniformly accepted definition yet. Despite of that competitiveness is one of the basic measures of economic performance and reflects advantages in a broader comparison. Therefore the growth of competitiveness belongs for several years between main goals of many national governments and national groups. Factors that determine competitiveness are significantly different not only between nations but also between regions and hence nowadays the attention is moving from nations to regions. Regions become central geographical units for evaluation of competitiveness.

## **The competitiveness of regions**

These days regional competitiveness is very actual theme. However there is no common acceptable definition of this term applied on regional level. Stroper (1997) claims: “Regional competitiveness is the ability of the region to attract and maintain firms with stable or rising market position, while maintaining stable and rising standards of living for its citizens”. According to European Commission (1999) regional competitiveness depends on common features, which characterized whole region and affect all firms located inside. If region has conditions to increase its standard of living, which represents its ability to keep winning results, region is competitive (Bristow, 2005). The concept of regional competitiveness also meets with criticism. Krugman (1994) sees this concept as dangerous obsession, which could lead to wrong political decisions. He argues that the term which is usually applied on individual companies, could not be applied on regional economies. According to him the only meaning of this concept is productivity. In spite of different definitions the increasing of regional competitiveness becomes part of many national strategies, for example Europe 2020 Strategy. The main aim of this strategy is to promote smart, sustainable and inclusive growth in the whole EU. But achievement of those objectives requires active involvement of regions (European Commission, 2010). National Strategic Reference Framework 2007 – 2013 argues: “Competitiveness of regions, the Slovak economy and employment have to be significantly increase till year 2013, with respecting sustainable development”(NSRF, 2007). In terms of increasing competitiveness of regions, it is very important to find out method to evaluate regional competitiveness. The composition of index is the most common approach to evaluate competitiveness of regions. For example Regional competitiveness index – RCI, whose second edition is constructed by Paola Annoni and Lewis Dijkstra (2013), is well known. This index is composed from input and output variables of competitiveness together. According to us this one-dimensional approach puts only regions in rank and does not explain why regions achieve high and low positions. We consider that is important to distinguish between input variables, which represent comparative advantages and output variables, which represent final competitiveness. If political makers want to find way to increase competitiveness of regions, they have to have information about potential of regions; about their comparative advantages. Camagni (2002) states that regions compete on the base of comparative advantages, which regions can get if they have superior technological, social, infrastructural and institutional assets. Those assets are external but they are influencing individual firms, situated inside regions. “Regions are obtaining comparative advantage from size and diversity of concentrated economic activity that improves access to markets, access to suppliers, co-workers and leads to more numerous labour forces” (Turok, 2004). Crucial aspect to obtain success and thus comparative advantage is the existence of facilitating social networks, social capital and institutional structure (Porter, 2003).

## Data and Methods

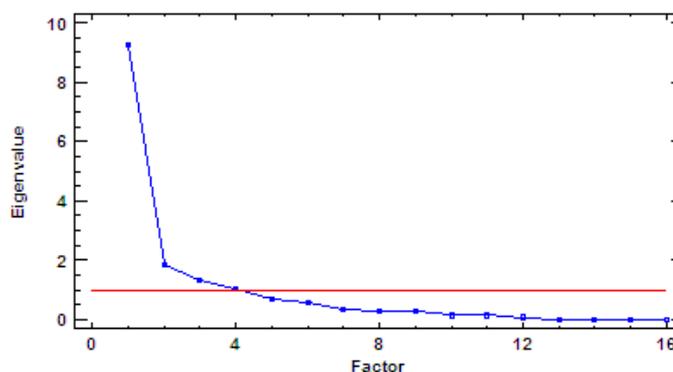
Data for analysis are obtained from informative database of Eurostat. Compiled database contains a wide range of variables, which cover not only economic, but also social, demographic, technological and research fields. 16 variables, standing on the side of inputs, are chosen: Gross fixed capital formation (GFCF), Total intramural R&D expenditure (GERD), Total R&D personnel (R&DPer), Total R&D researchers (R&DRes), Patent applications to the EPO (PatApp), Human resources in science and technology (HRST), Employment rate (EmpRate), Unemployment rate (UnempRate), Employment in technology and knowledge-intensive sectors (EmpTKISec), Employment in agriculture, forestry and fishing (EmpAFF), Economic activity rate (EcAcRate), Population aged 25-64 with tertiary education attainment (PerTerEd), Life expectancy (LifeExp), Infant mortality rate (InfMorRate), Fertility rate (FerRate) and Average number of usual weekly hours of work in main job (WeekHourWork). Analyses are made for year 2010, using software Statgraphics, SAS and GIS. We are focusing on comparison of 84 regions of Central European countries according their comparative advantages (8 Czech regions, 30 German regions, 7 Hungarian regions, 9 Austrian regions, 16 Poland regions, 8 Romanian regions, 2 Slovenian regions and 4 Slovak regions).

The factor analysis (FA) is applied to reduce the number of chosen indicators of competitiveness, to remove interdependencies between them and to create a smaller number of common factors of comparative advantages. The main goal of FA is to assess the structure of relations between variables and find out if it is possible to divide variables into groups, in which their mutual correlations are significant and between those groups are not significant. The role of factor analysis is creation of new variables (factors) that are not measurable in practice, but they help to understand analyze data better. The necessary condition of FA is interdependence between variables. This condition is verified through correlation analysis. Varimax rotation of factor is used for better interpretation. (Stankovičová, Vojtková, 2007).

The cluster analysis (CA) is applied on multidimensional classification of selected regions into mutual similar clusters. The criterion for classification into clusters is common factors of comparative advantages, which are obtained from factor analysis. The goal of CA is decomposition of file of objects into few relatively homogeneous clusters. Objects belonging into different clusters have to be the least similar and objects belonging into the same cluster have to be the most similar. Ward's method is used for classification of objects (Stankovičová, Vojtková, 2007).

## Results and Discussion

Regions have different comparative advantages, which represent their competitive potential. 4 relevant factors are created from chosen 16 input variables, using factor analysis. The number of factors is selected on the base of eigenvalues (Figure 1). Factors together explain 83.9% of the total variability of the considered inputs.



**Figure 12: Eigenvalues for factors**

First factor has the largest share on the explanation of total variability, explains 33.3 % (Table 1). The lowest share has fourth factor, which explains 17.5 % of total variability of considered variables. The remaining two factors explain approximately the same percentage (second factor explains 25.7 %, third factor explains 23.5 %)

**Table 1: Variance explained by each factor**

Variance Explained by Each Factor			
Factor1	Factor2	Factor3	Factor4
0.333	0.257	0.235	0.175

Varimax orthogonal rotation of factors is applied to obtain the best interpretable solution. Indicators with important factors' weights (weigh >0.5) represent the most appropriate indicators of factor (Tab. 2).

The first factor, which can be interpreted as "The quality of human potential", is positively correlated especially with:

- Gross fixed capital formation –GFCF (0.558),
- Total intramural R&D expenditure – GERD (0.682),
- Total R&D personnel - R&DPer (0.916),
- Total R&D researchers - R&DRes (0.949),
- Human resources in science and technology – HRST (0.758),
- Population aged 25-64 with tertiary education attainment – PerTerEd (0.788).

Variables Total R&D personnel and Total R&D researchers have the highest influence on the creation of factor.

**Table 2: Rotated factor pattern**

Rotated Factor Pattern				
	Factor1	Factor2	Factor3	Factor4
GFCF	0.558	0.540	0.364	0.262
GERD	0.682	0.353	0.449	-0.023
R&DPer	0.916	0.260	0.126	0.095
R&DRes	0.949	0.199	0.034	0.065
PatApp	0.250	0.393	0.733	0.073
HRST	0.758	0.248	0.320	0.399
EmpRate	0.288	0.710	0.512	0.344
UnempRate	-0.157	-0.827	-0.256	-0.009
EmpTKISec	0.281	0.829	0.175	0.213
EmpAFF	-0.423	0.227	-0.426	-0.639
EcAcRate	0.304	0.582	0.544	0.430
PerTerEd	0.788	0.062	0.262	0.182
LifeExp	0.341	0.492	0.602	0.455
InfMorRate	-0.297	-0.153	-0.316	-0.755
FerRate	-0.084	0.352	-0.178	0.734
WeekHourWork	-0.169	-0.238	-0.882	-0.079

The second factor “Labour market” is correlated principally with:

- Employment rate – EmpRate (0.710),
- Unemployment rate – UnempRate (-0.827),
- Employment in technology and knowledge-intensive sectors – EmpTKISec (0.829),
- Economic activity rate – EcAcRate (0.582).

Variables Unemployment rate and Employment in technology and knowledge-intensive sectors have the highest influence on creation of this factor, but in opposite way.

The third factor, which can be interpreted as “Innovation potential”, is created mainly from:

- Patent applications to the EPO – PatApp (0.733),
- Life expectancy – LifeExp (0.602),
- Average number of usual weekly hours of work in main job – WeekHourWork (-0.882).
- The fourth factor “Demography” is correlated especially with:
- Employment in agriculture, forestry and fishing – EmpAFF (-0.639),

- Infant mortality rate – InfMorRate (-0.755),
- Fertility rate – FerRate (0.734).

The higher value of all factors leads to higher comparative advantage of regions.

Consequently, regions are classified into six groups - clusters based on created factors of comparative advantages. Frequency in each cluster and also average value of variables for each cluster are shown in Table 3.

**Table 3: Average values of variables for each cluster**

Variable	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
Frequency	3	16	7	29	23	6
GFCF	8258,3	2995,7	7109,8	5163,2	1789,4	944,3
GERD	895,4	207,2	1619,2	507,4	90,8	12,3
R&DPer	4,5	1,3	3,2	1,4	0,9	0,3
R&DRes	3,2	0,8	1,9	0,9	0,6	0,2
PatApp	32	16,8	222,7	139,6	9,4	0,4
HRST	41,5	24,7	35,9	29,6	21,9	13,5
EmpRate	69,3	63,9	72,6	71,7	56,8	58,7
UnempRate	5,7	7,9	5,5	5,9	11,6	7,2
EmpTKISec	50,2	46,2	49,5	47,5	39,1	43,2
EmpAFF	0,3	4,1	0,6	1,4	3,3	15,1
EcAcRate	73,5	69,3	76,9	76,3	64,3	63,5
PerTerEd	32	19,3	29,3	22,5	19,5	12,2
LifeExp	78,7	77,5	81,3	80,6	75,9	73,5
InfMorRate	4	3,6	3,4	3,3	5,4	10,5
FerRate	1,4	1,5	1,4	1,4	1,3	1,3
WeekHourWork	40,3	40,5	35,6	36	40,1	40,2

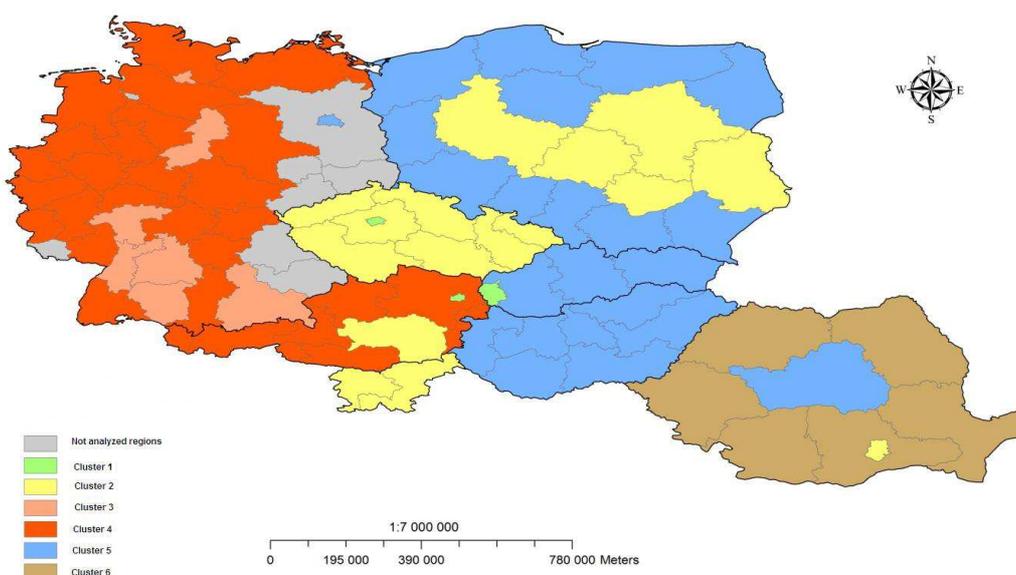


First cluster (Figure 2 – green colour), specified as “The highest quality of human capital, good labour market and the lowest employment in agriculture, forestry and fishing”, consists of 3 regions – SK01:Bratislavský kraj, CZ01:Praha and AT13:Wien. In those regions capital city of Slovak Republic, Czech Republic and Austria is situated. They together achieve the highest average value of Gross fixed capital formation, Total R&D personnel, Total R&D

researchers, Human resources in science and technology, Employment in technology and knowledge-intensive sectors and Population aged 25-64 with tertiary education attainment (Tab. 3).

Second cluster (Figure 2 – yellow colour), classified as “Slightly low quality of human potential and slightly bad labour market” is created from almost all Czech regions (except region CZ01:Praha), 5 Poland regions (PL11:Lódzkie, PL12:Mazowieckie, PL31:Lubelskie, PL33:Swietokrzyskie a PL41:Wielkopolskie), both Slovenian regions, Austrian youngest and smallest region AT22:Steiermark and Romanian region RO32:Bucuresti – Ilfov. Those 16 regions together achieve the highest average value of Fertility rate and Average number of usual weekly hours of work in main job.

Third cluster (Figure 2 – pink colour), specified as “The best labour market and the highest innovative potential” contains only 7 German regions (DE11:Stuttgart, DE21:Oberbayern, DE91:Braunschweig, DE12:Karlsruhe, DE14:Tübingen, DE60:Hamburg and DE71:Darmstadt). Those regions have the best position in terms of comparative advantages. They together achieve the highest average value of Total intramural R&D expenditure, Patent applications to the EPO, Employment rate, Economic activity rate, Life expectancy and the lowest average value of Average number of usual weekly hours of work in main job.



**Figure 13: Clusters of regions**

Fourth cluster (Figure 2 – red colour), classified as “High innovative potential and slightly good labour market” consists of 22 German regions and 7 Austrian regions. Those regions together achieve the lowest value of Infant mortality rate.

Fifth cluster (Figure 2 – blue colour), specified as “Low quality of human potential and the worst labour market”, is created from all Hungarian regions, 11 Poland regions, German region DE30:Berlin, Romanian region RO12:Centru and 3 Slovak regions (SK02:Západné Slovensko, SK03:Stredné Slovensko a SK04:Východné Slovensko). Those 23 regions together achieve the highest value of Unemployment rate and the lowest value of Employment rate and Employment in technology and knowledge-intensive sectors.

Six Romanian regions (RO11:Nord-Vest, RO21:Nord-Est, RO22:Sud-Est, RO31:Sud – Muntenia, RO41:Sud-Vest Oltenia a RO42:Vest) create sixth cluster (Fig. 2 – brown colour),

which is the least competitive. Sixth cluster is specified as “The lowest quality of human capital, the worst demography and the highest employment in agriculture, forestry and fishing”. These Romanian region together achieve the worst average value for almost all variables except Employment rate, Unemployment rate, Employment in technology and knowledge-intensive sectors and Average number of usual weekly hours of work in main job.

## Conclusion

In term of comparative advantages of regions, the most important factor is “The quality of human potential”. This factor is created mainly from Gross fixed capital formation, Total intramural R&D expenditure, Total R&D personnel, Total R&D researchers, Human resources in science and technology, Population aged 25-64 with tertiary education attainment. According to us, the most effective way how improve comparative advantages of regions is invest more funds in research, science and technology and higher education of people. On the base of multivariate classification of selected regions, the large differences between regions are found. Huge differences are especially between regions with capital city and other regions of Slovak Republic, Czech Republic and Romania. The most competitive regions according comparative advantages are German regions, situated in cluster “The best labour market and the highest innovative potential”. 6 Romanian regions, situated in cluster “The lowest quality of human capital, the worst demography and the highest employment in agriculture, forestry and fishing” are least competitive.

## Acknowledgements

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# Analysis of Taiwanese population and its age structure

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Alexandra KESIDISOVÁ

## Abstract

The article deals with the analysis of Taiwanese population, which is presented using age pyramid for years 1992 and 2012 – i.e. first and last surveyed years. It also analyses its age structure which is described using convergence analysis of individual administrative districts of Taiwan and is subsequently displayed by cartogram. Further, a prediction of further development of mentioned indicators was carried out using extrapolation. Results of analyses indicate that in surveyed period Taiwanese population has been aging and this status shall continue in future years.

## Keywords

Taiwan, demographic analysis, regression line, convergence analysis

## Introduction

Evaluation of demographic development, whether of towns, cities or whole countries, is a necessary precondition for public administration every time it makes a decision about development of its area. By means of demographic analysis it is possible to obtain valuable information, which can be applied subsequently when dividing financial and other sources. Current demographic data thus become an important part of development plans, socioeconomic studies and other strategic documents.

The most valuable part of the whole analysis is setting prognosis of future demographic development. However, one has to be aware of the fact that there is no prognosis that would be able to take account of all economic, social, political and natural factors, and therefore it can never be absolute. Yet, it provides important information on whose basis it is possible to decide, whether it is for example necessary to create supportive programs to increase birthrate or to pay higher attention to prevention of specific serious disease in the population.

Official prognosis for whole Taiwan is published regularly by National Development Council together with Taiwanese Statistical Office through their web pages. National Development Council also deals with tasks related to planning, designing, coordination, review and assessment of global development of the nation.

Taiwan, more likely known as the Republic of China, was founded in 1902. Its name is composed of two signs; first “tai” meaning terrace, and second “wan” meaning bay<sup>3</sup>. After 1949 when Chinese Communist Party founded People’s Republic of China on the mainland, government of the Republic of China laid by Kuomintang moved to Taiwan. It maintained control of the island and also of other islands, such as Penghu, Kinmen and Matsu. Since this time the above mentioned regions on both sides of Taiwanese Strait have been administered

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separately and naturally they have undergone different development. Its' political development have transformed the island into independent democracy.

### Study objectives and method

The objective of this study is to provide demographic analysis of the Republic of China during years 1992 and 2012, with primary focus on the analysis of Taiwanese population and its age structure. Furthermore, on the basis of knowledge of mentioned indicators estimation of future demographic development of Taiwan was enabled. For this prediction a method of extrapolation was used.

As sources of information were used data freely available from the following web pages: National Statistical Office of Taiwan, Ministry of Interior, National Immigration Agency, Ministry of Foreign Affairs, Ministry of Health and National Development Agency. Some specific data were requested via email communication from relevant offices. This communication was smooth, quick and effective. The data were further processed using Microsoft Office Excel and ArcGIS programs. Development of monitored indicators was described by means of their fit a regression line. For indicators involved in the structure of the population a convergence analysis was used.

### Results

Island of Taiwan was divided in administrative reform in 2010 into 14 counties, 3 provincial cities and 5 special municipalities.

**Table 1. Development of administrative divisions of Republic of China**

County		Special municipality	Provincial City
Yilan County	Chiayi County	New Taipei City	Keelung City
Taoyuan County	Pingtung County	Taipei City	Hsinchu City
Hsinchu County	Taitung County	Taichung City	Chiayi City
Miaoli County	Hualien County	Tainan City	
Changhua County	Penghu County	Kaohsiung City	
Nanton County	Kinmen County	Since 25. December 2010 ě 2010	
Yunlin County	Lienchiang County		

**Source: Adapted from Ministry of Interior**

First official census was taken in Taiwan seven years after the resettlement of the government of the Republic of China to island, i.e. in 1956. In monitored period there was three times observed more than ten percent increase of the population as can be seen from chain index in Table 2.

**Table 2. Population of the Republic of China in census years from 1956 to 2010 and its development between individual censuses (in %)**

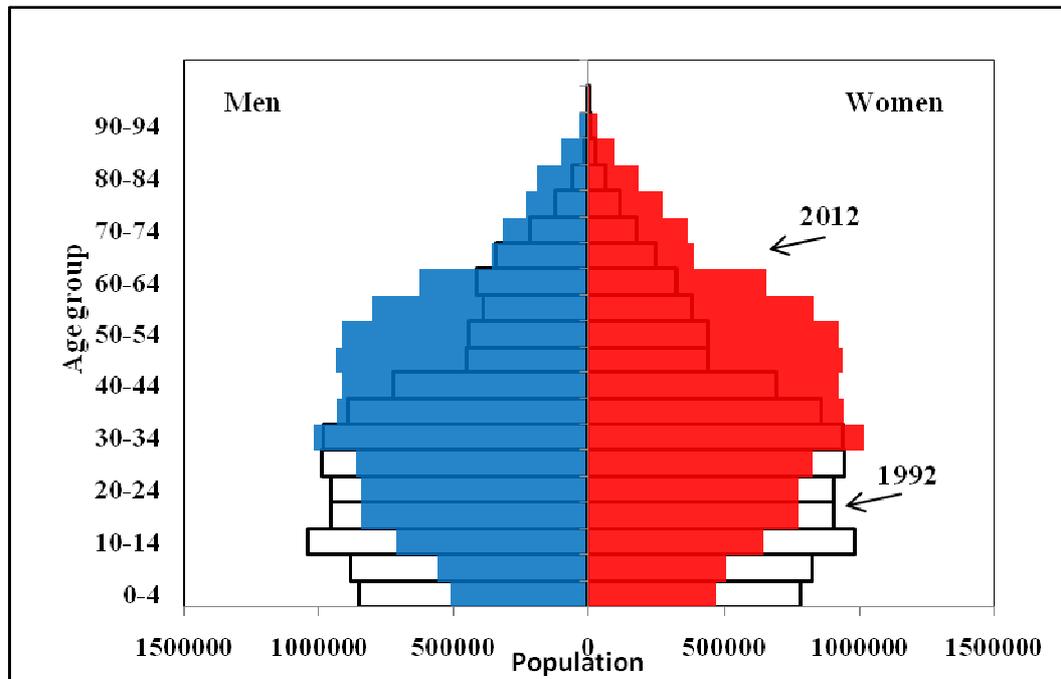
	1956	1966	1980	1990	2000	2010
<b>Population</b>	9367661	13505463	18029798	20393628	22300929	23123866
<b>Chain index</b>	100,0	144,2	133,5	113,1	109,4	103,7

**Source: Adapted from National Statistic**

Last census registered only 3,7 percent growth in Taiwanese population. This rapid growth of the population recorded from the second half of the twentieth century can also be explained by a significant economic growth of the whole country, which is naturally connected to increased living standard of Taiwanese inhabitants. Concurrently, present lower increases are a consequence of changes of values as well as changes in Taiwanese life style that does not

support traditional role of family and children. Second reason for lower increase might be seen in recent more hospitable relations with People's Republic of China and in higher migration rate back inland. To sum up, Taiwanese population has grown between years 1956 and 2010 by almost 14 millions.

Age structure of Taiwanese population is presented graphically in Figure 1, which shows the structure of the population divided into age groups by five years periods, analyzing men and women individually.



**Figure 1. Age pyramid of Taiwanese population for years 1992 and 2012 (to 31.December 2012) Source: Adapted from Statistical Yearbook of Interior 2013**

The pyramid suggests that during sixties and seventies of the last century there was a population boom in Taiwan<sup>4</sup>. In 1992 the largest age group was aged between 10 and 14 years, this group of adolescents was born by the end of seventies, when Taiwan experienced great success not only on the economic<sup>5</sup> field but also on the political one. Second most numerous group in 1992 was composed of persons aged between 25 and 29 years and tightly behind is third age group between 35 and 39 years, which is formed above all by parents of already mentioned group of adolescents. This group is composed by people born at the end of fifties in the last century.

In the last surveyed year, i.e. in 2012, the most numerous age group was composed of persons between 30 and 34 years, who are people that constituted the largest group in 1992. Second and third most numerous age groups were people aged between 45 and 49 years and between 50 and 54 years, who occupied remaining two most numerous positions in 1992 and it remained same twenty years later.

Taiwan faces aging population as well as majority of other highly developed countries, which can be illustrated by the above mentioned age pyramid. According to data from 2009 the Republic of China together with Germany held first place in having the lowest birthrate in the world. Lifestyle, shared values and financial situation of young families do not favor giving rise to babies and many young couples have decided not to have children at all. The lowest

<sup>4</sup> BAKEŠOVÁ IVANA, Jiná Čína, 1992.

<sup>5</sup> Taiwan obsadil druhou příčku v rychlosti ekonomického růstu, hned po Singapuru (BAKEŠOVÁ Ivana, FÜRST Rudolf, Čína ve XX. století, 2003, 218 s.).

birthrate was recorded in Taipei City. One of the reasons is that Taipei is the most expensive place for living in Taiwan. The government in Taipei is aware of this unpleasant situation and therefore it introduced a project “Have a care-free pregnancy” in 2011. This fund is aimed at couples who are expecting a child. It also provides funding for the purposes of healthcare during pregnancy and also for the first two years of compulsory education of pre-school children in kinder gardens, i.e. until they reach the age of five. Even after reaching five years of the offspring it is possible to draw money from other established programs. For example, during their basic schooling children can stay at school until late afternoon hours enabling their parents to dedicate themselves to their working commitments without problems. In compliance with regulations that guarantee gender equality by the employment law, all companies with more than 250 employees must establish a baby care facility or implement such company policy that subsidize childcare<sup>6</sup>.

**Table 3. Indicators of age structure of the population of the Republic of China in selected years: pre-productive component (0–14 years), reproductive component (15–64 years), post/productive component (65+ years).**

Year	Mean age	Proportion of pre-productive component (%)	Proportion of reproductive component (%)	Proportion of post-productive component (%)	Ageing index (%)
1992	28,2	25,8	67,4	6,8	26,4
2002	33,1	20,4	70,6	9,0	44,2
2012	38,4	14,6	74,2	11,2	76,2

**Source: Adapted from Statistical Yearbook of Interior 2013**

Development of the mean age of the population of the Republic of China has changed significantly in surveyed period as is shown by Table 3. In the last twenty years the mean age increased significantly, that is by 10,2 year. While in 1992 the mean age was 28,2 years, in 2012 it is 38,4 years. The value of the indicator differs between genders. In 2012 the mean age for male population was 37,9 years, and 39,1 years for female population. This difference can be also seen in the age pyramid (see Figure 1), and it gives evidence that from 35 years of age women prevail in the population. It is most apparent in older age groups and is caused by the general excess mortality of men in all age groups.

During surveyed period there was also a considerable change of the relation between the pre-productive, reproductive and post-productive components in Taiwan. The most significant change may be noticed in generation between 0 and 14 years, which showed decrease by 11,2 percent. The established trend of child-free couples was demonstrated here and thanks to it proportion of this component decreased significantly. The other two components display moderate increase. Proportion of reproductive component increased by 6,8 percent and proportion of post-productive component increased by 4,4 percent. Development of all economic generations shows that there will be decrease in economically active population in the future. Gradually we face progressive aging of population. This phenomenon is seen as negative not only from the demographic point of view but also from the economic one.

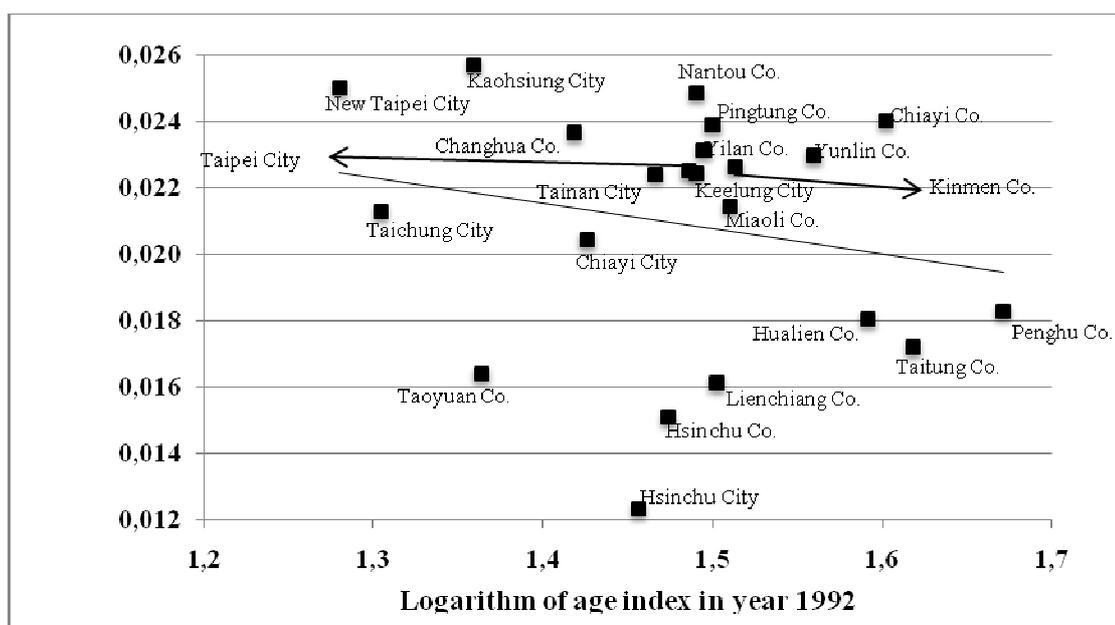
Ageing index<sup>7</sup> refers to negative development of age structure of Taiwanese population in the surveyed years of 1992 and 2012. Since 1992 when the value of the indicator was rather low (26,4%) the ageing index grew significantly and in the 2012 it reached its value of 76,2 percent. During surveyed twenty years there has been a rapid increase of value of this indicator by 49,8 percent.

<sup>6</sup> Have a Care-free Pregnancy, Taipei Yearbook 2012, 2011.

<sup>7</sup>  $is = \frac{S(65+)}{S(0-14)} \cdot 100$ , where  $S(65+)$  is population in age group 65 and more years and  $S(0-14)$  is population in age group 0–14 years. Resulting indicator is presented in percents.

Higher increases were taken down from 2008, when there was a rise of 3,6 percent between 2008 and the following year 2009. The increase of value was similar in the following year. There was a biggest rise of 4 percent in the value of ageing index between year 2011 and 2012. More and more people in post-productive age correspond to hundred people of pre-productive age. Again it can be confirmed that population of the Republic of China is aging as well as population in majority of developed countries.

On the basis of this fact a convergence analysis of ageing index of all administrative divisions in Taiwan was carried out. It will show whether the ageing index is developing similarly in individual administrative districts.



**Figure 2.  $\beta$ -convergences of administrative divisions of Taiwan of ageing index between 1992 and 2012**

**Source: Adapted from Statistical Yearbook of Interior 2013**

The equation of regression line<sup>8</sup>:  $\log \bar{k} = 0,0323 - 0,0077 \log y_0$

Coefficient of determination: 0,042

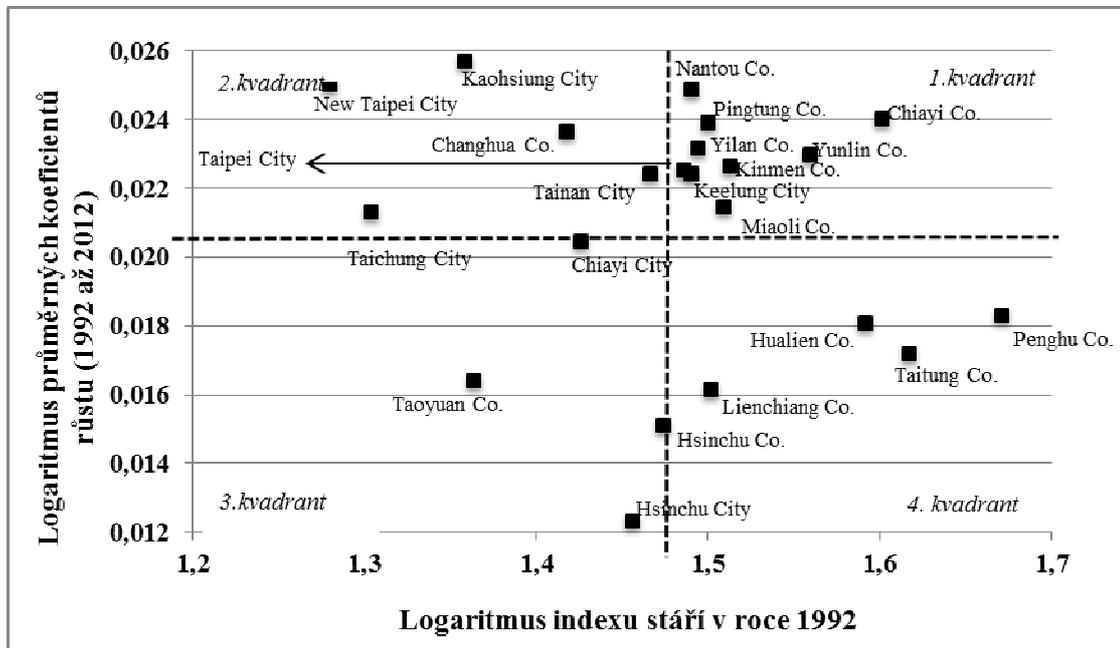
Direction of regression line acquires negative values, thus convergence process is confirmed. Final value of coefficient of determination shows very weak, insignificant convergence. Therefore it is convenient to perform analysis of scatter plot.

There were many administrative districts on the island, which had similar initial values of logarithm of ageing index; however, their logarithm of mean coefficients of growth was different. Among them were following counties: Yilan, Miaoli, Nantou, Kinmen and Lienchiang together with provincial city Keelung. The highest value of mean coefficient was found in special municipality Kaohsiung City (0,026). The lowest value was found in the provincial city Hsinchu City (0,012). The highest value of initial status was found in Taitung County (1,618), the lowest in the special municipality New Taipei City (1,280).

Interrupted lines at the Figure 3 mark arithmetic means of logarithms of initial status and mean coefficients of growth and they divide whole diagram into four quadrants. Individual

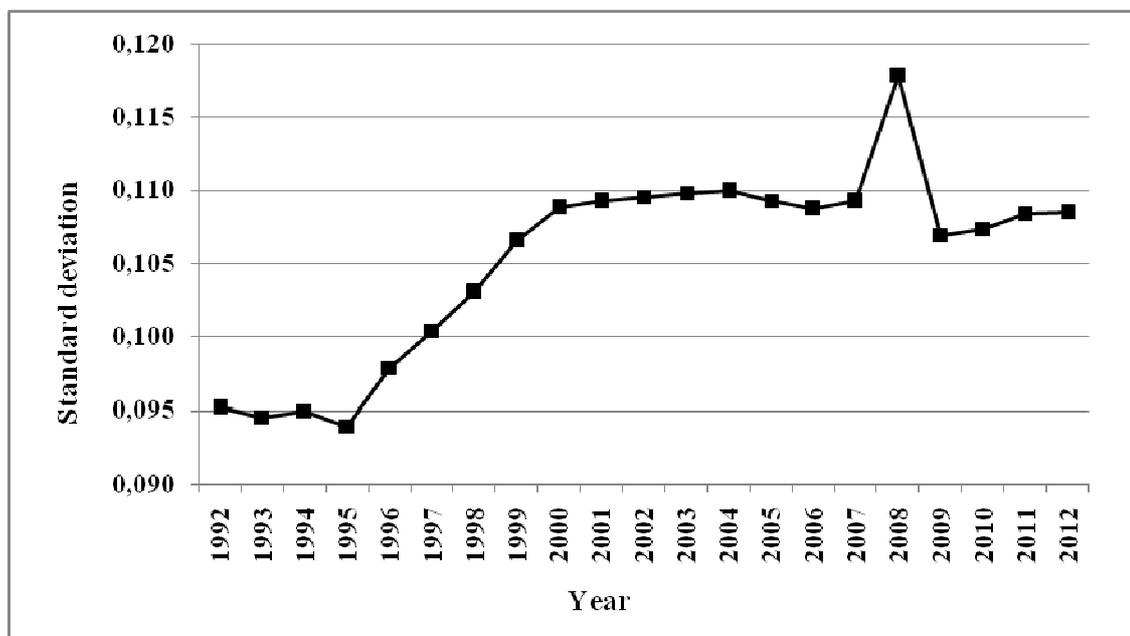
<sup>8</sup> General form of regression line is  $\log \bar{k} = \alpha + \beta \log y_0$ . If  $\beta < 0$ , prevailing tendency is convergence, if  $\beta > 0$ , prevailing tendency is divergence and if parameter  $\beta$  is approximately equal to zero, it is none of the two tendencies (MINAŘÍK Bohumil, BORŮVKOVÁ Jana, VYSTRČIL Miloš, Analýzy v regionálním rozvoji, 2013).

administrative divisions of the island are divided into quadrants according to position of their values, i.e. logarithm of ageing index in 1992 and logarithm of mean coefficient of growth, in relation to values of arithmetic means (i.e. whether the values are above average or below average).



**Figure 3. Scatter plot of Taiwanese counties for ageing indexes between 1992 and 2012**

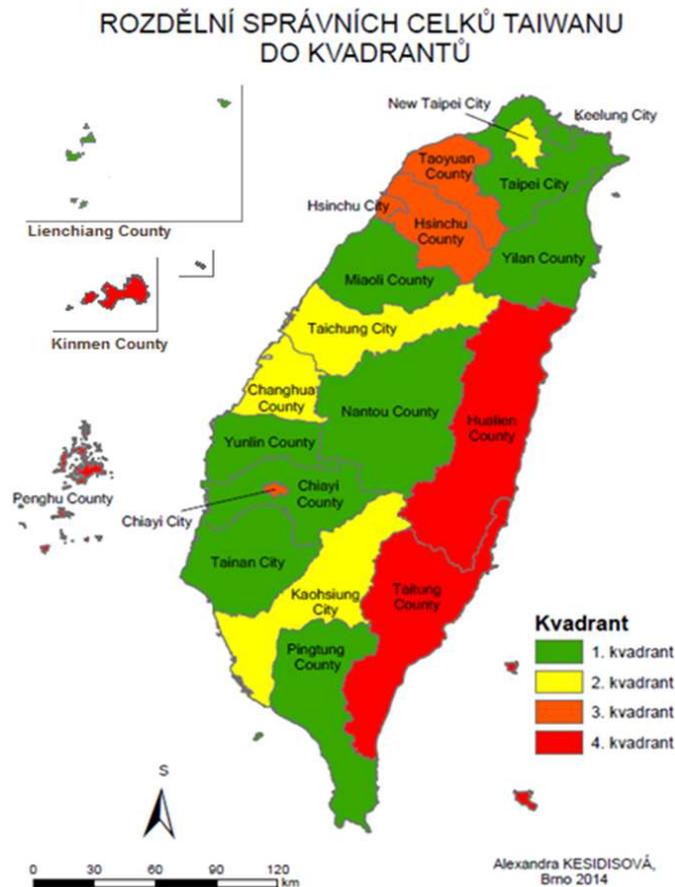
*Source: Adapted from Statistical Yearbook of Interior 2013*



**Figure 4. Sigma convergence of ageing indexes in Taiwan in years 1992 to 2012**

*Source: Adapted from Statistical Yearbook of Interior 2013*

Results of sigma convergence, recorded on Figure 4, in surveyed period demonstrate rather divergence in years from 1995 to 2004, when there is a growth of values of standard deviation. Then there is monitored a slight decrease, which is interrupted by year 2008. In this year there was an abrupt increase followed by immediate decrease.



**Figure 5. Division of all Taiwanese administrative districts into quadrants according to results of analysis of scatter plot of ageing index**

**Source: Adapted from Statistical Yearbook of Interior 2013**

Figure 5 describes development of individual administrative divisions of Taiwan, which are on the basis of scatter plot divided into four quadrants. First quadrant consists of counties, which proved above average initial value and above average rate of growth of ageing index. Counties that fall into second quadrant have below average initial values and show above average rate of growth. In relation to ageing index it is a negative phenomenon, as initial values of ageing index were rather favorable, but during surveyed period was observed fast aging of local population. Third quadrant refers to counties, which have below average initial value together with below average rate of growth of value of ageing index. In the fourth quadrant there are administrative districts which have above average initial values and below average rate of growth, which can be perceived in relation to ageing index as a rather favorable phenomenon, as this population is not aging too fast.

Last step of the analysis was estimation of future development based on knowledge of past development that is extrapolation. Collected data were fitted to a regression line, in our case with parable, which was further extended into future years. Table 4 presents equation of regression line and forecast of future development for selected indicators for years 2013, 2015 and 2020. The results suggest that both surveyed indicators will grow in the future.

**Table 4. Equation of regression function, regression type and prediction of selected indicators for years 2013, 2015 and 2020**

Indicator	Equation of regression function	Regression type	2013	2015	2020
Mid-year population in calendar year	$T = 22296997,740 + 134216,548 t - 3132,920 t^2$	Parabolic	23394297	23512349	23697830
Ageing index (%)	$T = 44,919 + 2,387 t + 0,068 t^2$	Parabolic	79,4	87,4	109,9

**Source: Adapted from Statistical Yearbook of Interior 2013, RIS, National statistics**

### Conclusions:

The study dealt with the analysis of selected indicators of the Republic of China that is not only in surveyed period between years 1992 and 2012 but also with future development of these indicators through the method of extrapolation. Mean age of population in surveyed period grew, it increased from initial value of 28,2 to value of 38,4 years. Ageing index also rose. In 1992 its value reached 26,4 percent and at the end of 2012 it reached value of 76,2 percent. Such increase of number of aging people is alarming and it is clear that population in Taiwan is aging. For this indicator a convergence analysis was carried out analyzing individual administrative divisions of the island. The fastest aging can be seen in special municipalities of New Taipei City, Taichung and Kaohsiung. Changhua is among the fastest aging counties.

Assessment of demographic data from surveyed period of 1992 and 2012 enabled to create a demographic prognosis using the method of extrapolation, which was carried out until 2020. Extrapolation was carried out for such a short period as its predictive value for far future may be significantly distorted, since prediction is constructed on the basis of requirement of constancy of current tendencies of development of given phenomena.

Among main findings is a fact that Taiwanese population is aging and this process will continue into the future. Some administrative divisions are aging faster, others more slowly. Fast aging regions are to be found in traditional regions in the East of the island, where a significant outflow of young people to more developed regions can be noticed. Unless Taiwan does not deal with aging of its population, the number of senior people will keep growing. On the grounds of these facts local administrative districts should tailor their planning to this development by adjusting and building more facilities for growing number of economically non-active people such as hospitals for long-term ill and/or senior care facilities etc.

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# Lifelong Learning and Its Impact on Job Position of Workers in Firms

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## Abstract

The aim of the paper is to characterize the role of lifelong learning in modern society, tasks performed within the education system, and to find to what extent is lifelong learning able to contribute to the development of companies and society. The new concept of the lifelong learning is much wider and more comprehensive than the current system of the formal education. It includes all learning activities and learning throughout the life. The importance of education takes an immense role in learning during the working processes in companies. The methodology of the paper is based on the comparative analysis of the causes and effects of lifelong learning to companies and society and will include research on participation in the lifelong learning according to the type of a job. Job characteristics such as an industry and an occupation strongly influence participation in the lifelong.

## Keywords:

lifelong learning, company, education system, European Union, knowledge society

## Introduction

The concept of the lifelong learning has become a basis for the current education policy in the most developed countries. The lifelong learning contains an answer to the rapid growth of knowledge and information, and to the integration possibilities of people in a society. The challenges and changes in a technology, in every economy and in a society require a constant acquiring of new skills, and also the ability to accept permanent changes. Investing in the lifelong learning is necessary, especially when a country needs to improve skills of a workforce. D. Checchi stated: „As a consequence, the returns on education are not restricted to entry into the labour market, but appear along the entire working life of individuals” (Checchi, 2006). Therefore the lifelong learning is closely connected to the labour market of every country and economy. “Lifelong learning's cornerstones are laid at school. Especially teachers' behaviour is central. As of yet, there is no instrument to measure teachers' efforts in promoting aspects associated with lifelong learning within their students” (Klug et al, 2014).

The globalization and the development of new technologies have expanded international markets for goods and services. The result is a fierce competition in skills, particularly in fast-growing and high-technology markets. Therefore more people should adapt to changes in technologies and to the needs of the changes in the labour market. As The Ministry of Education in the Czech Republic states: “More than 40% of adults participate in formal and/or informal education across the OECD countries. This proportion ranges from more than 60% in New Zealand and Sweden to less than 15% in Greece and Hungary” (Ministry of Education, 2012).

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An extension of the existing education systems is not enough for further educational sectors. A government should take a completely different view of the entire educational systems including its close links and relationships with the surrounding world. The Ministry of Education in the Czech Republic reacts to that recommendation as: "The 38% of young people aged between 25-34 years had participated in formal and/or informal education in 2007; and 22 % of people aged between 55-64 had participated in formal and/or informal education in 2007. The similar average values achieve the other OECD countries and the countries of the EU21" (Ministry of Education, 2012). Due to the OECD's glossary of statistical terms the EU 21 countries are all EU countries prior to the accession of the 10 candidate countries on 1 May 2004, plus the four eastern European member countries of the OECD, namely Czech Republic, Hungary, Poland, and Slovak Republic.

## **Materials and Methods**

The aim of this paper is to characterize the role of lifelong learning in modern society, as well as characterize tasks performed within the education system, and to show to what extent is lifelong learning able to contribute to the development of companies and society. The main research method used when writing the paper is comparative analysis. We also conducted research on lifelong learning of workers in companies - fast food chains.

### **The Development of the Lifelong Learning**

The development of the education systems in the world has led not only to the quantitative growth of its institutions, but also to the qualitative, structural and content changes in the education. All these factors have led to the beginning of the lifelong learning.

The issues of the lifelong learning are not only a theme for a certain countries such as Czech Republic, but also for the whole Europe. For example, the European Union had already published "White Papers" in 1995. The papers included the basic statements about the teaching and learning in the European countries. The essentials of the lifelong learning were the result of processing these papers by the European Commission in 1997. Moreover, the year 1996 was announced as a year of the lifelong learning in the European countries.

The European Commission expressed its position for the lifelong learning particularly in the Memorandum of November 2000. According to this Memorandum, the European countries are moving towards a knowledge-based economy and society. More than ever before, the access to new information and knowledge is the essential key for the Europe countries' competitiveness, the boosting employment and the adaptability of the workforce. The memorandum also states that people of Europe do live in a complex changing social and political world (Vlk, 2004). The existence of changes also proves the last political issues of March 2014 in the certain European countries (the discussion about the probable independence of Scotland, Venice, and Catalonia). Despite of the permanently changing world, modern individuals have better opportunities to plan their own lives than individuals in the last centuries. At the same time they are expected to be actively involved in the life of society, mainly by accepting cultural, ethnic and linguistic differences of other nations. And that is the reason why, the education in its broadest sense is the primary tool to identify and cope with all these challenges.

The lifelong learning was also analysed in the Berlin's memorandum (the Bologna process) in 2003. The lifelong learning, according to the memorandum should become an integral part of all European universities. And every person, according to the Bologna process, should have an opportunity to participate in the lifelong learning and in the higher education system of Europe due to his/her wishes and abilities (Šrédli, Kopecká, 2012).

In OECD countries 27% of adults aged 55-64 and 50% of young people aged 25-34 years have participated in formal and/or non-formal education (Ministry of Education, 2012). People 25-34 years are nearly twice more likely to participate in the lifelong learning than older people (aged 55-64 years). Differences between males and females participation in the formal and/or non-formal education are very small and do not exceed 5%. However, the

participation rate in the lifelong learning of women is higher in such countries, as Canada, Finland, Sweden and the United States. The participation rate in the lifelong learning of men is higher, for example, in the Czech Republic, Germany and the Netherlands (IIE, 2010).

## **Results and Discussion**

### **Lifelong Learning at Universities**

The main authors of the report on the development of the European educational area discuss issues of the lifelong learning in universities. This report was written by Sybille Reichertova and Christian Tauch in 2003. They stated that the debate on the lifelong learning had focused on the two main themes. Firstly, the lifelong learning offers variety of courses for candidates from almost all possible industries. Secondly, the lifelong learning tries to satisfy an extendable demand of participants with different abilities and educational foundations. Generally, we can talk about the lifelong learning as a tool of knowledge which can be implemented in all stages of a person's life and in all his/her possible industries of working.

The OECD statistics illustrates that adults with a finished higher education are more likely to participate in a further formal and/or non-formal education than people without any finished education. Only 14% of total population participate in education systems for older people, while 65% of total population participate in a tertiary education for young people, the other part of population prefer not to participate in education systems (Ministry of Education, 2012). The average statistics for the OECD countries states, that people with a tertiary education are more likely to participate in other learning activities (with a probability up to three times) than people without any tertiary education. As for the Czech Republic, 62% of graduated people participate in the lifelong learning, 37 % of people with finished secondary education participate in the lifelong learning and 15% of people with finished primary education participate in the lifelong learning in the country. And the percentage of young people exceeds the percentage of adult and older people (Ministry of Education, 2012).

As it was mentioned earlier, all European Union countries are involved in the so-called "Bologna process". This process states, that the lifelong learning at the tertiary level should have a transparent and a comparable system. The major aims of the process are the similarity of the undergraduate, masters and the doctoral educational systems; and the implementation of the European Credit Transfer and Accumulation System (ECTS). The survey also settled that most of the countries have already started the developing of the international and national strategies for the lifelong learning. The survey had also identified countries with the highest percentage of universities with developed strategies for the lifelong learning. These countries are the Czech Republic, Bulgaria, France, Iceland, Slovakia and the United Kingdom.

There are other interesting results, which come from the survey. The majority of students' organizations stated that there were changes in the attitude of universities to the lifelong learning in the past three years. There are now more available courses even for so-called non-traditional students meaning older students or students who are already working. For example, there were no structural changes in terms of teaching in the tertian education for the last decade (Reichert and Tauch, 2003). Despite the support of governments of the United Kingdom, France, Finland and others, many universities are still regretting the acceptance of the lifelong learning. It is widely spread among the European universities to prefer to keep a classical way of teaching and traditional types of doing a research.

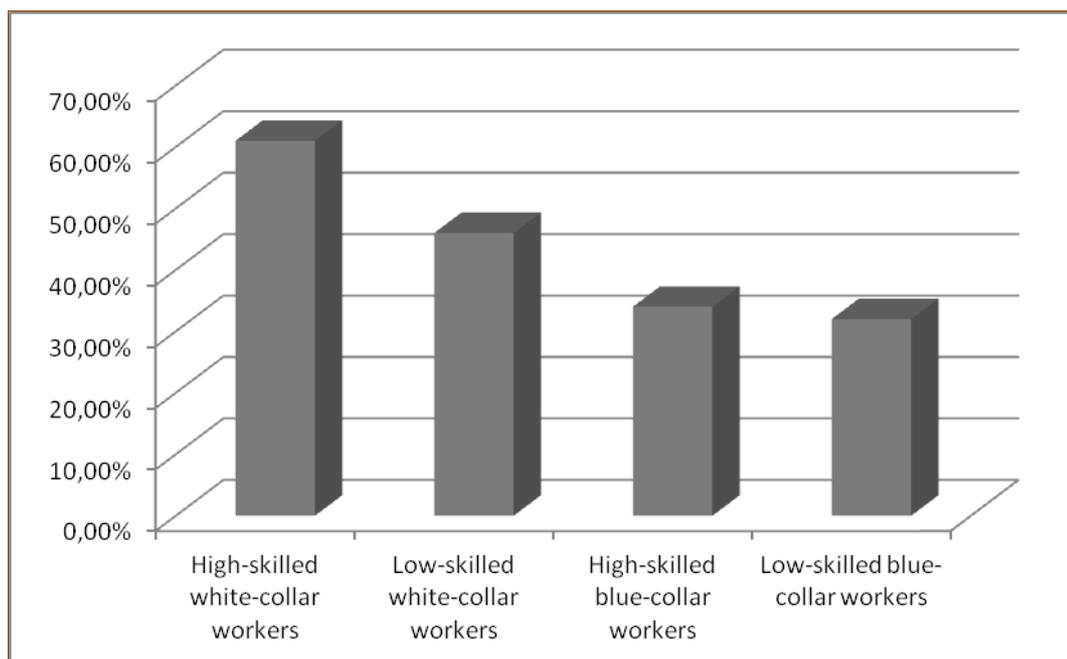
The development of the lifelong learning in universities reflects the majority of market needs. At the same time the lifelong learning is the result of the enhanced communication among all participants of a society. Two thirds of the European universities state that they offer courses for the lifelong learning mainly for companies. Almost half of the universities prepare shared programs. The shared programs are a widespread practice in many

countries, for example in Finland, Iceland, Sweden, Norway, Estonia, Ireland and the UK. However, it should be also noted that the approach of the lifelong learning as “a direct response to market needs” often meets with a critical attitude of academics and universities (Vlk, 2004).

### The Concept of the Lifelong Learning for Companies

The new concept of the lifelong learning is much wider and more comprehensive than the current system of the formal education. Firstly, it includes all learning activities and learning throughout the life. Secondly, it assumes that learning activities might be a part of many surroundings (not only as a formalised process). For example, learning activities might be held at home, at workplace, inside a community and a society. Moreover, the importance of education takes an immense role in learning during the working processes in companies (Šrédl and Kopecká, 2012).

Job characteristics such as an industry and an occupation strongly influence on participation in the lifelong learning. For example, across the OECD countries, 61% of people belong to the highly skilled occupations or “high-skilled white collar workers” which participate in the lifelong learning during the whole life; 46% of the low-skilled occupations or “low-skilled white collar workers” participate in the lifelong learning. Only 34% of high-skilled manual occupations (“high-skilled blue-collar workers”) participate in the lifelong learning; and only 32% of low-skilled manual occupations (“low-skilled blue collar workers”) participate in the lifelong adult education (IIE, 2010).



**Fig. 1 : Participation in the lifelong learning according to the type of a job in 2008 (IIE, 2010)**

### Own Research in Fast Food Restaurants

To verify whether the workers of fast food restaurants are taking a part in lifelong learning, a survey was conducted in five randomly selected restaurants. The survey was done in KFC and McDonald, where there were interviewed 90 workers of the two groups (white collars – 15 persons, blue collars – 75 persons). Based on the interviews, it was found that currently 51% of all 90 workers participate in lifelong learning. In case of white-collars due to their managing positions, which assume higher education, 73% of workers participated in business courses of formal education. In the case of blue-collars who are recruited from low-skilled workers (mostly students and people who cannot find another

better paid job) it was found that 47% of these labourers participate in lifelong learning. It is significantly more than is stated in average values of OECD statistics. It is due to their efforts to improve their future employment status. Many of them also participate in formal education as students attending secondary schools and universities with the prospect of future change of employer.

Nowadays, the main source of information is no longer a school. People have many other sources of information, for example, media, electronic resources, newspapers, books. Therefore there need to be a change in the main mission of the school as a traditional transfer of knowledge. And one of the main missions of the school today is searching for new methods how to teach students to manage enormous information flows, how to use and process the knowledge. The information is also drawn from Wikipedia or social networks, such as Facebook, Twitter and LinkedIn. We can find a large number of other types of social networks; however, these are the most effective ones for the needs of the lifelong learning. Firstly, they contain the majority of needed information and they are widely known among the globalised society. Secondly, the potential partners, employees and employers also try to follow these networks for marketing, work purposes and social life.

As for the macroeconomic indicators in the OECD countries, the average payments made by the companies there for the lifelong learning for its employees were 0.4% of total GDP in 2007. The average levels of investment in the companies for the lifelong learning were higher for men than for women and grew along with the educational attainment of a particular worker. In the Czech Republic, the total training expenditures of the companies for its employees on average were 0.39% of total GDP of the country. And in the European countries, the total training expenditures of the companies for its employees on average were 0.35% of total European GDP (Ministry of Education, 2012).

### **Evaluation of the Analysis**

Among the roles of an every school remains the ability to provide a systematic and balanced structure of basic concepts and relationships that will allow people to use learned practises in future. Generally, younger people and people with a higher education are looking for other educational activities and possibilities. The 52% of adults participates in formal and/or informal trainings and educational activities. The education possibilities and preferences are different in the European countries. For example, more than two-thirds of the total population aged 25-64 remains outside the educational systems in Greece, Hungary, Italy, Poland and Portugal. Whereas two-thirds of the total population aged 25-64 participates in the educational systems in Finland, the Netherlands, Sweden and the UK (IIE, 2010). The statistics proves that information of the lifelong learning systems is equally accessible for old and young population. That is why the participation in the lifelong learning might depend on preferences of a person, habits and traditions for the educational system within a certain country.

Countries with a higher level of participation in a formal or/and informal lifelong learning usually invest a relatively higher percentage of total GDP in the learning programs than countries with a low level of participation.

The developed countries of Western Europe have made the significant steps to arrange the equal access of all people for the education. Educational systems have undergone structural and curricular reforms that significantly contributed to the fact that almost all young people have successfully finished secondary and higher education. We can state, that the access to the higher education is more open nowadays. It is available for almost every person, and moreover it allows combining the job with the learning experience. Therefore the developed countries have opened an access to the lifelong learning. Nowadays we can see the significant expansion of educational opportunities and growth of institutions for higher and lifelong learning.

This year maturas in the Czech Republic, on the other hand, showed a decline of productive skills of students. In the spring of 2014 70,236 pupils attended the first attempt of matura exams; nearly ten thousand entries did not attend it for various reasons. 18.7% of students

have not managed state maturas in the spring of 2014; their knowledge was lower compared to the last year in all subjects. It is the worst result since 2011, when the state matura was introduced. Apart from mathematics a German language was the worst. This year so far surpassed even the worst year 2012, when 18.2% of students did not succeed (Czech News Agency, 2014). 44.2 percent of high school students who are repeating or trying for the first time did not make matura tests in the autumn and the worst results were again from the mathematics; 47.2 percent of students failed it. The main problem is not an annual deterioration, but too high a percentage of failures. It is inefficient and uneconomical, and the cause is according to the opinion of experts in fact that there are too many students in high schools including vocational schools in the CR (Czech News Agency, 2014). These unsuccessful students will be able to complete their education later in the framework of lifelong learning.

## **Conclusion**

The knowledge brings a fundamental change in the labour market. The success of companies and individuals depends on how far they will be able to cope with the ongoing social changes, particularly changes caused by the globalization and the development of new technologies. Qualified people will be naturally attracted to sectors that offer the best opportunities for a career development on the labour market. In the changing world, companies, including large multinational chains, also try to react promptly, acquiring and developing the education of its employees. They need to have the balanced structure of the workforce in firms, and in order to follow the challenge of the world they implement the lifelong learning for its employees, managers, chiefs executives and manual workers. Adult education is a part of lifelong learning of every person. It is considered to be an important tool for solving problems in the world with a high market competitiveness, demographic changes, unemployment, poverty and social exclusion, which affects a large number of people in all countries.

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# The Proposal of Process Model for Strategic Management in Electronic Commerce

Veronika SVATOŠOVÁ<sup>1</sup>

## Abstract

The importance of e-commerce environment is still growing. Therefore, many research activities in this business field have been revealed. This business field offers many possibilities for the long-time success, but also many shortcomings. The most meaningful shortcoming, e.g. for the start-up e-company, is definitely highly competitive environment. This mentioned element could be reduced by creation and implementation of an effective and successful e-strategy with the help of strategic management process. The practice and research studies show that the importance of strategic process in e-commerce is deeply underestimated. Therefore, the main subject of this paper is to analyse the existing possibilities of individual views on definition and creation of strategy and its processes in e-commerce. Based on the studies of available resources, the key element and principles leading to an effective strategy in e-commerce are created. It is also characterized by the strategic management process that optimizes the function of a successful e-strategy. The main aim of this paper is based on critical analysis of current approaches that leads to the creation and implementation of a successful strategy for electronic commerce and creation an effective process model for strategic management in e-commerce. The main methods used in this paper is an analysis and synthesis of current situation about strategy and e-commerce environment, modelling of process model for strategic management in e-commerce and case study that gives information about the selected e-company and compares the theoretical process model with the real strategic processes in e-commerce. The creation of the process model is based on literature review about the issue examined, especially the theory about the e-strategy and other process strategic model and the observation of the current e-commerce environment. The theoretically created process model is suitable for developing new research theories in the issued examined and for making effective strategic decisions in practice. This model could be used for reducing the shortcomings that e-companies during the strategic process usually make. The practical part of this paper focuses on the application of this process model in practice with the help of case study. This case study focuses on the analysis of contemporary strategic management of the selected e-company. Based on personal interviews with managers of this e-company and observation of its activities in e-commerce environment, the strategic process model for this selected e-company is proposed (respecting the main principles of theoretically created process model). At the same time the main shortcomings in the strategic process of the selected company are defined and recommendations for its elimination are suggested. The results of the paper show that the created process model of strategic management in e-commerce is valid and usable in theory and practise and can offer the effective way to the creation and implementation of a successful e-strategy.

## Keywords:

e-commerce, e-strategy, strategic management, strategic process in e-commerce, strategy

## Introduction

In today's business world, the strategy represents one of the main pillars of successful entrepreneurship and competitiveness of companies. It builds on the vision and mission of the

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company with the possibility of a precise definition of long-term business goals and other objectives. The current management of companies should understand the importance of the effectively created and implemented corporate strategy. Nevertheless, what is the reality? Charvát (2006) states that the current Czech companies often significantly underestimate the importance of the long-term corporate strategy formulation; they are focused on solving the operative problem during the decision-making process because. The other problem of vague strategy inclusion in the management of the company may lie in the negative effect of benchmarking – companies lose the motivation to create its strategy with the absence of strategy in competing companies.

Sadler and Craig (2003) describe the strategy such as the intention and mission of the company as well as strengths and weaknesses, the key success factor or the sustainable competitive advantage and key decision. The strategy is understood as the complex of processes determining the aspects, by which the company achieves its objectives. Voříšek (2002) adds that the strategy give the clear direction to all business activities. Strategy can be defined by the author of the article as a complex set of processes that create major long-term objectives of the company and which find ways to achieve the set objectives of the company.

The traditional view of strategy focuses on forecasting of analyses that lead to certainty. The essence of this view is not expanding, future growth or increase in profitability, but the survival. It was assumed that the growth and profit improvement is spontaneous expression of the foregoing activities. The new view of strategy is considered in a broader context and allows for unforeseen events that may significantly affect the strategic process. According to Čima and Mariaš (1993), the corporate strategy creates linking with marketing, personnel, logistics, financial and innovation strategies. Synthesis of a comprehensive strategy should be more variable. Each variant is processed by modification of the sub-strategies and eliminating weaknesses. It is necessary to use the integrity of solutions (i.e. the synergistic effect), to review current and expected strengths of the company and vice versa to eliminate weaknesses.

The successful corporate strategy should be unique, difficult to imitate, used as the main instrument of business competition and as a basis for further strategic decisions. In every area of entrepreneurship, the rules for creating and implementing the successful and effective strategies are specified. The current issue in the academic and business environment has become a process of strategic management in e-commerce. With the development of e-commerce, the professional need (in area of academic and business space) for strategic and effective solutions is created. The e-commerce is a narrower concept that characterizes the buying and selling of products and services through the Internet. According to Kotler and Keller (2012), the e-commerce is more specific than e-business: it means that in addition to providing information to visitors about the company, its history, products, it is about implementing or supporting the sale of products and services on-line. In this framework, the activities associated with the sale (e-marketing) and purchase (e-purchasing) are earmarked (Kotler, Armstrong, 2004). Brončková and Bernátová (2005) specify the e-business as all forms of commercial transactions in the implementation of activities, including institutions and individuals, which are based on processing and transmission of digital data, including text, sound and visual images.

## **1. Theoretical Framework**

The e-commerce offers diversity in decision-making, which leads to the formation of strategic approaches (from web design, understanding the online customer behaviour to brand building and the strategic position in the market), (Nescott, 2012). Therefore, the strategy for electronic commerce is growing in its importance, which is also called the e-strategy or the e-commerce strategy. Chaffer (2007) defines the e-strategy as the specific objectives and approaches that use electronic channels, tools and methods for achieving them. Its creation and implementation is closely linked to the electronic market. Jelassi and Enders (2008) evaluated the e-strategy as an effective tool for creating real value of e-commerce.

The e-strategy can be formed as a major business strategy if the company carries out its activities entirely through the Internet or may be formed as a functional strategy in relation to the corporate strategy. Jiang and Yu (2009) emphasize that the e-strategy should be an exclusive part of the corporate strategy and currently cannot be in the business development overlooked. The actual implementation of e-strategy can be also seen as one of the main the necessary strategic steps (Mohapatra, 2013).

The e-strategy follows the mission and vision of the company and reflects current trends in e-commerce. The e-strategy, like the classic business strategy, is based on the situational analysis and other strategic steps. The e-strategy respects the needs and specifics of the electronic market. This means that it takes into account sales area, which also includes the web design, understanding and meeting the needs of online customers, connection to internet marketing tools with the business platform in the electronic market, technology background and functionality of e-commerce and its systems. The e-strategy is combined with the creation of traditional and modern main instrument for achieving the major long-term objectives of the company, in the form of online and offline strategy.

An effective e-commerce strategy should ultimately lead to the same results as the classical principles of business strategy - increasing the competitiveness, market share, gaining customer loyalty, increasing the economic and non-economic results of the company, image and awareness about the products or the brand and more. The e-strategy has to be flexibly adapted to the currently changing conditions and needs of the electronic market (e.g. strategic concept of conversion marketing, interactive communications and marketing in social media and their connectivity with e-commerce, mobile application of e-shop for smartphones and tablets, etc.). The effective e-strategy is the output of the strategic management process.

Strategic management is the process that seeks to define and implement business and corporate strategy for achieving the objectives of the company. It is the essential element of effective management of the company. Ansoff (1994) formulated the strategic management as the complex process, which begins with the strategic diagnosis and leads the company through a series of other steps culminating in the form of new products, markets and technologies as well as new capabilities.

Lam and Harrison-Walker (2003) state that ten years ago over the fifty models were created that deal with the strategic and decision-making processes for e-business. For example, Figiel (2005) proposes a typology circular model for the strategic process in electronic commerce. The model at the core of the creation of strategy emphasizes the importance of history, mission and vision of the company; the other parts of the model are composed of the internal and external processes and virtual environment, which has to be thoroughly analysed (e.g. STEEP or SPACE analysis, using the method Balance Scorecards, SWOT analysis, Porter's analysis, Ansoff matrix, etc.). The model should be used for decision making in the field of electronic commerce. Kao and Deco (2003) in their process model for strategic management in e-commerce highlight the major dimensions that influence the formation of and implementation of e-strategy: financing, marketing, legal, logistics, technology, security, for operational processes. When creating e-strategy, they emphasizes that companies should take into account the timing, the distance between the company and the customer, customer relations, customer interaction and the actual offered product.

Chang and Graham (2012) summarize the main critical success factors that affect strategic projects in e-commerce: ensuring the quality information, the well-formulated plan, acceptance by stakeholders, the appropriate staffing, internal communication and interactive feedback. Oliva et al. (2003) emphasize that the creation and implementation of effective e-strategy should be fully subordinated to the online and offline customers and should take into account current trends in virtual environment. Power (2005) mentions the importance of resources (material, information, personnel, capital) that are necessary for creating a successful strategy for e-commerce and easy orientation in the virtual business environment. According to Bílková and Dvorak (2012) the process of strategic management in e-commerce should support these features: high-quality catalogue of goods and services, e-commerce integration with ERP (Enterprise Resource Planning), personification of customer

service – support of CRM (Customer Relationship Management) and integration e-shop with other sales channels. All opinions and approaches developing the strategy for e-commerce can be used in the construction of the complex process model for strategic management in e-commerce. The created process model for strategic management in e-commerce (see chapter 3.1) is based on the previous models and theories about the strategic management in e-commerce.

## **2. Methods and objectives of the research**

The subject of this paper is to analyse the approaches to creating a successful strategy for e-commerce. The main objective of this paper is to create the process model of strategic management in e-commerce, which enables more effective strategic management and e-strategy (as the output of this process) of companies that trading mostly electronically.

The main methods recovered for this paper are: analysis of the current state based on the literature review, synthesis of knowledge in the field of strategic management for e-commerce, method of observation that focuses on the e-business filed and actives of the selected e-company, method of modelling and simulation the process of strategic management in e-commerce and the method of case studies that illustrate and simulates the process of strategic management in selected Internet company and compares it with the generated process model of strategic management for e-commerce. The information for the case study is received from the personal interviews with the management and internal data of the selected company.

The e-company was selected for the case study based on the following criteria: the Czech company trading mostly electronically, the company selling through the web sites on as the retailer (on the B2C market), the legal entity registered in the Commercial Register and the company that verified (awarded by the quality certificate by Associate for the Electronic Commerce and Heuréka.cz portal). This means that the selected company represents of the selected entire research file (counting 264 of the examined companies trading mostly electronically). This case study is used as the primary survey for the other research activities of the selected file.

## **3. The analysis of the problem**

The following chapter deals with the creating the process model for strategic management that is compared with other theoretical statements in this area and the case study that demonstrates the use of this model in practise.

### **3.1 The Strategic management process in E-commerce**

The following strategic management process model (see Figure 1) is based on a literature review (see the chapter 1) of the strategic management process in accordance with the factors that influence business success (note: the model due to space restrictions includes only the connections that have the key importance for this process). This created model is then simulated in the case study (see the chapter 3.2).

The bearer and executor of the strategic process is the top management, which with the intense participation and cooperation of other levels of management, could lead to an effective final outputs. The gradual process of strategic management begins by defining the vision and mission of the company, followed by identifying objectives that are based on the analysis of external, departmental and internal environment of the company (using a number of methods; the best known of them are shown in the model). The mission should reflect the ambitious, but achievable objectives. On the basis of the objectives, together with the knowledge, information and skills, the corporate strategy is determined, which is further refined into sub-functional strategies.

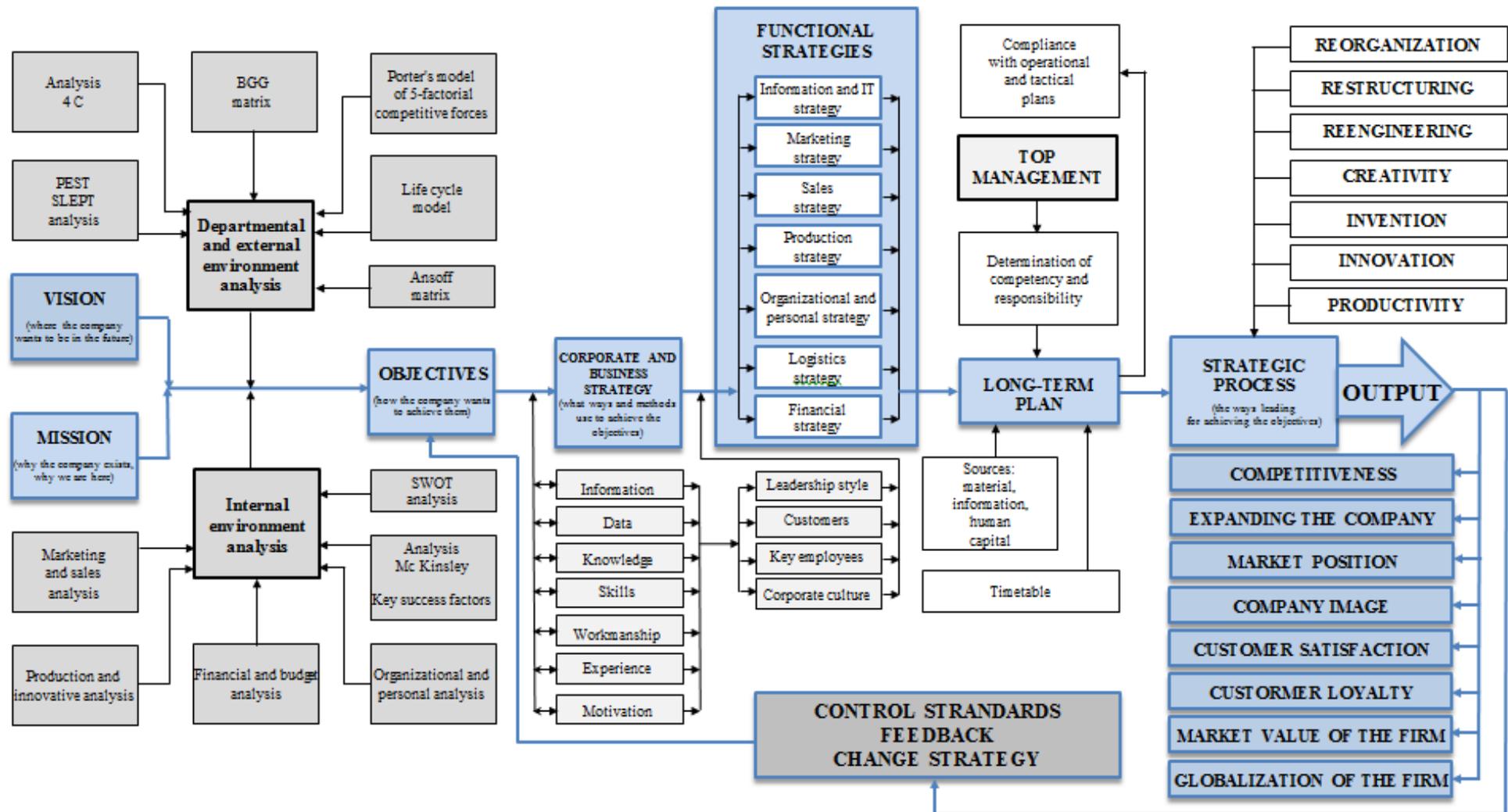
It can be said that that comprehensive strategy should also include the definition of the scope of business activities such as the geographic and business branch or the type of customers. This phase of the strategic management process also significantly affects the

management style, corporate culture, wishes and needs of customers and key employees. The following part of the model is the strategic plan, which should be in accordance with the operational and tactical plans and in which all necessary resources should be provided (human, material, capital, information). In the strategic plan, it is necessary to define the timetable for implementation of the various functions and also the definition of individual competencies and responsibilities of top management.

Finally, based on the previous phase, the strategy is implemented in the form of a strategic process that determines the path towards reaching the objectives and is accompanied and supported by innovation, inventiveness, creativity, productivity, restructuring, etc. The result of the process is the output as the fulfilment of business objectives such as competitiveness, company image, customer loyalty, etc. The entire process is accompanied by a feedback system and the possibility of making strategy changes as a response to the dynamics of the process. It is also necessary to provide feedback to the specification of critical control standards and suggest possible strategic changes, which corrects deviations from the set objectives. The entire process should take into account the unpredictable aspects of the environment that may significantly change the process of creating and implementing the strategy. The strategic management model is common to all disciplines of business, as well as for e-commerce.

The model illustrates the various steps leading to the effective strategic management process and final strategy. These strategic steps should continuously follow up on all other activities and processes of the company. In other words, the all processes of the company should be based on the strategic principles and then corrected by tactical and operational steps. The created process model of strategic management has a general validity, for the selected disciplines it can be adapted (such as the e-commerce, which results in the creation of e-strategy). The process model of strategic management for the creation of e-strategy is further modified in the following sequential steps:

1. The management of the Internet company should lay down a clear mission in accordance with the vision that should reflect the long-term trends of e-commerce.
2. At the beginning, it is necessary to carry out a situational analysis of e-commerce and situational analysis for an Internet company, then online segmentation, positioning a definition of the target group of online customers. This leads to the objectives of the Internet company.
3. The following step is the formation of e-strategy that reflects the vision of the Internet company, needs of the target group of online customers, the position of the company and the current situation of the Internet market. For the creation of e-strategy, it is necessary to apply the principles of knowledge management (knowledge, skills, experience, etc.).
4. The e-strategy should be the result of systematic cooperation and participation of all employees, from the management to ordinary employees. The e-strategy is further elaborated on the lower levels of management - human resources, production, information (IT), marketing, sales, logistics or finance.
5. The specific methods and tools to achieve the objectives and e-strategy are processed into long-term business plan.
6. The entire process has to respect the factors (external, internal) that can significantly affect the whole strategic process.
7. When applying the creativity, invention, innovation and other process changes, the output of the entire company can be expected, which subsequently affects the entire e-commerce environment.



**Pic. 1 The Process Model for Strategic Management in E-commerce**

### 3.2 Case study – Strategic process in E-commerce

The subject of the case study is an analysis of the strategic processes of selected Internet company and their comparison with the created process model for strategic management in e-commerce. The selected Internet company wished to be remained as anonymous, therefore in this paper is labelled only as the company A. This company represents the examined research file according to the selected criteria (more detail in chapter 2). The sources for the case study is personally conducting interview with leaders of the company A, web analytics by author of this paper, information of annual reports of the company A, the analysis of customers' satisfaction in online forums and social networks. Author of this paper had to work with limited information (but it was sufficient for the evaluation of the findings of case studies). The company A is one of the largest holding companies in the Czech and Slovak market and is currently one of the largest Internet retailers that forms and indicates a trend for the Czech and Slovak Internet market.

The company A consolidates nine web stores in the Czech and Slovak Republic (therefore, the company A is one of the biggest online shopping centres in the Czech and Slovak Republic). It is thus one of the strongest groups in this area. The company A offers to its customers a complete range of audio-video, white goods, consumer electronics, photo and computer equipment, sporting goods, garden and auto-moto technology, cosmetics, toys and baby equipment, furniture and accessories for leisure time and entertainment. This is a range covering more than a thousand international brands and 80 000 products. This first sale of the company A took place over the Internet in 1999, in 2000 opened the first store. In 2003, it opened its first foreign branch the Slovak Republic. The Company A are trying to apply the latest trends in the field of e-commerce. This relates to the introduction of new and more secure software, setting up the call centre and also new logistics and distribution centres.

The company applies a strong progressive strategy; its priority is the ongoing territorial and financial expansion. This example demonstrates the aggressive turnover growth of the company A - in 2005 its turnover amounted to 0.5 billion CZK, in 2011 the turnover amounted to almost 2.3 billion CZK. The company A realized its possible potential of e-commerce, which was used for its expansive growth. Currently, the company A belongs to the most successful Internet companies. The company A declares that its greatest competitive advantage lies in providing high quality products and services, sophisticated customer service and building the strong and trusted brand. The company A conducted a survey (in 2013) which shows that, in comparison with the previous year, the number of reclamations declined from 4,4 % to 2,8 % and best-selling brands even at 2.6 %.

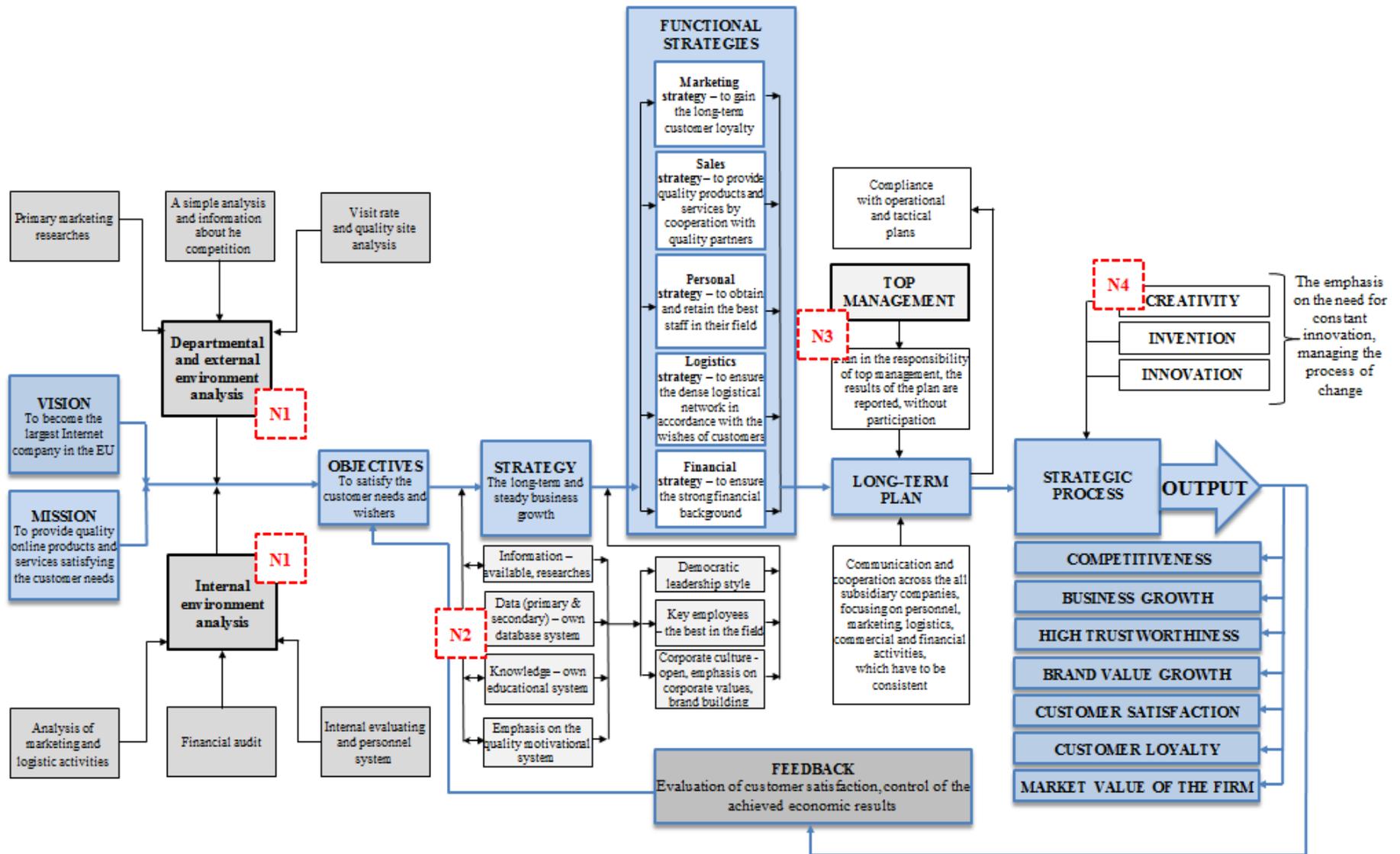
The main objective of the company A is the maximum satisfaction of customers' needs. The company A declares that the most important is not to get the customer, but also to maintain him/her. Therefore, it has the built superior customer care system (such as the ability to test products, interactive communications and online counselling, the possibility of returning the goods within 30 days of purchase), which is building their loyalty. The priority of the company A is marketing and trade areas. This priority is successful because Heureka.cz portal guarantees the high quality of products and services and customers tagged it as one of the most trusted online stores for Czech internet market (customers expressed high satisfaction with the products and customer service - 98%).

The company A monitors and follows the current trends that are shaping the present form of the Internet market. At this time, the biggest trend is building the trust of Internet companies and the entire Internet market. The company A is therefore a full-fledged member of the Association for Electronic Commerce (it has certified the quality and trustworthiness - 88%). The company A invests a considerable part of funds in the development of technologies that can ensure safe and trouble-free purchase and sale. The company A puts emphasis on modern web design that performs marketing and business solutions around e-commerce. The safety, quality technology and web design can be provided by quality workers because the company employs the best IT professionals in the field. The company A also declares that there is great emphasis in the strong motivation of its employees - i.e. strong financial and non-financial motivation based on an open and honest discussions with staff,

emphasis on effective internal communication, career progress, participation in profits, benefit system and regular extensive training and educational system. Management of the company A recognizes the importance of key personnel, so its important activity is the application of sophisticated motivational system.

The other trend in e-commerce is the consolidation of Internet companies into larger units, which allows them to strengthen their position and their competitiveness. On the other hand, the small specialist internet retailers are forming that address the specified target group of customers. This trend threatens the position of the medium-sized e-retailers. The company A follows this trend and, by its impact and strategic action, forms the whole Czech and Slovak Internet market. The customers in e-commerce prefer credibility and trustworthiness therefore they return to online purchases to proven retailers such as the company A. In case of these proven Internet companies the long-term steady business growth can be recorded. Although the company A belongs to the most successful e-companies in the Czech and Slovak Internet market, it declares that it is never satisfied with the current situation - it is necessary to be adapted to constant change and live in permanent innovation.

The following illustration (see Figure 2) shows the process of strategic management that is applied for the company A. This illustration is based on the model mentioned above (see Figure 1) and is adapted to the needs and processes of the company A (on a basis of available information about the company A). The steps are specified for the company A, i.e. especially its objectives, main and sub-strategy or the long-term plan (i.e. to meet customer needs, long-term and steady business growth etc.). The Figure 2 shows the possible shortcomings (denoted as N1, N2, N3, N4), which may reduce the inefficiency of the process. The analysis of the current state showed that the identified shortcomings in company A are: an insufficient analysis of the current state, poor quality of information ensuring, the insufficient application of the principles of knowledge management, the actual poor quality approach of top management or insufficient support of the creativity (more details see in chapter 4). However, despite of identified shortcomings, the conceptual approach to creating the strategy is applied, which provides the strong position of the company A in the Czech and Slovak Internet market.



Pic. 2 The Process Model for Strategic Management (applied for company A)

## 4. Results and discussion

The results of the case study confirmed that the company uses strong growth strategy also implements the basic principles of strategic management in the Internet market. During the application of process model for strategic management for the company A, the following shortcomings (labelled as negatives N1, N2, N3, N4) were discovered:

**N1: Underestimating the analysis of the current state.** In this case, the analysis is not applied in a comprehensive approach - i.e. the analysis of external and internal factors. It does not implement e.g. the SWOT or PEST analysis or does not use tools for market analysis and evaluation of risks. Management of the company A declared that focuses mainly on the customer by implementing its own marketing research, own website analytics and competitor analysis. The internal analysis of the company A is carried out on the basis of financial audit and self-evaluation system. The reason for the absence of current analyses by the company management is the difficulty of assuring enough quality and relevant information for this type of analysis. However, the management of the company A does not consider this type of analysis as important.

**N2: The problematic ensuring the quality of information and knowledge management principles.** Another shortcoming was discovered in the information system of the company A. The company A stated that it is difficult to provide quality information (particularly from secondary data); therefore it conducts its own marketing surveys. The company A would define a competent person, which would give the assurance of quality and relevant information and tools of Business Intelligence (which can be effectively used for a rigorous analysis of the current situation). This shortcoming is related to the non-use of the potential of knowledge management. Data and information cannot turn in the required knowledge. Although the company A has built an educational system of its workers, the gained knowledge is not for the company effectively used. Therefore, the company A would create an educational system which can measurably evaluate its usefulness.

**N3: The problematic role of top management in setting up the long-term plan and strategy development.** Creating a strategy and follow-up long-term plan is fully the responsibility of top management. This plan and strategy is not with other workers discussed and communicated. It is presented as a definitively valid document, which had to be accepted by the other workers and without a discussion. This form of action may be considered in terms of labour relations and the corporate culture as questionable. The efficiency of this step and greater staff motivation can be ensured by the active participation and discussions of all employees of the company A (during the preparation of the plan).

**N4: Non-using the creative potential of employees.** Although the company A emphasises the importance and need to constantly innovate, exploiting the potential of creativeness and inventiveness of own staff is underestimated. This means that there is no conceptual approach to the targeted support of creativity. However, encouraging the creativity and invention can significantly increase the possibility that the innovation processes of the company will achieve efficient outcomes. This can be achieved for example by holding regular creative meetings, the application of methods and techniques of creative thinking or motivational system supporting initiative of workers that leads to creative and viable ideas.

## Conclusion

The analysis of the current state showed that strategic processes in company A are not carried out effectively. These findings were made in the form of case study on the selected Internet company, which represents the examined research file of the selected companies trading mostly electronically (due to the selected criteria). However, the conclusions of this case study cannot be extrapolated to the entire file. Nevertheless, this case study has certain information capability and can be used for other researches in the area of e-commerce (especially for Czech and Slovak companies trading mostly electronically). While the company A applies the strong progressive strategy, which enables its development, in its process of strategic management, the meaningful shortcomings have been identified. Inefficiencies and increasing the success of strategic processes in e-commerce can be solved by following the

principles of the established process model for strategic management in e-commerce and recommendations for the elimination of the identified shortcomings.

The identified shortcomings in the strategic management can be eliminated through the analysis of the current situation, taking account the role of management in creating the strategy, ensuring the quality information and effective use of knowledge about the market and stakeholders and the targeted support creativity. The created model incorporates the necessary steps and other factors, which in the long term can lead to a strong and unique e-strategy. It is important to create an e-strategy, which reflects the needs of the Internet market and is able to flexibly adapt to a constantly changing environment. The results of the research confirmed that the created process model for strategic management in e-commerce can be used for theory and practice. This process model can therefore be applied to other retail companies trading electronically and for other research activities.

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# Education of Qualified Workers for Companies in the Czech Economy

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## Abstract

The Czech Republic can be classified as a country with highly developed industry and with that connected apprentice education, yet domestic companies have more and more trouble finding qualified craftsmen in blue-collar professions. A significant goal of the Czech education politics therefore is to concentrate greater part of practical teaching directly to workplaces of the companies, for which introducing new technologies is a necessary condition for survival in currently very highly competitive environment. Technical vocational schools, on the other hand, struggle with lack of masters and teachers of technical subjects. The article considers current proposals to solve apprentice education issues in the Czech Republic and ensuring qualified labour for Czech economy. The aim of the article is to characterize problems related to lack of qualified workers in blue-collar professions, especially in areas of material services and agriculture, and to present proposals for their solution.

## Keywords:

blue-collar worker, company, labour market, master, vocational school

## Introduction

The Czech Republic belongs to countries with the highest proportion of people with secondary education in population. However, not all people reach secondary education in a knowledge society. As is clear from statistics, about one fifth of inhabitants are not able to match the demands of this age and are not able to fully participate in the knowledge society. Greger and Černý in this connection point out stratification of society and state that „... the concept of knowledge society presents itself as society of all, society from which everybody can live, but in reality it only reflects in a relevant way one, maximum two higher social segments, to which the logic and principles of knowledge society are imminently related. The rest of population basically does not participate in knowledge society (or only indirectly) and is constantly being excluded from it (Greger and Černý, 2007).“ It is logical that it has to be, among others, the institution of vocational school that should prepare a young individual for the current conditions on the labour market and by doing so prevent unfavourable social stratification. “The goal of the vocational education is not only to provide the economy with qualified professionals, but also to promote personal development of vocational school students, their motivation, critical thinking, responsibility, values” (Augskalne et al, 2013). The aim of the article is to characterize problems related to lack of qualified workers in blue-collar professions, especially in areas of material services and agriculture, and to present proposals for their solution.

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## **Materials and Methods**

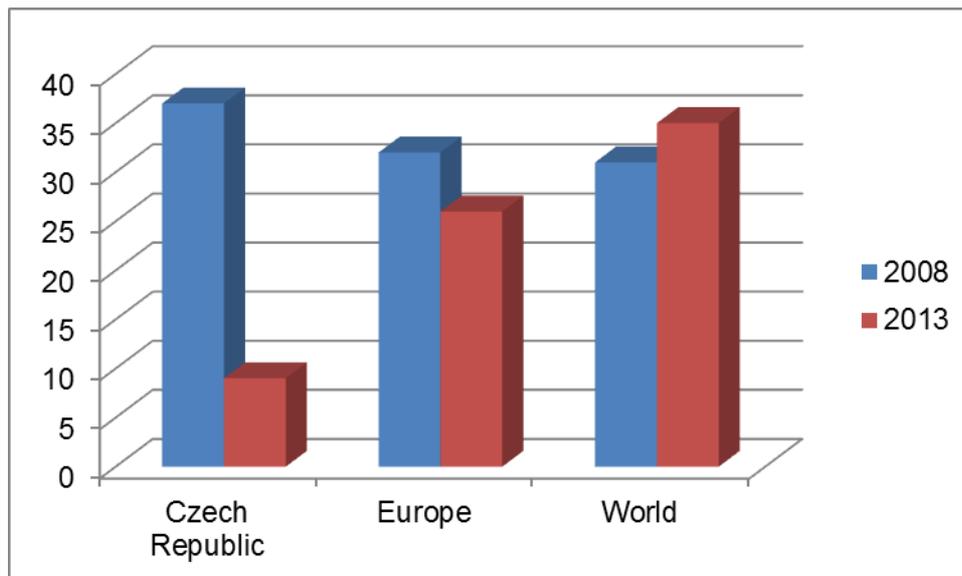
From a methodological point of view, higher secondary education (level ISCED 3 according to OECD) - whose part is also education of apprentices – is a level of education that follows after finishing lower secondary education at a primary school. Its length in individual countries ranges between two and five years, while common age of starting this type of education is 14-16 years. Upper secondary education either has a character of “final“ education phase, that is the graduates are coming directly to the labour market, or it prepares graduates for entry into postsecondary or tertiary education (Průcha, 1999). Based on its content, secondary (upper secondary) education is divided into two basic types: general upper secondary education and vocational/technical education, which also contains preparation of apprentices for company praxis. The main method used in the processing of the paper was the description method used when describing causes of problems of vocational schools (lack of teachers) and comparative analysis used for comparison of apprentice training for blue-collar professions in selected countries. Also we used graphs for illustrative documentation of filling vacancies in job positions. Synthesis of findings from the essay resulted in the evaluation of analysis and recommendations of solutions of the problems of vocational education in the Czech Republic.

## **Qualification of Workers for Profession Performance**

Education at vocational/technical schools must in a greater extent than before result in the ability of graduates to further study, but besides that also in their qualification for performance of their profession. The first requirement is necessary with respect to the above mentioned needs of modern society, the second supports easier finding of employment of young people on labour market and lowers the risk of their unemployment (Mach, 2009). The Czech Republic can be categorized among countries with highly developed industry and with that associated apprentice education, which has a rich tradition. However, successful future and further development of the country requires not only using valuable experience and time- tested procedures from the past, but also the ability to continuously react to the changing social conditions and demands of the current labour market (Severová, Svoboda, 2014).

Distinct changes are coming in society and first of all on the labour market, not only due to the influence of new technologies, but for example also due to the impact of global economic recession. Work environment in companies is adapting to that. However, there are fewer and fewer people with the desired profile on labour markets and the situation will be quickly getting worse for employers. The world is finding itself at a doorstep of new development phase, in which the main accelerator of economic growth will become the attitude towards people with appropriate abilities and skills.

Although the lack of people with needed qualification has been greater and greater in the world since 2008, inland companies experience smaller problems with finding suitable employees. But the most difficult issue in the Czech Republic is to find craftsmen. The proportion of employers having trouble with appointing open jobs due to lack of corresponding applicants decreased in the Czech Republic from 37 % in 2008 to last year's 9 %. This proportion decreased in Europe from 32 % to 26 %, on the other hand it increased in the world from 31 % to 35 %. Qualified employees are the most difficult to find in Japan (85 %) and Brazil (68 %). On the contrary, the best countries in this regard are Ireland and Spain with 3 % of companies (CNA, 2014).



**Pic. 1: Proportion of employers with the problem of appointing open positions (CMA, 2014)**

It will be more and more demanding to find the right talents. According to world-wide survey done by personal agency Manpower, 30 % companies indicated problems with appointing key work positions in the last two years. It showed that even at the time of high unemployment and economic decrease it remains difficult to find the appropriate employees.

## Results and Discussion

### Fusion of Teaching Students at Vocational Schools with Praxis in a Company

Competition on labour markets is now bigger than ever and apprentices need to gain experience usable in praxis just as intensively as theoretical knowledge from schools. One of the goals of education politics in the Czech Republic therefore is to concentrate greater part of practical teaching directly to workplaces of the companies, for which introducing new technologies is a necessary condition for survival in currently very highly competitive environment. Dual system of teaching apprentices in the Czech Republic, especially in technical fields, should – in a simplified way – contain a weekly teaching at a vocational school and a weekly manufacturing praxis right in a company. It should help raise a new technically educated generation of workers who are so much needed by domestic industry. This model of cooperation between companies and schools proved itself valuable mostly in neighbouring Bavaria, which has a similar economic profile. There, graduates from real gymnasium continue most often in some type of vocational school (Berufsschule), in so called dual system, that is when about 3 to 4 days a week are spent at work and 1 to 2 days at a vocational school. "Dual subject" (school & enterprise cooperation) will benefit those students under the standard management. Therefore, enterprise will participate in the practice actively and good effect will be proved. All these will fit for the talent cultivation mode, which include Work-integrated Learning, school & enterprise cooperation and post practice" (Juan, 2013).

Preparation for qualified blue-collar positions in Denmark is based on unified system of initial technical education that is implemented by means of 85 courses with approximately 200 specializations. The preparation takes 3-4 years and leads basically to qualification for blue-collar and other professions. It is a combination of practical preparation in a company (about two thirds of preparation volume) and study at school (about one third of preparation). A rarity is the fact that this type of technical education can be started by young people either by transfer directly from school (Folkeskole) or they can first complete practical preparation in a company as apprentices (Průcha, 1999).

In Switzerland, almost 70 % of all young people in upper secondary education are preparing in technical and vocational type of education. The basic model of vocational education is – similarly to our neighbours in Germany – a so called dual system. In this system, the responsibility for vocational preparation of apprentices is taken by both a company and a vocational school together. The company is responsible for training in practical skills and the school provides teaching in theoretical technical subjects and general education. In both cases the curricula are managed at a federal level (Průcha, 1999).

Some vocational schools in the Czech Republic want to solve the crisis by arranging hours of praxis for apprentices from the last grade in private companies and with craftsmen. Confederation of Industry of the Czech Republic agrees with this, as two thirds of companies associated there complain about the lack of such practical skills in vocational schools graduates. There is, however, a so far unsolvable problem. If future craftsmen are to be taught in companies and not by masters, it will probably be expensive.

### **Education of Blue Collars Workers for Multinational Retail Chains**

We meet with ample representation of various blue-collar job positions at shops of multinational retail chains. In most cases we are talking about trained salesman and warehouse workers. Salaries of these most common professions (we do not take into consideration unskilled workers for cleaning establishments) are only a little above the minimum wage. Recruitment of unskilled foreign workers on these job positions may not only lead to false informing of customers about offered food but also may lead to operating losses. In case of trained sales people we can expect a positive relationship to the profession and interest in customer satisfaction. However, since large multinational retail chains in most cases do not have their own schools (unlike consumer cooperatives), it is necessary to provide cooperation of these companies with vocational schools in the future. This cooperation may be conducted by the share in funding of apprenticeship or training experts in their schools.

A fundamental measure may also be support of employers' entry into financing vocational education system. An example of effective tool can become for instance tax stimulations. The Ministry of Education Youth and Sports initiated in this matter an expert negotiation with the Ministry of Finance, during which – among others - an agreement about the question of tax allowance of financial contribution provided to a secondary school student preparing him/herself to profession performance for an employer based on contract relationship was reached. This mentioned adjustment has become a part of the Law on income Tax amendment.

### **Lack of Masters with Pedagogical Education at Technical Vocational Schools in the Czech Republic**

Companies and schools will have to now focus more on individual approach to people and to take into consideration requirements of employees. High-quality labour is aware of the demand on work markets and places its own demands that are patterned mostly on the character of the new generation. It presents requirements on harmonization of working and private life, greater flexibility, using modern technologies and also stresses social responsibility, empathy and so on. If employers become aware of this trend soon enough and will respect it, then they may get a bigger chance in finding good-quality, narrowly-profiled employees, and their competitiveness and productivity will increase.

Secondary technical and vocational schools in the Czech Republic are in a long-term struggling with lack of masters and teachers of technical subjects. Current educators are getting older and new ones will be missing, especially electricians, car mechanics, glaziers, or machine operators by profession. Mostly vocational schools from all over Prague are dealing with this problem of lack of teachers for technical subjects and masters of various crafts. Pensioners or people shortly before retirement are teaching in many classrooms.

They are often excellent thanks to experience from praxis, but who will replace them when they are gone? When someone understands a field or a craft, he/she devotes him/herself to his/her own business and low salaries in school system do not persuade him/her to change profession and to start teaching. "Attitudes and behaviors of teachers, peers and school administration have major effects on students who are at dropout risk" (Tas et al). „Risk can be viewed as a difference between the real future state and expected future state. This difference arose due to the change of risk factors, which translated utility of subjects“ (Šrédl, 2010).

Big effort is in this connection needed for example in finding qualified machine operators, chemists or civil engineers; the issue concerns almost all technical fields. For instance in the Centre of Professional Training in Technology and Economics in Prague 9, many teachers of technical subjects are over 58 years old. We are talking about fields such as car electronics, office technology or electro energetics.

Growing use of external workers will also become a significant factor in the change of structure of educators at vocational schools. Companies in Western Europe and in the US are used to use external workers to a greater extent, in order to – among others – ensure sufficient flexibility of workers, and they pay much more attention to the integration of these people into the company.

The problem, which is even more distinct in the capital than in the rest of the country, has been pointed out to the Czech Republic by international organization OECD as well. Average age of teachers at secondary schools and vocational schools in the Czech Republic is the fifth highest among member countries of OECD; approximately 45 % of secondary school teachers are older than 50 years and most of them will be retired in 10 years. When there is none to teach future craftsmen, every Prague citizen will feel that when he/she will not be able to find a glazier to fix his/her window, or when he/she will not have a skilful heating technician, carpenter, painter or car mechanic at hand. The reason for this trouble is simple. It is logical that someone who is an expert in a given field or craft and is at the top of his/her mental and physical power, they will devote themselves to this field or craft as trader or in a company; education system is currently unable to sufficiently pay such people (Prouzová, 2013).

### **The Evaluation of the Previous Analysis and Recommendations**

- Another cause of the problem of vocational schools is represented by overly strict laws, according to which only a person with pedagogical education can teach. Where should, however, a vocational school search for an expert with 20 years of praxis e.g. in civil engineering, who also has graduated with a pedagogical degree? Or is willing to at least go through the pedagogical minimum study at his/her older age? The situation in Prague is moreover worse than in other parts of the country, because average salaries in entrepreneurial sphere are higher there and schools cannot compete with them.

- Directors of vocational schools will in the future most likely have to accept even specialists and craftsmen without pedagogical education. After all a lot of such educators are already teaching today. Schools are currently thinking over also other scenarios of solving the situation. In the Centre of Professional Training young people (not even 30-years-old masters) were experimentally employed. „It looks promising. They are gaining needed technical experience from their older colleagues and teach them to operate computers in return,“ describes the mutual cooperation director of the Centre Ležal. He is satisfied with the way such a seemingly heterogeneous team functions (Prouzová).

- Global recession has a large share in this trend, as it has forced employers to produce more with the same number of workers. The need to lower expenses has its consequence in innovations we have never experienced before. Vocational schools will have to change their approach to employees and to put much greater emphasis on their development, motivation and effective organization – an organization that surely includes use of external workers, but also for example outsourcing of individual services.

- Dual system of teaching apprentices in the Czech Republic, especially in technical fields, should – in a simplified way – contain a weekly teaching at a vocational school and a weekly manufacturing praxis right in a company. Some vocational schools in the Czech Republic want to solve the crisis by arranging hours of praxis for apprentices from the last grade in private companies and with craftsmen
- Should apprentices be in contact with technical praxis, then it holds twice as much for their teachers. The Ministry of Education Youth and Sports will therefore support both domestic and foreign internships of technical subjects' teachers and masters of expert training as an adequate tool in the system of further education of pedagogical workers, including the use of resources from the European Social Fund.
- A change in school legislation allowing employers - at whose workplaces will practical training take place - to gain financial sources from the state budget, can also be considered an effective tool. Drawing funds will only be done based on contract relationship between the school and the employer.

## Conclusion

Real readiness for performance of a profession can be gained by students of vocational schools hardly by other means than by continuous contact with praxis. It is necessary to invest a lot of time and resources into the development and strengthening bonds with local entrepreneurial community, to invite its experts to teach at vocational schools or to build partnerships of companies and vocational schools. Requirements of companies are quickly changing as a result of technological progress and globalization. On the other hand, the population growing older, inadequate qualification structure and change of life attitudes and motivations of people all lead to the situation that there are still fewer needed employees available.

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# Business Valuation of Telefónica Czech Republic, a.s.

Zuzana SVOBODOVÁ<sup>1</sup>

## Abstract

Business valuation is a scientific discipline, which covers several other areas. Each valuation represents an individual and very complex process. Business valuation shall be carried out on the basis of law requirement (e.g. in case of company transformations – fusion, division) or for other purposes (e.g. on the sale, purchase, introduction to the financial market, on the entry of a foreign capital, etc.).

In this case, the subject of valuation was Telefónica Czech Republic, a.s. with its seat in Za Brumlovkou 266/2 Praha 4, Michle 140 22. This company is one of the world's leading integrated telecommunications operators that offer solutions in the field of communications, information and entertainment.

The aim was to determine the market value of the company, or share capital of Telefónica Czech Republic, a.s., on December 31, 2011. The company was valued at the net business assets level, i.e. net worth. The net worth is defined in the Czech Commercial Code (Section 6, 3) as "business property reduced by liabilities incurred by an entrepreneur in the course of his business activity, if such entrepreneur is an individual (a natural person), or business property reduced by (all) liabilities, if such entrepreneur is a legal entity." This value is therefore the result of valuation at the level of an ownership interest.

Methods applied in the research were: Two-stage DCF model at the level equity (income approach) and business enterprise valuation (market approach).

The valuation was carried out on the basis of publicly available resources.

## Keywords

Valuation, telecommunications, market value, Telefónica Czech Republic, a.s.

## Introduction

Valuation as a self-contained area can be considered one of the latest practice-oriented economic activities. Its purpose is to determine value of a company expressed in monetary terms. It is always determined as on specific date and particular purpose. There is no law nor regulation in the Czech Republic which would represent a set of general rules for company valuation. Choice of optimum approach to company valuation is thus dependent on individual assessors. Contrary to this practice, the Slovak Republic has a binding regulation on general property value issued by Ministry of Justice of the Slovak Republic. The regulation details the valuation methodology.

The development of the telecommunication sector is closely linked to technical development. Its origins dates back to 1794, when an optical telegraph was assembled. Cornerstones of mobile communication go back 1837, when the first telegraph was constructed. Now telecommunication can be distinguished for:

- fixed telephony
  - fixed telephone network
  - data service (Internet)
- mobile telephony.

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The landline telephone network in CZ dates back to 1882. Its development was extremely fast. The number of active lines has been falling since 2001. CZ officially joined the worldwide Internet network in 1992. The first ISDN Internet connection dates to 1998. Mobile operators have been present on the Czech market since 1991.

The subject of valuation is Telefónica Czech Republic. The company has constantly had the major share of the Czech market. It is an international corporation, which is engaged in telecommunications on 25 markets in Africa, Latin America and Europe (Czech Republic, Slovak Republic, Germany, Spain, Ireland, United Kingdom). The organization was established on 19 April 1924 in Spain as publicly traded limited company called Compañía Telefónica Nacional de España (CTNE). Its founder was an American company International Telephone and Telegraph Corporation. Telefónica in Spain changed its image and name to Telefónica de España S.A. in 1988 and as early as in 1990 the company acquired shares in telecommunication operators' networks in other countries.

In the Czech Republic Eurotel Praha, spol. s.r.o. and Český Telecom, a.s. were sold in tender in 2005. There were ten bidders in the tender. The process resulted in sale of majority share worth 82.624 billion to Spanish Telefónica.<sup>2</sup>

Telefónica CR has been a long-term prospering company and contributes positively to employment in CZ regions. The company's policy incorporates environmental protection, social responsibility and lately also reduction of discrimination of women in managerial posts.

## Goal and Methodology

The aim of the contribution is to evaluate the market value of the equity, therefore the market value of Telefónica Czech Republic, a.s. shares, by using discounted cash flows method in the equity version. Second used method will be the market comparison to December the 31.<sup>3</sup>

It is necessary to determine a specific purpose before valuation. It is always determined as on a specific certain date. Valuation can be provided on the basis of more multiple techniques. The final value is usually a synthesis of the results of valuation methods used. There are three basic approaches to valuation. (Mařík, 2007):

- Methods based on analysis of returns (income approach),
- Methods based on market analysis (market methods),
- Methods based on property analysis (property valuation).

Every approach contains a whole range of methods, partial techniques and their combinations. Based on theoretical foundations, the following procedure for valuation is recommended:

- basic company data,
- purpose of valuation,
- categories of value,
- strategic analysis,
- financial analysis,
- assets allocation operationally necessary and unnecessary,
- analysis of value,
- financial plan,

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<sup>2</sup> The second highest bid was from the company Swisscom for CZK 79,2 mill., and the third highest one was from Belgacom for CZK 67,5 mill.

<sup>3</sup> The value of any asset is always related only to a certain given moment in time, so-called decisive day, valuation date, etc.

- discount rate,
- valuation,
- overall valuation.

Final valuation is reconciliation of all the major valuation approaches that were used. This does not cover any mechanical calculations using average results. Each method should be assigned a function within the resulting valuation (Sabolovič, 2008).

## Results and Discussion

Telefónica Czech Republic, a.s. was incorporated in Register of Companies on 1 January 1994 for indefinite period of time. The subject of enterprise includes mainly telecommunication and mobile services.

The majority shareholder is Telefónica, S.A. disposing with a share of 69.41%, other shareholders keep 30.59%. Structurally, Telefónica CR belongs under the European division of Telefónica Europe Plc group (TCR Annual Report, 2011).

The valuation purpose is estimation of own capital value, i.e. market value of Telefónica Czech Republic, a.s. shares the method of discounted cash flows in the "equity" option and through market comparison as on 31 December 2011. The value category searched for is the market value. In case of market estimation the assumption is the existing market with the commodity, i.e. telecommunication market.

The telecommunication sector is characterized by a smaller number of competitors, i.e. 2 to 4 mutually competing companies. The Czech Republic is not an exception. The market in CZ is divided into three large companies holding major market share - Telefónica Czech Republic, a.s., T-Mobile Czech Republic a.s. and Vodafone Czech Republic, a.s. Market shares of other competitors are insignificant. European Union tends to divide the market power among more companies within one market.

The prices and profit margins of the operators in the Czech Republic are above average, which suggests that the environment is less competitive. What is specific for the sector is mainly the high capital investment demands, international participation and dominant position of multinational concerns.

Czech GDP dependence on telecommunications is 3% on average. In OECD countries the average ranges between 2% and 2.5%. Falling revenues in the sector mean falling trend of telecommunication share in GDP and thus approaching to OECD average percentage.

The average profit ratio of Telefónica reaches approximately 13% and the own capital share in overall liabilities exceeds 70%. The company, compared to other competitors, has the lower ratio of long-term liabilities towards overall borrowed capital. T-Mobile has the highest operational profit margin of all.

The following table shows SWOT analysis, which assesses opportunities, threats, strengths and weaknesses of the company.

**Tab. 4 SWOT analysis**

<b>Opportunities</b>	<b>Threats</b>
Investments in research and development	Intensity of competition
Making use of benefits of technological progress	Regulation by European and national institutions (CTU)
Transition to contract customers	Changes in consumer behaviour in relation to the advent of new technologies
Growth Process Optimization	High cost of marketing
Greater coverage of households	

Expansion of capacity of optical network Advent of LTE network (trademarks option) Increasing the availability of digital television VOIP Diversification of activities	Possible decrease in the total number of customers  Falling operation in fixed telephony (especially landline) possibility of expansion of offer competitive companies in the sphere of digital television high cost of maintenance of existing capacity (obsolete lines)  Lack of networking due to demand
<b>Weak Points</b>	<b>Strong Points</b>
Property amenities Innovation Wide coverage of broadband Internet in a fixed location High quality and availability of voice and data services A significant proportion of the services provided by the private and public sphere Complexity of services offered Largest share of the revenues of telecommunication market in CR	The higher price level than competition Low flexibility Image Weak marketing

Source: own data processing

The next step is the analysis of value generators, which in the sphere of company's valuation property amenities of a valued company reflects the fact, that in the course of monitored period, the company has declining property amenities. However, this is not only the case of Telefónica. Competitors act on a similar basis. The planned financial statements are connected to generator values.

Subsequently, the discounted rate is set. Self-evaluation is carried out by a two-phase model of discounted cash flows at the level of equity (cash method) method and the method of comparable companies (market comparison method). WACC at the time of valuation amounts to 10,80 %.

### Two-stage DCF model-valuation equity

Before determining the final value, a few more steps were made. The values were found out on the basis of previous steps, thus from value generators and financial plan. The following tables present discounted FCFE<sup>4</sup> for the first phase and prognosis of profitability of invested capital. FCFE calculation scheme is as follows (Mařík, 2007):

- = Adjusted operating profit before taxes (KPVH<sub>d</sub>)
- Adjusted income tax
- = Adjusted operating profit after tax adjusted (KPVH)

<sup>4</sup> Free cash flow to equity

- + Depreciations
- + Other costs that are not dispensed in the current period
- Investments in adjusted working capital (operationally required)
- Investments in the acquisition of fixed assets (operationally required)

- 
- = Free cash flow (FCFF) in the level of the business unit (Entity)
  - Interests of foreign equity, ratio decreased of tax shield – interest \* (1- tax rate)
  - Repayment in interest- bearing debt
  - + Newly adopted an interest bearing loan capital
  - = Free cash flow from operation shareholders (FCFE)

**Tab. 5 Discounted FCFE for the first phase (in mill. CZK)**

	2012	2013	2014	2015
<b>FCFE</b>	10 262	9 135	9 728	8 239
<b>SPPW for discounted rate: 11,09%</b>	0,9025	0,8146	0,7352	0,6635
<b>Discounted FCFE</b>	9 262	7 441	7 152	5 467

Source: Author

Translator's note: **SPPW – SINGLE PAYMENT PRESENT WORTH**

**Tab. 6 Prognosis of profitability of invested capital from 2012 to 2015**

	2012	2013	2014	2015
<b>Growth rate of the adjusted operating VH</b>	16,8%	-13,0%	13,8%	-9,3%
<b>Rate of net investment</b>	-15,6%	-13,7%	-12,0%	-11,3%
<b>Profitability of net investment</b>	-19,8%	83,5%	-101,0%	77,5%
<b>Profitability of invested capital</b>	13,0%	11,6%	13,4%	12,3%

Source: Author

The values of the parametric pattern are included in the table No.: 4. The result is a continuing value at the end of the first phase of CZK 88 354 mill.

**Tab. 7 Calculation of continuing value ( in CZK mill. )**

Growth rate	4,0%
Rate of net investments into DM and PK	30,7%
Profitability of net investments	13,0%
<i>FCFF 2016</i>	6 008
Parametric pattern <sup>5</sup>	88 354
Gordon pattern <sup>6</sup>	88 354

Source: Author

<sup>5</sup> Parametric pattern can be calculated as :  $FCFE_{2016} / (WACC - growth\ rate)$ .

<sup>6</sup> Gordon pattern can be calculated as:  $(KPVH * (1 - rate\ of\ investment\ netto\ from\ DM\ and\ PK)) / (WACC - growth\ rate)$ .

The final value of the DCF equity method is presented in the table No.: 5. The current value of 1st phase is calculated as the sum of discounted FCFE from 2012 to 2015. The company disposed of interest-bearing short-term foreign capital worth CZK 3 061 mill., which is subtracted from the gross operating values brutto, in order to obtain net operating values.

**Tab. 8 Revenue valuation, effective from 1<sup>st</sup> January 12012 ( in mill. CZK)**

Current value 1st. phase	29 321
Current value 2nd. phase	58 623
Operating gross value	87 944
Interest-bearing loan capital to the date of valuation	3 061
Operating net value	84 883
<b>Resulting equity value by DCF</b>	<b>84 883</b>

Source: Author

The value equity to 31.12.2011 is CZK 84 883 mill. The estimate of the value of a company of a share is CZK 264.

### Valuation by the method of comparable companies

Although the professional literature shows the comparison with minimally 5 to 8 companies, the comparison is made only for three mentioned companies (Vodafone, Telefónica, T-Mobile).

Comparability of the companies is made primarily on the basis of inclusion in the same branch, the same legal forms and related manufactured products.

Equity value is given by the expression of the market value of share, where the final value is the net value (VK). Net is simply divided by the total number of shares of the company and the value of one share is thereby obtained. The following table shows the calculation of multipliers of individual companies.

**Tab. 9 Calculation of company multipliers**

Company	P/S <sup>7</sup>	P/BV <sup>8</sup>	P/E <sup>9</sup>
Telefónica	2,93	1,81	15
T-Mobile	0,65	1,08	8,17
Vodafone	1,81	1,09	12,56
<i>Average value</i>	<b>1,80</b>	<b>1,33</b>	<b>11,91</b>

Source: (Companies annual reports, 2007 – 2011), own data processing

The final value is determined on the basis of weights assigned to individual multipliers. The highest weight was assigned to the multiplier P/E, which is tied to the amount of net profit.

**Tab. 10 Valuation according to multipliers derived from competing companies of CR**

	turnover	VK (BV)	VH
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<sup>7</sup> The market price of share / sales per share

<sup>8</sup> Market price of share / book value shares

<sup>9</sup> Market price of share/ earnings per share

Total	52388	69097	8684
Multiplier	P/S	P/BV	P/E
The value of the multiplier	1,80	1,33	11,91
The calculation of the value of share	292	285	321
Net value	94 124 mil. CZK	91 669 mil. CZK	103 426 mil. CZK
Selected scale	0,3	0,25	0,45
Typical net value	97 696 mil. CZK		
Partial value of 1 share	303 Kč		

**Source: (Companies annual reports, 2007 – 2011), own data processing**

Enterprises throughout all the sphere of telecommunications services sector differs in risk, profitability, market capitalization or size of the capital invested. Complementary appreciation is demonstrated by the multiplier for the sector as a whole. Professor Damodaran calculates and up-dates these multipliers of 78 European companies, operating in a particular sector. The valuation is given in the following table.

**Tab. 11 Valuation by means of multipliers derived from the European market**

	turn	VK (BV)	VH
<b>Total</b>	52388	69097	8684
<b>Multiplier</b>	P/S	P/BV	P/E
<b>The value of the multiplier</b>	0,87	1,8	13,03
<b>Calculation of the value of share</b>	142	386	351
<b>Net value</b>	45 578 mil. CZK	124 375 mil. CZK	113 153mil. CZK
<b>Selected scale</b>	0,3	0,25	0,45
<b>Weighted net value</b>	95 686 mil. CZK		
<b>Partial value of 1 share</b>	297 CZK		

Source: (Damodaran, 2013), own data processing

Assigning individual weigh remains the same. The value P/S is the smallest. The reason is relatively low contrary to European competitors.

### Final company valuation

DCF method allows insight into current and future potencial. It is considered as major. The next valuation is on the basis of comparison of competing companies in CR and comparing with companies operating in the European market.

**Tab. 12 Total valuation**

Method	Net value (mil. CZK)	Value of share (CZK)
<b>Method DCF equity</b>	84 883	264
<b>market comparison method– multiplier of domestic competitors</b>	97 696	303
<b>market comparison method – multiplier of European competitors</b>	95 686	297

Source: own data processing

The resulting value of Telefónica Czech Republic, a.s. ranges **from CZK 84 883 mil., to CZK 97 696 mil.**, in calculating per share from **CZK 264 to CZK 303**.

## Conclusion

The estimated own capital value determined through DCF equity method as on 31 December 2011 was CZK 84,883 mil. An estimated share value is CZK 264.

The market comparison method based on comparison of domestic competitors values the company at CZK 97,696 mil. with a share value of CZK 303. The market comparison method was widened by multipliers calculated by professor Damodaran. The multipliers represent the value for all the companies operating on European telecommunication market. Overallly, there are 78 companies. Following such multipliers the own capital value is determined at CZK 95,686 mil. with a share value of CZK 297.

The resulting company value assessment interval in monetary terms ranges between CZK 84,883 mil. and CZK 97,696 mil. A share value interval ranges between CZK 264 and CZK 303. The company managed to increase its value in several years, which can also be seen from the original purchase price of CZK 82,623 mil.

Valuation of Telefónica as on 31 December 2010 carried out by Mrs. Smolíková (Smolíková, 2011) ranged within the interval of CZK 111,719 mil. and CZK 134,965 mil., with a share value between CZK 347 and CZK 419. Although the same methods were used for the valuation, the price level is higher. The reason consists in higher drop in revenues within the sector than expected. At the same time, a high level of subjectivity brought into the assessment by the assessing individual is apparent. Convergent trend in the area of telecommunications forces Telefónica deeper into the process of restructuring. Currently, the companies tend to decrease number of own real estates in CZ. The process will be accompanied by repeated staff reductions in 2013.

The company will endeavor to further optimize individual functional processes at all levels of management, thus operating cost efficiency. To maintain this trend, the company must expand its professional experience portfolio. Even bigger layoffs of its own employees are expected to begin.

To maintain its market position the company will try to get frequencies for 4th generation mobile networks (LTE) in auction. The technology will make much more effective infrastructure building possible through which mobile Internet will be many times faster than current 3G networks, accompanied by much better coverage in rural areas. Such licence might improve the company's competitiveness.

The main contribution of this paper is receiving the market value the examined company and its analysis of the current internal and external situation in this area. The selected methods of appraisal and the process of appraisal can be used in other similar situations and companies in the examined field. The results of the paper are useable for other research activities in this area.

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### Other Resources

- Annual reports Telefónica Czech Republic, a.s. from 2006 to 2011
- Annual reports T-Mobile Czech Republic, a.s. from 2006 to 2011
- Annual reports Vodafone Czech Republic, a.s. from 2006 to 2011

# The changing position of EU canola producers on the global market

Vojtěch Tamáš

## Abstract

Canola is offering a wide range of use for food and non-food purposes. For food purposes can be achieved quality of final products (eg. Frying and cooking oils, 100% fats, margarines, low-calorie fats, phospholipids, lecithin, tocopherols and phytosterols) with significant positive effects on the quality of food and nutrition. In terms of non-food use of canola the great importance especially in feed and oleo-chemistry. In the EU and the USA are vegetable oils (mainly rapeseed, sunflower and soya) used in the manufacturing process of transport fuel. The EU is currently the main producer of methyl esters of fatty acids with standardized quality of biofuels (biodiesel) for diesel engines in the world. Implementation of agricultural products as raw materials for the production of renewable motor fuels is not without obstacles. Opponents often argue lower yield of pure energy and has adverse economic balances due to the costly conversion process, especially for bioethanol. It is also necessary to take into account the development of renewable raw materials are not without some support, both at the national and the European Union. Includes area, from research and development, marketing guidance to investment to ensure and create new jobs in rural areas. In the context with these facts arises a lot of research and moral questions concerning adequate choice of using canola. All these aspects then have their full economic impacts in areas with significant motivation of the producers themselves. Through the different approaches and strategic objectives of agricultural policies in different regions of the world there is also a difference in the focus of the development of the producers in the world. Aim of the paper is to characterize the broader context of current changes in conditions, which are affecting producers involved in the canola commodity chain in the EU in comparison with canola producers in selected global production centres. Methodologically the analysis is based on a comparison of development canola exports, production costs and prices in the EU and in selected global production centres. General considerations based on the theory of agribusiness, are applied and documented examples of the factors influencing the development of production costs for producers of canola. Analyses are based on the results of processing data from professional publications and resources focusing on the theme followed.

## Key words:

Agribusiness, canola, harvest area, sowing area, yields

## Introduction

Production of animal feed: feed mixtures with a share of the extracted scrap, rapeseed or crude oil as feed. Cultivation of rapeseed is advantageous for many EU agricultural producers. The cost of cultivation of rapeseed have slightly increased in recent years, but achieved average yield per hectare and favourable producer prices these costs greatly exceeded. Rapeseed can be therefore currently described as a profitable crop to produce. This fact proves the study of ÚKZÚZ (2014), which documents the volume of sales of rapeseed, which brings the growers in the Czech Republic, from the harvest in the year 2012 according to qualified estimate: CZK 13.15 billion and the harvest in the year 2013: CZK 14.4 billion. This is related to a significant increase in rapeseed cultivation, which reacts also to the increasing demand on the market.

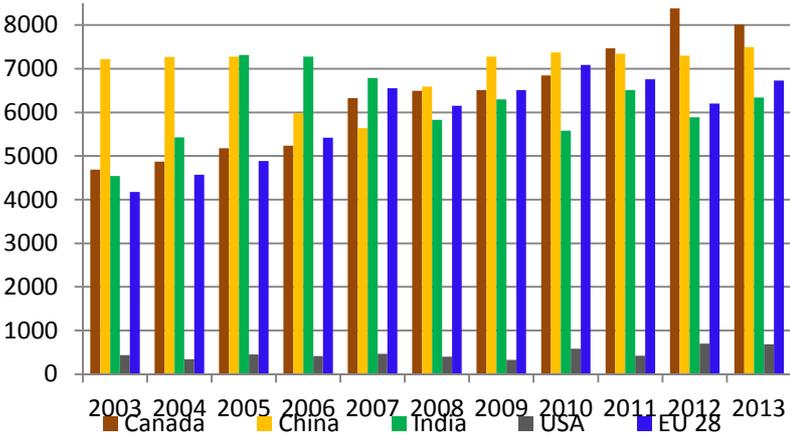
**Objective and methodology**

The aim of this paper is to describe the broader context of current changes in the supply of European canola producers in the current global market.

Methodically analysis focuses on the characteristics of the development of harvested areas and yields/hg of canola. Furthermore, a comparison of the development of harvested areas between selected world and European production centres. Analyses are made for the period of 2003 – 2013. The research is based on the results of data processing FAO, USDA on the development of indicators monitored, and The Reports about the oilseeds and scientific journals focused on the given topic.

**Results and discussion**

According to FAO (2014), after the strong rebound of 2012/13, global oilcrop production is forecast to expand by another 6 percent, or 27 million tonnes, in 2013/14. Higher area and better yields will both contribute to the expansion. Significant improvements are also expected for canola and sunflower seed. Global canola production is estimated to expand by an above-average 11 percent (2014), following near-ideal weather conditions in several key producing countries, especially in Canada, the United States, Ukraine and the Russian Federation, but also in the EU, India and China. While higher plantings in some countries also contributed to the rise in production, the area harvested in Canada actually dropped compared to the previous year. By contrast, Australia reported a reduction in both area and yields. Currently more than 80 % of the world production of canola is provided by producers from EU 28 countries, China, Canada and India. A global leader in the production of canola is EU 28 (21,01 mil. t. in 2013).



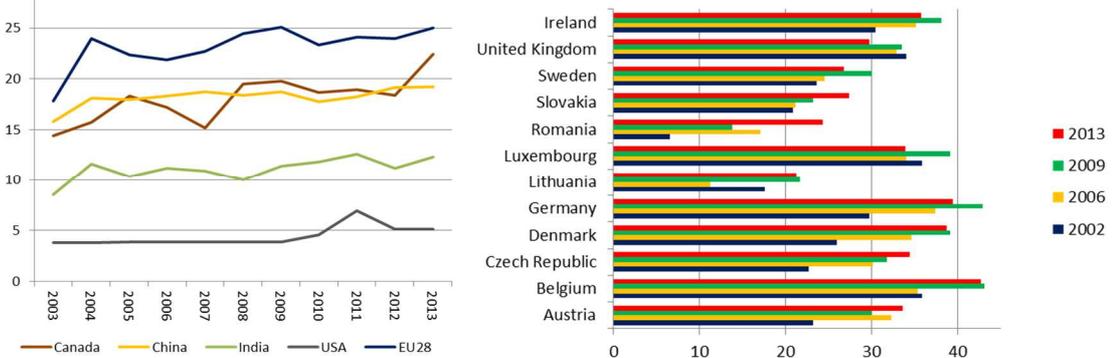
**Chart 1: Harvested areas in the main world production centres (in ths. Ha)**

Source: FAOSTAT (2014)

According to USDA (2014) EU rapeseed yields have been excellent, particularly for France, Germany, and the Czech Republic. With rapeseed area expanding by only 1 percent this year, higher yields are primarily responsible for an 11 percent increase in EU production from a year ago (2013). USDA’s forecast of EU rapeseed production was raised by 750 000 tons this month to 23.4 million. The higher domestic supplies could trim EU imports in 2014/15 to 2,6 million tons from 3.5 million in 2013/14. Limited prospects for growth in the EU rapeseed crush may boost season-ending stocks to 2,6 million tons. Nevertheless, EU vegetable oil production may expand to a record high this year (2014). In Canada, canola swathing is underway but harvest progress is delayed with the recent cool and wet weather. The Canadian Prairies have received above-normal rainfall this year (excluding the Peace River Valley region of Alberta, where it has been drier than average). Excessive rains in June in south-eastern Saskatchewan and south-western Manitoba caused scattered ponding in fields, damaging yield potential. On account of a lower yield outlook, the 2014/15 production forecast for Canada

declined 550 000 tons this month to 14,7 million. But the impact on total supplies is cushioned by a large inventory. Carryover stocks from 2013/14 totaled 2,4 million tons, up from 588 000 tons a year earlier.

According to FAO (2014) estimation, the EU 28 has the fourth largest area sown with canola in the world (6,73 mil. of ha in 2013). The highest yield/hg of canola can also be found in the EU-28 countries. The highest yields of canola are in Belgium 4.27 t/ha, in Germany 3.95 t/ha, in Denmark, 3.87 t/ha and in Ireland 3.58 t/ha (see charts 2).

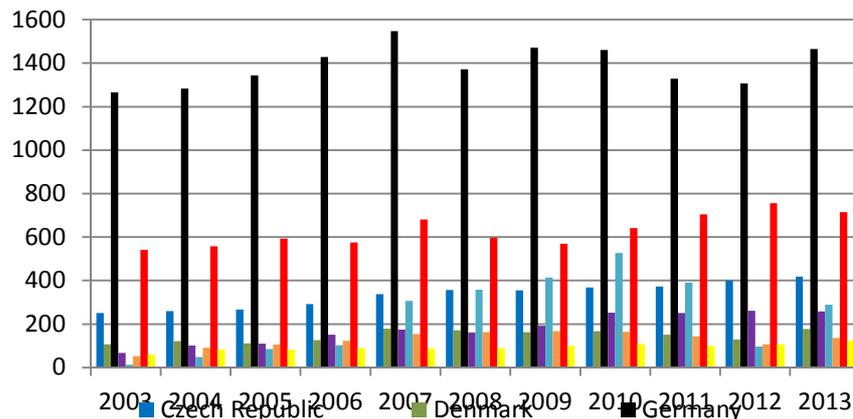


**Chart 2: Canola Yields in the main world production centres and the EU (Hg/Ha)**  
 Source: FAOSTAT (2014)

Directive of the European Parliament and the Council no. 2003/30 / EC on the introduction of mandatory blending biofuels into fuels and many EU countries increased demand for canola. This affected the increase in sowing areas and production of canola. The production of canola methyl ester for the domestic market and exports annually in the Czech Republic is consumed approximately 550 thousand. t canola. Increasing demand on the domestic, but also in the foreign market has an impact on the significant growth in producer prices and the declared values in foreign leaving a mostly stock exchange prices.

Canola in the is EU commodity whose growing in recent years for most farms very favourable. The cost of cultivation of rape have increased in recent years, rising slightly, but the average yield achieved a very favourable producer prices ranks among oilseed crops profitable.

In 2003/04 canola area in the Czech Republic fell below 300 thousand. ha and in the next four-year period with rape in the Czech Republic grew to 251 thousand. up to 292 thousand ha. From the marketing year 2007/08 again growing area exceeds 300 thousand. ha and production of rapeseed 1 mile. t. All harvested rapeseed finds application in domestic and foreign markets.



**Chart 3: Harvested areas in the main production centres in the EU 28 (in ths. Ha)**

Source: FAOSTAT (2014)

## Conclusions

Canola is one of the most important oilseed in the EU. EU has the fourth largest area of canola production in the world. The highest yield/hg of canola can also be found in the EU countries. The most important export commodities including canola oil, seeds, canola cakes and meals. Growing canola for agricultural producers in the EU is very advantageous. This is related to a significant increase in rapeseed cultivation, which also responds to the increasing market demand. In the EU there is a long-term fundamental changes in the commodity structure and proportions of the main sectors of agricultural production. These changes are particularly evident in the new EU Member States, both in the structure of crop and livestock production. Within the commodity measured rape is recorded long-term increase in sown areas and increasing its production. In the past, reached three main varieties of the majority of market share. Now they are increasingly initial variety replaced by newer and more powerful. The obvious is therefore shift to diversification varietal, which is becoming increasingly diverse.

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# New Cleavages in post-apartheid South Africa

Eva TATEROVA<sup>1</sup>

Ivo VALKA

## Abstract

Since the fall of apartheid, the Republic of South Africa is known as a country that proclaims the protection of all minorities living in the country. In 1994, there was a major change in South African society in comparison to previous political development. The politics of apartheid was officially refused and new liberal democratic Constitution was implemented. This new Constitution guarantee rights to all members of the society without any exclusion.

However, the reality is rather different from the ideals defined in the Constitution. The history of last twenty years (1994-2014) has shown that there are very significant new cleavages (conflicts lines) in the society of Republic of South Africa. What it is possible to observe nowadays is a shift from the conflict line black versus white people to the conflict line majority vs. minorities. Undoubtedly, the racial aspects are still very important but it is obvious that since 1994 there is a rise of new challenges regarding the status of minorities in the society.

The aim of this study is to describe these new cleavages that appear in the society of Republic of South Africa. Special attention will be headed to the sexual (LGBT) and religious minorities. In last two decades, there have been cases of the various attacks on these minorities. What can be observed in post-apartheid South Africa is the rise of anti-Semitism, Islamophobia and the hate of LGBTs. The examples of concrete events will be used in order to explain the discussed trends and phenomena.

In terms of methodology, this article shall be seen as a preliminary study and survey. Thus, descriptions of the discussed issues shall be the main method that is used. The available primary and secondary sources of literature will be studied and analyzed. As the topic of this article is very contemporary, most of the thesis cannot be confronted with the conclusions of other authors. It is also necessary to emphasize that the described trends cannot be considered as having been completed yet, thus the presented conclusions cannot be understood as definitive. The basic method of research is qualitative research with regard to the analysis and interpretation of the available quantitative data. The historical research methods will be used.

The achieved results shall be confronted with the existing theories related to the cleavages in society (especially the works of Seymour M. Lipset and Stein Rokkan). In conclusion, it shall be stated whether the new cleavages in the society of Republic of South Africa can be considered as more dynamic than the traditional ones.

## Key words:

South Africa, minorities, cleavages, anti-Semitism, LGBT

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## Introduction

Since 1994, the Republic of South Africa has experienced the overall transformation of both political regime and of the whole society. In previous decades<sup>2</sup>, the policy of apartheid was officially promoted. At that time, the racial segregation was practice in order to separate the white population from the black inhabitants of the country. There were places assigned for white people only where the black population was denied an entry. The public institutions such as schools, hospitals, cinemas, theatres, park, and also public transport were opened exclusively up for either white or black people. Within the country, so called Bantustans were created. The Bantustans should be the autonomous territories for the black people. In reality, these territories remained entirely dependent on the central government of South Africa in terms of both economy and political leadership. Any attempts of resistance against the central government of South Africa were usually ceased by a military intervention (see Hulec O. 2010).

Such a regime was not sustainable in a long-term view, and since 1980s there was a widespread opposition to the current system in South Africa. This process escalated in early 1990s when most of apartheid law was abolished. As one of the breaking points was the release of Nelson Mandela from prison. Subsequently, he became the first black president of the country (see Hulec O. 2010; Horáková H. 2007).

Since the fall of apartheid, the Republic of South Africa is known as a country that proclaims the protection of all minorities living in the country. In 1994, there was a major change in South African society in comparison to previous political development. The politics of apartheid was officially refused and new liberal democratic Constitution was declared by President Mandela in 1996. This new Constitution guarantee rights to all members of the society without any exclusion (Constitution of Republic of South Africa 1996).

However, the reality is rather different from the ideals defined in the Constitution. The history of last twenty years (1994-2014) has shown that there are very significant new cleavages (conflicts lines) in the society of Republic of South Africa. What it is possible to observe nowadays is a shift from the conflict line black versus white people to the conflict line majority vs. minorities. Undoubtedly, the racial aspects are still very important but it is obvious that since 1994 there is a rise of new challenges regarding the status of minorities in the society. The aim of this study is to describe these new cleavages that appear in the society of Republic of South Africa. Special attention will be headed to the sexual (LGBT) and religious minorities. In last two decades, there have been cases of the various attacks on these minorities. What can be observed in post-apartheid South Africa is the rise of anti-Semitism, Islamophobia and the hate of LGBTs. The examples of concrete events will be used in order to explain the discussed trends and phenomena.

## Methodology

This article shall be seen as a preliminary study and survey. Thus, descriptions of the discussed issues shall be the main method that is used. The available primary and secondary sources of literature will be studied and analysed. As the topic of this article is very contemporary, most of the thesis cannot be confronted with the conclusions of other authors. It is also necessary to emphasize that the described trends cannot be considered as having been completed yet, thus the presented conclusions cannot be understood as definitive. The basic method of research is qualitative research with regard to the analysis and interpretation of the available quantitative data. The historical research methods will be used.

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<sup>2</sup> *Period from 1948 to 1994.*

## Theory of Cleavages

In political science, the term cleavage refers to the division of voters into voting blocks. The analyses of the cleavages in the society have been a part of political science research since 1967 when Stein Rokkan together with his colleague Seymour Martin Lipset published a book *Party Systems and Voter Alignments: Crossnational Perspectives* (Rokkan S. and Lipset S. 1967). In this book, the authors defined four basic cleavages that appear in Western European countries as follows:

- Center vs. Periphery.
- State vs. Church.
- Owner vs. Worker.
- Land vs. Industry.

Originally, the theory of cleavages was applied only to Western European countries when the breaking points in history were seen as crucial for the development of cleavages in the society. During time, this concept was revisited and updated by various authors. Nowadays, it is possible to distinguish two main attitudes towards the cleavages in the society. The first attitude is represented by political scientists, the most famous author is Ronald Inglehart. The other attitude is often titled as sociological as it emphasizes the concept of social classes. This attitude is represented by Stein Rokkan, and Michael Gallagher.

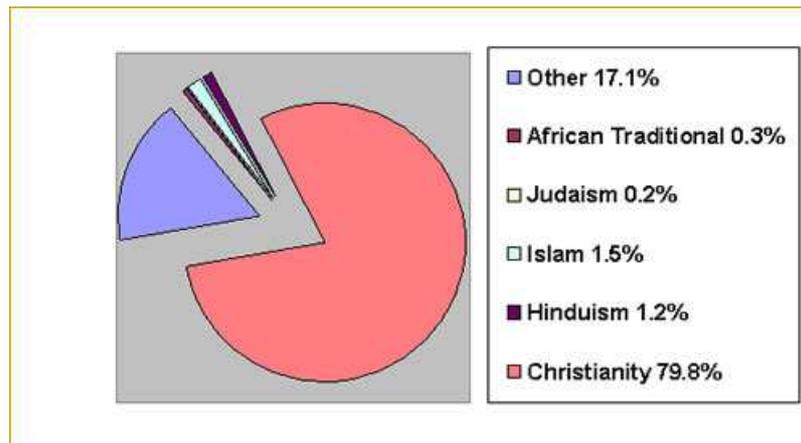
Regarding this study, it is important to introduce seven basic types of cleavages defined by Arend Lipjhart in 1999. In his work, Lipjhart decided to replace the term cleavage by the term ideological dimension. The dimensions that can appear in the society are as follows (Lipjhart A. 1999):

- Socio-economical dimension.
- Religious dimension.
- Culture-ethnic dimension.
- Urban-rural dimension.
- Post-material dimension.
- Support for regime.
- Foreign policy.

As this study is focused on the description of new cleavages in the society of Republic of South Africa, special attention will be headed the religious dimension and culture-ethical dimension.

## Results

Religion still plays a very important role in nowadays Republic of South Africa. Similarly to other countries, religion can be a cause of both reconciliation and conflict in the society. The following graph shows the distribution of religious groups in South African society.



**Pic. 1 Religion in Republic of South Africa (South African Embassy in the Netherlands 2014)**

The majority of people in South Africa is of Christian denomination. As for the other members of other churches, the percentage of their believers might seem to be very low<sup>3</sup> but the recent events have proved that even not very numerous religious minorities can be a source of conflicts in the society. What is also important here is that religion usually has got a certain influence on how the sexual minorities are perceived. In last two decades, there have been cases of the various attacks on both religious and sexual minorities. What can be observed in post-apartheid South Africa is the rise of anti-Semitism, Islamophobia and the hate of LGBTs. The examples of concrete events will be used in order to explain the discussed trends and phenomena.

### **Status of Jews in post-apartheid South Africa**

Nowadays, Jewish population in South Africa is estimated to be about 75,000 people and that makes 0.2% of the population. Despite these low numbers, Jews in South Africa has always been the elites in the society. The first Jewish settler came to the territory of nowadays South Africa as a part of Portuguese expedition in first wave of colonialism in 15<sup>th</sup> century. During the time, Jewish population in South Africa was growing constantly. Originally, most of Jews was located in Cape Town area, later on they also moved to new growing cities such as Johannesburg, and Pretoria. At the beginning of 20<sup>th</sup> century, Cape Town Jewish Board was to establish in order to represent the Jewish community. This organization is still active today (Jewish Virtual Library 2014).

At this period of time, anti-Semitism appeared in South African society. The first major incident came during Boer Wars (for more information see Wilkinson-Latham C. 2012). As most of Jews supported Great Britain rather than Boers, anti-Semitism was a typical reaction of some Boers. Another wave of anti-Semitism came during World War II when some Afrikaners seemed to be inspired by Nazi regime in Germany. South Africa accepted the Jewish emigrants from Europe till 1937 when new restricting law was adopted (Jewish Virtual Library 2014). During the apartheid period, Jews belonged to the privileged white population despite the fact some Jews opposed the apartheid regime<sup>4</sup>. What was significant in this period of time was the strengthening mutual cooperation between South Africa and the State of Israel. Jewish community in South Africa, it is a very religious community<sup>5</sup>. About 80% of them are Orthodox Jews (Peters J. 1992).

<sup>3</sup> It is important to emphasize the category others in the graph 1 also includes the atheists. There are about 15% of atheists in South African society (Ashton G. 2008)

<sup>4</sup> E.g. 14 Jews involved in Treason Trial in 1956 when Nelson Mandela was arrested for treason.

<sup>5</sup> Jewishness can be understood both in terms of religion and cultural identity.

Since the fall of apartheid, there has been a constant outflow of Jews from South Africa. It is estimated that about 1,800 Jews leave the country annually especially because high criminality rates and economic problems of the country. Many of these emigrants decide to settle in Israel due to Law of Return. Quite often, they are encouraged to move to Israel by the political authorities. In 2014, former Israeli Minister of Foreign Affairs urged South African Jews to move to Israel in sake of their own safety: *“The South African government is creating an anti-Israel and anti-Semitic atmosphere, which will result in pogroms against the country’s Jews. I call on all Jews still living there to make aliya as soon as possible, before it is too late”* (Jerusalem Post 2013).

What is typical for anti-Semitism in South Africa is the link to the events in the Middle East. Anti-Semitism in South Africa usually grows when any crisis regarding Israel appears (so called relocation of Arab-Israeli conflict to other part of the world). A good example of such a case could be the response of South African Muslims to the Operation Protective Edge<sup>6</sup>. In August 2014, there was a huge march in Cape Town when more than 40,000 people declared their support for Palestinians living in Gaza Strip (Kamaldien Y. 2014).

According to the head of South African Zionist Federation Zev Krengel, this situation is similar to other conflicts in the past: *“I’ve been 12 years in this position. I started in the height of the Second Intifada, have served through the Second Lebanon War, Operation Cast Lead... I don’t feel that it is any different, any worse or any better”* (The Times of Israel 2014).

The trend of relocation of Arab-Israeli conflict to South Africa is also confirmed in the annual reports on anti-Semitism issued by South African Jewish Board of Deputies. According to the available reports, in previous years the anti-Semitic acts were of non-violent nature<sup>7</sup> (South African Jewish Board of Deputies 2012). In general, it can be assumed that the local Muslims are responsible for most of the anti-Semitic incidents rather than Christian majority which a significant shift in comparison to history of 20<sup>th</sup> century.

### **Status of Muslims in post-apartheid South Africa**

Today, Muslims are considered as a minor religious group in South Africa. It is estimated that there are about 1.5% of Muslims<sup>8</sup> in the country. The first Muslims arrived to the territory of nowadays South Africa in 1667 as the slaves from Dutch East Indies<sup>9</sup>, later there were few more immigration waves. After the end of apartheid, most of Muslim immigrants come from northern Africa and south Asia with a vision of getting a better job. Typically, they are located by the big cities such Cape Town, Durban, Johannesburg, Port Elizabeth, and Pretoria. However, not all Muslims in South Africa are the immigrants or the descendants of immigrants. Since early 1990s, there have been significant wave of conversions to Islam. In fact, it is estimated that Islam is the most growing religion in South Africa. It is assumed that one of the important motives for black people to convert to Islam could be the attempt to differentiate themselves from the white people who are mostly Christians (Mumisa M. 2002). In terms of politics, South African Muslims had their representatives in parliament only once. In 1993, Africa Muslim Party and the Islamic Party were able to succeed in election. Since that, a similar success has not been repeated. According to available sources, most of South African Muslims consider themselves to be moderate. In response to growing Islamic extremism worldwide, in 2014 there was a petition of South African Muslim declaring that denied violence (Asmal F. 2014).

As Constitution of South Africa guarantee rights to all members of the society without any exclusion, Muslim living in the country are allowed to practice their religion without any

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<sup>6</sup> *This term refers to Israel-Gaza conflict in summer 2014.*

<sup>7</sup> *Typical anti-Semitic acts in South Africa are vandalism, hate mails, personal assaults, and offensive media.*

<sup>8</sup> *Most of them are Sunni Muslims.*

<sup>9</sup> *The former Dutch colony located in modern Indonesia.*

limitation. Muslim student are allowed to attend the Muslim schools, or when they attend the public and private schools they are exempt from prayers and Biblical curriculum. Halal food products are available within the country. The government of South Africa have been discussing the implementation of Muslim Personal Law or Muslim Family Law. These days, this discussion is still open.

In general, it can be assumed that the relations between Muslim minority and the majority of society in South Africa are peaceful and without serious problems. However, there are also examples of individual cases when there were some controversies. In 2010, there was so called Zapiro's affair. There were a series of Muslim demonstrations in reaction to publication of Prophet Mohammad's cartoon in journal newspapers Mail&Guardian. The author of the cartoon Jonathan Zapiro and the editor of the journal received few anonymous death threats. These events resulted in the intense discussion regarding both the freedom of speech and the respect to other religion (Smith D. 2010).

The same year, there was a lot of resistance of people in Durban against a plane of local Muslim community to build a mosque in Queensburgh neighbourhood. In the end, the permission to start the construction works was granted but the problems endured. In 2012, during Muslim holy month Ramadan a pig head<sup>10</sup> was found at mosque site. This event was interpreted a provocation and another evidence of hatred for Muslims (Mbuyazi N. 2012). Similar problem appeared in Pretoria where local people opposed to the plan to build a new mosque in 2013 (Pitt B. 2013).

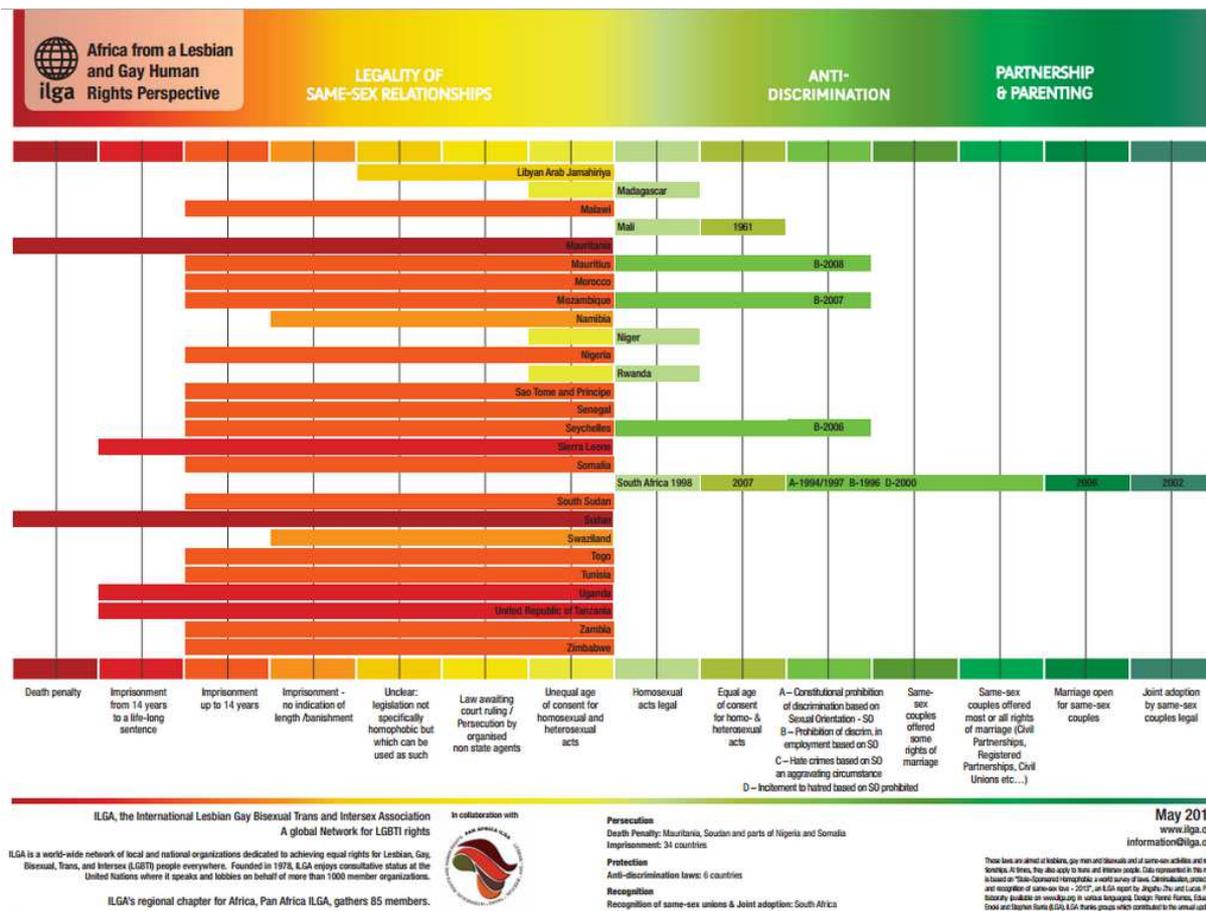
### **Status of sexual minorities in post-apartheid South Africa**

Nowadays, Republic of South Africa is usually considered as one of LGBT<sup>11</sup> people most friendliest-country in Africa. Constitution of post-apartheid South Africa is considered as one of the most liberal in the world regarding the sexual minorities. South Africa was also the first country in Africa that recognized same-sex marriage in 1993. The following picture shows the attitude of South Africa regarding the other issues important in terms of LGBT people's status.

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<sup>10</sup> *Pig is considered as an unclean animal by Qur'an.*

<sup>11</sup> *Lesbian, gay, bisexual, and transgender people.*



Pic. 2 Status of LGBT in selected African countries (ILGA 2013)

Despite of the liberal law, the social status of LGBT South Africans is often very sensitive. There are significant dangers that the sexual minorities in South Africa have to face up to such as homophobic violence, HIV-AIDS, and least but not last social stigma.

According to John Meyer, health manager in Out, homophobia is still a very contemporary issue in South African society: *"When laws change, it doesn't mean that attitudes on the ground do. It often takes a bit of time for people to catch up. Many people still believe strongly that being LGBT is wrong. It's a traditional, conservative outlook on life that will take a while to change yet. But things are changing, slowly"* (Everett C. 2014).

The attitude towards LGBT is quite often determined by religious views. As the majority of South African population is of Christian denomination, many of these people take over the conservative values of Christian church<sup>12</sup>. The emphasis on conservative values, and thus condemnation of LGBT is particularly strong especially in rural areas. As for the big cities such as Cape Town, Johannesburg, and Pretoria more liberal approach is usually adopted.

One of the most discussed issues in terms of violation of human rights regarding LGBT are so called corrective rapes<sup>13</sup>. Especially but only the black lesbians living in the townships are affected by this practice. Nowadays, this issue has been discussed in the Parliament. There are the claims of various NGO to classify corrective rape as a hate crime (Everett C.

<sup>12</sup> LGBT is perceived as negative by most of Christian denominations. As for Islam, homosexuality is seen as a mortal sin.

<sup>13</sup> A corrective rape is supposed to be a cure of homosexuality.

2014). Corrective rapes are seen as the most serious anti-LGBT acts, but the annual reports of Human Rights Watch also highlight the other forms of discrimination of LGBT.

## Conclusions

This study aimed to analyse, and to describe these new cleavages that appear in the society of Republic of South Africa. Special attention was headed to the religious and sexual (LGBT) minorities. For these reasons, the religious dimension and culture-ethical as defined by A. Lipjhart were discussed.

Since the end of apartheid, Republic of South Africa has been facing up to various new challenges. The status of minorities in the society is one of the very important issues that have been discussed. While the existing law is very liberal and supportive to the minorities, there is some tension in the society regarding particular groups.

Surprisingly, the religious dimension does not seem to be a source of conflict in South Africa in terms of mutual relations between majority and minority. In general, the attitudes of majority towards the religious minorities are quite tolerant. What appears to be more conflicting is how the particular religious minorities perceive the other religious minorities. The case that was studied in this article was the relationship of Jews and Muslims in South Africa. In fact, this case is a good example of relocation of Arab-Israeli conflict to another country because according to available data, most of anti-Semitic incidents is committed by local Muslims.

As for culture-ethnic dimension, the story is more complicated. In many cases, the attitude towards LGBT people is affected by conservative religious views and lack of education. Today, to be a sexual minority in South Africa still often means a social stigma and even risk of being a target of violent attack. Despite of information campaign by various NGOs, this issue is still very vivid in South African society. If not analysed and approached responsibly, this issue might be a source of serious conflict in the society in the future.

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# Beveridge Curve as an Indicator of Labour Market Performance

Michal TVRDON<sup>1</sup>

## Abstract

The paper deals with defining and evaluating development of the Beveridge curve in the countries of the Visegrad group in the period 2000 to 2012. Labour market performance is largely dependent on the economic cycle. In other words, if the economy gets into negative output gap rising unemployment appears and vice versa. The unemployment rate by itself cannot adequately characterize situation on the labour market. The recorded data can be stated that during the period correspond to shifts in the Beveridge curve in the different countries of the Visegrad group theoretical concept of this curve. This trend was reflected by reducing unemployment and raising the number of unfilled jobs. In the next phase, after reaching the summit, unemployment started to grow and the number of unfilled jobs started to decline as the consequences of the economic crisis. On the contrary, the Hungarian labor market can be described as rigid, though some shifts occurred during the observed period.

## Keywords:

Beveridge curve, labour market performance, unemployment rate, Visegrad group

## Introduction

In the literature, we can see many approaches to the analysis of the labour market development and the Beveridge curve is one of them, although it is not often used. Labour markets in the Visegrad group countries have undergone the turbulent developments during the past ten years and the aim of this paper is, based on available data, to compare the development of the Beveridge curves within the Visegrad group countries. The Beveridge curve is an empirical relationship between job openings (vacancies) and unemployment. It serves as a simple representation of how efficient labour markets are in terms of matching unemployed workers to available job openings in the aggregate economy.

The paper is structured as follows: (i) in the first part, the paper deals with theoretical-methodological background; (ii) the second part focused on empirical results – construction of the Beveridge curve in the analysis was based on quarterly data from the OECD and Eurostat database. This research was financially supported by the Student Grant Competition SU within the project SGS/7/2012 “The influence of regional disparities on the business environment”.

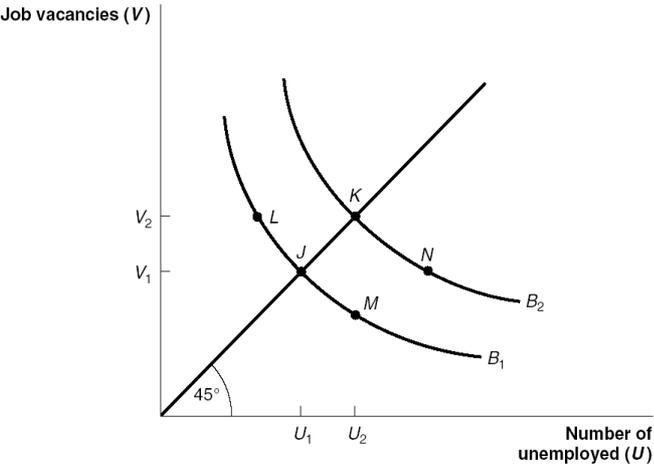
## Theoretical background

There are many ways how to describe labour market performance. The most common is to use the unemployment rate. However, this macroeconomic indicator by itself cannot capture all aspects of the functioning of the labour market. Some economists focus on institutional aspects like employment protection legislation, structure of wage bargaining or taxation of labour and their influence on labour market performance. Another approach is based on statistics of unemployment and of unfilled vacancies that is used to illustrate trends in the demand for labour or so called UV-curve as the inverse relation between the unemployment and vacancies in an economy. However, according to Rodenburg (2007) the place and role of the UV-curve in economic thinking has changed radically over the decades since its first appearance

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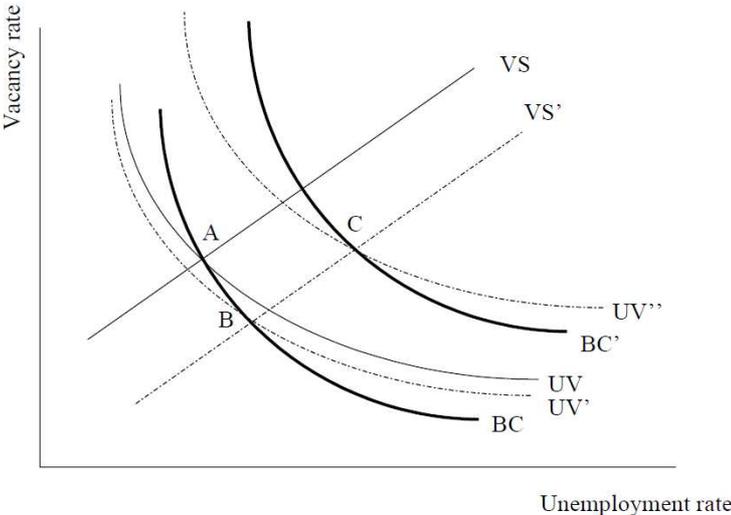
<sup>1</sup> Silesian University in Opava, School of Business Administration in Karvina, Department of Economics and Public Policy, Univerzitni nam. 1934/3, 733 40, Karvina, Czech Republic, email: tvrdon@opf.slu.cz

According to Dow and Dicks-Mireaux (1958) the long-period 'divergence' between the unemployment and the vacancy statistics is probably best interpreted as evidence that one or other or each of the series was being affected not only by the demand for labour but also by something else. Theoretical Beveridge curve could be derived from uv curve which was mentioned in Dow and Dicks-Mireaux (1958) – see figure 1. An idealized UV-curve as a rectangular hyperbola. Points J, K, L, M, N on the diagram represent observed values of unemployment (u) and vacancies (v). An upward sloping line through the origin at a 45° degree angle separates the areas of excess supply and demand for labour or in other words. Zero net excess demand is then to be defined as all points where unemployment equals true vacancies (45° degree line through the origin). Successive points on the 45-degree line (e.g. points J, K) correspond to different degrees of maladjustment that may conveniently be measured as the amount of unemployment which would exist at any time if there were zero net excess demand. For any given degree of maladjustment, there will be a series of points corresponding to different degrees of demand, and lying on a curve convex to the origin (points L, J and M).



**Pic. 1 Name of picture 1 – use style [ICABR Pictures-Tables]**

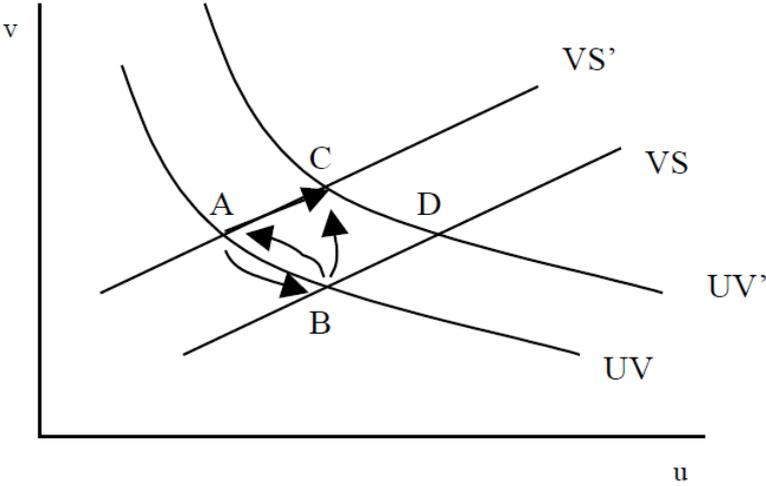
According to Galuščák and Münich (2007) each point on the Beveridge curve in the unemployment-vacancy space is represented by an intersection of a downward-sloping unemployment-vacancy (UV) curve and an upward-sloping vacancy-supply (VS) curve (see figure 2).



**Pic. 2 Beveridge curve. Source: Galuščák and Münich (2007)**

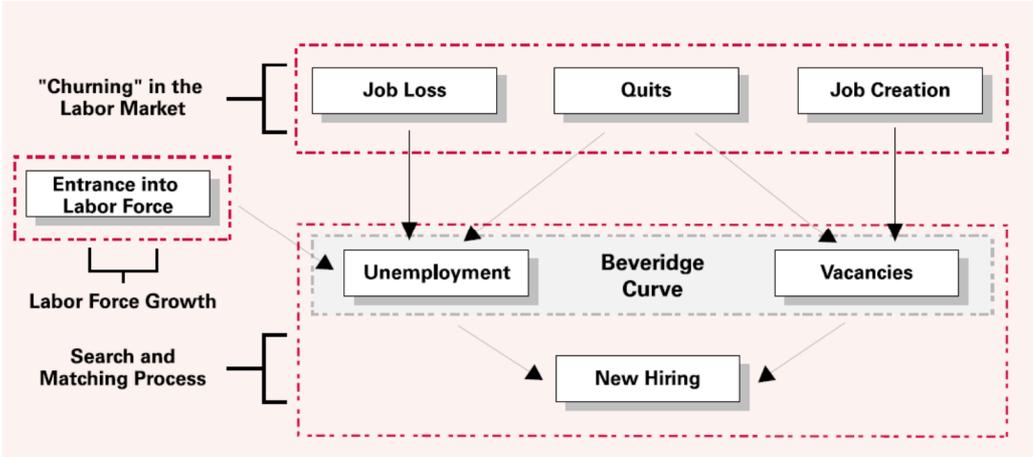
The question is how different shocks can influence Beveridge curve. Galuščák (2014) distinguishes three groups of shocks: (i) in aggregate demand (fiscal and monetary policy), (ii)

change in wage pressures and (iii) change in non-labour income. These three types of shocks entail temporary or permanent shift in the VS curve, corresponds to movement from A to B (see figure 3). On the other hand, there exist also structural shocks (e.g. lower demand in a specific industry) that may cause right shifts of the UV curve. UV curves shifts to the right due to higher regional or occupational mismatch between  $u$  and  $v$ . Structural shocks lead to temporary or permanent shifts from A to C due to the UV curve shift (see figure 3). In addition, hysteresis causes shift from B to D (if the demand is permanently lower) or from B to C (temporary drop in demand).



**Pic. 3 Shifts of UV and VS curves. Source: Galuščák (2014)**

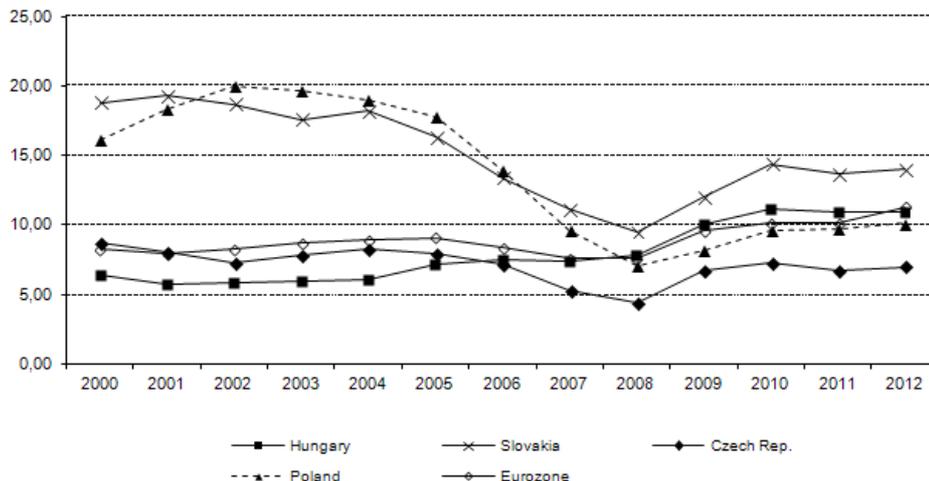
According to Bleakley and Fuhrer (1997) Figure 4 presents a schematic of the simple model. The Beveridge curve is represented by the grey box outlined at the centre of this figure; it is determined by the flows of workers and jobs into and out of unemployment and vacancies, as indicated by the arrows. As the figure shows, unemployment arises as the result of flows of job losers, job leavers (“quits” or voluntary job separations), and flows into the labour force. Vacancies arise from the expansion of firms (“job creation”) and from quits. The outflows from the Beveridge variables are new hires: Workers leave unemployment upon finding a job and jobs are no longer vacant once a worker is hired. The flows fall into three broad categories: labour market reallocation or “churning,” labour force growth, and the search and matching process.



**Pic. 4 A simple model of unemployment and vacancies underlying the Beveridge curve (source: Bleakley and Fuhrer 1997)**

## Empirical part

Figure 5 shows the evolution of the unemployment rate from 2000 to 2012. This period was marked by several events that had an impact on unemployment, whether positive or negative. In terms of the business cycle, firstly the V-4 countries grew slightly, and then there was a slight stagnation, while in the period from the year 2004 to the year 2008, the real GDP growth rate reached high values, which had positive impacts on job creation and reducing unemployment, including its long-term component. Then, however, has been a significant decline in real GDP (with the exception of Poland). This was a consequence of the global financial crisis and subsequent economic crisis. As mentioned above, the economic crisis had huge impact on the labour market performance within the EU countries and USA. To restore economic balance was an exacting task for national governments. If we look at the evolution of the unemployment rate, we can conclude that for all V-4 countries, with the exception of Hungary, was recorded positive trends in this indicator over the last three years before the economic crisis - the unemployment rate dropped significantly. The main factor that caused the higher efficiency of the labour market was impressive economic growth in those years. The higher rate of growth had a positive impact on labour market performance. We can consider the massive inflow of foreign direct investment, higher household consumption and economic growth in major trading partners in Western Europe, especially in Germany among other factors having a positive impact on better labour market performance.



**Pic. 5 Unemployment rates in V-4 countries, years 2000-2012 Source: Eurostat**

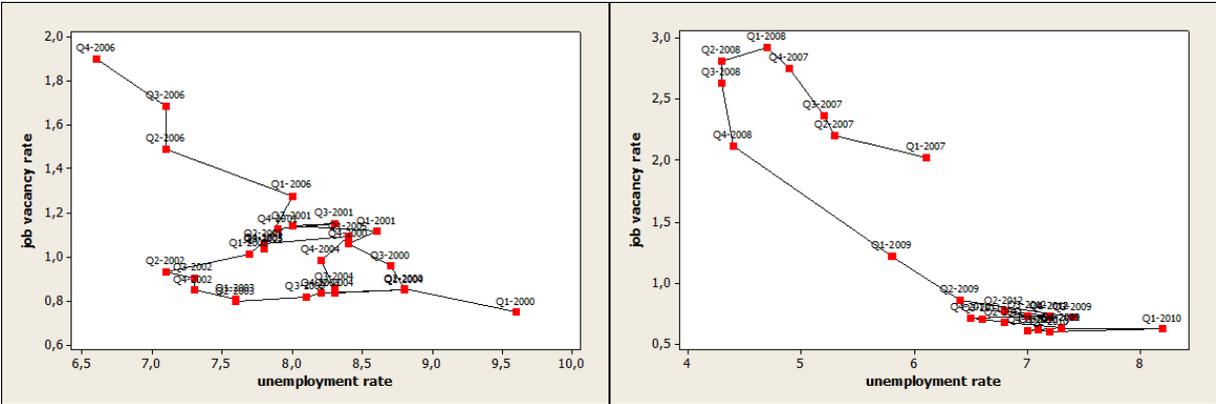
Downward trend in the development of the unemployment rate was particularly striking in the case of countries with traditionally high unemployment rate (Poland and Slovakia), where the rate fell from 19.9 % or rather 18.7 % in 2002 to 7.1 % or rather to 9.5 % in 2008. In the case of Slovakia, factors like effective cooperation of job placement services to job seekers, new legislation in the area of employment services, as well as tightening the provision of unemployment benefits or some fiscal measures on the part of demand, such as reducing taxes on corporate income, improved the labour market performance during the observed period. The trend of lowering the unemployment rate was typical in this period in the case of the Czech Republic, where the unemployment rate decreased to 4.4 % and the Czech economy before the crisis was among EU countries with the lowest unemployment rate. Hungary was the only economy that could be characterized by increasing unemployment rate (unemployment rate has increased from 6.4 % in 2004 to 7.4 % in 2007). Previous decline in the unemployment rate (from 1994 to 2001) was partly the result of changes in the system of unemployment benefits, reduced period for providing unemployment benefits and more strict criteria for inclusion in the system (Joint Memorandum on Social Inclusion of Hungary, 2003). The subsequent development of the Hungarian unemployment rate (since 2003) was influenced by the unsatisfactory economic situation in the country, which was mainly caused

by an unstable system of public finance, which caused large fiscal imbalances that resulted in an increase in public debt. Due to the size of fiscal imbalances government had to increase the revenues of the state budget, for example. Increasing the employee share of social security contributions, value added tax and a higher burden of the business sector. Ultimately, these changes resulted in a reduction in disposable income of households and businesses, which had a dampening effect on aggregate demand (OECD Studies, 2007).

The deep recession in most EU countries has led to a significant deterioration in labour market performance since 2008. General macroeconomic rules shows that the unemployment rate fluctuates depending on the phase of the business cycle - during a recession or depression it tends to increase, while in times of economic growth the unemployment rate tends to decrease. In light of the recent global recession, it is worth to say that due to partial reforms in labour markets and product markets and, last but not least, another overall micro and macro environment in most EU countries, the impact of the crisis in segments of long-term unemployed and structurally unemployed was milder in comparison with previous crises of 30s or 70s of the 20th century.

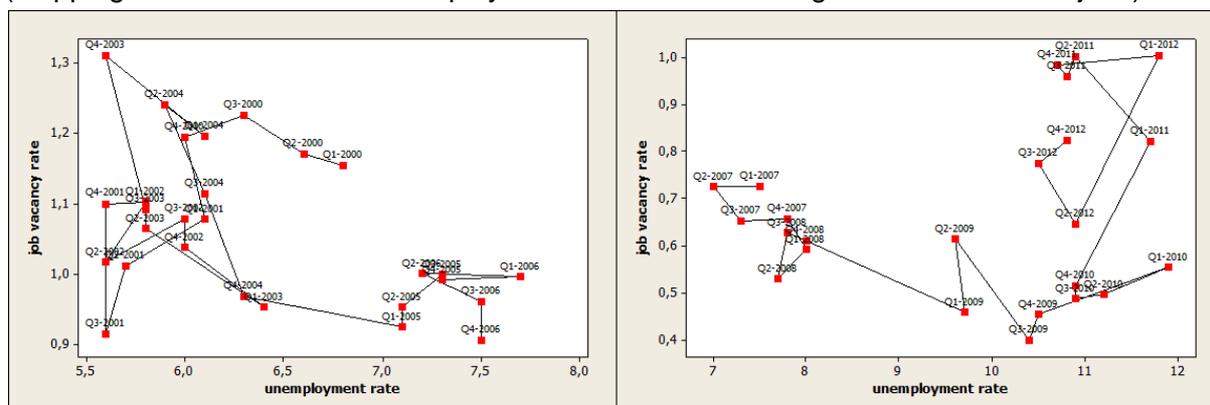
The global economic recession still posed a major shock to the Visegrad Group countries. According to our estimates in previous studies (see Tvrdon, Tuleja and Verner 2012), both Czech and the Slovak were in positive output gap which means that the real GDP was higher than potential output. At the same time, however, the massive growth in GDP accompanied by reform of public finances led to increasing inflationary pressures in the Czech economy. We can count increase the number of unemployed, while at the same time was part of the employed labour force used fewer hours than before the crisis (see Popescu, Duica and Hrestic, 2010) among crisis's consequences. As absorbing "pillow", which eased the rapid increase in the unemployment rate, we may indicate a significant decline in demand of employers for temporary agency employment of foreign workers who were among the first groups that were fired.

Development of the Czech labour market most closely matches theoretical construction of the Beveridge curve (Figure 6). We divided the observed period into two parts: (i) years 2000 till 2006 and (ii) years 2007 – 2012. If we look at the first period, we can see that the initial quarter (1Q2000) was characterized by the high unemployment rate and low level of unfilled jobs. The figure shows that the Czech labour market has undergone two cycles during this observed period. The first cycle occurred between 2000 and 2004, the second one occurred from 2006 to 2010. Each cycle started by gradual improvement in the labour market. This trend was reflected by reducing unemployment and raising the number of unfilled jobs. In the next phase, after reaching the summit, unemployment started to grow and the number of unfilled jobs started to decline as the consequences of the economic crisis. The fundamental difference between these two cycles consisted of dynamics. While in the first cycle, shifts of the Beveridge curve were minor, there were significant shifts during the second cycle (see figure 6).



**Pic. 6 Beveridge curve Czech Republic, years 2000-2006 (left side) and years 2007-2012 (right part) Source: OECD; Eurostat**

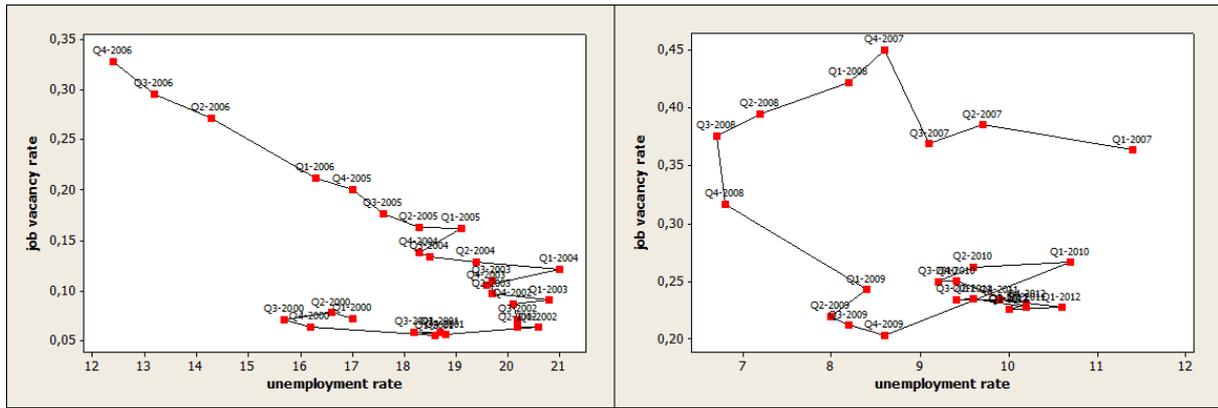
On the contrary, the Hungarian labour market can be described as rigid, though some shifts occurred during the observed period. In the first half (until 2004), both the unemployment rate and the rate of unfilled jobs stayed quite stable. Since 2004, however, the unemployment rate has increased and the rate of unfilled jobs has decline. Unlike other V-4 countries the subsequent development of the labour market was affected by the problems with which the economy struggled. As shown in Figure 7, the unemployment rate has increased continuously since 2007, even labour market performance significantly improved in the rest of the V-4 countries. This insufficient labour market development was influenced by bad economic situation in the country which was caused by unstable finances, large fiscal imbalances and high government debt. Given the size of fiscal imbalances, government had to raise state budget's revenues, e.g. hikes in employee social contributions, value-added tax and business taxation. Yet development of recent data shows the first signs of labour market performance (stopping an increase in the unemployment rate and increasing the rate of unfilled jobs).



**Pic. 7 Beveridge curve Hungary, years 2000-2006 (left side) and years 2007-2012 (right part) Source: OECD; Eurostat**

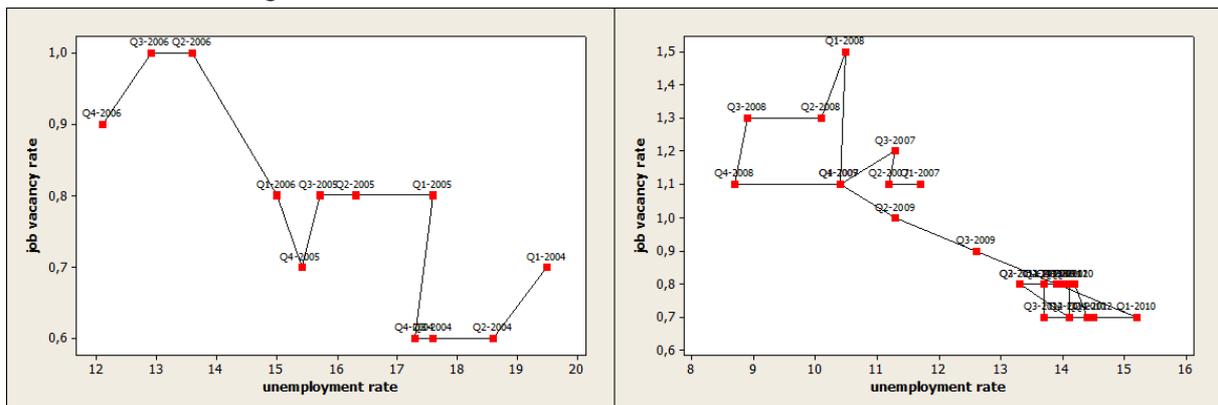
Polish labour market performance was worsening by increasing the unemployment rate to beyond 20 % accompanied by the low rate of unfilled jobs in the first four years. It has started to improve since 2004 - the unemployment rate gradually declined to a historically low rate of 7 % before the economic crisis. Like the rest of V-4 countries or other EU countries the unemployment rate started to increase again since the second half of 2008. Compared to such development in the Czech Republic, the overall shift of the Beveridge curve did not reach such a dynamic perspective. Although the Polish market is four times bigger than the Czech labour market it was not reflected by a higher number of unfilled jobs. Therefore, the rate of unfilled vacancies exceeded 0.5 % during the observed period, whereas the Czech labour market vacancy rate reached up to 3 %.

In this context, however, we must face the problem that is associated with the way how statistical data are collected. For example, in the Czech Republic, the number of unfilled vacancies is distorted to the extent that they are not automatically excluded from the records. After some controls carried out by authorities it was found that there was a significant portion of these vacant jobs which were not valid. In addition, some employers' positions remained vacant, and for this reason, that the work permits of foreign nationals is guaranteed only after the expiry of three months and then these positions are not suitable for placement of suitable candidates (Kalužná 2008). On the contrary, in the case of Poland, there are problems with the list of vacant posts, which is limited compared with the Czech Republic; Polish employers must notify the competent authorities only vacancies for low-skilled positions. Surveys have also revealed that only half of employers contacted the local authority mediation when needed to hire a new worker (Kalužná 2009).



**Pic. 8 Beveridge curve Poland, years 2000-2006 (left side) and years 2007-2012 (right part) Source: OECD; Eurostat**

The vacancy rates data from OECD database were inaccessible in the case of Slovakia. So we used Eurostat data but the database starts with first data at the first quarter of 2008. However, Figure 9 shows that the Slovak labor market was influenced by the economic recession. Unlike the Czech Republic the economic recession showed a decline vacancy rate first. Afterward the unemployment rate increased and this increase was among the EU countries with the highest shift.



**Pic. 9 Beveridge curve Slovakia, years 2000-2006 (left side) and years 2007-2012 (right part) Source: Eurostat**

## Conclusions:

In drawing conclusions about the Beveridge curve shift analysis it is necessary to take into account important factors: (i) shift to the right and downwards at the same time is considered negative (rising unemployment and declining rate of job losses); (ii) the evaluation must take into account the scale of the axes or ranges of values of the axes. Moreover, changes in the unemployment rate and job vacancy rate are consistent with cyclical changes, while outward shifts signal increasing mismatch, in other words it means that there is an increase in structural unemployment.

For most countries, you can read some dependence curve BC with the development phase of the business cycle. First, in the period 2006-2008 there is a shift of the curve BC to the left and upward (growth rate of the jobs is increasing, while the unemployment rate declined). Since the second half of the year 2008, however, the entire economy of the European Union was affected by the economic recession. In this period, it was recorded BC curve shift to the right (reduction of vacant jobs and growth of the unemployment rate). Other period, although with less intensity, which confirms the dependence of the BC curve development to the economic cycle is the period 2000-2004. The exception is Hungary, which

for most of the period saw a shift to the right of the curve BC, which was due to internal economic problems of the country.

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# Internationalization of small and medium sized enterprises in selected regions of Germany

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Felix Franz HOTZINGER<sup>2</sup>

## Abstract

In connection with the experts, SMEs are specialized in individual products and services on customer demand. Relationships between employees and management frequently are informal and personal, which results in a low degree of formalism and bureaucracy and enables SMEs to react to environmental changes rapidly. In spite of these virtues on a local level only a quarter of Germany's SMEs operate internationally. Only 16 % of SME turnover is from exports. In total German industry though earns more than 30 % from export goods. Concerning international engagement German SMEs hence dispose of further growth and turnover potential. Why are Germany's SMEs reluctant to go abroad? This paper intends to fill gaps in knowledge on German SME internationalization and explore the cause and effect chain of SME characteristics, SME internationalization modalities and internationalization success in more detail. Already this short but contradictory overview shows that the topic of SME internationalization has not been explored systematically so far -though diverse studies are available on this question, hardly any author discusses the topic comprehensively in an empirically founded model that brings cause and effect relationships together. While some studies on SMEs in Northern European or Anglo-Saxon economies have been published, studies on German SMEs' internationalization so far are virtually unavailable. The preparation of going international, internationalization strategies applied and possible impediments to internationalization so far have not been explored by SME type (for instance differentiating by branch, firm size or management experience) systematically. The impact of internationalization strategies or preparation for internationalization on the degree of internationalization and comparative competitive performance has partly been evaluated for large MNCs but widely is unknown for SMEs so far.

For example, to what extent do SME characteristics (e.g. firm age, branch, size, leadership) determine internationalization preparation, strategy and possible impediments to internationalization? To what extent do parameters of internationalization preparation, strategy and possible impediments to internationalization determine the degree of SME internationalization success and performance? To what extent does the degree of SME internationalization determine SMEs' competitive performance? To answer these research questions the paper conducts a systematic review of previous studies on SME internationalization strategies, impediments and success and derives categories to assess the cause and effect relationships of SME internationalization systematically. These considerations result in a causal research model, which will be argued and detailed as to its indicators in the course of the paper. Model hypotheses to be tested by multiple regression modelling are derived from previous empirical research in the course of the paper. To test this model the study relies on an empirical survey among 167 German SMEs. It applies exploratory factor analysis to assign adequate items to the parameters and develops a multiple regression model to test the relevance of the indicators of the model parameters on the assumed causal relationships.

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**Introduction**

Small and medium-sized enterprises play a significant and essential role in all countries with a market economy. They also have extraordinary significance in the development of the Slovak economy, for creating new jobs and in regional development. However, small and medium-sized enterprises are to an increased extent sensitive to the quality of the business environment. The Government's task is to continue improving the business environment and thereby generating the conditions for increasing their competitiveness in the domestic and international markets. In any industry, in any country, managers must have an overall knowledge of the wheres, whats, whys, and hows of the countries and regions of the world. SMEs are an integral part of Germany's economy. 99.3 % of German companies are SMEs. These 3.55 million German SMEs employ more than 24.3 million people and account for more than 60 % of Germany's turnovers. According to a EU definition SMEs comprise three firm size categories: • Micro-enterprises have got less than 10 employees and an annual turnover or balance sum below two million Euros.. Small enterprises employee less than 50 persons and their annual turnovers or balance sum is below 10 million Euros.

- Medium sized enterprises have got less than 250 employees and turnovers below 50 million Euros or a balance sum of no more than 43 million Euro. These firms are in the focus of this paper. Mugler (2005, 31-32) additionally suggests qualitative characteristics to differentiate SMEs from large corporations: Usually they are coined by the personality of the firm owner, dispose of a dense network of personal contacts to suppliers and customers. SMEs are specialized in individual products and services on customer demand. Relationships between employees and management frequently are informal and personal, which results in a low degree of formalism and bureaucracy and enables SMEs to react to environmental changes rapidly. In spite of these virtues on a local level only a quarter of Germany's SMEs operate in-ternationally (Geyer & Uriepe, 2012, 1). Only 16 % of SME turnover is from exports. In total German industry though earns more than 30 % from export goods (Yalcin & Zacher, 2011, 17). Concerning international engagement German SMEs hence dispose of further growth and turnover potential. Why are Germany's SMEs reluctant to go abroad? Diverse factual and psychological reasons have been found to interact for SMEs from different nations. Due to high personal involvement with the business Finnish SMEs frequently find it hard to delegate tasks and accept cultural diversity (Kotinen & Ojala, 2010). Acs et al. (1996) assert that SMEs are disadvantaged concerning property rights protection and face larger entry barriers than big corporations. Evaluating SMEs expansion to China Goxe (2010) finds that SMEs frequently fail due to cultural barriers and lacking intercultural relationship management. Inadequate internal and external resources as well as entrepreneurial vision are further reasons why UK retail SMEs usually are more reluctant to expand internationally (Hutchinson et al., 2009).

On the other hand empirical studies have repeatedly proven that SMEs basically dispose of valuable abilities concerning international expansion: New Zealand SMEs are prone to innovation and flexible to cope in new setting. They usually dispose of highly personalized contacts in the target country, which reduces the risk of going abroad (Chetty & Stangl, 2009). Personal relationships are particularly valuable in the process of knowledge transfer between foreign and local units as well as firm integration (Forsman et al., 2002). The form of the venture as well as the characteristics of the firm apparently have got additional impact on internationalization propensity and success: Li et al. (2011) point out that US biopharmaceutical SME Internationalization success depends on the experience with similar projects, the design of the alliance and the degree of geographical and cultural dispersion. The degree of entrepreneurship and leadership properties as well as external conditions like market, product and timeframe of the project are further crucial points (Ruzzier et al., 2006).

## METHODOLOGY AND RESULTS

Already this short but contradictory overview shows that the topic of SME internationalization has not been explored systematically so far:

- Though diverse studies are available on this question, hardly any author discusses the topic comprehensively in an empirically founded model that brings cause and effect relationships together.
- While some studies on SMEs in Northern European or Anglo-Saxon economies have been published, studies on German SMEs' internationalization so far are virtually unavailable.
- The preparation of going international, internationalization strategies applied and possible impediments to internationalization so far have not been explored by SME type (for instance differentiating by branch, firm size or management experience) systematically.
- The impact of internationalization strategies or preparation for internationalization on the degree of internationalization and comparative competitive performance has partly been evaluated for large MNCs but widely is unknown for SMEs so far.

Model hypotheses to be tested by multiple regression modelling are derived from previous empirical research in the course of the paper. To test this model the study relies on an empirical survey among 167 German SMEs. It applies exploratory factor analysis to assign adequate items to the parameters and develops a multiple regression model to test the relevance of the indicators of the model parameters on the assumed causal relationships. A novel research approach on German SME internationalization accordingly should first answer the following questions (univariate analysis):

1. To what extent do SMEs prepare for internationalization considering individual value-added stages?
2. Which impediments concerning the internationalization process do they observe?
3. Which preconditions to internationalization success do they consider relevant?
4. How successful are German SMEs concerning internationalization?

The initial research questions concretize in the following hypotheses, but the main attention is devoted mainly to the H2:

- H1) preparation to internationalization by value added stage, H2) internationalization strategy
- H3) experienced impediments to internationalization.

For each of the measurement variables a comparative univariate analysis explores the data set. The characteristics of the sample are estimated for each value series, i.e. the amount of values observed for each measurement parameter, calculating the distribution of frequencies.

Means and standard deviations characterize value rows. They standardize the results for reason of comparison. The Mean  $\bar{X}$  results as the sum of observations  $x_i$  divided by the size of the sample (Blunch, 2008, 237). For each main question a comparison of averages of the sub-questions is conducted.

$$\bar{X} = \frac{\sum_{i=1}^n X_i}{n}$$

The standard deviation for each value row results as the square root of its variance (Blunch, 2008, 238) with

$$s = \sqrt{s^2} = \sqrt{\frac{(x - \bar{X})^2}{n - 1}}$$

## Process patterns of SME internationalization

Frequently it is argued that the pattern of internationalization chosen by expanding firms develops over time. The Uppsala Model suggested by Johanson and Vahlne (1977, 23-32) is based on the evaluation of internationalization patterns of Swedish manufacturing firms. The authors find that firms usually enter foreign markets slowly step by step testing increasing degrees of engagement and integrations. The observed Swedish firms usually started from non-regular export phase. Regular exports then are established by independent representatives. With growing turnovers overseas sales subsidiaries are installed before in a fourth phase foreign production is established (Moen et al., 2004; 1237; Johanson & Vahlne, 1990).

Shrinking degrees of psychic distance to the target country are another reasons for the suggested step-wise approximation process. Growing understanding of the foreign cultural, political and economic system according to the Uppsala model enable firms to intensify their engagement abroad (Moen et al., 2004, 1237). With growing internationalization experience according to the Uppsala model firms increasingly dare to enter psychically distant markets.

The Uppsala model of internationalization frequently has been criticized for being too deterministic, leaving no way back and assuming an ever-growing process of internationalization. Since it was established on the observation of a limited sample of Finnish manufacturers in the 1970ies it has been argued that the proposed gradualism of the model does not fit for all branches or any sample of firms. Growing global intercultural understanding and an increasing interconnectedness has reduced the dimension of psychic distance (Nordström, 1991). Aspelund and Moen (2007, 1425) argue that the strategy of internationalization depends on further aspects: the founding process, the firms' organizational structure and environmental factors. Further firms differ on their global commitment, their export strategy and competitive advantages (Moen et al., 2002). For this reason a uniform model of internationalization can't be generally assumed.

Born-Globals focus on international markets soon after foundation and export the major part of their production. Frequently born-globals are high-tech companies or serve specific markets spread worldwide. Previous studies differ on number of external markets, the time of foreign market entry after foundation and the quota of exports typical "born-global" firms serve. Born-global rather describes a basic pattern in contrast to the gradual Uppsala-model internationalization, than a compulsory definition (Lehmann, Schlange, 2004, 210). Born-global stands for a "radical, non-incremental and committed internationalization pattern", usually driven by committed leader figures. It rests on a solid knowledge base that is applied to rapidly penetrate new markets (Olenik & Swoboda, 2012, 468).

Bell et al. (2003) (cited from Kotinen & Ojala (2012, 505)) add the pattern of re-born globals for firms that after significant changes, for instance a generational switch, completely revise their internationalization strategy from traditional to born-global. In contrast to born-globals these firms first are solidly established in the home market and then suddenly conquer several foreign markets drawing on this technology (Olenik & Swoboda, 2012, 468). According to a range of studies SMEs frequently are born-global, due to owner-centred commitment and management structure, and attain competitive advantage due to this strategy:

Lin & Zheng (2006, 45) argues that Chinese born global SMEs serve niche markets worldwide and survive by selling small-scale innovations to an international customer pool.

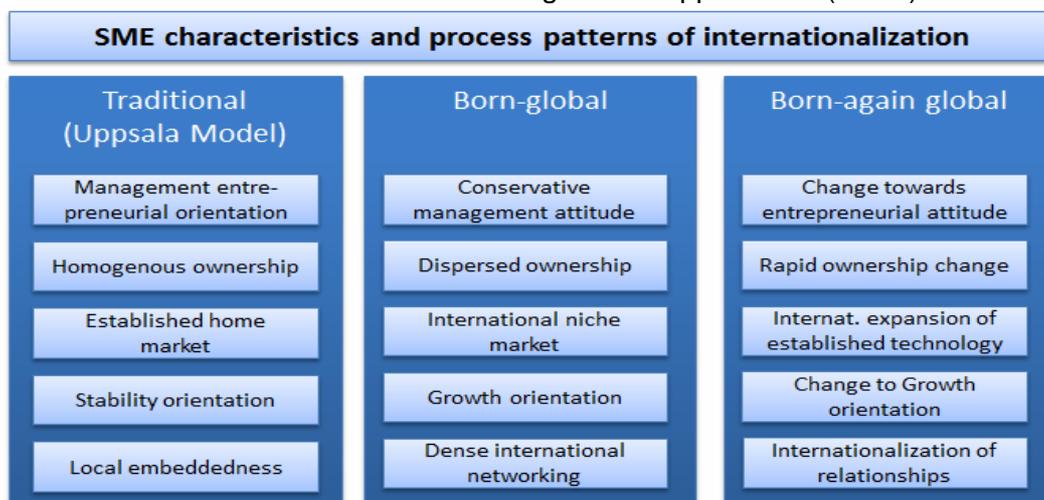
Previous owners' and management experience is crucial to a born-global strategy. The idea to found a born-global company frequently originates in previous international experience in large MNCs. Kontinen and Ojala (2012, 505) explain for Finnish family SMEs that concentrated ownership structure encourages born-global strategies and re-born (respectively: born-again) global strategies, while firms with fragmented ownership structures usually take the traditional path suggested by the Uppsala model.

Drawing on a case study of a Croatian SME Paunovic und Prebezac (2010, 67) suggest that the internationalization process and the rate of change from local to international orientation to large extent depends on decision-makers or owners attitudes, motivation and market knowledge. Additionally the density of the personal network of foreign contacts is a pacemaker in the internationalization process.

Olenik and Swoboda (2012) test the validity of the three patterns of internationalization – traditional, born-global and reborn global, on a sample of German SMEs analysing the parameters target country, time lag of internationalization and foreign sales ratio. The category born-global is assigned for sufficient growth of the sales ratio not for high international activity from the beginning (Olenik & Swoboda, 2012, 491). The evaluation is based on a survey completed by 855 German manufacturing SMEs (i.e. firms with less than 500 employees). With latent class analysis the study confirms the relevance of the three internationalization patterns for the sample. 268 SMEs are traditional, 267 are born-global and 139 are born-global again. Additionally the study finds that some SMEs have changed their internationalization strategy since 1998. The major part of SMEs across all groups though has maintained their strategy. 81 firms have changed from traditional to born-global, 57 to born-again global, which are the dominant development patterns. (Olenik & Swoboda, 2012, 484-485).

Additionally, the study evaluates strategic orientations and compares the difference conducting a t-test. Accordingly, born-global and born –again global German firms in Olenik's and Swoboda's sample are significantly stronger oriented towards international markets, they display a higher growth orientation. Communication capabilities though are stronger for traditionally operating SMEs. As compared to traditional and born-global firms, born-again global SMEs excel in intelligence generation capability (Olenik & Swoboda, 2012, 486). The authors argue though that further individual factors like external circumstance and product or firm specific aspects determine SME internationalization pattern (Olenik & Swoboda, 2012, 491).

Summarizing these empirical insights on internationalization strategies of SMEs, the categories traditional (in the sense of the Uppsala model), "born-global" and "born-again global" are typical internationalization strategies of SMEs. The following overview summarizes SME characteristics that encourage these approaches (Pic. 1):



**Pic. 1 SME patterns of internationalization (summarizing own draft)**

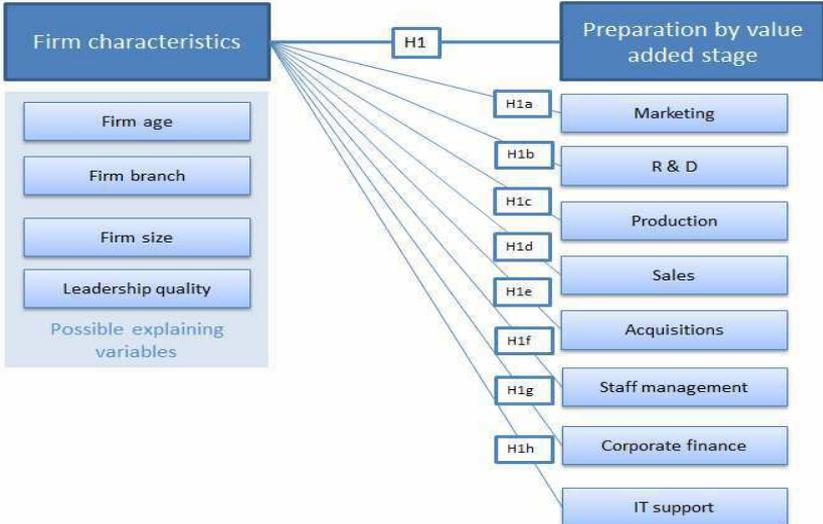
The preparation of SMEs to internationalization has not been systematized by value added stage yet. The discussion of achievements and limitations of so far empirical research in SME internationalization though suggests that the impact of firm characteristics might differ by value added stage and that individual value added stages could contribute to observable success effects to different extent. To evaluate these relationships firms preparation to internationalization is assessed differentiating 8 value added stages, that comply with service as well as manufacturing firms: Marketing, R&D, production, sales, acquisitions, staff management, finance and IT support.

Internationalization strategy comprises the development and integration of factors that have been identified pre-conditional to internationalization success. Apart from leadership quality, which is evaluated with primary firm characteristics in this survey, four factors have elaborated: cultural integration, communication & networking, strategic planning skill and staff and knowledge management. These subcategories are employed to describe the model parameter internationalization strategy.

Items for the “impediments to internationalization” in the work model equally are derived from the review. Six fundamental impediments have been identified which are: lacking capital, lacking leadership competence, strategic and organizational deficits, inadequate staff and knowledge management, inadequate market assessment and lacking language and culture competence. These items are assessed for internationalization impediments in the survey.

Since according to previous discussion (Sullivan, 1994, Kuivalainen et al., 2010 and Olenik & Swoboda, 2012) comprehensive success assessment relies on both factors, the survey differentiates growth-related and performance related internationalization success. To determine performance related success in accordance with previous studies this survey assesses the foreign sales ratio. It equally determines the foreign acquisitions ratio though, since as detailed before sales figures are reliable for export centred firms only. To estimate growth related success the study relies on firms’ personal assessment of competitive performance and their quest of new markets.

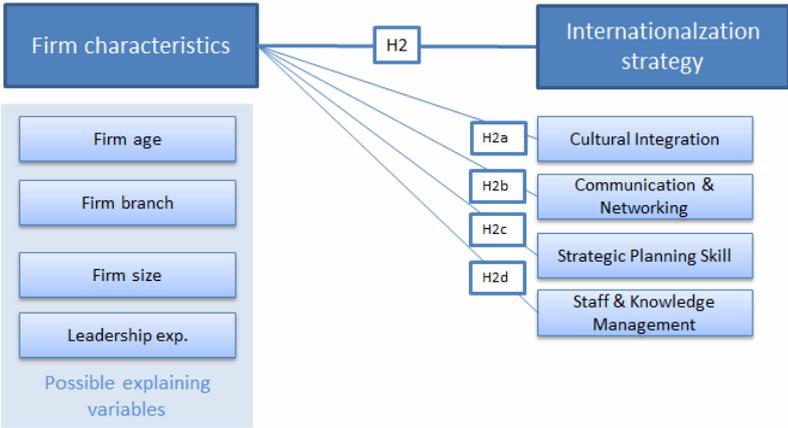
To test the fundamental hypotheses now the developed items are brought together in multiple regression models. Regression modelling tests the causal impact of one or several influence factors on one output category (Brosius, 2011). To illustrate this approach the concretization of the above hypotheses in part-hypotheses is illustrated graphically and briefly explained in the following Pic. 2.



**Pic. 2 H1: Impact of firm characteristics on preparation to internationalization by value added stage (own draft)**

To test hypothesis 1 the causal impact of firm characteristics on the preparation to inter- nationalization by value added stage is tested. H1 splits up into 8 part hypotheses (H1a to H1h) which are concretized as follows:H1) SME’s preparation to internationalization on the value-added stages H1a) marketing, H1b) R&D, H1c) production, H1d) sales, H1e) acquisitions, H1f) staff manage-ment, H1g) corporate finance, H1h) IT support are significantly (ANOVA- significance < 0.05) determined by a regression model with the explaining variables firm age, firm branch, firm size and leadership quality.

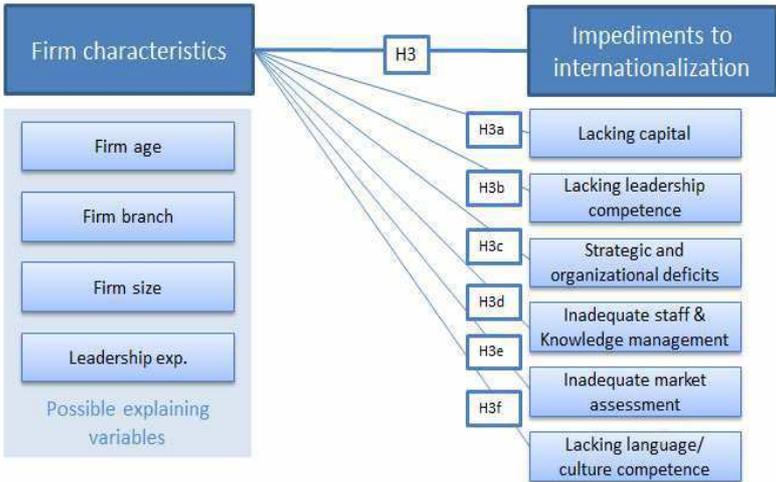
To test hypothesis 2 the impact of firm characteristics on the internationalization strategy is evaluated. As Pic. 3 illustrates H2 splits up into 4 part hypotheses a to d.



**Pic.3 Impact of firm characteristics on preparation to internationalization strategy (own draft)**

H2) SME internationalization strategy characterized by the parameters H2a) cultural integration, H2b) communication & Networking, H2c) strategic planning skill, H2d) staff & knowledge management are significantly (ANOVA- significance < 0.05) determined by a regression model with the explaining variables firm age, firm branch, firm size and leadership quality.

Accordingly H3 describes the impact firm characteristics have got on impediments to internationalization. Since a set of six impediments has been identified, H3 splits up into 6 part hypotheses a to f (Pic. 4).



**Pic.4 Impact of firm characteristics on perceived impediments to internationalization (own draft)**

H3) Impediments SMEs experience in the internationalization process i.e. H3a) lacking capital, H3b) lacking leadership competence, H3c) strategic and organizational deficits, H3d) inadequate staff & knowledge management, H3e) inadequate market assessment, H3f) lacking language/culture competence are significantly (ANOVA- significance < 0,05) determined by a regression model with the explaining variables firm age, firm branch, firm size and leadership quality.

## Impact of firm characteristics on internationalization strategy (H2)

H2 tests the impact of firm characteristics on internationalization strategy. It subdivides into four part hypotheses evaluating the impact on the four items of internationalization strategy cultural integration, communication & networking, strategic planning skill and staff & knowledge management. H2a tests the effect firm characteristics have got on cultural integration. The inclusion model is admissible since the corrected R<sup>2</sup> value is 0.025. The Durbin Watson test suggests that several further influence parameters on cultural integration exist beyond firm characteristics (D.W. = 1.487). The ANOVA test is insignificant for the inclusion model (ANOVA = 0.09 > 0.05), which means that H2a can't be accepted on the basis of the inclusion model. None of the 4 input parameters of the initial model is significant. The standardized regression equation would result as

$$\text{CULT} = 0,117 * \text{C\_age} - 0,056 * \text{C\_branch} - 0,057 * \text{C\_size} + 0,151 * \text{C\_leader}$$

but might not be fitting at a probability of 9 %.

To improve the model a second test of H2a is conducted applying the backward elimination method. Since the corrected R<sup>2</sup> values are above 0 all four backward elimination models basically are admissible. The Durbin-Watson test (1.458 < 2.00) again points out that the extracted parameters are not the only possible explanations for the development of the item cultural integration. Regression models with two or one input parameter now deliver significant ANOVA tests. Reasonable models accordingly include leadership quality and firm age or leadership quality alone.

In the two factor model firm age is not a significant parameter according to the T-test (Sig. = 0.147). For this reason the one factor solution with leadership quality only is chosen. The model equation now results as:  $\text{CULT} = 0,171 * \text{C\_leader}$ . H2a now is accepted: cultural integration as a strategic quality in the internationalization process improves with leadership quality according to the survey.

H2b tests the impact of firm characteristics on communication & networking. Though the inclusion model with R<sup>2</sup> = 0.027 and corrected R<sup>2</sup> = 0.003 is admissible, the model fit is low. The Durbin Watson statistics delivers too low values to assume that the input parameters explain the target variable well. The ANOVA significance results as 0.342. H2b can't be accepted on that basis. The suggested regression equation is not significant:

$$\text{COM} = -0.024 * \text{C\_age} + 0.017 * \text{C\_branch} - 0.061 * \text{C\_size} + 0.151 * \text{C\_leader}$$

The parameters are low and do not indicate a significant development of the output variable on this basis. Can the model be improved by backward elimination?

In the backward elimination model again R<sup>2</sup> and corrected R<sup>2</sup> are low (0.022 and 0.016). The true model explains only a small part of the total variance. Durbin Watson remains significantly below 2. (1.293). None of the reduced models results significant judging from the ANOVA test. The best identified model displays a significance of 0.054 and includes

leadership quality only. The regression equation would be:  $COM=0,149*C\_leader$ , but the input parameter still is not significant ( $sig. = 0.054 > 0.05$ ). H2b has to be denied.

Testing H2c, i.e. the impact of firm characteristics on strategic planning skills with the same approach is more successful. Still the Durbin-Watson test and the corrected  $R^2$  value suggest that the model is incomplete. Most of the model variance is not explained by the input parameters alone, but depends on further factors not assessed in the survey. Nonetheless ANOVA significance is 0.027 and accordingly H2c is accepted. The following overview shows that not all parameters are significant in the initial model:

**Tab.1 Initial regression model for H2c (inclusion)**

H2c – inclusion model	Unstandardized coefficients		Stand. coeff. Beta	T	Sig.
	Regression coefficient	Standard error			
(Konstante)	2,358	,237		9,937	,000
C_age_categories	-,014	,044	-,024	-,307	,759
<b>1 C_branch</b>	-,087	,043	-,156	-2,036	<b>,043</b>
C_size	-,029	,044	-,050	-,648	,518
<b>C_leader</b>	,105	,046	,177	2,300	<b>,023</b>

According to this chart only the input factors branch and leadership quality are significant predictors of the target variable. The initial regression equation is:

$$STRAT = -0.024 * C\_age - 0.156 * C\_branch - 0.050 * C\_size + 0.177 * C\_leader$$

To improve the fit of the model and exclude redundant factors backward elimination method is applied. According to the  $R^2$  value the explanatory value of the model now improves slightly, to 0.05, but the Durbin Watson test remains too low. According the ANOVA test the reduced models are significant as a whole. To choose a possibly comprehensive approach the significance of the individual parameters is assessed. Only in the two factor solution including the inputs branch and leadership quality all input parameters are significant. The optimal regression equation is:

$$STRAT = -0.154 * C\_branch + 0.177 * C\_leader$$

Service and production firms are less skilled in strategically planning the internationalization process than technology and e-commerce firms. Experienced leaders have got a positive impact on strategic skills for all branches.

The final part hypothesis of H2 evaluates the impact of firm characteristics on staff & knowledge management in the internationalization process. The inclusion model again explains only a rather small part of the total variance of the target parameter.  $R^2$  results as 0.093, corrected  $R^2$  is 0.07. The model is admissible but according to Durbin-Watson (= 1.611) disposes of significantly correlated residuals. Further input parameters would be needed that have not been assessed empirically. Nonetheless the ANOVA test is highly significant ( $Sig. = 0.003$ ). H2d is accepted. Not all model parameters though are relevant in the inclusion model:

**Tab. 2 Initial regression model for H2d (inclusion)**

H2d – inclusion model	Unstandardized coefficients		Stand. coeff. Beta	T	Sig.
	Regression coefficient	Standard error			
(Konstante)	1,946	,222		8,780	,000
<b>C_age_categories</b>	,092	,041	,169	2,227	<b>,027</b>
1 C_branch	-,056	,040	-,106	-1,398	,164
C_size	-,028	,041	-,051	-,670	,504
<b>C_leader</b>	,111	,043	,196	2,585	<b>,011</b>

Only firm age and leadership quality appear to be important to staff & knowledge management in internationalization, while branch and firm size are insignificant. The model is reduced by backward induction accordingly. All reduced models are significant judging from ANOVA (0.003 to 0.001), which one should be chosen? By the elimination of the parameter firm size the model fit according to the R<sup>2</sup> test first improves slightly to 0.074. The elimination of the parameter branch reduced the explanatory value again to R<sup>2</sup> (corr.) = 0.068. The parameter branch itself though is not significant (T-test sig.= 0.164). Branch accordingly is eliminated and the two factor solution is chosen. Its regression equation is: KNOW=0,168\*C\_age+0,211\* C\_leader. Older firms with good leadership quality are more successful in staff and knowledge management in internationalization processes accordingly.

To finally assess the impact of firm characteristics on internationalization strategy as a whole equally the condensed variable IS (Pic.3) is available. Regressing firm characteristics on internationalization strategy according to H2 results in a significant model according to ANOVA (Sig. =0.011). H2 as a whole is accepted. The model has got a corrected R<sup>2</sup> of 0.054 and a Durbin-Watson statistics of 0.880. These results show that the comprehensive model for internationalization strategy explains only a rather small part of the target variance. Significant correlations remain among the residuals. Further input parameters beyond firm characteristics would be needed to predict internationalization strategy reliably. Only one coefficient of the inclusion model is significant – leadership quality:

**Tab. 3 Initial regression model for H2 total**

H2 total – inclusion model	Unstandardized coefficients		Stand. coeff. Beta	T	Sig.
	Regression coefficient	Standard error			
(Konstante)	2,137	,179		11,955	<b>,000</b>
C_age_categories	,032	,033	,075	,975	,331
1 C_branch	-,041	,032	-,097	-1,277	,203
C_size	-,031	,033	-,070	-,925	,356
<b>C_leader</b>	,098	,035	,218	2,845	<b>,005</b>

Backward elimination of insignificant parameters as expected results in a single factor model which with an ANOVA of 0.002 is highly significant as a whole but explains only about 5.2 % of the variance of internationalization strategy (corr. R<sup>2</sup> =0.052). The Durbin Watson test is 0.861. The significant regression equation of leadership quality on internationalization strategy is: IS=0.240 \* C\_leader. The overview table 3 summarizes the results of the tests of

H2. Three from four part hypotheses have been accepted. The regression model is reliable for the comprehensive construct “internationalization strategy”, too. Firm characteristics have got an impact on cultural integration, strategic planning skill and staff and knowledge management in internationalization processes. For communication and networking the impact of firm characteristics is not significant. H2 in sum is accepted. Firm characteristics, above all leadership quality significantly determine internationalization strategy. For all regression models further important parameters that have not been assessed in the survey that would explain the target variables more precisely. None of the Durbin-Watson tests is satisfactory. Analysing the input parameters the evaluation finds that leadership quality again is the most important determinant of internationalization strategy. Leadership quality is the most important predictor in all part models assessed in H2. Firm age has got a significant positive impact on staff & knowledge management. Older, established firms possibly have got a broader knowledge stock and are more attractive to employees. Branch affects strategic planning skills. E-commerce and technology firms are more successful here. Possibly these branches are more open to international markets, more innovative and more frequently pursue a born global strategy from the beginning.

## Conclusions

Certainly further empirical research drawing on larger SME sample and differentiating by SMEs types will be necessary to develop reliable insights on the whole complexity of determinants of SME internationalization success. Probably a structural equation model would have been better apt to evaluate the relationships between the broad range of input factors and outputs in more detail. The participating SMEs’ present internationalization strategy only partly improves performance success and impairs growth success. A change in leadership according to H2 should bring about changes in internationalization strategy, i.e. result in a turn to a more successful internationalization concept.

In practice this means: SME leaders with little international experience intending to start an international venture should from the beginning seek expert advice and admit internationally experienced managers and consultants to their management team. Successful internationalization is much about local cultural knowledge and business experience, which small and medium sized firms, that so far have served local markets only, do not dispose of. Internationally experienced advisors can help to improve the preparation to internationalization by value added stage, contribute to the development of internationalization strategies based on the development of cultural competence, efficient staff management and foreign market knowledge. By seeking advice with experts in international ventures SMEs can obtain a competitive advantage as compared to their local competitors trusting on in house knowledge alone and keep up with large corporations disposing of knowledge on internationalization processes based on many years of experience. Nonetheless the study has found that the observed sample of German SMEs to date is not really satisfied on the success of their international ventures. Leadership quality determines SME internationalization strategy and success to a large extent. SMEs could enhance their international competence and success by trusting on the advice of an internationally experienced management team or specialized external consultants.

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# The development of macronutrient consumption and the impact of macroeconomics indicators on their consumption in years 2004 - 2011 in the Slovak republic

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## Abstract

Nutrition security is related to food security and in a recent few years has become an important part of everyday life. According to FAO (2009) „food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.“ As Frankenberg, T. R. et. al (1997) claim „nutrition security exists when the person has a nutritionally adequate diet and the food consumed is biologically utilized.“

Nutrition requirements are different and mostly depend on society and household income. Meanwhile, a large number of empirical studies have been devoted to analyze consumer demand for food and demand for food diversity. It is believed that income is a relevant variable of consumer choice that explains the differences in consumption behaviour.

In general, people with lower income have tendency to consume more fatty food and their nutrition is not diversified enough. Therefore, in this paper we will focus on consumption of macronutrients – proteins, carbohydrates and lipids in the Slovak republic. The attention will be paid to nutrition intakes of Slovak population and their evaluation from the point of food and nutrition security. Using data from Household budget survey from Slovak statistical office for years 2011 – 2014, we construct econometric model to analyse, which factors affect consumption of macronutrients. The regression analysis with dependent variables (income; family size; education, type of municipality and amount of children) is applied to analyse individual nutrition behaviour. Our analysis is not take into account age of individual household members. According to survey of Di Giuseppe, S. (2011), macroeconomic development also affects purchasing power and consumption. Due to this assertion we extend our analysis to macroeconomic indicators, such as GDP per capita and unemployment rate in selecte regions. Slovakia is divided into 8 regions (region of Bratislava; Trnava; Trenčín; Žilina; Nitra; Banská Bystrica; Prešov; Košice). We assume that the existing differences between them, e. g. in transport infrastructure, education, GDP, incomes, employment, etc., affect consumer behaviour.

Finally, the Berry index is used to evaluate food diversity in selected regions during the observed period. We tried to prove that there are differences in food diversity between lower income households and higher income households. Moreover, it is assumed that lower income households do not have diversified diet, resp. their diet is not sufficiently diversified. Our results are shown in tables and figures in this paper. To summarize, in our paper is analysed the development of macronutrient consumption of Slovak population, as well as identified the factors having impact on demand for macronutrients.

## Keywords:

nutrition security; macronutrients; macronutrient consumption; food diversity

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## Introduction

The Slovak republic is a small country in the central Europe with population around 5.43 milion and with the capital city Bratislava, which is situated on the west part od Slovakia and which has about 417, 000 inhabitants. The Slovak republic is divided into 8 regions (region of Bratislava; Trnava; Trenčín; Žilina; Nitra; Banská Bystrica; Prešov and Košice). These regions are different developed and these differences are e. g. in transport infrastructure; education; investments; incomes; GDP; unemployment; etc. The most developed is western and southwestern part of Slovakia.

Using household data from Household budget survey and a demand systems approach, we analysed macronutrient consumption and food diversity in the Slovak republic in years 2004 - 2011. We assume that the knowledge of nutritional contents in different food groups has impacts on consumers choices of food they purchased and consumed. The survey was aimed at private households located in the urban and rural areas, all across the country Using these household data and conversion tables from Eurostat, we calculated an amount of macronutrients in grams (g) for each kind of food and after we used regression analysis to see impacts of variables, which we choose according literature sources on consumption of macronutrients.

We use similar analysis as HERZFELD, T. et. al., who investigated how the changes in socio-demographic and economic indicators affect consumption behavior. They estimated demand functions for macronutrients, cigarettes, and alcohol, as well as for the diet diversity. PARK, J. L., et. al. examined poverty status for U.S. household using data obtained from Household budget survey and counted own-price elasticities; expenditure elasticities and income elasticities. They analyzed elasticities for twelve commodity groups. Own-price elasticities were similar between the income groups and income elasticities were consistently higher for the lower-income group.

## Material and Methods

To achieve our objectives we used data from Household budget survey from Slovak statistical office. We have analyzed macronutrient consumption for years 2004 – 2011.

Databases with all items of the consumer basket contain data in kilograms, grams, liters and pieces (for eggs). We did not pay attention on non-alcoholic beverages, alcoholic beverages and cigarettes. Based on these data, we performed calculations of household consumption in quantitative units into the nutritional value. We used conversion tables and indices obtained from Eurostat.

We used regression analysis to create a model of demand for macronutrients (carbohydrates, proteins, lipids) in reported period. The aim of regression analysis is to explain the variability of the random variable  $Y$  (dependent variable) depending on its median value for several non-random independent variables  $X$ .

In our research we used the following equation to estimate demand for macronutrients:

$$\ln q_i = \ln \beta_0 + \beta_1 \ln INCOME + \beta_2 \ln FAM\_SIZE + \varepsilon_i, \text{ where } i = 1, \dots, n,$$

$$\vec{x} = (INCOME; FAM\_SIZE)$$

$$\vec{\beta} = (\beta_0; \beta_1; \beta_2)$$

where:  $q_i$  is demand computed for  $i$ -th macronutrient group; INCOME is net monthly income per household member and FAM\_SIZE is dummy variable represents size of a household.

Our second objective was to analyze food diversity. Food diversity can be measured by a Berry index, where  $s_j$  is the share of expenditures on food group  $j$  in household's total consumption expenditure.

$$BI = 1 - \sum s_j^2$$

Higher values indicate a more diverse diet. Nutritionists believe that a more varied diet is one core element of healthy nutrition behavior.

We compared the parameters of two basic samples with normal distribution using two-sample parametric tests - comparing the mean values and comparing the variances to known if there are differences in food diversity between poor and rich households.

### Estimation of demand for macronutrients

The most significant variable, which affects demand for food and consumer choice is household income. According to HERZFELD, T. et al. (2013) demand for lipids increases with increasing income. Consumer behavior is also affected by another factors such as regions; family size; education; age and gender. In the beginning, according noted studies we chose five factors, but during our research we found only two factors (family size and income), which are statistically significant.

We focused on macronutrient consumption in the Slovak republic in years 2004 – 2011. In the following tables we can see the results of the regression analyzes, where are shown results for years 2007, 2009 and 2011.

Tab. 1: The regression model for macronutrients in year 2007

coefficient	carbohydrates	lipids	proteins
Const	10. 0842	9. 02714	8. 81012
In family size	- 0. 975042	- 0. 961246	- 0. 968508
In income	- 0. 0429141	- 0. 0346 insignif.	- 0. 0331778
R-squared	0. 439368	0. 424571	0. 469062
P-value (F)	0	0	0

Source: Own processing

Regression equation for carbohydrates:

$$Lncarbohydrates = 10.08 - 0.9750 Infamily - 0.0429 Inincome + \varepsilon_i$$

If an income will change by 1 %, the consumption of carbohydrates will change by 0.04 %.

Regression equation for lipids:

$$Lnlipids = 9.03 - 0.9613 Infamily - 0.0346 Inincome + \varepsilon_i$$

If an income will change by 1 %, the consumption of lipids will change by 0.03 %.

Regression equation for proteins:

$$Lnproteins = 8.81 - 0.9685 Infamily - 0.0332 Inincome + \varepsilon_i$$

If an income will change by 1 %, the consumption of proteins will change by 0.03 %.

Using regression analysis we found that in year 2007 income per one household member is insignificant variable in case of consumption of lipids, while for another macronutrients both variables are statistically significant.

Tab. 2: The regression model for macronutrients in 2009

coefficient	carbohydrates	lipids	proteins
Const	9. 93262	9. 23263	8. 79684
In family size	- 0. 983594	- 1. 00669	- 0. 990106
In income	- 0.0296998	- 0. 0739	-0. 0356615
R-squared	0. 473271	0. 461569	0. 52622
P-value (F)	0	0	0

Source: Own processing

Regression equation for carbohydrates:

$$Lncarbohydrates = 9.93 - 0.9836 \lnfamily - 0.0297 \lnincome + \varepsilon_i$$

If an income will change by 1 %, the consumption of carbohydrates will change by 0.03 %.

Regression equation for lipids:

$$Lnlipids = 9.23 - 1.0067 \lnfamily - 0.0739 \lnincome + \varepsilon_i$$

If an income will change by 1 %, the consumption of lipids will change by 0.07 %.

Regression equation for proteins:

$$Lnproteins = 8.79 - 0.9901 \lnfamily - 0.0357 \lnincome + \varepsilon_i$$

If an income will change by 1 %, the consumption of proteins will change by 0.04 %.

As we can see, the average income per household member in percentage rose up, the average consumption of carbohydrates, lipids and proteins decreased. It might be a consequence of the economic crisis, when households reduced their consumption expenditure and economy found itself in decline. These changes started in the end of year 2008 and it was connected with a decrease in economic growth and rising unemployment.

Tab. 3: The regression model for macronutrients in 2011

coefficient	carbohydrates	lipids	proteins
Const	6. 7703	5. 99025	5. 58686
In family size	- 0. 6041	- 0. 64814	- 0. 589019
In income	0. 449906	0. 426636	0. 458145
R-squared	0. 584827	0. 546394	0. 623555
P-value (F)	0	0	0

Source: Own processing

Regression equation for carbohydrates:

$$Lncarbohydrates = 6.77 - 0.6041 \lnfamily + 0.4499 \lnincome + \varepsilon_i$$

If an income will change by 1 %, the consumption of carbohydrates will change by 0. 45 %.

Regression equation for lipids:

$$\ln lipids = 5.99 - 0.6481 \ln family + 0.4266 \ln income + \varepsilon_i$$

If an income will change by 1 %, the consumption of lipids will change by 0. 43 %.

Regression equation for proteins:

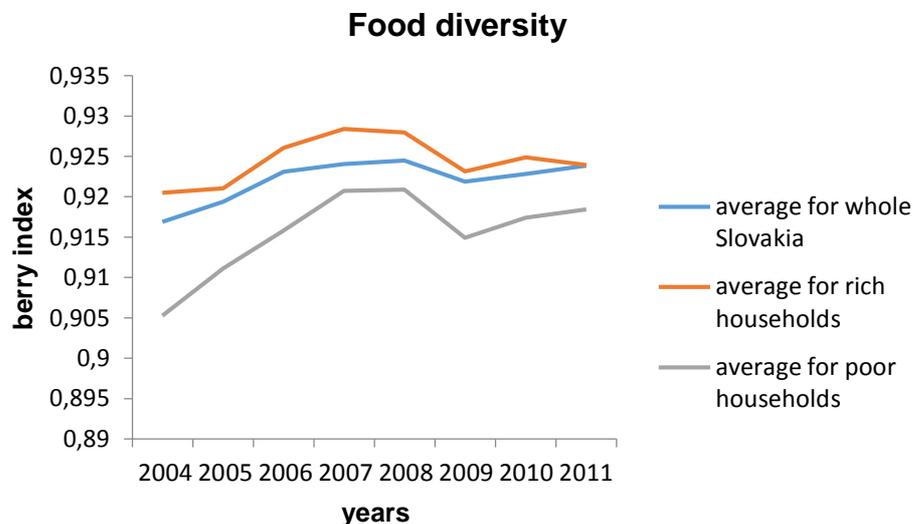
$$\ln proteins = 5.59 - 0.5890 \ln family + 0.4582 \ln income + \varepsilon_i$$

If an income will change by 1 %, the consumption of proteins will change by 0. 46 %.

The higher number of household members means that macronutrient consumption per household member decreases. This is probably due to the fact that consumption is divided among the other household members.

### Food diversity

Food diversity is measured by Berry index. Berry index is interpreted as more as its value close to 1, food consumption is more diversified. Whereas the average value for whole Slovakia in years 2004 - 2011 is 0. 92332 we can confirm that Slovak consumers have diversified diet. We investigated whether mean values are different between rich and poor households. We divided households according their incomes per household member and took 10 % of households with the highest incomes and 10 % of households with the lowest incomes per household member. The test showed us that mean values are different between rich and poor household in reported period. To test mentioned differences we used two-sample t-test and based on the p-value, which is less than 0. 05, we can confirm mentioned differences.



**Pic. 1: Food diversity measured by Berry index**  
Source: Own processing

From the previous analysis and as the figure shows, food diversity has increasing trend since year 2004. While we can see difference between diet for rich and poor households, food diversity was increasing until year 2008 and at the same time the gap between poor and rich households was decreasing. In year 2009 due to global economic crisis, unemployment rate rose up and real GDP decreased, as well as diet diversity decreased for rich and also for poor

households. After year 2009 values of Berry index slowly began to rise, but their values have not returned yet to values before pre-crisis period.

### An analysis of income and calory intake from macronutrients

In following table and figure is shown development of average income per household member in each year. In years 2004 – 2008 we used average exchanged rate SKK – EUR obtained from the National Bank of Slovakia.

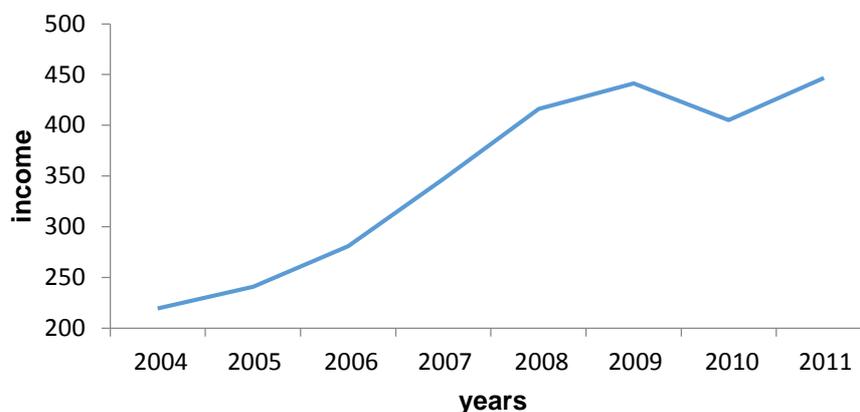
Tab. 4: Average income per household member in Euro

	2004	2005	2006	2007	2008	2009	2010	2011
<b>average income per household member</b>	219. 23	240. 54	280. 7	347,159	416. 16	441. 11	405. 16	446. 55

Source: Own processing

Average income per household member in reported period was increasing and if we will compare year 2004 with year 2011 it increased twofold.

### Average income per household member



Pic. 2 Average income per household member in Euro

Source: Own processing

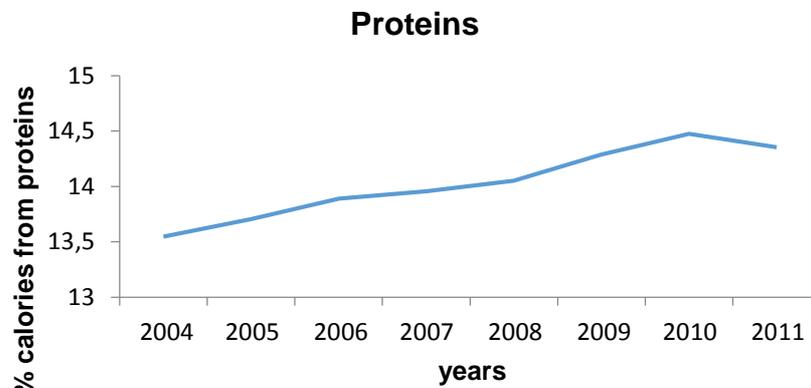
Another part of our research was to analyze calory intake from proteins, lipids and carbohydrates in % from all calory intake for slovak consumers. Proteins, lipids and carbohydrates were converted into calories - 1 gram of lipids = 9 calories; 1 gram of carbohydrates = 4 calories and 1 gram of proteins = 4 calories. In general, daily amount of carbohydrates is 45 - 65 %; 20 - 35 % of total calories should come from lipids and diet should consist of 10 - 35 % proteins. This table shows the share of calories in household in percentage on total consumption of calories. Slovak consumers take the most amount of calories from carbohydrates, on the other hand the least from proteins. We can claim it from mean values and variaton margin, which is the difference between minimum and maximum.

Tab. 5: Calory intake from proteins, lipids and carbohydrates in %

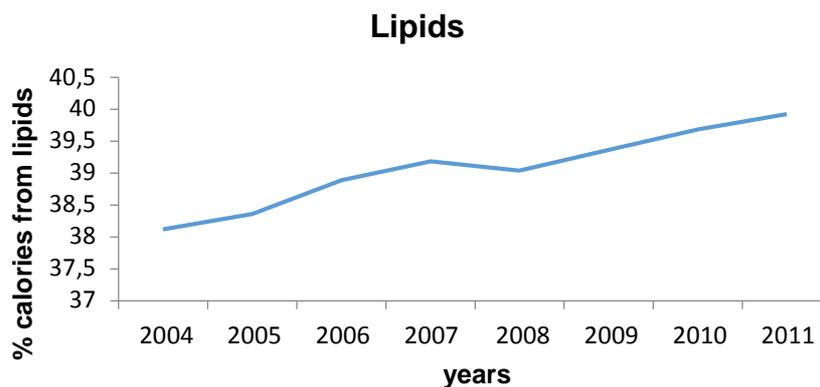
	2004	2005	2006	2007	2008	2009	2010	2011
<b>proteins</b>	13. 548	13. 704	13. 890	13. 958	14. 052	14. 288	14. 477	14. 356
<b>lipids</b>	38. 115	38. 354	38. 885	39. 182	39. 035	39.363	39. 682	39. 920
<b>carbohydrates</b>	48. 336	47. 942	47. 225	46. 860	46. 913	46. 35	45. 841	45. 723

Source: Own processing

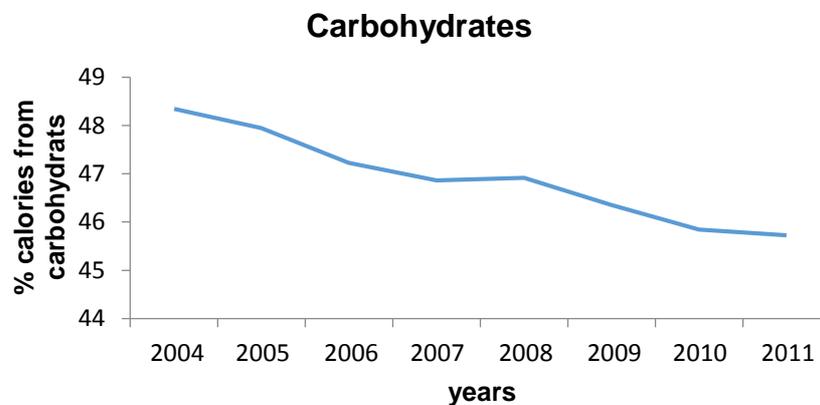
In following figures are shown calory intakes from macronutrients for slovak inhabitants. The daily amount of proteins and lipids has increasing trend and on the other hand calory intake from carbohydrates has decreasing trend. It may be due to balanced diet and healthy lifestyle, which is becoming popular in last years, but still there is a high consumption of lipids. The calory consumption is also based on incomes, where people with lower incomes have tendency to consume more fatty food.



**Pic. 3: Calory intake from proteins in %**  
Source: Own processing



**Pic. 4: Calory intake from lipids in %**  
Source: Own processing



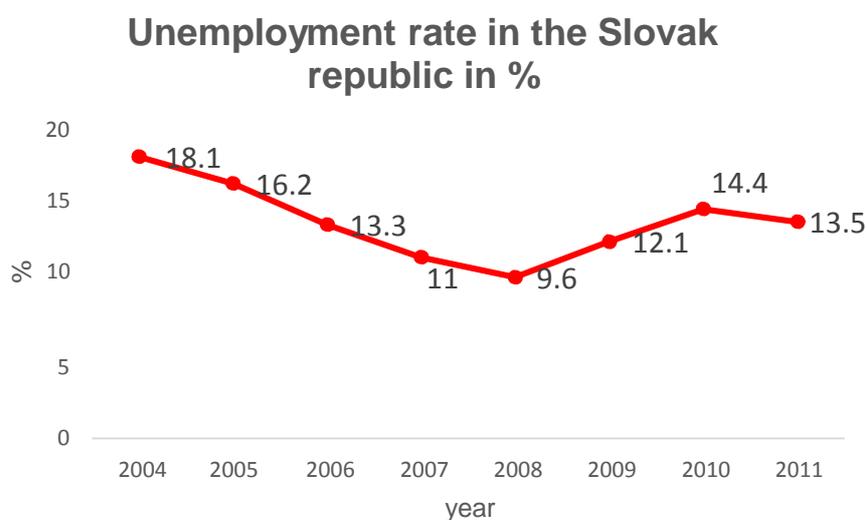
**Pic. 5: Calory intake from carbohydrates in %**  
Source: Own processing

## Macroeconomic development in the Slovak republic

The macroeconomic development in the country has also impact on purchasing power and demand for food and macronutrients. Therefore, we focused on three main macroeconomic indicators in the Slovak republic in the reported period.

### Unemployment

The unemployment rate has fluctuated trend, at the end of 2008, the labor market reflected the impact of the economic crisis, stagnation of production, leading to massive redundancies in the industry. The economy finds itself in a recession and has a hard time recovering. Since 2009 there has been also a stagnation in foreign direct investments, which has negative impacts on the Slovak labor market and unemployment. The development of unemployment rate we can see in the following figure:



**Pic. 6: Unemployment in the Slovak republic in % Source: Own processing**

### Gross domestic product

In 2006 gradually increased the rate of growth of GDP to 8.3%, which was associated with an increase in both foreign as well as domestic demand. Positive development in economic growth occurred in 2007, when the GDP growth rate increased to 10.5%. The effect of this phenomenon can be regarded by foreign direct investments. In next year 2008 GDP growth fell to 5.9%, due to an incipient economic crisis and consequently weak external demand. In 2009, Slovakia had recorded a dramatic decline in exports, production and consequently economic growth to a level of -4.9%. This fact is related to the adverse impact of the global economic crisis. In 2010, GDP growth reached 4.2%. Source of economic recovery in that year was particularly recovery of foreign trade, while domestic demand grew only slightly. The dynamics of economic growth slowed in 2011, when GDP growth reached 3.3%. This was a very great extent influenced by the decline in domestic and external demand. In 2012, was recorded a slowdown in economic growth to 2.0%. The main cause was high unemployment, which was reflected in domestic consumption and government efforts to consolidate public finances.

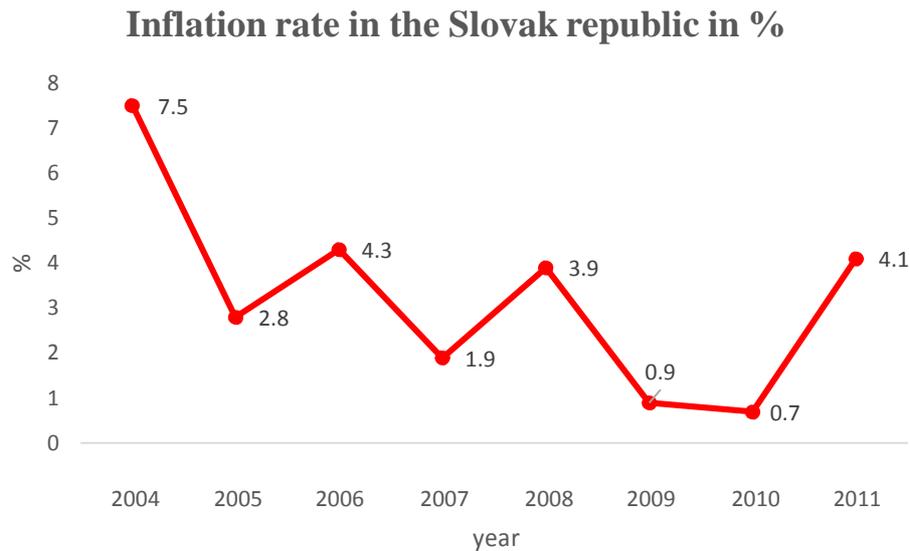
Tab. 6: The Regional GDP per capita at Current Prices in EUR in Selected Regions and in the Slovak republic

year	Regional GDP per capita at current prices in EUR				
	Bratislava region	Banská Bystrica region	Košice region	Prešov region	Total SR
2004	18, 958	6, 910	7, 392	5, 022	8, 391
2005	22, 270	6, 565	7, 721	5, 385	9, 154
2006	23, 784	7, 537	8, 599	5, 583	10, 203
2007	26, 918	8, 450	9, 362	6, 259	11, 387
2008	28, 503	9, 317	10, 180	7, 258	12, 365
2009	28, 318	8, 479	9, 070	6, 700	11, 590
2010	29, 241	8, 974	9, 581	6, 861	12, 131
<b>average</b>	25, 427.43	8, 033.14	8, 843.57	6, 152.57	10,745.86
<b>median</b>	26, 918	8, 450	9, 070	6, 259	11, 387

Source: Own processing

### Inflation rate

In year 2004 the inflation rate in Slovakia reached 7.5 %, this decrease was caused by several factors, the most important were price increases, such as gas and electricity in the beginning of the year and the beginning of the validity of a 19 % VAT rate. The reduction in the inflation rate was recorded in year 2005, when decreased by almost 5 % to 2.7 %. It was caused by more than 6 % wage growth. Inflation developments since 2006 largely influenced the decision of the Slovak Republic to join the Monetary Union on 1 January 2009. In 2006, inflation was rising again, which was mainly due to increase in oil prices in the beginning of the year. In 2007, the inflation rate dropped to 2.8 %, affected by a strengthening of the exchange rate koruna against the dollar. In 2008, the inflation rate increased again to the level of 4.6 %. This resulted into rapid increases in oil prices and consumer prices. In 2009, the average annual inflation fell to 1.6 % and in 2010 to 1.0 %. It caused by the global economic crisis. In 2011 the inflation rate rose to 3.9 %.



**Pic. 7: Inflation rate in the Slovak republic in %**  
**Source: Own processing**

It is believed that macroeconomic development in the country affects purchasing power and consumption, but the most important is household income, which is a relevant variable for consumers choice and consumption behavior.

## Conclusion

The consumption of macronutrients as well as a poor diet are expected to affect consumer health directly or indirectly. This paper empirically analyze the consumption of carbohydrates, proteins and lipids for Slovak households in years 2004 - 2011. In our analysis we also paid attention on macroeconomic environment, especially unemployment rate, economic growth and inflation rate in the Slovak republic and their development in relation to the global economic crisis.

The main aim of this research was to estimate demand for carbohydrates, proteins and lipids in reported period (years 2004 - 2011) for slovak households, while we used OLS method. Using regression analysis we found two relevant variables, which affect the macronutrient consumption (income per household member and the number of household members). But also we can see differences between each of the selected years.

Our another objective was to find if Slovak inhabitants have diversified diet or not and based on Berry index we can claim, that their diet is varied and there are differences between poor and rich households, which we can confirm from results using t-test. We can say that rich households have more diversified diet.

And our last objective was to analyze calories intake from proteins, carbohydrates and lipids and their share on total calories intake in percentage. Slovak consumers take the most amount of calories from carbohydrates, which is in average around 47 % from total calories and vice versa the least amount from proteins, which is about 14 %.

Economic situation in the country has impact on demand for food and macronutrients. After economic crisis, when unemployment rate rose up, food consumption respectively expenditures for food slightly decreased.

Using mentioned methods we achieved our tasks and our findings show how macronutrients play an important role in a demand for food, balanced nutrition and diet. Our approach and results can be useful for another researches and for consumers to make more informed food consumption choices.

These research is one part of project VEGA - Economic growth, world commodity markets and food security in countries of central and eastern Europe and western Balkan (with registration number 1/0843/14).

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# UN Millennium Development Goals and Social Development in Nigeria

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## Abstract

The aim of this contribution is to analyse the changes in the key social indicators such as poverty and hunger, education, health and gender equality in Nigeria with reference to the United Nations MDGs, which was set to be achieved between 1990 and 2015. The study attempted to assess the progress and challenges the country faces in the course of delivering on the promises it has made to its citizens, to better their living standards in measurable terms within the time frame for attainment of the MDGs.

The available secondary data obtained from reliable sources for the period 1990-2013, indicate that Nigeria has made remarkable progress in many targets. However, the country is not likely to achieve all the goals as many of the targets are still lagging behind the 2015 deadline. To be specific, the Nigeria is not likely to attain the target of reducing poverty as over 60% of the population still live in abject poverty, but there is improvement in hunger reduction target. Even though, Nigeria has made some tremendous progress in reducing child and maternal mortality rate, the country still reported among the worst countries in these targets in the world. The fragile security, safety of lives and properties (terrorist attacks, frequently armed robbery cases, kidnapping, military and paramilitary extrajudicial killings of civilians, and other social vices) in recent time have brought setbacks in the country. More so, high-fertility rate, high rate of unemployment, large-scale institutional corruption and bad governance, as well as misplaced priorities, are among the major bottlenecks that are militating the country from achieving MDGs by 2015.

For Nigeria to achieve its prospects of attaining the targets in order to fulfil the promises to improve the well-being of its citizens by 2015, rigorous efforts should be made to tackle the obstacles that are impeding inclusive growth and sustainable development goals. The Nigerian government and partners should create and implement policies that would lead to poverty reduction, creation of better jobs and wealth. The Nigerian government should provide affordable health care and other social infrastructure and services within urban and rural areas.

## Keywords:

poverty, education, health, gender, mortality, MDGs, unemployment

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## 1. Introduction

Since September, 2000, following the adoption of the United Nations Millennium Declaration by the world leaders from 189 countries, who laid the foundation for the Millennium Development Goals (MDGs), it has become a valuable tool for monitoring social development worldwide. The eight time-bound goals are to: eradicate extreme poverty and hunger; achieve universal primary education; promote gender equality and women empowerment; reduce child mortality; improve maternal health; combat HIV & AIDS, malaria and other diseases; ensure environmental sustainability; and develop a global partnership for development.

Many developing countries in South America and Asia are striving hard to achieve most of the goals, whereas, in Sub-Saharan Africa, the reverse is the case as many countries are far from meeting all the goals. As 2015, the deadline is fast approaching, Questions are being asked, why Nigeria is still lagging behind in achieving the goals? Nigeria is economically and socially underdeveloped. The question is, why underdeveloped? Any hope(s) for the country? Statistical data available indicate that Nigeria is experiencing socioeconomic development, albeit at a slow pace.

Nigeria is located in West Africa. The country has more than 250 different ethnic and linguistic groups. As of July 1, 2014 her population was estimated by the United Nations to be 178,517,000 inhabitants, making it the most populous country in Africa and the 7<sup>th</sup> most populous country in the world. The country has returned to democracy since 1999 paving ways for economic, political and institutional reforms. In recent years, the country has pursued social and economic reform program called the National Economic Empowerment Development Strategy (NEEDS) which centered on improving macroeconomic stability, liberalization, privatization, and improving the efficiency and transparency of businesses and public regulations (National Planning Commission, 2004). The economy has grown rapidly, achieving an average annual growth rate of 7% in recent years. After Nigeria rebased her economy, it took over from South Africa and has become the largest economy in Africa, and ranked as the 23<sup>th</sup> largest economy in the world, with nominal GDP worth about \$523 billion in 2013 (World Bank, 2014).

Despite rapid economic growth and institutional reforms, poverty rate in the country rather than decreases, it increased from 54.4% in 2004 to 62.5% in 2011. The Unemployment rate has drastically risen from 5.3% in 2006 to 23.9% in 2011. Ranked 152/163 (lowest category) in United Nations's human development index (HDI) in 2013 (UNDP, 2014). This shows Nigeria is not experiencing an inclusive growth; rather the country has been experiencing growth without a meaningful development. Arguably, the growth has not translated into better infrastructural development and employment generation. Consequently, shared prosperity, social inclusion or inclusive growth remains a major policy bottleneck in Nigeria.

Security is one among the greatest challenges Nigeria is facing presently. It ranges from terrorism (Islamic extremists - Boko Haram fighting to eliminate western education) to armed robbery, from kidnapping to ritual and extra-judicial killings, from ethnic crisis to cultism in schools. No one is safe from security risks and other social vices or civil unrest in the country.

The latest ranking produced by the Institute for Economics and Peace, in the Global Terrorism Index (GTI) report 2012, Nigeria was ranked from 16<sup>th</sup> position in 2008, down to 11<sup>th</sup> in 2009; 12<sup>th</sup> in 2010; and 7<sup>th</sup> in 2011 of the most terrorist country in the world (IEP, 2012). The security situation in Nigeria continues to worsen, as the country ranked 151/162 (lowest in the state of peace) in global peace index in 2014 (IEP, 2014). Globalization has partly fuelled the insecurity as it begets terrorism and aided other related violence in Nigeria. Insecurity has, to some extent impeded socioeconomic development in Nigeria.

The aim of the paper is to highlight the trends and present status of the respective MDGs, and identifies the major challenges that are needed to be tackled by the country in order to improve its prospects of attaining all the targets.

## 2. Social Development

There is no single acceptable definition of 'development' as it means different things to different scholars, organizations and individuals across the globe. Development means improvement or advancement of something, which includes positive socio-cultural change, technological progress and economic transformation.

Development is a change, which can be described as the process of social and economic transformations within societies (Thirlwall, 2006). It is a process of social change (ICPF, 1994). UNDP (2013) opined that development is all about changing a society to enhance people's well-being across generations by enlarging their choices in health, education and income and expanding their freedoms and opportunities for meaningful participation in society. According to Walter Rodney (1973) development, in human society is a many added process. At the level of human beings, it implies increased skill and capacity, social change, greater freedom, creativity, self-discipline, responsibility and material wellbeing.

The term 'development' until recently used in an exclusive economic - the justification being that the type of economy is itself an index of other social features (Walter, 1973) and also phenomenon in which rapid gains in overall and per capita gross national product (GNP) growth would either "trickle down" to the masses in the form of jobs and other economic opportunities (Todaro and Smith, 2011).

### 2.1 Theories of Social Development

Social theory is the study of scientific ways of thinking about social life. It encompasses ideas about how societies change and develop, about methods of explaining social behaviour, about power and the structure, class, gender and ethnicity, modernity and civilization, revolutions and utopias, and numerous other concepts and problems of social life (Harrington, 2005). Marx, Durkheim, Weber and other notable classical social theorists have postulated interrelationships between economy, society, politics and important social functions of cultures across the globe. They have also looked at social differentiation and complexity, which transient to modern societies (Owen, 1997).

In the 19th century, great classical theories of social change emerged: One of the earliest classical social theories in the 19th century is known as social evolutionism theory also known as Social Darwinism. As its name suggests, the theory drew from Charles Darwin's writing on biological evolution. He argued that, human societies struggle with another for survival just like a biological organism. He maintained that the conflict between communities leads to social change as the dominant groups defeat inferior ones. For instance, modern societies of the West have out-competed and controlled African countries and other weak nations across the globe (Giddens, 1989). The theory holds during the western era of imperialism, colonialism, and even in the present era of globalization. The west still controls the global economy to its advantage at the expense of the developing countries like Nigeria and Ghana.

Another classical theory of social change is a Marxist historical materialism theory, coined by the German philosopher, economist, sociologist and revolutionary socialism, Karl Marx. His theory has some similarity with evolutionary theory; both regard the significant patterns of change as 'being brought about by interactions with the material environment'. Marx further argued that each society rests on economic base or infrastructure-political, legal and cultural institutions. He continues, 'human beings actively relate to the material world, seeking to master and subordinate it to their' advantages (Giddens, 1989, p. 637). Both theories, evolutionary theories and Marx's historical materialism received criticism by many scholars, including Max Weber, who argues that both approaches are doomed to failure to assume the whole history only in terms of material (environmental) world, or economic factors. Though such influences are paramount, but they are not the sole control of the overall processes of social development. Critics postulated three major forces of social change: physical environment, political organization, and cultural factors (Giddens, 1989).

### 3. MDGs and the Social Development in Nigeria

Since September, 2000, following the adoption of the UN Millennium Declaration by the world leaders from 189 countries, which laid the foundation for the MDGs, it has become an important tool of monitoring socioeconomic indicators worldwide, Nigeria included. The eight time-bound goals which Nigeria is a signatory to for national development are to: eradicate extreme poverty and hunger; achieve universal primary education; promote gender equality; reduce child mortality; improve maternal health; combat HIV and AIDS, malaria and other diseases; ensure environmental sustainability, and develop a global partnership for development.

Even though, Nigeria has made tremendous progress towards the attainment of the MDGs, the country still faced many challenges. For instance, the fragile security, safety of lives and properties (terrorist attacks, frequently armed robbery cases, kidnapping, military and paramilitary extrajudicial killings of civilians, and other social vices) in the country in recent time have brought a major setback. In addition, the high - fertility rate (6 births per woman), high aids menace, large-scale institutional corruption and bad governance, as well as misplaced priorities, are the major bottlenecks that are militating social development and attainment of the MDGs by 2015. The MDGs are briefly highlighted below to together with past and current status of Nigeria towards the attainment of the goals.

#### 3.1 MDG 1: Eradicate Extreme Poverty and Hunger

Globally, the majority of the world's hungry people live in developing countries. Data available in 2013 shows that between 2011 and 2013, over 842 million people suffered from chronic hunger. They did not get enough food to consume and conduct their normal daily activities. More so, 98% of the people living in hunger were from developing countries like Nigeria (FAO, IFAD, and WFP, 2013). Symptoms of poverty and hunger are everywhere in Nigeria, especially in the northern part of the country. Nigeria has experienced growth in recent years. However, such level of growth has not translated to the expected increase in job opportunities, wealth creation and poverty reduction in the country. One of the most challenging issues Nigeria is facing is the growing rate of Unemployment, estimated at 23.90% in 2011 as compared to 5.3% in 2006. As shown in table 1, the poverty rate in the country has increased from 54.4 to 62.60% between 2004 and 2011 respectively. This shows that Nigeria is not likely to achieve poverty eradication target of 21.4% by 2015.

**Table 1: Trend in and status of poverty and hunger in Nigeria**

Indicator	1990	1992	1996	2004	2010	2011	2015 target
Halve percentage of people living in (Proportion of population below USD 1 (PPP) per day (%))	NA	42.7	65.6	51.6	61.2	NA	21.40
Poverty gap ratio (%)	32.1	NA	NA	29.6	NA	NA	NA
Share of poorest quintile in national consumption (%)	5.0	5.1	5.1	5.9	5.5	NA	NA
Proportion of underweight children under the age of five (%)	35.7	35.1	NA	27	NA	24	17.85

Source: NBS, 2013; FGN, 2013

Poverty in Nigeria is dynamic, and it has many dimensions. People may move in and out of poverty as a result of natural disasters or health problems, lack of access to credit. Poor people are more likely to live in rural areas, be less educated, and have larger families than the rest of the population (National Planning Commission, 2004). Other notable reasons are corruption, bad governance and mismanagement of resources by the government and other stakeholders.

Drawing on corruption-related data in the public sector, Nigeria scored 2.4/10 in a Scores range from 0 (highly corrupt) to 10 (very clean) and ranked 143 out of 183 in 2011. In 2012, the public sector corruption on a scale of 0 - 100, where 0 (highly corrupt) and 100 (very clean), Nigeria scored 27/100 and ranked 139/176, while in 2013, the country scored 25/100 and ranked 144/177 countries in the world, in corruption perceptions index (Transparency International, 2014).

As presented in table 1, Nigeria is likely to achieve its target on hunger as the downward trend is reinforced and are tailored to decrease the differences in hunger rates. Given the progress in the past decade and the current efforts through the agricultural development, it is possible that the share of under-five children that are underweight was reduced to 24% in 2011, and it is likely to be brought down to 17.85% by 2015 (FGN, 2013).

### 3.2 MDG 2: Achieve Universal Primary Education

In 1939, Chief Essien of Calabar, Nigeria, asserted that *‘without education it will be impossible for us to get to our destination, which is Nigeria’s economic independence and Nigeria’s political independence’* (Walter, 1973, p. 431). It means that the education is an integral factor for any nation to experience a meaningful social development. It is against this background that the UN has set goal number 2 of ensuring universal primary education in countries, Nigeria included. Education can be referred as the process of becoming critically aware of individual reality in a manner that leads to efficient and effective action. Educated persons understand their world well enough to deal with it effectively (Oniye, 2004).

In order to achieve goal 2, everyone is expected to complete primary education worldwide. The measurable indicators for MDG 2 are net enrolment ratio in primary and secondary education; proportion of pupils starting grade 1; and literacy rate of 15-24 year-olds. The government of Nigeria has recognized the need for education of both men and women as an ingredient or vehicle for national development. In view of this, it has formulated some policy guidance through its National Policy on Education (NPE) and asserts that, educating both men and women will continue to be rated to its national development plans. Arguably, *education is an integral instrument of positive change, as any fundamental change in the intellectual, social outlook of any society has to be preceded by an educational revolution* (FGN, 1998). In order to ensure that everyone has access to qualitative education, the Nigerian government setup a programme in 1999, called ‘Universal Basic Education (UBE).’ The program aimed among others, to eradicate illiteracy at all levels, ignorance and poverty, and national integration. Analysts argued that, the progress of this initiative was hampered by the administrative bottlenecks, corruption and enabling law to execute some aspects of the programme.

**Table 2: Universal primary education indicators in Nigeria**

<b>Achieve universal primary education</b>	<b>1990</b>	<b>2000</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2008</b>	<b>2012</b>	<b>2015 target</b>
Net enrolment in primary education (%)	68	95	81.1	84.6	89.6	88.8	NA	100
Primary six completion rate (%)	58.0	76.7	82	69.2	67.5	80	87.7	100
Literacy rate of 15–24-year-olds (both sex) (%)	71.2	64.1	60.4	76.2	80.2	80	66	100

Sources: FRN, 2010 and 2013; NBS, 2013

As shown in table 2, net enrolment ratio in primary education increased from 68% in 1990 to 89% in 2008. In the same direction, the rate of people who completed primary education has also risen from 58% in 1990 to 88% in 2012. This shows that Nigeria has made tremendous progress in achieving the MDGs 3 by 2015. As shown in table 2, in 2008 the country has met at least 80.0% in all the three indicators: net enrolment rate, the gross enrolment rate and primary six completion rate. The country is likely to attain goal 2 by 2015.

### 3.3 MDG 3: Promote Gender Equality and Empower Women

*“When we empower women, we empower communities, nations and entire human family”* UN Secretary-General, Ban Ki-moon.

Historically, women have relatively been subjected to injustice, oppression and marginalization, both in public and private life related activities. The rights of women have been severely infringed over the years, especially in Africa (Ejumudo, 2013). Since the adoption of

the UN MDGs in 2000, gender equality and women’s empowerment has become one of the central focal point in global negotiations, agreements. Arguably, countries and organizational bodies understand the need of gender equality as a catalyst for development strategies that are targeted at uplifting people out of poverty, improving their living conditions (Ejumudo, 2013).

In line with the UN MDGs 3: Promote gender equality and empower women have led the campaign for gender equality across the world over the past quarter century. There has been an improvement on many genders related activities. Many countries have guaranteed women and men equal rights under the law not only in education, but also in other areas such as ownership of property, marriage and inheritance (World Bank, 2012). Notwithstanding the progress so far, gender inequality persists, and it’s remained pervasive, especially in the northern part of Nigeria. Women continue to face discrimination in the allocation of the resources, access to education, health care service, nutrition, employment and economic assets, and participation in government in the northern part of Nigeria (UN, 2012; World Bank, 2012).

**Table 3: Nigeria: Gender equality indicators**

Indicator	1990	2000	2004	2005	2008	2012	2015 target
Ratio of girls to boys in primary education (girls per 100 boys)	76	78	81	81	85.4	90	100
Ratio of girls to boys in secondary education (girls per 100 boys)	75	81	77.4	80.6	80	88	100
Ratio of girls to boys in tertiary education (girls per 100 boys)	46	66	75.5	70.1	66.8		100
Share of women in wage employment in the non-agricultural sector (%)	6.6	NA	7.9	7.9	NA	14	NA
Proportion of seats held by women in national parliament (%)	1	3.1	3.1	3.1	7.5	7	35

Source: NBS, 2013; FGN, 2013; World Bank, 2014

The ratio of girls to boys in primary enrolment – 90.0% (see table 3) shows that the country is making progress towards achieving gender parity in primary and secondary enrolment by 2015. British Council Gender report (2012) ranked Nigeria 118/134 of countries in the Gender Equality Index. The council argued that, at every educational level, women earn less than their male counterparts. The majority of women were engaged in casual, low-skilled, low-paid informal sector employment. Nigerian girls who enrol in school left earlier than their male counterparts. Women are politically underrepresented. As presented in table 3, in the parliament, senate and house of representatives fell from 7% in 2007 to 6% in the 2011 election, the current assembly, only 7/109 Senators and 25/360 Representatives are women (British Council, 2012; NBS, 2013; World Bank, 2014). Available data show that there is still a wide gap between the income generating and job opportunities of men and women in all sectors of the economy in Nigeria (NBS, 2013).

### 3.4 Health: MDG 4: Reduce Child Mortality

Epidemic diseases have threatened social development opportunities in developing countries like Nigeria. Armed conflict, poverty, and natural diseases contribute to the spread of diseases in countries (World Bank, 2014). Health infrastructure is among the social issues in Nigeria. It is a pity that the globalization has opened doors for Nigerian political leaders who are supposed to build hospitals, and provide medical equipment for service delivery have failed due to large-scale corruption, mismanagement and bad governance. They frequently with their families and associates seek expensive medical care abroad at the expense of taxpayers, making it difficult for the country to meet MDGs targets on health issues. Seeking medical attention abroad has become the norm for influential men and women in Nigeria.

*“Every single day, Nigeria loses about 2,300 under-five year olds and 145 women of childbearing age. This makes the country the second largest contributor to the under-five and maternal mortality rate in the world. Preventable or treatable infectious diseases such as malaria, pneumonia, diarrhea, measles and HIV/AIDS account for more than 70 per cent of the estimated one million under-five deaths in Nigeria. Malnutrition is the underlying cause of*

*morbidity and mortality of a large proportion of children under-5 in Nigeria. It accounts for more than 50 per cent of deaths of children in this age bracket.” – UNICEF*

**Table 4: Trend in and status of child mortality indicators**

Indicator	1990	2000	2007	2008	2011	2012	2013	2015 Target
Infant mortality rate (per 1000 live births)	91	81.4	86	75	96.6	77	74	30.3
Under-five mortality rate (per 1000 live births)	191	188	147	142	126	122	117	63.7
Fraction of one-year-olds fully immunised against measles (%)	46	32.8	60	41.4	63	61	NA	100

Source: NBS, 2013; FGN, 2013

Nigeria has made progress over the years in reducing child mortality. As shown in table 4, infant mortality rate (per 1000 live births) has decreased from 91 (per 1000 live births) in 1990 to 74 (per 1000 live births) in 2013. Nigeria is not likely to achieve the target of 30.3 (per 1000 live births) of infant mortality rate by 2015. Under-five mortality rate (per 1000 live births) has also reduced from 191 (per 1000 live births) in 1990 to 117 (per 1000 live births) in 2013. Both infant mortality and under-five mortality rates indicate progress, however, the pace of development needs to be fastened, as the country is not likely to achieve all the targets or the goal of reducing child mortality rate by 2015.

### 3.5 MDG 5: Improve Maternal Health

Maternal and child mortality is a common event in many developing countries of the world. Worldwide, mothers and children are at highest risk for disease and death. Maternal and child mortality are closely interwoven and linked with poverty which leads to hunger and malnutrition that translate to the high rate of death (Olusegun, Ibe and Ikorok, 2012). Nigeria has made slow, but steady progress towards the goal of improving maternal health. As shown in table 5, Nigeria has witnessed a tremendous improvement in all the three key indicators: maternal mortality rate (per 100,000 live births); proportion of births attended by skilled health personnel (%); and antenatal care coverage over the years.

**Table 5: Nigeria: Trends in and status of maternal mortality indicators**

Indicator	1990	2002	2004	2005	2008	2011	2012	2015 Target
Maternal mortality rate (per 100,000 live births)	1000	704	800	800	545	NA	350	250
Share of births attended by skilled health personnel (%)	45	37.3	43.5	43.5	38.9	48.7	53.6	100
Contraceptive prevalence rate (%)	NA	NA	8.2	NA	14.6	NA	17.3	NA

Source: NBS, 2011; NBS, 2013; FGN, 2013

Nigeria has demonstrated to reduce the Maternal Mortality Ratio to a minimum level by 2015. Maternal Mortality Ratio (per 100,000 live births) has decreased from 1000 (per 100,000 live births) in 1990 to 350 (per 100,000 live births) in 2012. However, the country is still 28.6% behind the 2015 target. In the same direction, the proportion of births attended by skilled health personnel (%) has increased from 45% in 1990 to 53.6%.

Progress to these targets is partly as a result of the introduction of the Midwife Services Scheme, which leads to the increase of the ratio of skilled health personnel attending to births. Nevertheless, the country is still lagging before in this target and is not likely to attain the target of 100% of the proportion of births attended by skilled health personnel by 2015.

### 3.6 MDG 6: Combat HIV/AIDS, Malaria

In African countries, the spread of HIV/AIDS has over the years reversed the improvement in life expectancy and also left millions of children orphaned in the continent. Malaria takes a substantial share on young children. It weakens adults at great cost to their productivity.

Tuberculosis killed 900,000 people in 2012; most of them were between the ages 15–45, and sickened millions more. Life expectancy at birth in Nigeria was 52 years in 2012 (World Bank, 2014). Nigeria is one among the countries with worst life expectancy at birth in the world.

Nigeria has continued to stabilize and reverse HIV/AIDS prevalence in the country, even though the trend is still mixed. Nigeria faces some challenges such as gender disparities and considerable variations in prevalence rates across states (FGN, 2013). Other challenges are about collecting information on HIV/AIDS status, as many people are not willing to go for the HIV/AIDS test due to the fear of being stigmatised when tested positive. Consequently, information on the actual number of people living with HIV/AIDS is scanty (NBS, 2013).

**Table 6: Nigeria: Trend in and status of HIV/AIDS, malaria and tuberculosis (TB)**

Indicator	1990	2000	2004	2007	2010	2012	2015 target
HIV prevalence among pregnant young women aged 15–24 (%)	0.8	5.4	4.3	4.3	4.1	NA	100
The share of the population aged 15–24 years with comprehensive correct knowledge of HIV/AIDS (%)	NA	NA	18.3	25.9	24.2	33	100
Young people aged 15–24 reporting the use of a condom during sexual intercourse with a non-regular sexual partner (%)	NA	NA	43.9	63.8	45.7	33	100
Share of the population with advanced HIV infection with access to antiretroviral drugs (%)	NA	NA	NA	23.9 (2010)	32.7 (2012)	NA	100
Prevalence and death rates associated with malaria (per 100,000)	NA	2024	1157	1157	NA	NA	NA

Source: FRN, 2010 and 2013; NBS, 2013

As presented in table 6, the number of young women age 15-24 years old who have comprehensive correct knowledge about HIV/AIDS prevention, and transmission increased from 18.3% in 2004 to 33% in 2012 (NBS, 2013). Despite the progress, Nigeria is not likely to achieve a 100% target by 2015 as the country is still lagging behind the timeframe.

### 3.7 MDG 7: Ensure Environmental Sustainability

Globally, since 1990, more than 2 billion people have gained access to an improved drinking water sources. This progress has confirmed the commitment of Governments and other stakeholders who have seen the goal not as a dream, but as a vital step towards improving health indicators and well-being of people across the globe (UNICEF and World Health Organization, 2012). In 1990, almost 1.3 billion people lacked access to drinking water from convenient and protected sources. This figure has decreased to 752 million people in 2012 — a 41% reduction. In the same direction, in developing countries the proportion of people with access to an improved water source rose from 70% in 1990 to 87% in 2012. However, almost 27% of nations are not likely to meet the water target (World Bank, 2014).

The progress in Nigeria is slow. As shown in table 7, the proportion of the population using an improved drinking water source (%) has slowly risen from 54% in 1990 to 57.4% in 2012. The country falls short of the 2015 target of 77.0% on access to clean water; Nigeria is not likely to meet the improve drinking water target by 2015. The growth in the proportion of the population using an improved sanitation has remained a nightmare, and significant challenge for Nigeria as the 2015 deadline is by the corner. Similarly, about 33.7% of Nigerians had access to improved sanitation facilities in 2012, as against the 2015 target of 70.0%.

**Table 7: Nigeria: Trend in and status of safe drinking water and sanitation**

Indicator	1990	2001	2005	2007	2009	2011	2012	2015 target
Proportion of population using an improved drinking water source (%)	54	62.1	60	49.1	55.9	58.8	57.4	77
Proportion of population using an improved sanitation facility (%)	39	42.9	33	42.9	51.6	31	33.7	70

NBS, 2013; FGN, 2014

Many Nigerians daily lack access to safe drinking water, sanitation and hygiene. Lack of access to clean water and sanitation is particularly severe in rural northern Nigeria, where only about 30.0% of the inhabitants have access to safe drinking water and sanitation (FGN, 2013). Consequently, there is the prevalence of waterborne diseases, and it has threatened the livelihoods of many people across the villages in the country. Nigeria is one among the countries with the largest population that lack access to an improved drinking water and sanitation (UNICEF and World Health Organization, 2012).

### 3.8 Developing a Global Partnership for Development

Aid is the official development assistance (ODA) offered by developed world to improve the socioeconomic and environmental development of regions in the developing nations (Mackinnon and Cumbers, 2011). It is a vital source of external finance for many developing countries like Nigeria. Recent years have seen much progress in increasing the quality and quantity of official support (UNDP, 2011). Despite the UN MDGs goal 8: develop a global partnership for development, most developed economies failed to meet the aid target of 0.7% of their GNI to developing countries.

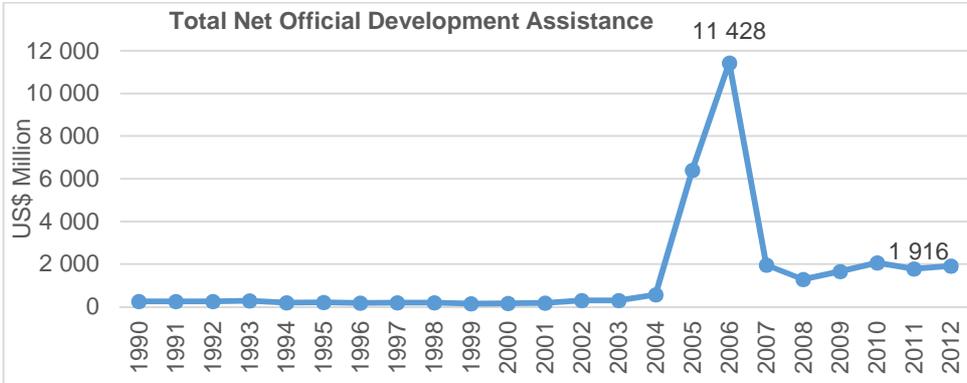
We are bound to ask questions: Does foreign aid accelerate economic growth? Is the Nigerian government effectively utilizing foreign aid in improving the socio-economic indicators in the country? Who are the beneficiaries, the privileged or underprivileged? Is the western world ready to help reduce poverty and create wealth in developing countries in line with the UN MDGs 8? These questions are subject to debate by scholars, donors, policy makers and NGOs in recent times.

There is continuing debate on the relationship between foreign aid and economic growth in countries, empirical results by scholars are mixed. It is very difficult to quantify or measure the impact of foreign aid in countries. In Nigeria, sceptics of foreign aid insist that despite the well-intended idea of impacting economic growth and wellbeing of people in the country, little has come from the enormous amount and variety of aid. Most aid projects in Nigeria are subject to failure from its inception. The reasons are partly because most of these financial assistances ended in the private accounts of those who are supposed to administer those projects, also that sometimes donors are not interested in what the money is being used for, but what they expected to get in return.

In line with MDGs 8, developed countries' primary reasons for financial aid and other assistance to developing country like Nigeria are, among others, to reduce poverty, provide technical assistance and support prosperity for effective partnerships, promote good governance and reduce corruption. In other reasons, donor-country governments give aid because it is in their political, strategic, or economic self-interest to do so; donor nations assist others without expecting any corresponding benefits like political and economic in return (Todaro and Smith, 2011). African countries like Nigeria have been maligned and ridiculed by the same countries that have exploited and made them underdeveloped. There is a lack of genuine support, cooperation and equal partnership from the developed economies for national development.

The European Union (EU) in line with the UN MDGs has been in partnership with Nigeria to accelerate social development of the country. More recently, political dialogue between the two, Nigeria- EU Ministerial Troika Meeting, "Nigeria-EU Joint Way Forward" which was held in Prague, Czech Republic, on 9th June 2009, in recognition of the importance the parties

attach to the corporation for the general progress and sustainable development (i.e. ensure industrialization, economy and export diversification, food security, migration). In continuation with the strategy implementation, the EU has in March 2012 committed €98 million (to spend: €35 million to combat corruption, €36 million to fight drug trafficking and related organized crime, and (€27 million to support justice system) help Nigerian government.



**Figure 1: Nigeria: Net Official Development Assistance (millions US\$), 1990-2012**

Source: Author's data analysis based on UNCTADsta, 2014

According to the then Head of EU Delegation to Nigeria, Ambassador David MacRae, "the overall objective of these projects is to promote good governance and contribute to Nigeria's efforts in enhancing transparency, accountability and combating corruption, contributing to the reform in the justice sector and addressing drug related issues in Nigeria," United Nations Office on Drugs and Crime (UNODC) is working in partnership with the EU and the Nigerian Government for the implementation of these initiatives (see <http://bit.ly/1mlm0y5>). Figure 1 shows the annual inflows of the net official development assistance to Nigeria between 1990 and 2012. The country received highest in 2006 with over \$11.4 billion, decreased to \$1.3 billion and then risen again to &1.92 billion in 2012.

**Table 8: Some selected DFID strategic priority and indicators in Nigeria**

Pillar/Strategic Priority	indicator	Expected Results (By 2015 unless specified)
Wealth creation	Number of poor people whose income increase by between 15% and 50% due to DFID projects.	600,000 (of whom 250,000 women) (Partially attributable to DFID).
Health	Number of additional pregnant women and children under five able to access health care free at the point of use.	4 million (600,000 directly attributable to DFID support)
Education	Number of additional children receiving education in Nigeria.	800,000 (75% girls) (Partially attributable to DFID)
Water and sanitation	Number of people using safer water and living in open-defecation free villages as a result of DFID support.	5.5 million, 50% girls and women, directly attributable to DFID.
Poverty and vulnerability	Number of pregnant women and unique under-five children reached by DFID	2.345 million (50% girls) (Directly attributable to DFID).

Source: DFID, 2013

As shown in table 8, the United Kingdom (UK) has also partnered with Nigeria through her agency, the Department for International Development (DFID). The partnership is aimed among others (see table 8) improving the lives of Nigerian citizens, providing better education, health services to stop women dying in childbirth, immunizing more children, helping to eradicate polio and distributing anti-malarial bed nets in the country. DFID has planned to spend an average of £250 million per year in Nigeria until 2015 (for more information <http://bit.ly/ek5buc>). In order to enhance socioeconomic indicators of Nigeria towards achieving the UN MDGs. DFID has promised to continue to work with other development partners, in line with the joint Country Partnership with the World Bank, AfDB and USAID (DFID, 2013).

Nigeria has made some progress on MDG 8: Develop a global partnership for development. Official development assistance (ODA) has fluctuated over the years as presented in figure 1. Debt service as a proportion of exports of goods and services has declined remarkably from over 10% in the early 2000s to 0.39% in 2011 (FGN, 2013).

Foreign aid and other final inflows have increased capital accumulation in Nigeria over the years. With the effective and efficient utilization of aid and other financial flows through sound monetary, fiscal policies and major reforms, social indicators such as employment generation, health care service, education, water, power supply, etc. may be improved in almost all the MDGs targets.

#### **4. Conclusion and Policy Implications**

The aim of this contribution is an attempt to analyse the changes in the key social indicators such as poverty and hunger, education, health and gender equality in Nigeria with reference to the United Nations MDGs. The available secondary data obtained from reliable sources for the period 1990-2013, indicate that Nigeria has made remarkable progress in many targets.

However, the state is not likely to achieve most of the goals as many of the targets are still lagging behind the 2015 deadline. To be specific, the country is not likely to attain the goal of reducing poverty as over 60% of the population still live in abject poverty. Nevertheless, there is improvement in hunger reduction and the country is likely to achieve it. The unemployment rate increased from 5.3% in 2006 to 23.9% in 2011. The fragile security and safety of lives and properties (terrorist attacks, frequently armed robbery cases, kidnapping, military and paramilitary extrajudicial killings of civilians, and other social vices) in recent time have brought a major setback in the country. In addition, high-fertility rate, large-scale institutional corruption and bad governance, as well as misplaced priorities, are the major bottlenecks that are militating the country from achieving MDGs by 2015.

Even though, Nigeria has made some tremendous progress in reducing child and maternal mortality rates, the country still reported among the worst countries in these targets in the world, and it is not likely to attain goal 3 by 2015. The country is likely to achieve MDG 2 of universal basic education. The proportion of girls to boys in education appears to be improving, however, gender inequality in many spheres of life still persists. The seats held by women in the national parliament were only 7% as against 35% target.

The progress recorded towards the attainment of some targets, so far, were partly attributed to the integration of the MDGs into all tiers of government's development plans and programmes. Nevertheless, the progress is not enough to meet many of these targets. For Nigeria to meet its prospects of attaining the targets in order to fulfil the promises to improve the well-being of its citizens by 2015, rigorous efforts should be made to tackle the obstacles that are impeding inclusive growth and most of the sustainable development goals. The Nigerian government and partners should create and implement policies that would lead to poverty reduction, creation of better jobs and wealth. In addition, the government should provide affordable health care and other social infrastructure and services within urban and rural areas in the country.

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# **Business Model of private tutoring for Armed Forces Academics Preparatory School (AFAPS) entrance purpose**

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**Preeyanuch APIBUNYOPAS<sup>1</sup>**

## **Abstract**

Recently, private tutoring for AFAPS entrance purpose has been growing rapidly because people still place importance on military officers, and people have attitude that military officers are people with honour. Small through big private tutoring for AFAPS business has rapidly spread all over Thailand especially at Central region (in Bangkok and Lopburi province), but most of successful private tutoring for AFAPS is a famous institute. Hence, it's interesting that how big private tutoring for AFAPS institute can manage and live for a long time until today with the increasing of competitors and various marketing campaign such as lower costs, and what are key elements that private tutoring for AFAPS institute had been provided to satisfy and attract customers. The objectives of the research were firstly to study business practices, problems and threats of private tutoring for AFAPS institute, secondly to study the satisfaction level of students taking service from private tutoring for AFAPS institutes, and lastly to propose appropriate business model of private tutoring for AFAPS. Interview and questionnaire survey were employed for data collection. Results of the research showed that the data from interview which could be separated into 3 aspects (Customer segment aspect, Key partnership aspect, Cost structure aspect.) There were some problems and threats that managers had recommended. In addition, the data from questionnaire were satisfaction of customers in each aspect in 9 Building Blocks, depending on satisfaction to each level such as in channel aspect, customers gave importance to famous institute first because customers think that they can trust and ensure quality of institute. Direct experience from people who used to study in each institute was another channel to build new customers trustworthiness too. The institution was recommended to use marketing strategies that can easily attract customers such as internet and social network. The results from the research could be used in building business model, approach business management, shape efficient strategies, and the results can be beneficial to business owners and entrepreneurs who are interested in foreseeing overall private tutoring for AFAPS and establishing private tutoring for AFAPS institute.

## **Key words**

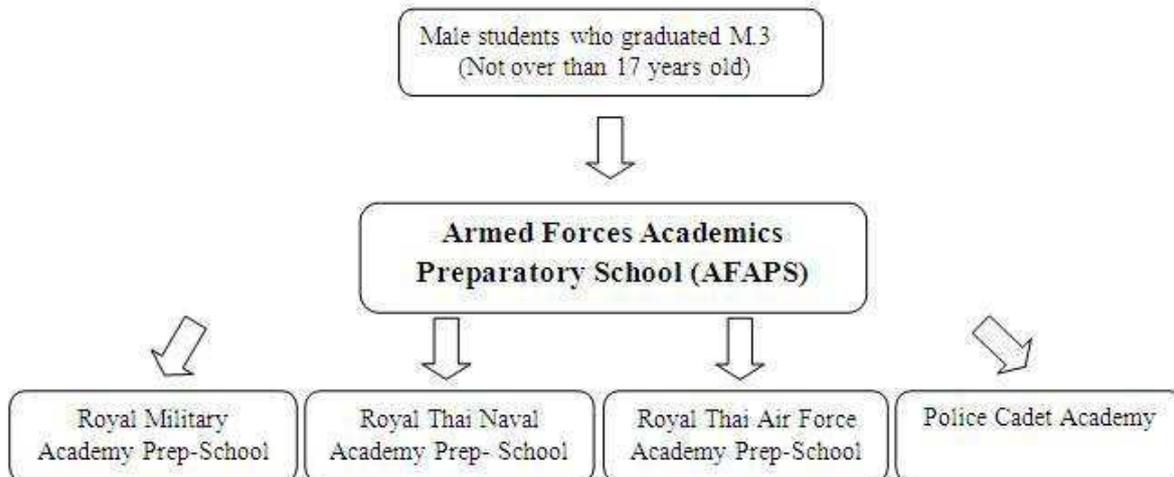
Business model, 9 building blocks, military, private tutoring for AFAPS entrance purpose

## **Introduction**

In Thailand military and police officers are important occupation and these occupations are interested by people who would like to be one of the commissioned officers. Students (male who graduated from grade 9) must be accepted by Armed forces academics preparatory school (AFAPS) before they are eligible to continue their education toward cadet schools (army, navy, air force, and police) as shown in figure 1.

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**Figure 1 Structure of Armed Forces Academics Preparatory School (AFAPS)**

In Thailand, working with government is high secure, beneficial in terms of welfare and good looking in Thai society. Therefore, there is a big number of student's demand, who want to study at Armed Forces Academics Preparatory School (AFAPS). In 2012, 18,644 students applied to AFAPS, while each military section requires only 100-120 students per year. Hence, the ratio stands as 180:1 candidates (The Royal Thai Air Force Academy's research, 2012).

From the data above, it affects to intense competition among students who would like to apply in cadet schools every year. Private tutoring for AFAPS institute had seen this competition, so they opened tutoring business just specifically to these students who would like to apply cadet schools. Consequently, parents and students who would like to compete over other students are very interested to use military tutoring business to achieve their goals, so private tutoring for AFAPS institute has grown rapidly. The value of Thai private tutoring for AFAPS institute is about THB 7,160 million in 2013 and will be up to THB 8,189 million in 2015, which is a rising of 5.4% per year (Kasikorn Research Center, 2013). Private tutoring for AFAPS institute is one of interesting businesses.

Normally, management of private tutoring for AFAPS institute in Thailand is controlled by an owner or shareholders. Majority of the owners are related or have worked in military career, and they decide on their business models, which may not be efficient in the long term. While high competition is growing in this tutoring business, the wrong business model will not guarantee the survival of business in the long run. Therefore the study of business model of private tutoring for AFAPS institute is needed to understand current problems and challenges of the tutoring business and to develop appropriate business model which will add more values to the operation process and to satisfy customers.

## Objectives

1. To study business practices, problems and threats of private tutoring for AFAPS management.
2. To study the satisfaction level of students who are taking or have taken service from private tutoring for AFAPS institute.
3. To propose appropriate business model of private tutoring for AFAPS institute.

## **Literature review**

The literature review in the research is included business model, satisfaction and private tutoring for AFAPS entrance purpose.

### **Business Model (The nine building blocks)**

Alexander Osterwalder & Yves Pigneur (2009) explained that a business model can best be described through nine basic building blocks that show the logic of how a company intends to make money. The nine blocks cover the four main areas of a business which included customers, offer, infrastructure, and financial viability. The business model is like a blueprint for a strategy to be implemented through organizational structures, processes, and systems.

The 9 building blocks are included;

#### **1. Customer Segments**

The customer segments building block defines the different groups of people or organizations that enterprise aims to reach and serve customers comprise the heart of any business model.

#### **2. Value Propositions**

The value propositions building block describes the bundle of products and services that create value for a specific customer Segment.

#### **3. Channels**

The channels building block describes how a company communicates with and reaches its customer segments to deliver a value proposition communication, distribution, and sales channels comprise a company's interface with customers.

#### **4. Customer Relationships**

The customer relationships building block describes the types of relationships a company establishes with specific customer segments. A company should clarify the type of relationship they want to establish with each customer segment. Relationships can range from personal to automated.

#### **5. Revenue Streams**

The revenue streams building block represents the cash a company generates from each customer segment (costs must be subtracted from revenues to create earnings).

#### **6. Key resources**

The key resources building block describes the most important assets required to make a business model work, every business model requires key resources. These resources allow an enterprise to create and offer a value proposition, reach markets, maintain relationships with customer segments, and earn revenues.

## 7. Key Activities

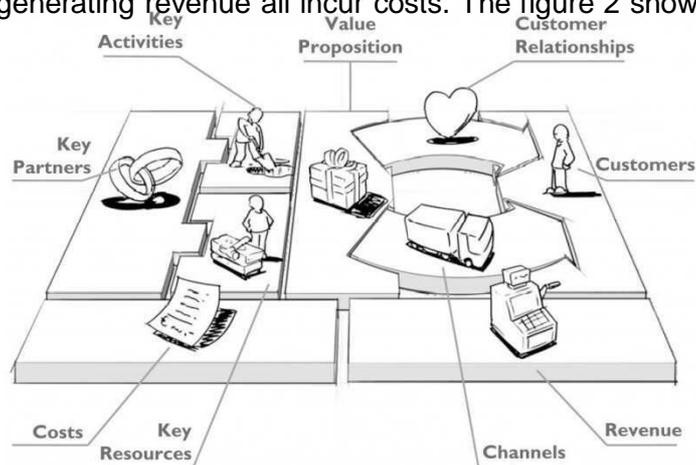
The key activities building block describes the most important things a company must do to make its business model work, every business model calls for a number of key activities. These are the most important actions a company must take to operate successfully.

## 8. Key Partnerships

The key partnerships building block describes the network of suppliers and partners that make the business model work companies forge partnerships for many reasons, and partnerships are becoming a cornerstone of many business models.

## 9. Cost Structure

The cost structure describes all costs incurred to operate a business model This building block describes the most important costs incurred while operating under a particular business model. Creating and delivering value, maintaining customer relationships, and generating revenue all incur costs. The figure 2 shows the 9 building block model.

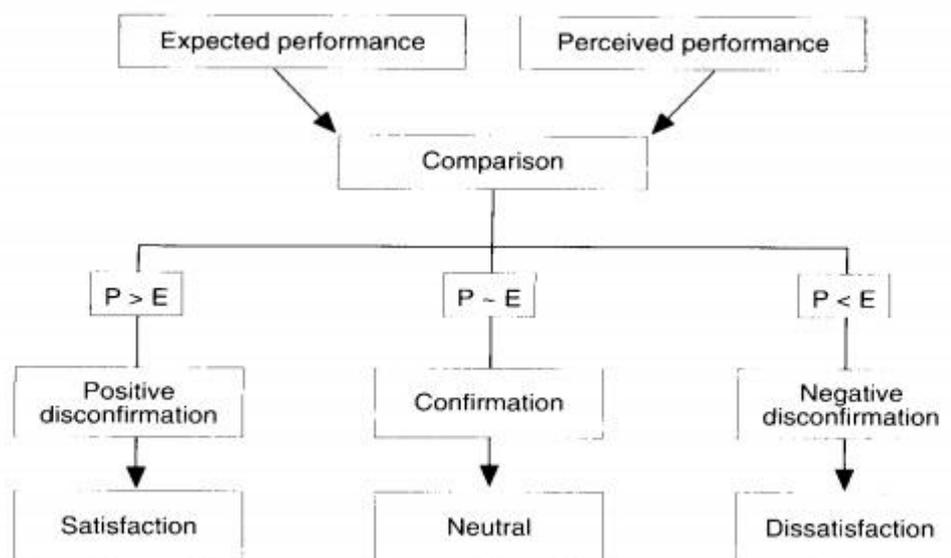


**Figure 2 Nine building blocks (Alexander Osterwalder & Yves Pigneur (2009))**

## Consumer Satisfaction/Dissatisfaction

Engel, Blackwell and Miniard, 1990 noted that consumers' beliefs that a product has certain desired attributes. Consumers compare the expectation of the product before purchasing with post-purchase of the products in forms of levels of satisfaction. The process is consumer compares post-purchase evaluation with the expectations before purchase. If the product performed better than expectation (perceived actual performance > expected performance), positive disconfirmation is expected to occur. This leads to consumer satisfaction, and strengthens consumers' beliefs, attitudes and future purchase intentions. In contrast, if the product performs worse than expected (perceived actual performance < expected performance), negative disconfirmation occurs; this may weaken future dispositions towards purchasing the product. Consumers may search for other products. When the product performs as expected (perceived actual performance = expected performance), the consumer is labelled "simple confirmation". Mattila, A & O'Neill, J.W. (2003) argues that satisfaction is related to the size and direction of the disconfirmation experience that occurs as a result of comparing service performance against expectations. Ekinci et al (2004) stated that satisfaction was the guest's fulfillment response. It is a judgment that a product or service feature, or the product or service itself, provided a pleasurable level of

consumption-related fulfillment, including levels of under-or-over- fulfillment. The satisfaction/dissatisfaction model is shown in the Figure 3.



**Figure 3 Disconfirmation Theory Model (Mattila, A & O'Neill, J.W. (2003)**

### Private tutoring for AFAPS entrance purpose

Precadet-home (2012) defined private tutoring for AFAPS as the institute that does not belong to government. It teaches students to improve and can pass the AFAPS test. After they complete a course in this place, they do not gain any education degree. Subject courses are included math, science, English language, Thai language, and Sociology. And physical education program is included sit-up, sit down, stand up, running 50 metres, running 1 km, and swimming 50 metres. There are two types of private tutoring for AFAPS. The first one is boarder students who spend their time and living in private tutoring for AFAPS institute everyday through the whole course and the second one is students who coming on weekend or weekday and go back home in the evening.

In order to build efficient business, business model is important give a competitive edge over other companies in the industry. Implementing a unique business model can give company a unique reputation in the marketplace, creating buzz among consumers. Researcher is used 9 building blocks business model to indicate satisfaction of customers toward private tutoring for AFAPS business.

### Related research

Tawat Boonseang (2011) studies Tutorial Schools : The Management Model Based on the Cultural Education Demand of Bangkok Metropolitan Society Tutorial schools have widely played important roles in Thai educational system. They have developed and continuously grown. Numbers of various kinds of tutoring schools have been established from kindergarten to college level, becoming a fashion and necessary for societies throughout the country. This qualitative study aimed at: examining the history, investigating the problematic conditions on the management, and finding an appropriate management model for tutorial schools. The research sites included Siam Square area, the Victory Memorial Statute area, Ngam Wongwan Street area, and Bangkok area. The research tools included a preliminary survey form, an observation form, an interview form, a group discussion form, and a seminar workshop form. There sults of the study were presented in a descriptive analysis form. Concerning the

problematic conditions on the management of tutorial schools in Bangkok Metropolitan, although the business entrepreneurs made benefit from their business, many problems arose. For instances, instruction managements were not really benefit for students, high competition among tutorial schools, too many offering courses and paying more expenses; excessive business strategy; marketing orientation to motivate students to incline to the advertisements. Sometimes, attending a tutorial program was just a kind of fashion, with no obvious objectives in terms of remediation or development of the learning potential in addition to the regular school class.

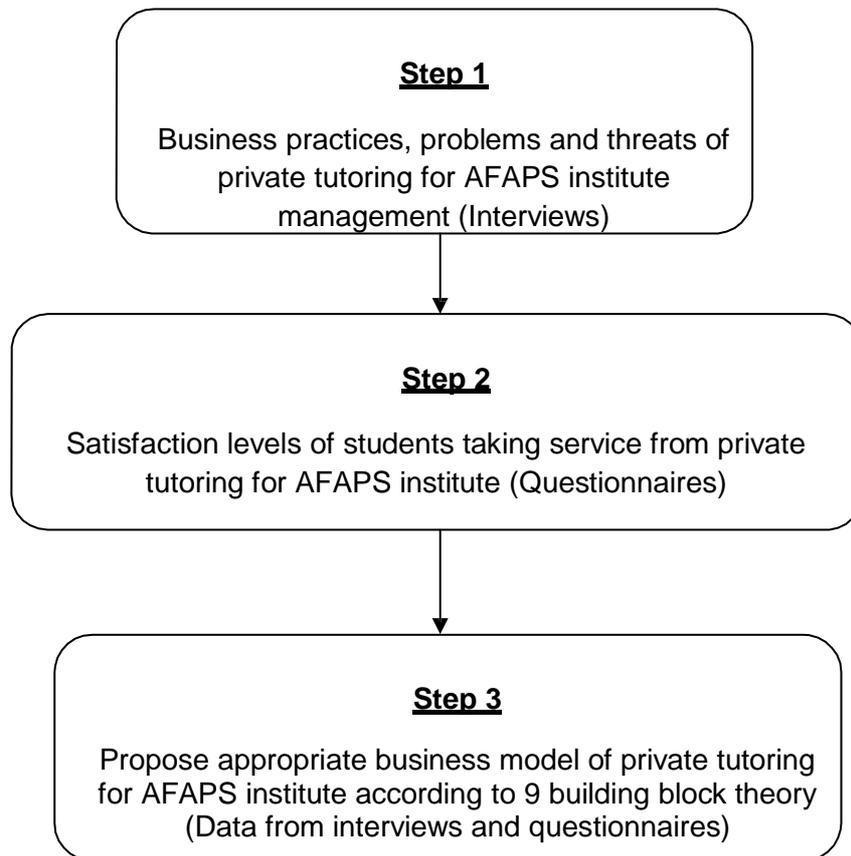
On the appropriate management model, it was found that it had to fulfill the students need for admission of famous universities. Tutorial schools had to develop various as followed: tutors of high academic level, experienced, good teaching techniques and good behaving model. They must have a quantified teaching aid materials update curriculum, covering university examination contents. There financial management had to be beneficial for both businesses and students. And for of terms of the management, these aspects: public relation, surrounding conditions, classroom, and others should be taking care to be proper and comfortable for students.

Hacklin Fredrik and Wallnöfer Maria (2012) studied the business model in the practice of strategic decision making: insights from a case study. Traditionally, management scholars have conceptualized the business model as a focus of innovation, planning tool, heuristic logic, or market device. However, so far, little is known about how the model is being applied in practice. To address this gap, this study aims to introduce a strategy-as- practice perspective and to explore the implications and limitations of applying the business model as a strategizing device. A single-case study design was selected to explore the implications and limitations of using the business model as a strategizing device in a high- tech firm. The business model provides a valuable structural template for mapping the current business model of a firm. However, in developing and discussing strategic options, it acts more as a symbolic artifact stimulating a creative decision-making process than as an analytic tool with a clear sequence of steps. When working with the business model concept in practice, its technical and linguistic legitimacy is initially highly limited. In the process of gaining legitimacy, however, a collective lock-in to the current strategic identity may arise. Managers have to be aware of these limitations and need to achieve an appropriate balance within the organization. The study introduces a social practice perspective into the business model debate, with a special emphasis on the implications and limitations of applying the business model concept as a strategizing device in a real-life setting.

From related researches, there are studies and developing management pattern by using history examining, problematic conditions investigating, and an appropriate management model finding for tutorial schools in Bangkok Metropolitan. And the second reseach which was about a study aiming to introduce a strategy-as-practice perspective. The study also explored the implications and limitations of applying the business model as a strategizing device. It can be used as a guideline to propose appropriate business model of private tutoring for AFAPS institute.

### **The study process**

There were three steps in the study including 1) to study of Business practices, problems and threats of private tutoring for AFAPS institute management, 2) to survey of Satisfaction levels of students taking service from private tutoring for AFAPS institute, and 3) to propose appropriate business model of private tutoring for AFAPS institute based on information derived from the first two steps as appeared in Figure 4.



**Figure 4 The Study Process**

## **Methodology**

Methodology used in the study consisted of 2 parts interview and questionnaire survey.

### **1. Interview**

The interview was applied to study business practices, problems and threats of private tutoring for AFAPS management. Five owners in different private tutoring for AFAPS institutes that have been established not less than 5 years and have at least 250 students per year were interviewed using semi-structured interview guideline in February 2014. These five owners were selected by judgmental method from 59 private tutoring for AFAPS institutes in Thailand. The interview guideline included 3 parts;

Part 1: General information of owner

Part 2: How to manage private tutoring for AFAPS entrance purpose according to nine building blocks including customer segment, key partnership, and cost structure

Part 3: Some problems and threats recommended by managers

Data analysis was conducted by content analysis along the light of 9 building blocks theory

### **2. Questionnaire survey**

To study the satisfaction level of students who are taking service from private tutoring for AFAPS institute, The questionnaire survey was applied. The target population was students who was taking or took service from private tutoring for AFAPS institutes. Questionnaire was used as data collection method. The questionnaire consisted of 2 parts;

Part 1: general information questions which related to personal information such as age, gender, education level, study program, GPA, parent's salary, tutoring expense, time availability, reason of choosing tutoring center, influence factors, preference of teaching styles (closed-question in form of checklist question).

Part 2: satisfaction of the respondents according to the nine building block, which included 6 aspects (Value Propositions, Channels, Customer Relationships, Revenue Streams, Key resources, Key Activities) , in form of rating scale from 1 to 5 (1 =Strongly Dissatisfied, 2 = Dissatisfied, 3 = Natural, 4 = Satisfied, 5 = Strongly Satisfied).

Questionnaire was pre-test from 30 respondents and Cronbach's Alpha statistics was applied for reliability analysis of the scale which is between 0-1. The real survey was conducted in March 2014. 400 Questionnaires were distributes to students who are taking service from 5 tutoring shool and all questionnaires were usable. Data was edited and then analyzed by descriptive statistics including frequency, percentage, mean, and standard deviation. Satisfaction level in each aspect in 9 Building Blocks were categorized into 5 levels as shown in Table 1.

**Table 1 level of satisfaction**

Interval	Level of satisfaction
4.21-5.00	Strongly satisfied
3.41-4.20	satisfied
2.61-3.40	Neutral
1.81-2.60	Dissatisfied
1.00-1.80	Strongly dissatisfied

## Result

The results of the study were divided into three parts as follows:

**Part 1:** Business practices, problems and threats of private tutoring for AFAPS institute management

The results from the interview of 5 famous big private tutoring for AFAPS institutes with more than 250 students applied yearly and more than 5 years of establishment revealed the current business model used by tutoring businesses according to 9 building blocks model of business model as follows:

**Business practice** can be categorized as follows:

1. Customer segment aspect

Customer segment were male students, who graduated from grade 9<sup>th</sup> (or Mattayom 3) and ages were not over 17 years old.

2. Key partnership aspect

Key partnerships were famous instructors, who graduated from Military cadet school. Some institutes have contracts with other partners such as common private tutoring institute, which is called "Joint venture institutes".

### 3. Cost structure aspect

Cost structure's starts up cost for business was about 10 million Baht, costs were included leasing, facility cost, and cash flow in business

#### **Problems and threats**

##### 1. Communication

Communication, most institutes had been using almost similar name using "cadet" or "chakdao". Customers could be confused and could apply therefore for other schools with the similar name instead.

##### 2. Marketing communication

Marketing communication of some institutes were not good such as some institutes had not promoted via the internet channel like websites, Facebook, Fanpage when some institutes didn't update their pages often, these caused failure in communication with customers and this could be a loss of opportunity to others instead.

##### 3. Standard every branches

In urban areas, institutes may join with other institutes or local schools in exchanging in famous instructors but there are some threats the can be occurred such as conflict between institutes, how to maintain same standard every branche, and how CEO operates in the same purposes and direction.

##### 4. Effective and efficient operation

To remain sustainable high standard was difficult; each institute had to concern this issue because every year military school will change some rules and regulations. Hence, institute had to follow up changeable situations for develop, manage, and operate effectively and efficiently with high performance and sustainable growth.

**Part 2:** The satisfaction level of students taking service from 5 tutoring shools.

The results are shown as following:

All of the respondents were single males. The major age was between 15-16 years old for 92.3 %. The major education was Grade 11 which was counted to 86.5%. The respondents study Arts-Math program for 75.2%. For Grade Point Average (GPA), the first majority group of the respondents has GPA between 3.51 - 4.00 for 61.2%. For parent's salary, the first majority of the respondents show that their parent's salary between 30,001-50,000 baht per month for 83%. The first majority of the respondents spend between 10,001-30,000 baht per month for 92%. For convenient time which respondents prefer to study at tutoring center, the majority of the respondents prefer Monday-Friday after school and weekend for 203 and 139 respondents which were 50.8% and 34.8% respectively. For reason of choosing tutoring center, the first majority group had reason that they wanted to pass AFAPS (Armed Forces Academics Preparatory School) test for 84.5% or 338 respondents. For the influence person or factor, the first majority group was well-known

institute at 61.5% or 246 respondents. For way of teaching, the first majority group was live teaching way at 95.5% or 382 respondents as shown in table 2-5 below:

**Table 2 Satisfaction of the respondents toward Value Propositions**

Satisfaction of the respondents toward the building blocks	$\bar{x}$	S.D	Satisfaction Level
<b>1. Value Propositions</b>	<b>4.24</b>	<b>0.41</b>	<b>Strongly satisfied</b>
1.1 Military school admission procedures are shown to students and parents for more understanding.	4.33	0.669	Strongly satisfied
1.2 Instructors teach only few or one school(s).	4.31	0.632	Strongly satisfied
1.3 School has provided special class until midnight.	4.30	0.606	Strongly satisfied
1.4 School has built family relationship or senior-junior relationship between school and students.	4.29	0.633	Strongly satisfied
1.5 School has analysed strengths and weaknesses of academic issue in each student.	4.29	0.691	Strongly satisfied
1.6 School has provided old tests to students as guidelines, indicate and announce test's result to students.	4.28	0.690	Strongly satisfied
1.7 School helps students reach higher grades in schools.	4.27	0.650	Strongly satisfied
1.8 School with no branch can keep standard better than school with branch.	4.27	0.723	Strongly satisfied
1.9 School has a website and webboard to respond and answer with students.	4.23	0.688	Strongly satisfied
1.10 School has focused on academic and morality practicing.	4.22	0.673	Strongly satisfied
1.11 School has achievement, proven by students can apply in 4 cadet schools.	4.22	0.781	Strongly satisfied
1.12 School has 24 hours surveillance and parents can follow studied environment.	4.20	0.695	Satisfied
1.13 Owners have special techniques and special formula in mathematics and science.	4.15	0.743	Satisfied
1.14 E-learning course has provided for students who don't have time to study in class.	4.12	0.817	Satisfied
1.15 School teaches morality and rules and regulations.	4.12	0.542	Satisfied
1.16 School has provided scholarship to outstanding students.	4.07	0.633	Satisfied

**Table 3 Satisfaction of the respondents toward Channels and Customer Relationships**

Satisfaction of the respondents toward the building blocks	$\bar{x}$	S.D	Satisfaction Level
<b>2. Channels</b>	<b>4.27</b>	<b>0.34</b>	<b>Strongly satisfied</b>
2.1 School uses marketing channel via website.	4.43	0.539	Strongly satisfied
2.2 Famous school and students spread the words (word of mouth).	4.36	0.593	Strongly satisfied
2.3 Schools have Facebook and Fanpage as marketing tools.	4.34	0.621	Strongly satisfied
2.4 Promote via intermediaries such as guidance teacher.	4.33	0.705	Strongly satisfied
2.5 School promotes school by showing students who could applied in military school and resume' or background could be checked.	4.28	0.684	Strongly satisfied
2.6 School has promoted via billboard and poster in an important place.	4.24	0.725	Strongly satisfied
2.7 School has launched brochures to public schools.	4.20	0.676	Satisfied
2.8 School has promoted via medias such as newspaper or radio broadcasting.	4.20	0.757	Satisfied
2.9 School has promoted by sales or discount admission fee for old students or group of students.	4.17	0.785	Satisfied
2.10 School has direct marketing communication to students and parents.	4.13	0.550	Satisfied
<b>3. Customer Relationships</b>	<b>4.32</b>	<b>0.46</b>	<b>Strongly satisfied</b>
3.1 Relationship between school and students are strict in procedures.	4.33	0.649	Strongly satisfied
3.2 Focus on quality more than quality.	4.32	0.627	Strongly satisfied
3.3 Relationship between school and students are likely a family pattern.	4.30	0.664	Strongly satisfied

**Table 4 Satisfaction of the respondents toward Revenue Streams**

Satisfaction of the respondents toward the building blocks	$\bar{x}$	S.D	Satisfaction Level
<b>4. Revenue Streams</b>	<b>4.29</b>	<b>0.39</b>	Strongly satisfied
4.1 School is set up reasonable price like others.	4.37	0.648	Strongly satisfied
4.2 School with March course.	4.38	0.621	Strongly satisfied
4.3 School with weekend course.	4.36	0.597	Strongly satisfied
4.4 School has been provided internet channel such as online payment or online admission.	4.33	0.688	Strongly satisfied
4.5 School has set up reasonable price and controlled by Ministry of Education.	4.32	0.680	Strongly satisfied
4.6 School has "drop course" which students have to pause studying from schools, only tutor with tutoring school entire year.	4.31	0.755	Strongly satisfied
4.7 School with cheaper cost than others.	4.30	0.653	Strongly satisfied
4.8 School has provided October course.	4.31	0.647	Strongly satisfied
4.9 School has provided Gifted course for only outstanding and high potential students.	4.29	0.678	Strongly satisfied
4.10 School let customers can pay by installments.	4.28	0.667	Strongly satisfied
4.11 School has decreased fee when students apply for many courses.	4.26	0.714	Strongly satisfied
4.12 Customers can pay a big chunk, not pay many times.	4.22	0.635	Strongly satisfied
4.13 School has provided course for grade 7 and 8 students, preparing for real apply in grade 9.	4.20	0.746	Satisfied
4.14 School has provided yearly course, which students can live in school and study in public school also.	4.12	0.593	Satisfied

**Table 5 Satisfaction of the respondents toward Key resources & Key**

**Activities**

Satisfaction of the respondents toward the building blocks	$\bar{x}$	S.D	Satisfaction Level
<b>5. Key resources &amp; Key Activities</b>	<b>4.30</b>	<b>0.33</b>	<b>Strongly satisfied</b>
5.1 School has a pretest providing to students.	4.39	0.655	Strongly satisfied
5.2 School has extra teaching for students who don't clearly understand in each lesson.	4.39	0.631	Strongly satisfied
5.3 School has adapted lessons to match with Ministry of Education's policy.	4.38	0.653	Strongly satisfied
5.4 Instructors were graduated from military school and are expert in each subject.	4.37	0.651	Strongly satisfied
5.5 School has provided facilities and parking lot.	4.32	0.663	Strongly satisfied
5.6 School is located in community area and easy to transport.	4.30	0.635	Strongly satisfied
5.7 Instructors are the expertise, have special techniques, understand students, good relationship, good manner, and look after students like senior and junior.	4.30	0.726	Strongly satisfied
5.8 School is provided modern technology instruments.	4.30	0.645	Strongly satisfied
5.9 School has attractive studying tools suitable with customers' age.	4.29	0.639	Strongly satisfied
5.10 Famous school and was established for a long time.	4.29	0.649	Strongly satisfied
5.11 School has contingency plan for students who missed applying military school.	4.28	0.745	Strongly satisfied
5.12 School has decorated modern, clean, and safe environment.	4.27	0.685	Strongly satisfied
5.13 Staffs are ready to serve and provide friendliness services.	4.17	0.583	Satisfied
5.14 School has well trained and developed instructors which can be divided to new techniques development and examination analysis in each year.	4.16	0.602	Satisfied

Results of researching 400 students showed that students' satisfaction level toward factors was as below;

1. Customer Relationships aspect, average of 4.32

Which included 3 relationship patterns; 1) Relationship between institute and students were strict in procedures 2) Focusing on quality more than quantity and 3) Relationship between institute and students was likely a family pattern.

2. Key resources & Key Activities aspect, average of 4.30

Which included 3 relationship factors; 1) Institute had a pretest provided to students 2) Institute had extra teaching for students who didn't clearly understand any lesson and 3) Institute adapted lessons to match with Ministry of Education's policy.

3. Revenue Streams aspect, average of 4.27

Which included 3 relationship factors; 1) Institute set up reasonable price like others 2) Institute had March course and 3) Institute with weekend course.

4. Channel aspect, average of 4.27

Which included 3 relationship factors; 1) Famous institute and students spread the words (word of mouth) 2) Promotion via intermediaries such as guidance teacher and 3) Institute promoted school by showing students who could enter in military school and their resumes or backgrounds could be checked.

5. Value Propositions aspect, average of 4.24

Which included 3 relationship factors; 1) Military school admission procedures were shown to students and parents for more understanding 2) Instructors taught for only few or one institute(s) and 3) Institute provided special class until midnight.

**Part 3:** The third objective was to purpose appropriate business model of private tutoring for AFAPS institute by using data from interviews and questionnaires.

### **Proposed Business Model**

Proposed Business Model was the result from analysis process. The model followed the nine building blocks method that may help owners of military tutoring business compete with other institutes and succeed in business effectively. As above proposed business model figure, it could be explained in each aspect as follows;

#### **1. Customer Segments**

To proposed business model of private tutoring for AFAPS institute, institute should focus on Thai students graduated from grade 9 in Thailand with ages not over 17. Mostly, students got GPA between 3.51 - 4.00, and their parents' salaries were between 30,001-50,000 baht per month. Tutoring fee was between 10,001-30,000 baht per month. The institute should focus on supporting students to enter in AFAPS (Armed Forces Academics Preparatory School) as much as possible to gain reputation, and live teaching is more attractive to students.

## **2. Value Propositions**

Institute provided instructors who teach for only few or one institute and the admission procedures in clear details. An extra class in nighttime for increasing opportunity to develop skills was an advantage.

## **3. Channels**

The marketing channel should focus on making institute become famous by using word of mouth and direct experience of people who used to study in the institute and passed AFAPS exam which influence consumer very well. Besides, institute used technology and internet to communicate among institutes, students and their parents via the internet, Facebook, or Fanpage, these channels were very important nowadays.

## **4. Customer Relationships**

Institute had rules and regulations as military school, therefore students get used to this atmosphere before admitting to AFAPS School. Meanwhile, family relationship pattern was important too.

## **5. Revenue Streams**

Institute set up reasonable price and compare with others. Tutoring fee was a major factor of revenue streams. And other revenue was from camp fee (summer camp in October) and transportation fee that students paid to institute.

## **6. Key activities**

To launch pretest before facing with actual examination, students had a chance to practice. Institute added some extra classes for students who didn't understand lesson clearly, and activities launched by institute could make good friendship and teamwork environment.

## **7. Key resources**

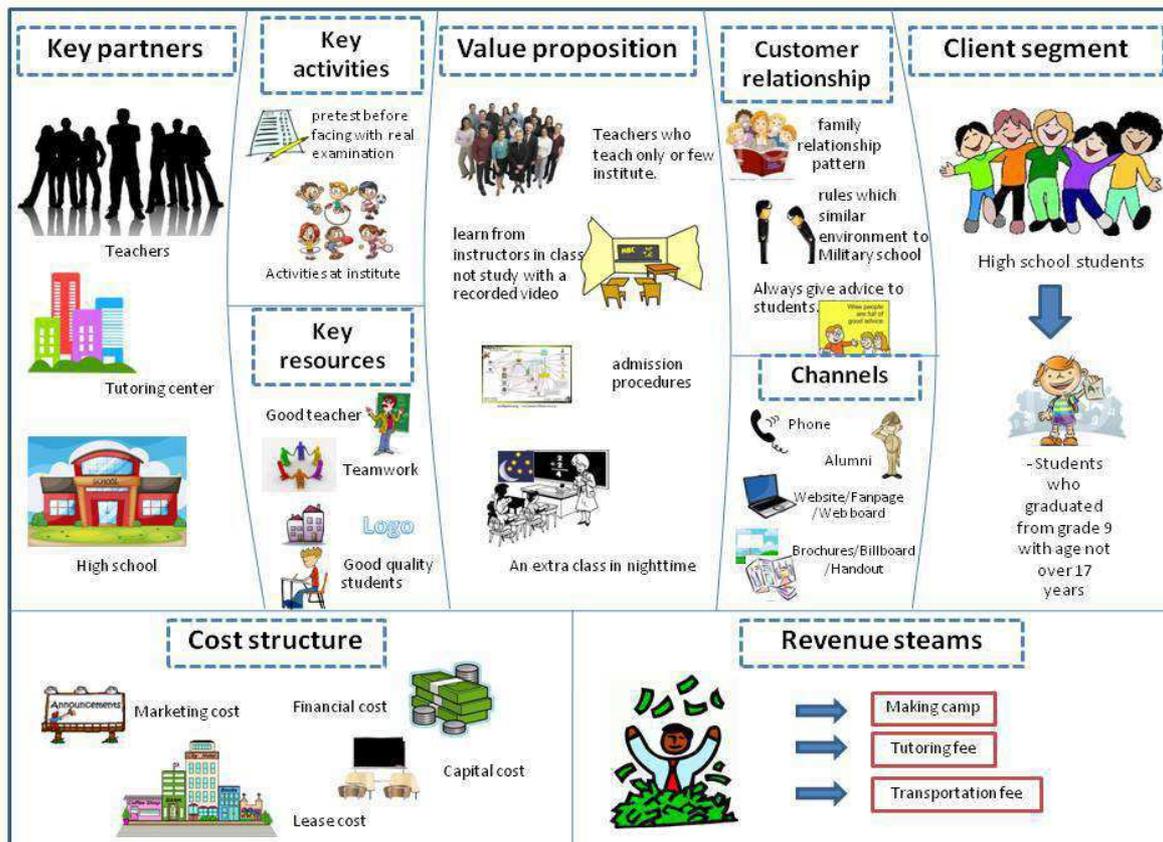
The institute needs good teachers who graduated from the Military School, staffs had teamwork skill for the best performance. Good quality students were wanted. Logo with clear name and had good brand image were fundamental factors for the business.

## **8. Key partnerships**

Famous instructors who graduated from military school were important because students thought their instructors were like the idols. Nowadays, joint venture in this business had already occurred. The advantages were strong cooperation, exchanging in famous instructors and personnel, cooperating in development and expanding investment in capital for more efficiency and effectiveness.

## **9. Cost structure**

The start up cost structure for large size private tutoring for AFAPS institute was about 10 million Baht, most of the costs were leasing, facility provided, and circulating fund in business. The appropriate business model of private tutoring for AFAPS institute based on 9 building blocks as in Figure 4



**Figure 4 Business model of private tutoring for AFAPS entrance purpose**

## Conclusions

The figure shows business model of private tutoring for AFAPS entrance purpose which included 9 parts building blocks theory as following Customer Segments, Value Propositions, Channels, Customer Relationships, Revenue Streams, Key activities, Key resources, Key partnerships and Cost structure

The satisfaction in each aspect in 9 Building Blocks, depending on satisfaction to each level such as in channel aspect, customers concerned the importance to famous institute first because customers thought that they could trust and ensure quality of institute besides, direct experiences from people who used to study in each institute was another channel to build new customers trustworthiness, too. In this globalization era, institutes had to adapt by using technology and the internet to connect institute with customers. Institutes with high concern in technology instruments like internet, Facebook, or Fan page would be more succeed in accessing to customers and take more advantages because most of customers nowadays are searching information via internet including searching for military private tutoring school. Besides, some important factors could be clarified such as costs and cash flow of institute. The institution was recommended to use marketing strategies that can easily attract customers such as the internet and social network. The results could be used to build business model, approach business management, shape efficient strategies for both business owners understanding problems, threats, and solving approach. Entrepreneurs were interested in foreseeing overall private tutoring for AFAPS entrance purpose and development guidelines. For further, the researcher may need to study and develop institute management pattern by using electronic devices more such as computer for teaching because nowadays and study model of private tutoring for AFAPS entrance purpose strategy,

such join famous institute with local institute for access local market and satisfy customer needs in local areas, then institutes would grow sustainable in the future.

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# Innovations of Professional Training in the Field of Informatics of Non-informatics Study Profiling

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## Abstract

The authors present in this paper some results of a research with a broader concept, of which one of the goals was to map the current state of informatics education in the scope of selected economic and management study profiling, and thus contributing to solving the issue of modernization and optimization of teaching in the field of informatics and to focus the content of the curriculum on the requirements determined by practice and labor market for knowledge and skills in the study area. The results of the pilot verification of the questionnaire were used to verify its reliability. To verify the reliability of the questionnaire, we used the analysis of reliability / items. The results of the analysis of reliability / items pointed to some of the questionnaire items as suspicious, decreasing its overall reliability. In the paper the authors present a statistical analysis and interpretation of the results of processing the student responses to selected items within the surveyed area entitled "What I would like to learn" through items, which participants were asked to what extent they believe is the relevant learning subject content interesting and significant for the education in the context of their study profiling, or significant for their professional future. The specification of learning topics investigated in this area is based on the needs of content innovation and proclaimed improvement of the quality and timeliness of the education in the stated scope of economic and managerial study profiling and linking of knowledge of professional tertiary education (ISCED 5) to the employers' current needs and practices, thereby improving the quality of learning outputs and the employability of the graduates of these programs.

## Key words

Computer sciences, education of informatics, informatics study programs, education innovation, graduates employability, statistical analysis, economic / management study profiling.

## Introduction

Today, informatics is in various forms incorporated into the curricula of virtually all study fields at all colleges and universities in the Slovak Republic. With the exception of technical expertise faculties and informatics departments (with a range of proprietary curriculum), the teaching of informatics disciplines focuses mostly on applied informatics in the context of a particular field of study. The primary objective of incorporating the informatics disciplines into study programs of economic and management focus on ISCED level 5 in the Slovak Republic is to develop those students' informatics competencies that have broad transfer, particularly from the aspect of the practice and the labor market requirements, i.e. on performing job in a particular area of the economy.

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Except for the proclaimed, generally unsatisfactory level of tertiary education in the field of informatics teaching in the study programs of economic and management focus, the situation is affected negatively by lack of attention that is paid to the inclusion of databases into the educational content (Dvorský, 2010; Chow, 2007; Calzarossa, Ciancarini, Mich and Scarabottolo, 2011).

Undoubtedly, this is due to the low time subsidy for individual disciplines of the informatics character. Create the conditions, means and mechanisms for targeted development of knowledge and skills of students in the field of database systems and database technologies is quite relevant and beneficial for students, through which they develop the ability of logical and analytical thinking, ingenuity, creativity, but also the systematic design, database development, as well as work with the data in the database. Last but not least, the process of teaching database systems and database technologies show the wide range of uses of acquired knowledge in the exercise of one's profession

The above-stated facts led us based on the research of broader scope to map the current state of IT education in the said scope of curriculums especially in terms of teaching database systems and technologies, and thus contribute to solving the issue of modernization and optimization of teaching in the informatics and to focus the study content on requirements determined by practice and the requirements of the labor market and skills in the study area. In the implementation of monitoring, due to the availability as well as the relationship of the development of education, we have selected the Czech Republic as the comparison country, with which we have compared the situation in Slovakia.

### **Summary of the preparatory phase of the research**

Based on the information above, we established the evaluation methodology of education in selected disciplines of informatics in the previously mentioned study programs through the screening of students' opinions through the evaluation of educational topics / issues. We believe that the above mentioned aspects of the acquisition could in relevant level participate in the shaping of the resulting image of the research problems. The questionnaire was used for the screening reviews of the students.

With the development of the questionnaire, realization and evaluation rules of the survey were simultaneously elaborated. The questionnaire is divided into the following six areas:

- *Factographical part.* Identification of sex and age of the respondent and four other items regarding the study focus of the interviewee;
- *What I want to learn.* To what extent is the study of stated topics interesting to the student;
- *My future profession.* To what extent are stated factors significant for the students during the selection and decision making about the future profession;
- *What I would like to learn.* To what extent is information from the stated fields interesting to the student;
- *My education in the field of informatics.* To what extent does the student agree or disagree with stated statements about the education of informatics disciplines, which he took during his graduate studies thus far;
- *My professional capability in the context of study profilation.* The respondents had to choice to choose one of seven alternative answers with which they identify themselves or which captures their position the most.

Specification of stated assessment areas was based on extensive research activities of available domestic and foreign sources [5], [6], [7], during consultations with experts from the discussed field of science, not least also during the personal discussions led in circles of professionals who have rich professional and educational experience in learning subjects, in context of which our research is focused.

The respondents expressed their evaluation towards the ordinal items through the five-point Likert scale, i.e. the point rating system from 1 to 5 with a median to express the neutral, emotionally indifferent evaluation response. In each respond, there was a recorded scale value in mentioned items of administered questionnaire, depending on what rate of their agreement or disagreement with the individual claims, or what degree of positive or negative evaluation of the attractions in the individual subjects he/she indicated. In the part of questionnaire titled *My professional capability in the context of study profilation*, the respondents got the opportunity to express their opinion on the way of their professional competence and enforcement in the labor market within the context of their study profiling.

Correctness of our research tool was confirmed on the basis of its reliability and identification of suspect items by analysis of the reliability/items. The overall reliability of the questionnaire was calculated by using Cronbach's alpha. The calculated value of Cronbach's Alpha for all four areas  $\alpha_B = 0.9570$  (*What I want to learn*),  $\alpha_C = 0.8405$  (*My future profession*),  $\alpha_D = 0.9620$  (*What I would like to learn*) a  $\alpha_E = 0.9293$  (*My education in the field of informatics*) indicates high internal consistency of the used measurement instrument (Chart 1).

Statistics have shown us that all items of the questionnaire correlate with the total score range within the field and after their removal the coefficient of reliability - Cronbach's alpha decreased. With some of the items we are observing the opposite; in these cases the reliability coefficient has increased. Based on the data tabulated in Table 1 we observe that after the removal of each of the items, the value of the decisive deviation has decreased (36.066, 11.420, 33.247, 13.313). We can therefore state that all items increased the overall variability of the questionnaire's score, but none significantly. Similarly, we evaluate also the indicator of the mean in terms of the mean rate.

From the correlation matrices, we have identified within each of the investigated areas suspicious items of the questionnaire. We have tested the statistical significance of correlations between the items on the significance level 0.05. From the correlation matrices of the questionnaire we have observed that there are statistically significant correlations ( $p < 0.05$ ) between majority of the items, which means that there is a degree of interdependence between these items. However items (Table 2) are an exception, which do not correlate with some other items of the questionnaire ( $p < 0.05$ ), from which we can conclude that values vary independently. Based on these results we identify especially these items as suspicious, reducing the overall reliability of the established research tool. After the removal of stated suspicious items in individual surveyed areas (Chart 2), the coefficient of reliability - Cronbach's alpha increased in all cases. Based on stated the said items reduce the overall reliability of the questionnaire. Based on the results of the pilot testing of the research tool, we have performed a detailed analysis of the suspicious items, i. e. items, after the removal of which the reliability of the questionnaire has increased.

More detailed conceptual and methodological basis of the research were presented in papers published on the international symposium (Záhorec, Hallová and Hennyeyová, 2014).

**Chart 1 Summary statistics of the questionnaire in the context of minimum and maximum values after the removal of corresponding values**

Surveyed area	N	Mean Mean after removal (min; max)	Standard deviation Standard deviation after removal (min; max)	Mean correlation Item-whole correlation (min; max)	Cronbach's alpha Alpha after removal (min; max)
What I want to learn	53	<b>180.755</b> (176.925; 178.245)	<b>36.066</b> (34.848; 35.466)	<b>0.298</b> (0.252; 0.731)	<b>0.9570</b> (0.9553; 0.9575)
My future profession	58	<b>91.931</b> (87.3103; 89.293)	<b>11.420</b> (10.707; 11.120)	<b>0.217</b> (0.131; 0.686)	<b>0.8405</b> (0.8265; 0.8451)
What I would like to learn	44	<b>147.364</b> (143.705; 145.000)	<b>33.247</b> (31.908; 32.641)	<b>0.358</b> (0.227; 0.747)	<b>0.9620</b> (0.9604; 0.9624)
My education in the field of informatics	57	<b>56.281</b> (52.421; 53.877)	<b>13.313</b> (12.317; 12.921)	<b>0.445</b> (0.206; 0.824)	<b>0.9293</b> (0.9211; 0.9348)

Note: in the parentheses we state the min. and max. values of statistics after the removal of the relevant questionnaire items.

**Chart 2 Statistics of the questionnaire after the removal of suspicious items**

Surveyed area: number of suspicious/overall number of items	Mean after removal	Standard deviation after removal	Item-overall correlation	Alpha after removal
<b>What I want to learn: 4/56</b>				
Internal computer architecture. (B2)	178.151	35.466	0.208	0.9575
Significance of cybernetics in management. (B38)	178.019	35.411	0.280	0.9571
Historic evolution of management. (B42)	177.736	35.376	0.252	0.9574
Origin and evolution of money. (B51)	177.283	35.364	0.292	0.9571
<b>My future profession 5/24</b>				
Work with animals. (C7)	89.069	11.078	0.167	0.8438
Work in the IT field. (C8)	88.276	11.014	0.239*	0.8406
Do easy and effortless work. (C9)	88.431	10.994	0.227*	0.8418
Work with machines and tools. (C10)	89.086	11.120	0.131	0.8451
Work artistically and creatively in the field of art. (C11)	89.293	10.934	0.214	0.8449
<b>What I would like to learn 2/48</b>				
Financial analysis of the company. (D46)	143.932	32.641	0.227	0.9624
Health insurance. (D47)	144.318	32.420	0.354	0.9622
<b>My education in the field of informatics 1/18</b>				
Informatics subject are content-challenging. (E3)	52.544	12.921	0.206	0.9348

\* > 0,216939

### Analysis and interpretation of the results of the survey

In the questionnaire part entitled "What I would like to learn" (indicating the items D1 to D22), the respondents were asked to what extent is the relevant learning topics content interesting and relevant to education in the context of their study profiling, or significant for their professional future. Specification of learning topics in this researched area is based on the needs of content innovation and proclaimed improvement of the quality and timeliness of

education stated in the scope of economic and management study profiling and linking of knowledge of professional tertiary education (ISCED 5) to the employers' current needs and practices, thereby improving the quality of learning outputs and employability of the graduates of these programs. Selection of surveyed learning topics were subject to the fact that students had to be partially acquainted with the subject matter in the course of their studies, and thus the potential incorporation of given topics into the teaching - learning content of the relevant discipline would develop their previously acquired knowledge in the field.

The items represent the attitudes of subjects - students to the learning topics under consideration measured by five-point Likert scale from 1 to 5 (5 – *very interesting*, 4 – *rather interesting*, 3 – *neither interesting, nor uninteresting*, 2 – *rather uninteresting*, 1 – *very uninteresting*).

Monitoring was realized during the academic year 2013/2014 on the sample of students from the Faculty of Economics and Management (FEM) and the Faculty of European Studies and Regional Development (FESRD) of Slovak University of Agriculture in Nitra. The sample of the Czech respondents was formed by the students of the Faculty of Business and Economics (FBE) of Mendel University in Brno. The faculties engaged in the research provide education with economic and management study profiling in almost identical curricula. The respondents of our questionnaire were students from the 3<sup>rd</sup> to the 10<sup>th</sup> semester (age group 19-24 years) of study programs Business Management, Quantitative Methods in Economics, Accounting, Agrarian Trade and Marketing, Business Economics, provided by FEM and study program European development programs provided by FESRD. The Czech research sample consisted of students representing the study program of Economic Policy and Administration and program of Accounting and Taxes.

**Chart 3 Composition of the respondents of the survey sample**

	Level of factor	N
COUNTRY	Slovakia (SR)	493
	Czech Republic (CZ)	42
GENDER	Female (F)	373
	Male (M)	162
ŠTUDIJNÁ PROFILÁCIA	Business economics (BEC)	319
	Agrarian trade and marketing (ATM)	62
	Quantitative methods in economics (QME)	28
	Accounting (AC)	37
	Business management (BMA)	20
	European development programs (EDP)	27
	Accounting and Taxes (ACT)	18
	Economic policy and administration (EPA)	24
Total		535

Chart 4 shows the descriptive characteristics of the final score of answers of the five most positive and most negative evaluated items - learning topics falling under informatics, examined within the field of the query "What I would like to learn." The table contains descriptive statistics of the final total score of items without the differentiation of respondents (factors STATE, SEX, STUDY PROFILING). Stated are the values of the mean, decisive

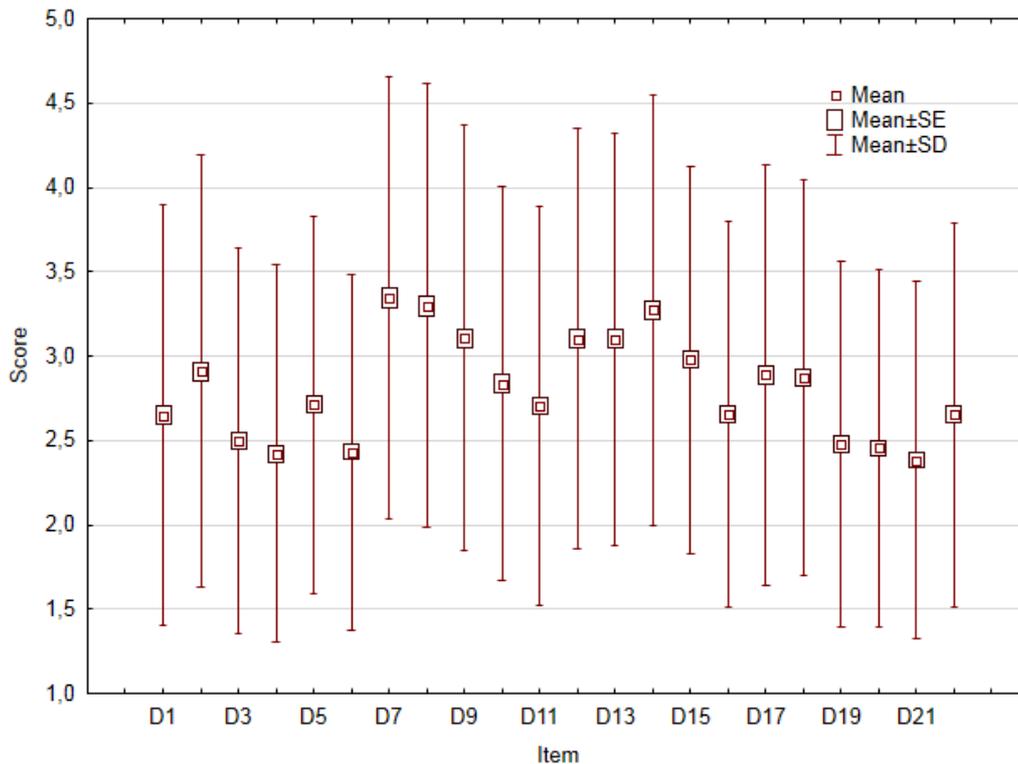
deviation, decisive errors of the mean estimate and a 95% interval of the mean reliability of the range value.

**Chart 4 From the results of the descriptive statistics of the two surveyed areas**

Surveyed area / items	Mean	Decisive deviation	Decisive error	Interval of the reliability of the mean	
				-90 %	+95%
<b>What I would like to learn</b>					
Programming and website development. (D7)	3,35	1,31	0,06	3,23	3,46
Web applications programming (chat, discussion forum, e-commerce). (D8)	3,30	1,32	0,06	3,19	3,41
Malware (viruses, Trojans, spyware, adware, hoaxes). (D14)	3,27	1,28	0,06	3,16	3,38
Computer network, sharing of equipment and data information transfer. (D9)	3,11	1,26	0,05	3,00	3,21
Cybercrime. (D13)	3,10	1,22	0,05	3,00	3,21
Advanced work with data through the SQL database command. (D19)	2,48	1,08	0,05	2,39	2,57
Case studies for the application of macros in the MS Access. (D20)	2,46	1,06	0,05	2,37	2,55
Modelling language UML (visualization, design and documentation of software systems). (D6)	2,43	1,06	0,05	2,34	2,52
Work with data in the database systems using SQL. (D4)	2,42	1,12	0,05	2,33	2,52
Creating of database applications through programming in Visual Basic for Access (D21)	2,39	1,06	0,05	2,29	2,48

N = 535

The results of the degree evaluation of the content appeal and educational significance of selected study topics from the field of informatics, from the students perspective in the area of "What I would like to learn" is summarized in Chart 1. Boxed chart 1 shows the mean, standard decisive error of the mean and decisive deviation of the ratings of individual items in given area of evaluation.



**Pic. 1 Box chart - differences in the assessment of selected items from the area D - What I would like to learn**

*Explanation: D1 - Object oriented programming (Java, C #, JavaScript, PHP); D2 - Modeling and visualization (animations, simulations) of data; D3 - Creating database applications in database systems Microsoft SQL Server, Oracle or MySQL; D5 - Design, development and implementation of information systems of companies and organizations; D10 - Application protocols and services in the Internet; D11 - Data encryption, the principle of symmetric and asymmetric encryption; D12 - Computer security, digital signature; D15 - Administration and configuration of the operating system of the Windows platforms; D16 - Creating applications in MS Excel using VBA; D17 - Using tools of MS Excel for statistical data analysis; D18 - Case studies focused on the automation of work with pivot table in MS Excel; D22 - Safety and optimization of databases.*

The question is whether the differences which are between the statistics of the respondents' answers to individual ordinal items of the questionnaire within the surveyed area entitled "What I would like to learn" (items D1 to D22) are random or whether they are statistically significant. The answer to this question can be obtained through the analysis of variance for repeated measurements. It should be noted that through this analysis the dependency from factors STATE, GENDER and STUDY PROFILING was not tested, because at the beginning of our research survey we wanted to get the resulting image of the examined issue from a global aspect, i.e. without national, study, or any other differentiation.

Based on the stated results of the descriptive statistics, we have set the following null statistical hypotheses:

*H<sub>0</sub>: There is no statistically significant difference in the assessments of items D1 to D22 of the area entitled "What I would like to learn."*

We tested the null hypothesis at the 5% significance level.

Within the scope of the statistical testing of the variables - items D1 to D22 of the questionnaire, we have discovered through the Mauchly sphericity test that the assumptions of equal variances, which the test data have to meet were breached ( $p < 0.05$ ).

**Chart 5 Mauchley test of sphericity**

Surveyed area / items	W	Chi-Sqr.	df	p
What I would like to learn / Item (D1 – D22)	0,002	3238,713	230	<b>0,00000</b>

**Chart 6 Greenhouse-Geisser and Huynh-Feldt correction for repeated measurements of the variance analysis**

df	F	p	G-G Epsilon	G-G Adj. df1	G-G Adj. df2	G-G Adj. p	H-F Epsilon	H-F Adj. df1	H-F Adj. df2	H-F Adj. p
Item 21	63,687	<b>0,00000</b>	0,544	11,424	6100,370	<b>0,00000</b>	0,557	11,692	6243,358	<b>0,00000</b>
Error	11214									

The results of testing the respondents' answers to items D1 to D22 based on Greenhouse-Geisser and Huynh-Feldt correction for repeated measurements analysis of variance (Chart 6) confirmed the statistical significance of differences in ratings between items within the surveyed area ( $p < 0.01$ ). We note that based on achieved results we refuse the stated null hypothesis

*H<sub>0</sub>: There is no statistically significant difference in the assessments of items D1 to D22 of the area entitled "What I would like to learn" with a 99% reliability.*

The results of statistical testing through Friedman's test (ANOVA Chi Sqr. (N = 535, df = 25) = 1252.825,  $p = 0.0000$ ) and the achieved value of Kendall correlation coefficient (Coeff. of Concordance = 0.112) between evaluators of assessed items D1 to D22 have confirm us the results of the Greenhouse-Geisser and Huynh-Feldt correction ( $p < 0.01$ ). Thus, we can proclaim that among the items D1 - D22 of the area "What I would like to learn" there are statistically significant differences in their evaluation.

By proving statistically significant differences in ratings of items D1 to D22 of the query area "What I would like to learn" we were interested, among which items are there statistically significant differences in the assessment. Chart 7 presents the results of identification of homogeneous groups in the evaluation of individual items depending on the researched aspects (items in given surveyed area). We determined the homogeneous groups through multiple comparisons of individual pairs.

**Chart 7 Identification of the homogenous groups**

Item	Mean	1	2	3	4	5	6	7	8	9	10	11
D21	2,39	****										
D4	2,42	****										
D6	2,43	****										
D20	2,46	****	****									
D19	2,48	****	****	****								
D3	2,50	****	****									
D1	2,65		****	****	****							
D22	2,65			****	****							
D16	2,65			****	****							

D11	2,70	****	****						
D5	2,71	****	****						
D10	2,8	****	****	****					
D18	2,87		****	****					
D17	2,89		****	****					
D2	2,91			****	****				
D15	2,98			****	****	****			
D12	3,10				****	****	****		
D13	3,10					****	****		
D9	3,11					****	****	****	
D14	3,27						****	****	****
D8	3,30							****	****
D7	3,35								****

The average scores of respondents' answers to the questionnaire items D1 to D22 are in the range of the scale 2 (*rather uninteresting*) to 3 (*neither interesting nor uninteresting*) of the maximum value of the scale of 5, while the majority part of these items the students assess at the level of *neither interesting nor uninteresting* (scale value 3). From the tabulation (Chart 7) of processing the respondents responses for each item focused on evaluating the contents appeal and significance of educational topics with a potential possibility of their inclusion into an informatics educational curriculum, we identify the lowest mean score for the item D21 (2.39), in which the respondents expressed themselves towards *interest in database application development through programming in Visual Basic for Access language*. Conversely, the highest mean score within the items evaluated in this area was recorded for items D7 (3.35) and D8 (3.30), through which the respondents rated the interest in *programming and webpage creation* (D7) and *programming web applications*, such as chat, e-commerce, dynamic banners. The subject directly dealing with programming and application development for database systems at FEM as well as PEF does not exist. Despite this, the FEM students have the opportunity to partially familiarize themselves with the programming of web applications and with the programming for databases as part of the discipline called *Programming*, falling to the 4<sup>th</sup> semester of the engineering studies as part of the optional mandatory disciplines. In the context of a professional profiling the surveyed sample of the students, we can therefore regard this result of the findings as more or less surprising.

As can be identified from the observed in the identified homogeneous groups, each overlaps at the level of its items with the previous or next homogenous group. The test results confirmed the significance of the items D21, D4, D6 (first homogeneous group) and item D7 (eleventh homogeneous group), which have shown statistically significant differences in students' assessment responses with all other tested variables. Another fact remains that the first homogeneous group consists solely of items - learning topics falling in the area of database systems and technologies (D21, D4, D6, D20, D19 and D3). The remaining two learning topics *Safety and optimization of databases* (D22) and the *Design, development and implementation of information systems in companies and organizations* (D5) from the stated field overlap at the third and fourth level (D22), fourth and fifth homogeneous groups respectively (D5). In the comparison of the results we see only noticeable shift in the positive evaluation of the learning topics - items D22 = 2.65; D5 = 2.71 from the items of the first homogeneous group (D21, D4, D6, D20, D19 and D3).

Learning topics which we surveyed through items (D3 to D6, D19 and D22) of the administered research tool extend the basic curriculum (B19 to B26) in the field of database systems and technologies, currently assigned into their education portfolio in the field of informatics. These topics should bring the students theoretical and practical knowledge from this field consistent with the requirements of current practice and labor market requirements. Comparing the results of evaluation of these learning topics, we see that they recorded relatively the same diapason of views through the evaluation of their attractions (they are assessed as *neither*

*interesting nor uninteresting*). We observe that in either case the resulting value of the mean answer score does not exceed the score level score 3 (*neither interesting nor uninteresting*). We may, also in connection with the evaluation of the results of selected topics from the area of database systems and technologies (items B19 to B26, the area of "*What I want to learn*") conclude that the learning topics from the stated field of information education are not in the selected sample of respondents strongly popular and preferred within the study. On one hand, we recognize that mastery of some learning topics from the area of working with database systems and technologies is not exactly the easiest (*Creating database applications in database systems, Microsoft SQL Server, Oracle or MySQL; Design, development and implementation of information systems; UML modeling language*), on the other hand understanding these issues at least on an intermediate level brings to the student career opportunities within the broader engagement of job opportunities. We believe that in this context the solution of our research how to contribute to the solution of the issue of modernization and optimization of the information education in stated engagement of curriculum and for the defining of the curriculum content especially from the perspective of teaching databases on the requirements determined by practice, on the knowledge of the studied area is highly current.

## Conclusion

The paper presents an analysis of some processing results to respondents' responses for individual items in the surveyed field entitled "*What I would like to learn*" aimed at the evaluation of the content appeal and significance of learning topics with a potential possibility of their inclusion into the informatics education curriculum. By realization of monitoring, we would like to contribute towards solving the problems in modernization and optimization of teaching informatics and towards the focus on curriculum content and on requirements that would practice the knowledge of the studied area. How to adapt teaching (scope and position) of database systems and database technology in selected non-computer-oriented study programs of tertiary level of education is constantly increasing demands of practice and constantly intensifying informatization of all areas of life remains the matter of discussion and assessment by relevant experts.

Based on the obtained results of the realized research survey in stated area, it would be interesting to see what is the divergence of the mean score values of the respondents' answers to the items in the surveyed areas "*What I want to learn*" (B1 to B26) and "*What I would like to learn*" (D1 to D22), depending on the *nationality* and *gender* of the respondents. We believe that within the scope of the investigation the discovery of the answers score of the responses to learning topics that are targeted at items of the administered research tool would be interesting also in terms of differentiation based on *study profiling*. Through the testing of the items, will statistically significant differences be achieved in ratings between the same items, or will they be reported among other items - evaluated learning topics falling in the area of information education in the scope of the researched study programs?

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# Development of the Czech dairy industry after entrance into the European Union

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## Abstract:

This paper deals with the development of the dairy industry in the Czech Republic after its entry into the European Union. Aims of this paper identify relevant factors in the monitored period formed the development of this sector. The paper generally contributes to a deeper understanding of the factors forming agribusiness field in a globalizing environment and assesses symptoms of these tendencies on the specific example of the dairy industry in the Czech Republic.

First part of the article is focused on analysis of the milk production development in selected relevant markets / countries in the European Union. Based on this analysis are clearly shows different trends between the new and the old member of European Union, but also inside these regions.

Second part is focused on analysis of the production and processing of dairy industry in the Czech Republic. Here, after an initial decrease of dairy production immediately after the transformation of Czech Republic agriculture in the nineties of the last decade, sector production is stagnated even in a situation, that the consumption of final products of dairy production in the last years is mildly increasing. From the analysis of demand-oriented approach to the analysis of sectorial relations follows knowledge insufficient adaptation to local production requirements of consumers. Fact that domestic producers of dairy products do not respond well on a changing needs of consumers of the Czech Republic, create space for the import of dairy products with higher added value, especially from Germany and Poland. On this basis increasing positive balance of international trade with milk, however, for products with higher added value is increasing the negative balance of international trade (especially with cheese). The analysis of price development shows that the dairy industry has in the commodity chain milk / dairy products difficult position, on their price margin presses retail chains and their manifestation of market power are very significant and negotiating ability is very high.

## Key words:

Milk, Dairy Production, Czech Republic, European Union, Agribusiness

## Introduction

The milk sector has undergone a number of changes in the Czech Republic over the last twenty years. Besides the local drivers of development, the current development is increasingly determined by the overall change in the business environment in European Union and on the world market of milk and milk products. The broader overview of the development of Czech agriculture can be found in earlier work of authors (Bečvářová et al, 2008; Bečvářová, Vinohradský, Zdráhal, 2009;

Globalization is currently one of the most important phenomenon influencing the agri-food markets. These result in broader relations integration among regions, but also to broader interactions among firms across the sectors. There are also many multinational producers operating on a world market of milk and dairy products, as well as on the Single market in European Union. These firms and their strategies could very significantly influence the milk

sector in particular region and also, these strategies are influencing the retail markets and consumers behaviour on these markets. Market power of these companies is getting higher and their share on the market is increasing.

Milk production and milk processing industry have a long history In the Czech Republic. Milk is typical product of animal production in this area (milk production was 17,49 % of the output of Czech agriculture in 2013), but nevertheless this history, there are observed many dynamic changes on this sector. It is globalization and Czech Republic's accession to the European Union that brought these changes. In European conditions, and specifically in the agriculture of Central and Eastern Europe, are globalization processes accompanied by a number of other quantitative and qualitative changes related to the transformation of the economy in the early nineties of the twentieth century and in particular, with the formation of common agricultural market of the European Union and its effects. Czech Republic and other countries of Central and Eastern Europe that accessed the EU are integrating into the highly competitive environment, and also, regulatory mechanisms (application of Common agriculture policy framework) was not sufficiently prepared for the consequences of changes in the system's transition from a supply to a demand-oriented model of agriculture (Bečvářová, 2011).

This paper deals with the development of the dairy industry in the Czech Republic after its accession into the European Union in 2004. At the moment it is highly relevant topic to ask the question, how was the milk sector in the Czech Republic able to adapt to new conditions after the 2004, and in situation, when the milk quotas system will be removed in EU.

## **Aim and methods**

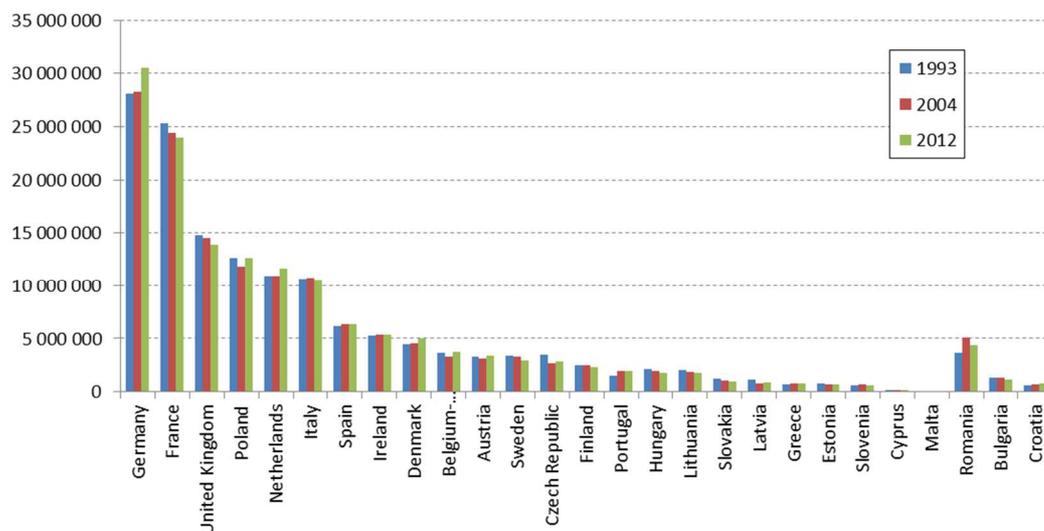
This paper deal with the development of the dairy milk production's industry in the Czech Republic, after its accession into the European Union in 2004. General aim is to identify relevant factors that formed this sector in period before and after the accession. The paper also contributes to a deeper understanding of the factors forming agribusiness by globalizing tendencies and valuation of effects of these tendencies on the specific example of the dairy industry in the Czech Republic.

This aim is achieved in two successive phases. First stage of the analysis is focused on evaluation of the development of commodity chain of milk and dairy productions in the Czech Republic using mainly input-output approach (flows of products among industries in the Czech Republic and also among Czech republic and other countries) and we use comparison with other EU countries in selected areas. Generally are used data from the Ministry of Agriculture's reports and from the Czech Statistical Office and from FAOSTAT. In the second part of the analysis, the attention is paid also on the dynamics of changes in the price environment.

## **Production and price context of the development of the milk sector in the EU**

The dairy sector is of great importance to EU agriculture in a variety of ways. In the assessment of the evolution of the EU position in World context (in terms of volume and market share in world milk production), it is visible significant drop of European producer's position. The World production of milk increased from 461,4 mil. tons in 1993 to 625,8 mil. tons in 2012. In these time period, milk production in the EU accounts for roughly one quarter of total world production, but maintaining this share is primarily due to the gradual accession of the new 13 countries to the EU in the years 2004, 2007 and 2013. Overall, the share of regions that currently make up the EU on the world milk production gradually diminished from 32,6% in 1993 to 24,1% in 2012.

The last two decades have led to the following development in milk production of individual member countries (Pic 1.).

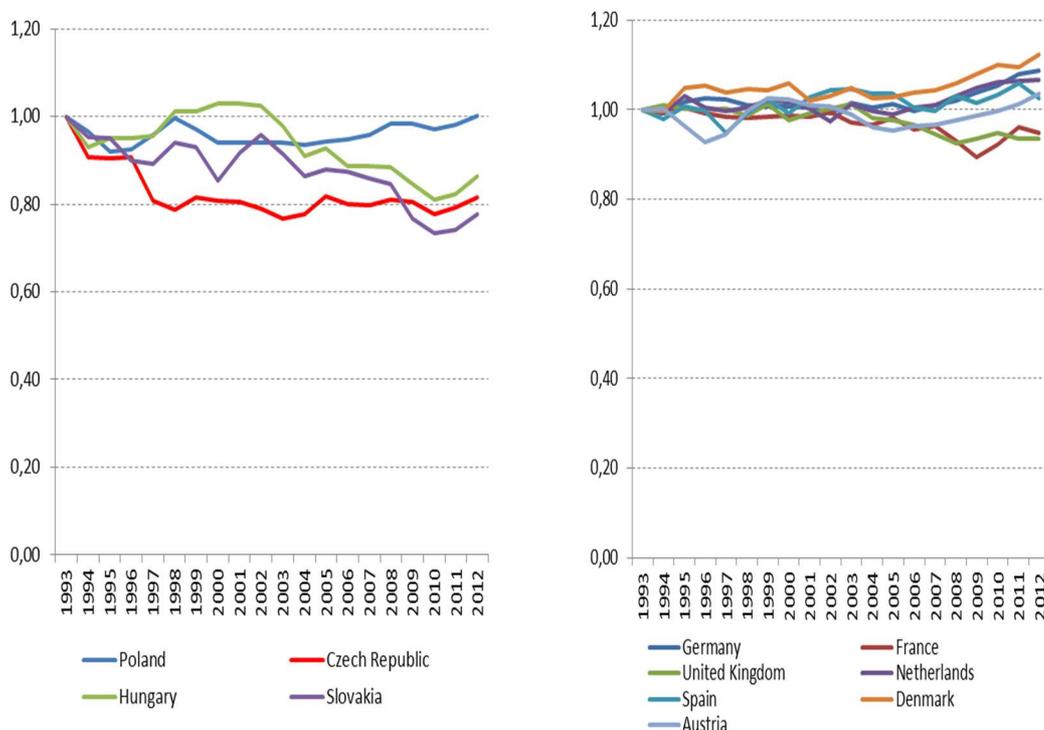


**Pic 1: Milk production in the EU-27, 1993, 2004 a 2012 (million tons)**

Source: based on FAOSTAT

Dairy production has a diverse structure across the EU Member States in terms of farm and dairy herd sizes, as well as milk yields. The production of cows' milk reflects the importance of the milk sector. Among key producers in EU belong Germany, France and United Kingdom, amongst the new EU Member States it is Poland. Very important position, both in terms of ability to finalize the basic raw material to dairy products with high added value, and even if occupy a small area of the region, belongs the Netherlands, Ireland and Denmark.

Development in selected old and new Member States and in the position of the Czech Republic can be documented by comparing the production indices (1993 = 1) in the following figures (Pic. 2 and 3).



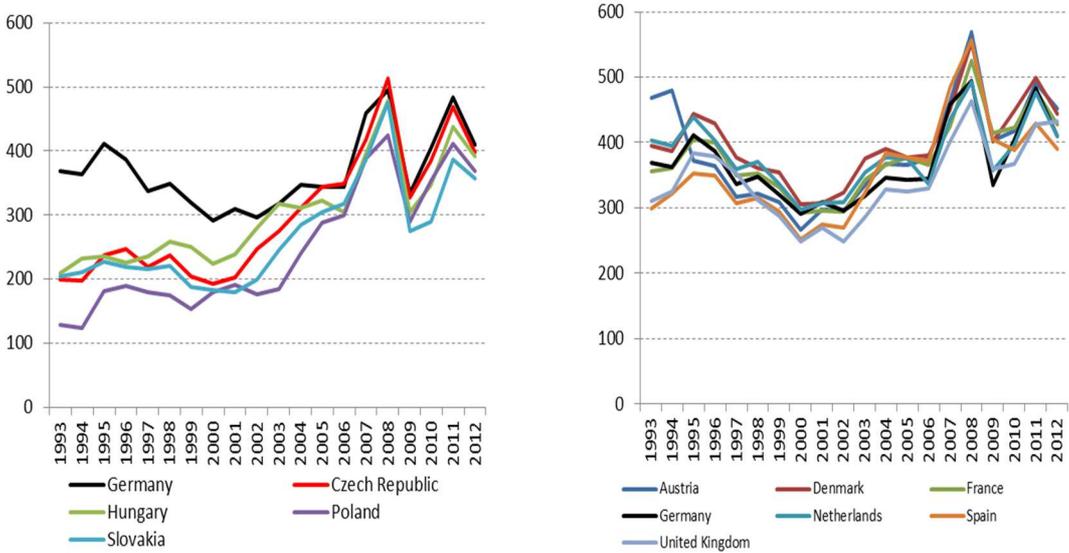
**Pic. 2 a 3: Milk production in EU, 1993-2013, 1993 = 1,00**

Source: based on FAOSTAT

From the analysis is possible identified, that the specific problem of the Czech Republic was established already in the nineties of the last century when the milk production decreased around 20 % (there were two significant drops in production in years 1994 and 1997). It was one of the consequences of decrease in consumer demand and opening the market for finalized dairy products that led to a decrease in the numbers of dairy cattle's. The decline in production was also the most significant in comparison with other new member countries. The new production base was then also reflected in the framework for negotiations on the scale of the production when the Czech Republic joined the EU.

The decline in production occurred gradually also in the group of other new member countries. In the nineties, the decline or stagnation of milk production were characteristic features for the original EU member states (EU15). In the last decade, however, we can observe a trend reversal and increased production in countries as Germany, Denmark, Netherlands, Austria and Spain. In some new member countries, the milk production has returned to the same level as in 1993, but in Czech Republic, Hungary and Slovakia the milk production is still about 20 % below the level of production in 1993.

Milk belongs to the one of the crucial agricultural commodities and is among the EU's most regulated commodities in the frame of CAP. Therefore there was the use of a relatively wide range of direct or indirect agriculture policy's measures on the volume and production/cost relations of milk production. This has led to certain deformations (non-equilibrium reaction) in the development of cost's patterns in supply base and the way how it is covered by the market price that is more and more influenced by the increasing competition of processors and their links within the commodity chain on an expanding European market. Price development including specification of manifestations and consequences of the formation conditions of the common market of milk in old and new member countries is shown in the following comparison (Pic. 4 and 5).



**Pic 4 a 5: Milk prices in EU, 1993-2012 (USD)**

Source: based on FAOSTAT

We can identify different development of producer prices in the old and new member states. Within the new member countries is typical steady growth of prices with a significant acceleration of this process just after accession the EU in 2004. The development in the EU 15 countries can be taken to characterize rather some fluctuations at the turn of the millennium, which is typical for all countries under review. The convergence of price levels is conspicuous among countries.

## Development in the milk commodity chain in the Czech Republic

Milk sector has also a long history and great importance in the Czech Republic and last twenty years were and still are a very dynamic period of time. The table 1 shows basic characteristics of dairy cow's population, milk yields, milk production and the ability to market the milk.

**Tab 1. Balance of milk production 1989 – 2012 in the Czech Republic**

Czech republic		1989	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Number of dairy cows	1000 heads	1 236	433	438	423	410	403	394	378	374	369	373
Apparent yield	l/head	3 982	6 006	6 254	6 370	6 548	6 776	6 870	6 904	7 128	7 433	7 443
Cow'milk production	(mil. l)	4 893	2 602	2 739	2 694	2 684	2 728	2 708	2 613	2 664	2 741	2 742
Marketability	%	91,4%	97%	95%	97%	98%	97%	96%	96%	96%	96%	96%
Cow'milk sold by farmers	(mil. l)	4 473	2 534	2 613	2 612	2 619	2 639	2 588	2 508	2 555	2 629	2 666

*Source: based on data from MZe*

The milk production sharply decreased from 4 893 mil. of litres to 2 703 mil of litres in a period between years 1989 and 1997. Since 1997, production was stabilized at around 2,700 million litres of milk. In recent years, production modestly increased to 2 742 million litres in 2014.

Number of dairy cows fell down from 1,228 thousands of heads to only 360 thousands (in 2012) in the Czech Republic since 1989. As well as the decline in milk production, the largest decline in number of heads generally occurred around 1993. Even when the increase in milk yield per cow (mainly thanks to new technologies and changes in used breeds in stocks), the total milk production decreased about 50% from 1989 to 2012.

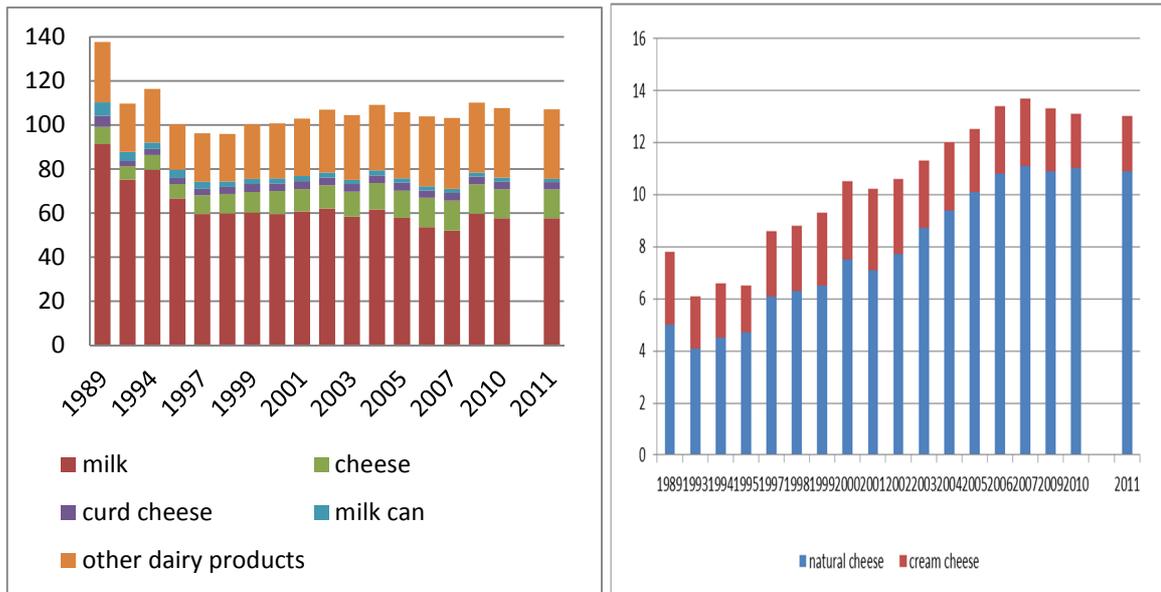
The milk market in the EU is regulated by a quota system. Every member state has a national production quota which it distributes to farmers. The quota system was applied in the Czech Republic since 2001, ie. before the accession of the Czech Republic to the EU. The quota was based on the years 1996-1999, and this amount was reflected in the amount of quota that was awarded the Czech Republic when entering the EU. The amount of milk in quota was slightly increased over the years, but now the Czech Republic does not meet the production volume of quota by approximately 5 %.

In assessing the development of the dairy sector is necessary to analyse the evolution and demand changes of the commodity and specific products (pic. 6 and 7).

During the eighties ranked Czech Republic in the consumption of milk at the forefront in Europe. Since the early nineties, there was a decrease in its consumption by one-third below 200 kg per person per year. Since 2000, we follow another increase in the consumption of milk and milk products, which exceeds the limit of 200 kg per person per year. Currently is consumed about 240 kg of milk.

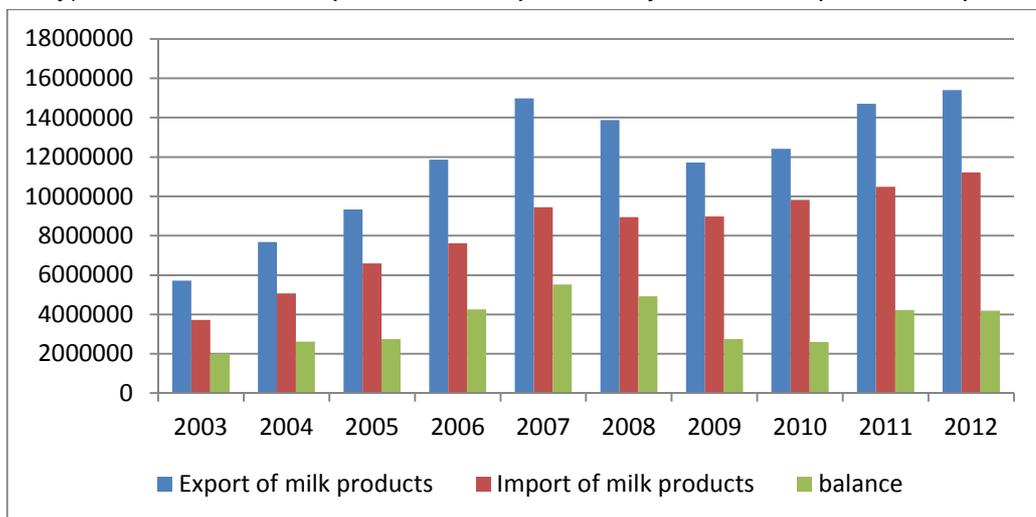
On a picture one and two is possible see development of dairy product consumption in this period - consumption of cheese, cottage cheese and fermented dairy products increased. On the other hand, there was a decrease in consumption of butter and drinking milk. Simultaneously, increasing the share of imports in domestic consumption of milk and dairy products. In a view of healthy life is higher consumption of natural cheese and decrease of consumption of cream cheese. The cream cheese is very famous in the Czech Republic, in other part of Europe or world is this type of cheese nonstandard.

Although present decade showed an increase in overall consumption, drinking milk consumption is still lower than in nineties, but on the contrary consumption of the products with higher added value is a higher (especially consumption of cheese) however these products are in the Czech Republic considerably imported.



**Pic. 6 and 7 Development of dairy products consumption in kg/person 1989 – 2011**  
 Source: based on data from MZe

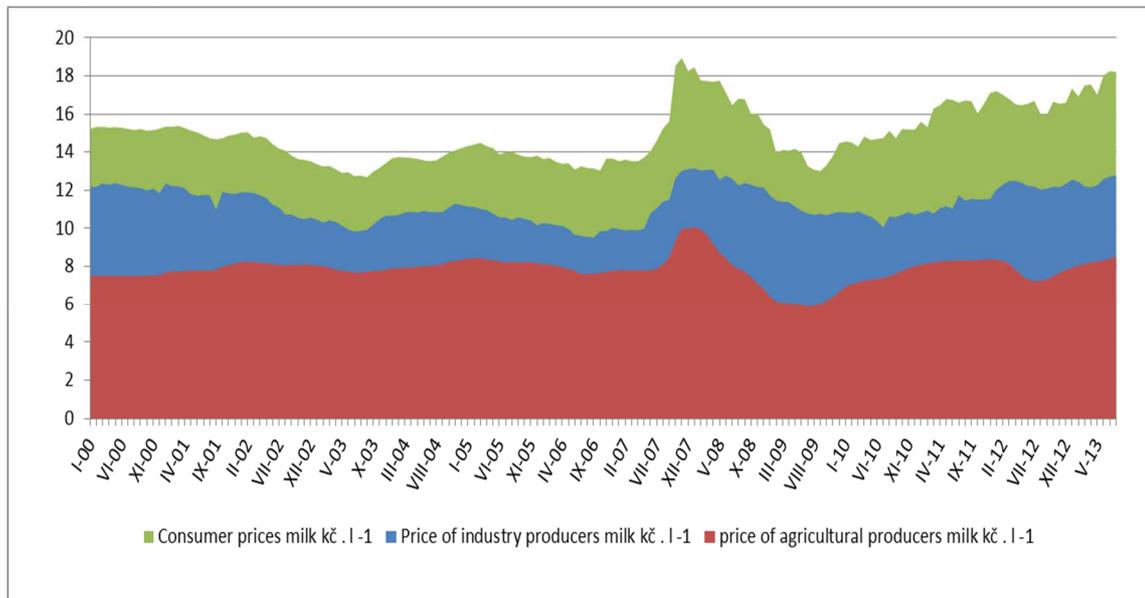
On a second picture we can see international trade with milk and processed milk products. Czech Republic's membership in the EU allows access to the Single market and expanding the scope of foreign trade. This led to significant changes in the volume and structure of foreign trade in milk and dairy milk products. Czech Republic has positive balance of international trade (pic. 8) with milk and processed products, but nowadays the structure of export and import, however, is very different. Export consists predominately of raw milk (especially to Germany), where it is further processed. Import mainly consists of processed products.



**Pic. 8 Development of international trade with dairy products thous. CZK 2003 – 2012**  
 Source: based on data from MZe

## Price Development in the Czech Republic

This part deals with price analysis in Czech Republic. Next picture (pic. 9) is shows development of prices in three phases of production. We can see that the prices in downstream phases (processing and retail) of production in general copy price on the lowest phase of production. From 2000 to about 2007, it is possible to observe a decline in consumer prices, which was associated with a high competition among large retail chains. In this period decreased mainly the share food industry's value the on the price of the final products. The prices paid to farmers for milk grew in this period as a consequence of milk prices in the Czech Republic getting closer to the prices paid to farmers in Germany.



**Pic. 9 Development of milk prices in a commodity chain 2000 – 2013 (CZK, Kč)**

Source: based on data from MZe

After the price peak from 2007 to 2009, the situation on milk market was relatively stable. In analysis of Dudová (Dudová, 2014) was found that price transmission between different phases of production in the milk chain has asymmetric transfer. That means that the market power of retailers is getting higher. Price changes from the inputs are not reflected on price on output and vice versa. Also, in 2012, was imposed higher VAT on food in the Czech Republic. Both of these factors probably contribute to the increase in the share of retail margins on the final price. Prices paid to farmers then mostly copied the prices of milk on the EU Single Market.

## Conclusions:

This paper deals with the development of the dairy industry in the Czech Republic after its entry into the European Union. Aims of this paper identify relevant factors in the monitored period formed the development of this sector. The paper generally contributes to a deeper understanding of the factors forming agribusiness field in a globalizing environment and assesses symptoms of these tendencies on the specific example of the dairy industry in the Czech Republic.

From analysis of the milk production in the Czech Republic may be summarized that after an initial decrease of dairy production immediately after the transformation of Czech Republic agriculture in the nineties, production is stagnated even in a situation, that the consumption of final products of dairy production is mildly increasing in the last years. Milk processing industry is not able to respond well on a changing needs of consumers in the Czech Republic and is under pressure from the imported dairy products (mainly with higher added value, especially from Germany and Poland). Raising export of raw milk is also leads to situation, that Czech Republic is losing possible value creation. That affects the contribution of milk industry to GDP

and employment as well. The agrarian policy decision makers should take advantage of the possibilities offered by CAP framework 2020 and promote innovation and competitiveness of Czech producers. Attention, however, should be given comprehensive solutions that cover the entire commodity chain. Part of the solution to the problem must be to increase efficiency and competitiveness of entire chain in the Czech Republic.

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# Methodology of Theoretical Physics in Economics: The Principle of Correspondence between Economic Variables and Kinematic Variables of Nonrelativistic Mechanics

Tomáš R. ZEITHAMER<sup>3</sup>

## Abstract

This paper is part of research examining the systematic application of methods used in theoretical physics in economics. One aspect of this research is the comparison of linear and non-linear analytical structures of physics with analytical structures of economics. The application of methods of non-relativistic mechanics in microeconomics presented in this work aims to derive motion equation for price which describes non-chaotic as well as chaotic fluctuations of price on a market with nearly perfect competition.

The question remains whether the import of concepts from physics to economics is merely an applied metaphor, or actually a modification of the analytical structure of economics. This is also one of the reasons for comparing the analytical structures of both scientific disciplines. To enable such a comparison, work has begun on a principle of correspondence between economic variables and the physical variables used in one of the most highly developed disciplines of classical physics, classical non-relativistic mechanics.

Methodological approaches of theoretical physics are used to derive the first step for constructing a principle of correspondence between microeconomics variables and kinematic variables of non-relativistic mechanics: the path corresponds to the instantaneous commodity price; the jerk in mechanics corresponds to the price jerk. Assuming that the market value of the commodity is fully determined exclusively by the value of the instantaneous commodity price, the price jerk equation acquires the form that corresponds to the non-relativistic equation for jerk in mechanics, following from Newton's second law of motion.

During the past four decades, great efforts have been made to understand chaotic dynamics in greater detail. Both the geometric theory of dynamics, which analyzes dynamic systems from the perspective of their flow in phase space, and its numeric counterpart, have proven to be powerful tools on the road to this success. For three-dimensional non-linear dynamic systems, the minimal functional forms required to generate a chaotic flow are discussed.

Minimal chaotic dynamics is also investigated from the viewpoint of jerky dynamics. Jerky dynamics is founded on the well known fact that any explicit ordinary differential equation of order  $n > 1$  can be replaced by an equivalent system of  $n$  first-order differential equations. This means that a scalar third-order ordinary differential equation can be transformed into a dynamic system although the contrary does not hold in general. For this reason, jerky dynamics should also be able to investigate non-chaotic as well as chaotic development over time. Elementary jerky dynamics can also be found in economics, as shown in this paper. In this paper price jounce and price crackle are defined.

The paper also focuses on factual research in bibliographic and biographical databases showing that representatives of the Czech School of Economics took a leading role in the methodological use of applied and theoretical physics in the basic economic research, especially in the second half of the twentieth century.

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## Keywords:

Differential equation, instantaneous commodity price, instantaneous relative depreciation, motion equation, correspondence principle, price jerk, price jounce, price crackle.

## 1. Introduction

The consistent and systematic application of the methods of theoretical physics in economics results in a modification of the analytical structure of economics. This was and continues to be one of the reasons we began to look at the mutual interaction of the analytical structures of physics and economics. To enable such analysis, work has begun on a principle of correspondence between economic variables and the physical variables used in one of the most highly developed disciplines of classical physics, classical non-relativistic mechanics. The application of methods of classical non-relativistic mechanics in microeconomics presented in this work aims to derive a single motion equation for price which describes non-chaotic as well as chaotic fluctuations of price on a market with nearly perfect competition. The final form of the principle of correspondence will to a certain degree be reflected in the methodological foundations used to teach economics itself.

Let us briefly consider at a market with nearly perfect competition: a) in each market there are a large number of buyers and sellers, none of which are strong enough to influence the price or output of a sector; b) all goods are homogeneous; c) there is free entry to and exit from market; d) all manufacturers and consumers have perfect information about prices and quantities traded on the market; e) companies attempt to maximize profit and consumers attempt to maximize utility; f) companies and consumers have free access to information about technologies (Goodwin, Nelson, Ackerman and Weisskopf, 2009; Nicholson and Snyder, 2008). This set of assumptions is further specified by the specific quantitative expression of the degree of understanding of information about technologies: companies and consumers understand only a part  $\delta(t)$  of the available amount of information about technologies at time  $t$ , where  $0 < \delta(t) < 1$  for  $t \in \langle t_0, +\infty \rangle$ ,  $t_0$  is the initial time of monitoring the commodity state.

The model of the region is defined in this work very simply. This is for many reasons. One basic reason is that it was necessary to establish an initial mathematical-physical theoretical model which would be able to gradually incorporate additional quantifiable qualitative attributes so that the partial models of the region converge to the real state of the region. In the first approximation, the region is defined as follows: The region is a simply connected set which is support of algebraic structures generated at different levels of everyday life. The set of all algebraic structures contains a subset consisting of those algebraic structures which are generated at the political, economic, military/security and demographic levels. This subset is called the core of algebraic structures set.

## 2. The incorporation of physics into economics

The late nineteenth century is a period in which there was a synthesis of economic laws formulated by the previous generation of economists, and increased attempts to describe these laws using the language of physics and mathematics. Economic phenomena and processes at that time were described and analyzed using analogies between the evolution of physical systems and the evolution of economic systems. Biographical research has shown that one of the reasons for the successful application of theoretical physics in economics is that many economists had initially studied physical and mathematical sciences, or fields related to the physical or mathematical sciences (Zeithamer, 2012 a, 2013).

Giovanni Battista Antonelli (17. 9. 1858 – 12. 5. 1944) began his early studies at the Technical Institute of Leghorn and then continued to study at the University of Pisa where, in 1882, he received a doctorate in mathematics and in 1884 became a professor of mathematics. After this, he completed his engineering studies at the Polytechnic School in Milan, where he was awarded the title of civil engineer. William Stanley Jevons (1. 9. 1835 – 13. 8. 1882)

studied chemistry and botany at University College School at London, where he obtained also knowledge of the physical sciences and logic. Alfred Marshall (26. 7. 1842 – 13. 7. 1924) studied mathematics and physics at Cambridge University, where he also taught mathematics. Vilfredo Pareto (15. 7. 1848 – 19. 8. 1923) studied at the Polytechnic Institute of Turin, where he wrote his dissertation on the theory of elasticity „Principi fondamentali della teoria della elasticità de corpi solidi in 1869. Marie Esprit Léon Walras (16. 12. 1834 – 5. 1. 1910) studied mine engineering at École de Mines in Paris, where he acquired knowledge not only of mathematics and general physics, but also the statics and the dynamics of mine constructions (Zeithamer, 2012 a, 2013).

The first half of the twentieth century witnessed a deepening integration of economics, mathematics and physics. The gradual spread of methods taken from experimental and theoretical physics and applied to economics during the 19<sup>th</sup> and especially the 20<sup>th</sup> century eventually led to the beginning of basic research, which in the 21<sup>st</sup> century consists of the systematically targeted application of experimental, theoretical and mathematical physics to economics. A part of this basic research in economics has become known as econophysics (Mimkes, 2013; Slanina, 2014; Zeithamer, 2012 a).

The methodology of qualitative and quantitative physical research of any system strives to achieve one basic goal, namely that the signal to noise ratio be much greater than one. If it is possible to deliberately increase the output signal from an inanimate system above the background noise, this brings to the forefront the natural relations which are common to different systems investigated (Roehner, 2002, 2007; Štroner and Pospíšil, 2011). Of course there are other systems which do not permit the researcher to amplify the level of output. In such case, there is another way to increase the signal to noise ratio. Here, it is necessary to continually decrease the background noise to the lowest possible level. A classic current example requiring such noise reduction is the detection of gravitational waves, the existence of which was predicted by prof. A. Einstein in his work from 1916 (Einstein, 1916). Outside the solar system, the theory predicts a number of “stellar” sources of gravitational waves, which could be detected in the event they reached Earth. For the Sun, a typical class G main-spectrum star, it has not yet been possible to theoretically determine such mechanisms which would be responsible for detectable levels of gravitational radiation (Weinberg, 1972; Papini and Valluri, 1976; Křivský and Zeithamer, 1982; Karmakar and Borah, 2013). Efforts similar to the detection of gravitational waves can be seen in numerous other multi-disciplinary fields, explored in publications such as: Physics of the Earth’s Magnetosphere (Zeithamer, 1987 a, b, 1988, 1990; Vörös, 1991; Kan, Potemra, Kokubun and Iijima, 1991; Otto, 2005; Vasyliunas, 2012), Heliometeorology and Helioclimatology (Sulman, 1982 a, b; Baker, 2005; Pérez – Peraza and Libin, 2012), Biophysics of the Sun – Earth Relations (Tromp, 1980; Sulman 1982 a, b; Kiefer, 2005).

A situation similar to the physical research of inanimate systems arises in the physical research of economic systems. In economic systems, one of the main reasons that the signal to noise ratio is close to one is the high degree of self-organization and self-improvement.

Finding causal mechanisms which explain observed socio-physical phenomena on a gravitational, electromagnetic or nuclear level is a very difficult, long and costly task. The same applies to the behavior of experts in commodity price theory, thoroughly based on the knowledge of basic physical force interactions. The theoretical constructions presented in this work are intended to facilitate solving both tasks mentioned in a future modern commodity price theory. Specifically, there are linear and non-linear elementary kinematic equations which do not explain the phenomena observed in the socio-physical system with interactions of force, but merely describe the developing state of the socio-physical system. While not easy to solve, these kinematic equations lead to quantifiable mechanisms which explain observed developments in the state of the socio-physical system using analytical dynamics, i.e. force interactions. The analytical dynamics of socio-physical systems is not the subject of this work, however, it is one of the subjects of basic and applied economic and physical research conducted by the author of this article.

### 3. The incorporation of physics into economics in the framework of the Czech School of Economics

At the Czech School of Economics during the 19<sup>th</sup> century, no reliable sources have yet been found indicating such an interdisciplinary approach or related original work. In the second half of the twentieth century however, we do find economists at the Czech School of Economics whose works represent applications of physics in economics, i.e. in econophysics in broader sense. Einstein's special theory of relativity was applied by professor Pavel Hrubý (\*5. 5. 1914 - †25. 6. 1994) in order to use economic spacetime for more precise economic analysis and prognosis (Hrubý and Kálal, 1974). Another Czech economist, who represents the Czech School of Economics in econophysics in broader sense, is professor František Drozen (\*30. 5. 1949), whose results were inspired by the work of German railway engineer August Wöhler (\*22. 6. 1819 – †21. 3. 1914). František Drozen constructed an analogy between the process of fatigue crack growth in axles of railway wagons and the process of price reduction for goods. This approach to modeling the process of falling prices for goods can be found in its final form in several of Drozen's works (Drozen, 2003, 2008).

### 4. Linear motion equation of commodity state without inflexion

In this paper it is assumed that the market value of a commodity is quantifiably determined only by the market price  $n$  of the commodity. We now make the generalizing assumption that the instantaneous acceleration of reduction of the market value is directly proportional to the instantaneous rate of reduction of the market value (Zeithamer, 2010). Then the deterministic differential equation of price which expresses this model is

$$\frac{d^2 n}{dt^2}(t) = -A \frac{dn}{dt}(t) , \quad (1)$$

where  $A > 0$  is the proportionality constant, and a negative sign is used to indicate that  $n$ , the market value of goods, i.e. a price, is decreasing and the acceleration of reduction of the market value increases over time. The initial conditions now are that over time  $t = t_0$  the market value is  $n(t_0) = n_0$  and  $\frac{dn}{dt}(t_0) = r_0 < 0$ , where  $t_0$  is the initial time of monitoring the commodity price,  $[A] = s^{-1}$ ;  $s$  – designates the basic time unit, seconds.

### 5. Nonlinear motion equation of commodity state with inflexion and jerk of price

During the past four decades, great efforts have been made to understand chaotic dynamics in greater detail. Both the geometric theory of dynamics and its numeric counterpart, have proven to be powerful tools on the road to this success. For three-dimensional non-linear dynamic systems, the minimal functional forms required to generate a chaotic flow have been found and tested (Spratt, 1994).

Minimal chaotic dynamics have also been investigated from the viewpoint of jerky dynamics (Spratt, 1997; Eichhorn, Linz and Hänggi, 1998; Linz, 1998; Spratt and Linz, 2000; Munmuangsaen, Srisuchinwong and Spratt, 2011). Jerky dynamics is founded on the well known fact that any explicit ordinary differential equation of order  $n > 1$  can be replaced by an equivalent system of  $n$  first-order differential equations (Tennenbaum and Pollard, 1963). This means that a scalar third-order ordinary differential equation can be transformed into a dynamic system although the contrary does not hold in general. For this reason, jerky dynamics should also be able to investigate nonchaotic as well as chaotic development over time (Eichhorn, Linz and Hänggi, 1998). Elementary jerky dynamics can also be found in economics, as shown in this paper and in the paper of professor Jiří Pospíšil (Pospíšil, 2013).

In this section of our work, we again presume the following conditions to be met: (1) the commodity is on one of the markets of a model of market structure with nearly perfect

competition at initial time  $t_0$ ; (2) at time  $t_0$  the commodity is found in its initial state, which is uniquely determined by the magnitude of instantaneous commodity depreciation  $w(t_0) = w_0$ .

Let the acceleration  $\frac{d^2n}{dt^2}$  of the instantaneous commodity price be the sum of two components, i.e.

$$\frac{d^2n}{dt^2} = \left( \frac{d^2n}{dt^2} \right)_1 + \left( \frac{d^2n}{dt^2} \right)_2. \quad (2)$$

The first component of acceleration is a consequence of physical and chemical processes, which cause the first component of the instantaneous acceleration to increase in direct proportion to the magnitudes of rate of change of the instantaneous commodity price  $n$ , i.e.

$$\left( \frac{d^2n}{dt^2} \right)_1 = B \frac{dn}{dt}(t), \quad (3)$$

where  $B$  is the proportionality constant,  $B > 0$ ,  $[B] = s^{-1}$ ,  $s$  – designates the basic time unit, seconds and  $t \in \langle t_0, +\infty \rangle$ . The second component of acceleration results from socio-psychological processes, which cause the second component of the instantaneous price acceleration to be directly proportional to the product of the magnitude of rate of change of the instantaneous price  $\frac{dn}{dt}(t)$  and the magnitude of instantaneous price  $n(t)$ , while the proportionality constant is negative, thus

$$\left( \frac{d^2n}{dt^2} \right)_2 = -A \frac{dn}{dt}(t) \cdot n(t), \quad (4)$$

where  $(-A)$  is the proportionality constant,  $A > 0$ ,  $[A] = (c.u.)^{-1} s^{-1}$ ,  $c.u.$  – designates the basic currency unit,  $s$  – designates the basic time unit, seconds,  $t \in \langle t_0, +\infty \rangle$ .

By substituting relations (3) and (4) into equation (2), we obtain the following motion equation for the acceleration of instantaneous commodity price  $n$

$$\frac{d^2n}{dt^2}(t) = B \frac{dn}{dt}(t) - A \frac{dn}{dt}(t) \cdot n(t). \quad (5)$$

A similar equation holds for commodity relative depreciation  $RD$  (Zeithamer, 2012 b, 2013)

$$\frac{d^2RD}{dt^2} = \tilde{B} \frac{dRD}{dt}(t) - \tilde{A} \frac{dRD}{dt}(t) \cdot RD(t), \quad (6)$$

where  $\tilde{A} > 0$ ,  $\tilde{B} > 0$  are the proportionality constants,  $[\tilde{A}] = [\tilde{B}] = s^{-1}$ ,  $t \in \langle t_0, +\infty \rangle$ .

For the motion of a solid body through space in which the magnitude of the force  $F$  of resistance in that space against the movement of the body is directly proportional to the velocity  $v$  of the body, i.e.  $F = -kv$  ( $k > 0$  is the constant of proportionality), the magnitude of jerk  $j$  is expressed by the following equation (Pospíšil, 2013),

$$j = \frac{d^3s}{dt^3}(t) = -\frac{k}{m} \frac{d^2s}{dt^2}(t), \quad (7)$$

where  $s$  is the path traveled by the body,  $m$  is the mass of the body,  $t$  is time, and  $j$  is the magnitude of jerk in units  $m/s^3$ . From the equation of motion for instantaneous price (1) we get the following equation for the magnitude of price jerk  $j_P$ , e.g. in units of  $USD/s^3$ ,

$$j_P = \frac{d^3 n}{dt^3}(t) = -A \frac{d^2 n}{dt^2}(t), \quad (8)$$

where  $n(t)$  is the instantaneous price of the commodity and  $t$  is the physical time. Equations (7) and (8) are the first basic step in constructing a principle of correspondence between economic variables and physical variables of classical nonrelativistic mechanics: the path  $s$  traveled by a solid body through space with a force of resistance against this movement is directly proportional to the velocity, which corresponds ( $\leftrightarrow$ ) to the instantaneous price  $n$  of a commodity in a market structure with nearly perfect competition i.e.  $s \leftrightarrow n$ . Equations (7) and (8) are also a second basic step in deriving a complete principle of correspondence between economic variables and physical variables: for the motion of a solid body through space, where the force of resistance against this movement is directly proportional to the velocity  $v$ , jerk  $j$  corresponds ( $\leftrightarrow$ ) to price jerk  $j_P$  for a commodity in a market structure with nearly perfect competition, i.e.  $j \leftrightarrow j_P$ .

The price jerk function  $j_P(t)$  for a non-linear motion equation of commodity state with inflexion (5) may be derived in the following manner. By taking the derivative of equation (5) with respect to time  $t$  and substituting into the right side of the resulting equation for  $\frac{d^2 n}{dt^2}(t)$  from equation (5), we get the price jerk equation in the form

$$\frac{d^3 n}{dt^3}(t) = (A n(t) - B)^2 \frac{dn}{dt}(t) - A \left( \frac{dn}{dt}(t) \right)^2 \quad (9)$$

The price jerk function  $j_P(t)$  on the right side of equation (9) may be expressed by a derivative of function  $G(t)$  with respect to time  $t$  in the form

$$j_P(t) = (A n(t) - B)^2 \frac{dn}{dt}(t) - A \left( \frac{dn}{dt}(t) \right)^2 = \frac{dG}{dt}(t), \quad (10)$$

where

$$G(t) = \frac{1}{3A} (A n(t) - B)^3 + A \int_0^t \left( \frac{dn}{dt}(u) \right)^2 du + const., \quad (11)$$

while constants of proportionality  $A$  and  $B$  from equation (5) are expressed in the following units  $[A] = (c.u.)^{-1} s^{-1}$ ,  $[B] = s^{-1}$ ;  $c.u.$  – designates the basic currency unit,  $s$  – designates the basic time unit, seconds. Then the price jerk equation (9) acquires the form

$$\frac{d^3 n}{dt^3}(t) = \frac{dG}{dt}(t). \quad (12)$$

Equation (12) corresponds to the non-relativistic equation for mechanical jerk, following from Newton's second law of motion.

Let us define price jounce as the change in price jerk over time, i.e.

$$\frac{d^4 n}{dt^4}(t) = \frac{d j_P}{dt}(t) = \frac{d^2 G}{dt^2}(t) \quad (13)$$

where

$$\frac{d^2G}{dt^2} = (An(t) - B) \frac{dn}{dt}(t) \left[ 4A \frac{dn}{dt}(t) - (An(t) - B)^2 \right]. \quad (14)$$

Equation (13) corresponds to the non-relativistic equation for mechanical jounce, following from Newton's second law of motion.

Let us define price crackle as the change in price jounce over time, i.e.

$$\frac{d^5n}{dt^5}(t) = \frac{d^2j_P}{dt^2}(t) = \frac{d^3G}{dt^3}(t), \quad (15)$$

where

$$\frac{d^3G}{dt^3}(t) = \left[ 2A \frac{dn}{dt}(t) - (An(t) - B)^2 \right]^2 \frac{dn}{dt}(t) - 7A \left[ \frac{dn}{dt}(t) \right]^2 (An(t) - B)^2 \quad (16)$$

Equation (15) corresponds to the non-relativistic equation for mechanical crackle, following from Newton's second law of motion.

## 6. Conclusion

Assuming that the market value of the commodity at time  $t$  is fully determined exclusively by the value of the instantaneous commodity price  $n(t)$ , methodological procedures taken from theoretical physics are used to construct motion equations for a commodity's instantaneous price  $n(t)$  and instantaneous relative depreciation  $RD(t)$ . Motion equation (5) for instantaneous commodity price with inflexion as well as motion equation (6) for instantaneous relative depreciation with inflexion are non-linear differential equations of the second order with constant coefficients. These motion equations were derived for a sequence of markets with nearly perfect competition. The principle of correspondence takes the following form:

$$(1) s \leftrightarrow n, \quad (2) j \leftrightarrow j_P, \quad (3) \frac{d^3s}{dt^3}(t) = -\frac{k}{m} \frac{d(ds/dt)}{dt}(t) \leftrightarrow \frac{d^3n}{dt^3}(t) = \frac{dG}{dt}(t)$$

$$(4) \frac{d^4s}{dt^4}(t) = -\frac{k}{m} \frac{d^2(ds/dt)}{dt^2}(t) \leftrightarrow \frac{d^4n}{dt^4}(t) = \frac{d^2G}{dt^2}(t), \text{ i.e. jounce} \leftrightarrow \text{price jounce},$$

$$(5) \frac{d^5s}{dt^5}(t) = -\frac{k}{m} \frac{d^3(ds/dt)}{dt^3}(t) \leftrightarrow \frac{d^5n}{dt^5}(t) = \frac{d^3G}{dt^3}(t), \text{ i.e. crackle} \leftrightarrow \text{price crackle}.$$

These five correspondences concluding the work present the basis for constructing a principle of correspondence between economic variables and kinematic variables of classical nonrelativistic mechanics.

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# Income Inequality in the Slovak Republic

Iveta ZENTKOVA<sup>1</sup>

Elena HOŠKOVÁ<sup>2</sup>

## Abstract

The goal of the paper is to identify the inequality of income distribution in Slovakia which was reviewed by foreign as well as by Slovak authors. This contribution expands former analyses and provides a deeper analysis of population income development in Slovak republic by occupation and gender in years 2009 – 2013. The population income is represented by average monthly gross income in the given year per employee and by median of gross monthly income per employee in the time series. The employees are divided according to the Statistical Office of the Slovak Republic in the following types: Legislation and management, Science and mentation, Technics, healthcare and pedagogy, Offices, Services and business, Qualified work in agriculture and forestry, Craftsmanship and other qualified employment, Using machines and devices, Elementary and auxiliary work, Army. The goal of this article is not only to identify inequality in income distribution of employees by occupation types, but also the rate of inequality of income distribution between males and females. The data source are Statistical Office of the Slovak Republic, and the Survey on wage structure for the years 2009-2013. The indicators of income inequality from mathematical-statistical methods, regression analysis were also applied. The income trend analyses results point out income growth in all types of employment in reference period. The major income growth trend was observed in Legislation and Judiciary. The gross monthly income growth was 54 EUR per year estimated by linear regression model with 96 percent certainty. The incomes in legislation were higher within all observed types of employment. The lowest statistically significant income growth rate was in services & sales and unqualified workforce. The average annual income growth of these sectors reached 16 EUR (with 82 percent and 99percent certainty). The income of unqualified workforce belonged to the lowest within observed types of employment. The income trend analysis points out that the income inequality among particular types of employment deepened in period 2009-2013. This fact was further verified by unequal income distribution rate. The second power of variance coefficient, Theil index, median and average ratio, modified index of income inequality were used. Calculated coefficients of income inequality rate did not verify the theory of income inequality deepening in Slovak Republic. The income inequality distribution decreases when average income trend is taken into account. The income inequality distribution increases when income median analysis is used. Further, income inequality distribution development observation between males and females in all sectors excluding services and sales employees was provided. Income inequality distribution in all areas was decreasing in observed period, except of services & sales employees and professional science & mentation employment.

## Keywords:

Income inequality, Quality of Life, Theil index, Income

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## Introduction

Income of a population represents the basic source of information to determine the level of inequality in the country and it is the key determinant of the standard of living which makes it a very important part of a research.<sup>3</sup>

## The aim and methods

The aim of the paper is to **identify the level of inequality of income distribution in Slovakia**. In the analyses are used the data from Selection data findings about income structure provided by Statistical Office of the Slovak Republic. For a detailed review of the topic is used the division of employees according to the type of their employment created by the Statistical Office of the Slovak Republic:

1. Legislation and management
2. Science and mentation
3. Technics, healthcare and pedagogy
4. Offices
5. Services and business
6. Qualified work in agriculture and forestry
7. Craftsmanship and other qualified employment
8. Using machines and devices
9. Elementary and auxiliary work
10. Army

Time period of the analysis is given by the years 2009 to 2013. The income is being watched by average monthly gross income per employee in particular type of employment in the given year. In accordance with the main objective of the paper there are the following partial goals presented:

1. **To describe the trends in income development of the employees in each particular type of employment.**

**Methods used: regression analysis, modified income inequality index *MIIn*.**

Assumptions for a regression analysis:

$$I_{it} = f(t), \text{ where:} \quad 1.1$$

$I_{it}$  - estimated value of average monthly gross income per employee in the  $i^{\text{th}}$  type of employment,  $i = \overline{1,10}$  in the given year  $t$ ,  $t = \overline{1,5}$

$$I_{it} = a + bt, \text{ where:} \quad 1.2$$

$a$  - estimate of average monthly gross income per employee in the  $i^{\text{th}}$  type of employment in the year foregoing the first year of the time series

$b$  - estimate of how much an average monthly gross income per employee in the  $i^{\text{th}}$  type of employment changes on average per year

Modified income inequality index (*MIIn*) is computed for selected types of employment: type of employment with the lowest  $i=9$ , average  $i=3$  and median  $i=7$  average monthly gross income per employee:

$$MIIn_{it} = \frac{I_{it}}{I_{1t}}, \text{ where:} \quad 1.3$$

$I_{it}$  - average monthly gross income per employee in compared type,  $i=3,7,9$  in the given year  $t$ ,  $t = \overline{1,5}$

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<sup>3</sup> Tkáč, M.: Inequality of individuallabourearnings and householdsdisposableincomesbased on Theilindexes. (2013)

$l_{it}$  - average monthly gross income per employee in a type with the highest income,  $i=1$  in the given year  $t$ ,  $t = \overline{1,5}$

- To investigate the level of inequality of an income distribution between particular types of employment with respect to total number of the employees (females and males together) partially females and males (methods used: squared coefficient of variation SCV used by Gerbery 2010<sup>4</sup>, Theil index<sup>5</sup>).**

Squared coefficient of variation (SCV), computed as follows:

$$SCV = \frac{var(l)}{\bar{l}}, \text{ where:} \tag{2.1}$$

SCV – squared coefficient of variation

var(l) –variance of the average monthly gross income in the individual types

$\bar{l}$  – average monthly gross income of all types of employment

Theil index:

$$TI_t = \frac{1}{n} \sum_i \left( \frac{l_{it}}{\bar{l}} \ln \frac{l_{it}}{\bar{l}} \right) \tag{2.2}$$

$l_{it}$  - estimated value of average monthly gross income per employee in the  $i^{\text{th}}$  type of employment,  $i = \overline{1,10}$  in the given year  $t$ ,  $t = \overline{1,5}$

$\bar{l}$  – average monthly gross income of all types of employment

## Results

### Trends in employees' income development

Employees' income development according to individual types of employments is presented in the Table 1. The earnings development is monitored by earnings increase index 2013/2009 which demonstrates the growth rate of employees' income in individual types of employments. The trend function estimated by regression analysis describes an average change in earnings and earnings development in 2009 – 2013. Earnings development is easily described by linear trend function (1.2). According to corrected determination index the estimated functions explain changes in time with 95 percent to 99 percent reliability. The exceptions are estimated functions of development trend of earnings development in business and service (5), where corrected determination index reaches the value of 0.81 and the trend of earning development in army (10) with the value of 0.53. The informative value of the models does not increase by the change of function to a nonlinear. Because of this we do not include them into the analysis.

**Table 1 Gross monthly income according to Type of Employment (EUR per employee)**

Type of Employment	2009	2010	2011	2012	2013	INDEX 13/09	Trend function
1	1 729	1 790	1 835	1 923	1 934	<b>1.12</b>	<b>1679.20+54.32t</b>
2	1 026	1 052	1 082	1084	1129	<b>1.10</b>	<b>1003.50+23.73t</b>
3	849	885	906	973	997	<b>1.17</b>	<b>807.10+38.32t</b>

<sup>4</sup>Gerbery(2010):[http://www.sspr.gov.sk/IVPR/images/IVPR/vyskum/2010/Gerbery/Prijmova\\_nerovnost.pdf](http://www.sspr.gov.sk/IVPR/images/IVPR/vyskum/2010/Gerbery/Prijmova_nerovnost.pdf)

<sup>5</sup>utip.gov.utexas.edu/tutorials/intro\_ineq\_studies.ppt-

4	647	666	699	734	739	<b>1.14</b>	<b>621.08+25.28t</b>
5	566	593	579	624	630	<b>1.11</b>	<b>550.37+15.98t</b>
6	527	537	574	591	610	<b>1.16</b>	<b>502.09+21.93t</b>
7	657	695	732	781	799	<b>1.22</b>	<b>621.44+37.09t</b>
8	653	678	708	723	757	<b>1.16</b>	<b>627.50+25.40t</b>
9	432	447	462	480	496	<b>1.15</b>	<b>414.79+16.18t</b>
10	1 070	1 098	1 105	1089	1111	<b>1.04</b>	<b>1072.80+7.28t</b>

Source: Statistical Office of the Slovak Republic, authors' calculation

Income of the employees is characterized by a high level of disparity in the researched period. Among the employees with the highest income there are employees in legislation and management (1), in army (10) and mentation workers in the science (2). In comparison, the borderline years of the analysis, 2013 and 2009, the growth rate of these types of employees is medium compared with the growth rate of income of other types. The estimated trend functions describe the given situation in a greater detail. According to the estimated regression coefficients the average gross monthly income was increased within the employees of legislation and management significantly on average per year by 54.32 EUR. Relatively, the average year growth is 3.13 percent from the level of their average gross monthly income of 2009.

The median of gross monthly income in 2009 was 655 EUR. This value is almost reached by the income of workers and other qualified employees (7). In 2013 the average value in this type of employment was 22 percent higher than in 2009. Relatively, it is 5.64 percent from the value of average from the level of monthly income in 2009. „Median type” of the employees earned significantly more in 2013 compared to 2009 than the employees in other types. The average year growth of the income is, according to the linear trend function, high as well and it is 37 EUR.

Similar situation occurred in the income development of technical and pedagogical workers (3). This type of employees with an average month income of 849.38 EUR represents „Average type” taking into consideration that the average income in the industry was 815 EUR in 2009. The growth rate of income (1.17), average growth rate per year (38 EUR) and relative expression of average growth per year compared to 2009 (4.68 percent) show that the „Average type” of employees is also classified in the type with more significant income growth.

The lowest growth per year was recorded within income of auxiliary and elementary workers (9) 16.18 EUR and qualified workers in agriculture and forestry (21.93 EUR). The income of given types of employment belong to employments with the lowest growth rate of income in 2013 compared to 2009. (Table 1).

### **Conclusions of the trend analysis and growth rate of income:**

The income of middle and the highest earners were growing more significantly in 2009-2013 than the income of lower earners. The given fact may have two different effects on the income inequality development:

- a. The employees with the highest income have a fast growing salary compared to other employees, the situation may contribute to an increase in the income inequality (increasing income differences among borderline types of employees).
- b. The employees with medium income have a fast growing salary, it can contribute to decrease of the income inequality (decrease of differences among employees of higher and medium income type).

The paper uses this partial results as an assumption for further analyses.

The objective is to find out which of the given facts influence the development of income inequality more significantly. Therefore, we will monitor the income development by other methods in accordance with the methodology. One of them is modified index of income inequality.

## Income inequality

### *Modified index of income inequality*

Index represents the share of gross average income of the lowest earners to earnings of the highest earning employees. The higher the value, the lower is the income inequality among individual types of employment. Index development (Table 2, part 1) shows data about development of income inequality of the borderline types of employment. Exclusion of medium earners in partial analysis enables us to find out how much the result a) might a difference of income inequality. The second and the third part of table 2 deals with verification of the second result b) and provides data about the share of gross average income of medium earners (median and average type) to gross average income of the best earners.

**Table 2 Modified Index of Income Inequality**

<b>1.Modified Index of Income Inequality (MIn 1.3.) 9/1</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
<i>MIn</i> of average gross monthly income males and females together	0.250	0.250	0.252	0.250	0.256
<i>MIn</i> of average gross monthly income of males	0.257	0.253	0.255	0.260	0.267
<i>MIn</i> of average gross monthly income of females	0.284	0.286	0.287	0.282	0.282
<b>2.Modified Index of Income Inequality (MIn 1.3.) 7/1</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
<i>MIn</i> of average gross monthly income males and females together	0.380	0.388	0.399	0.406	0.413
<i>MIn</i> of average gross monthly income of males	0.359	0.366	0.375	0.381	0.393
<i>MIn</i> of average gross monthly income of females	0.353	0.364	0.376	0.384	0.376
<b>3.Modified Index of Income Inequality (MIn 1.3.) 3/1</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
<i>MIn</i> of average gross monthly income males and females together	0.491	0.494	0.494	0.506	0.516
<i>MIn</i> of average gross monthly income of males	0.514	0.523	0.524	0.517	0.535
<i>MIn</i> of average gross monthly income of females	0.563	0.562	0.561	0.576	0.565

Source: Authors` calculation

### *Modified Index of Income Inequality of the lowest and the highest earning employees*

The average gross income of auxiliary and elementary employees oscillated around 25 percent from the income of employees in legislation and management. For a detailed review of the difference in development Dynamics there is *Mlln* of males and females computed. The average income of males who work as auxiliary and elementary employees creates 26-27 percent of the income of male employees in legislation. Females working in the lowest income area earn 28-29 percent of the income of females working in the highest income area. There are no dramatic changes in the values of the computed index in the monitored time period.

#### *Modified Index of Income Inequality of medium and the highest earning employees*

The average gross income of the „median type” employees – workers and other qualified employees (7) creates 38-41 percent of the income of the highest earning employees (1). The growing trend of the index development is more significant within males (3.4 percent) than within females (2.3 percent). The index development in „average type” employees – technical and pedagogical employees (3) is more moderate. In the monitored time the income of males grew by 2.1 percent, the income of females only by 0.2 percent.

#### **Conclusion of modified index of income inequality analysis:**

The development of income disparity monitored by modified index of income inequality:

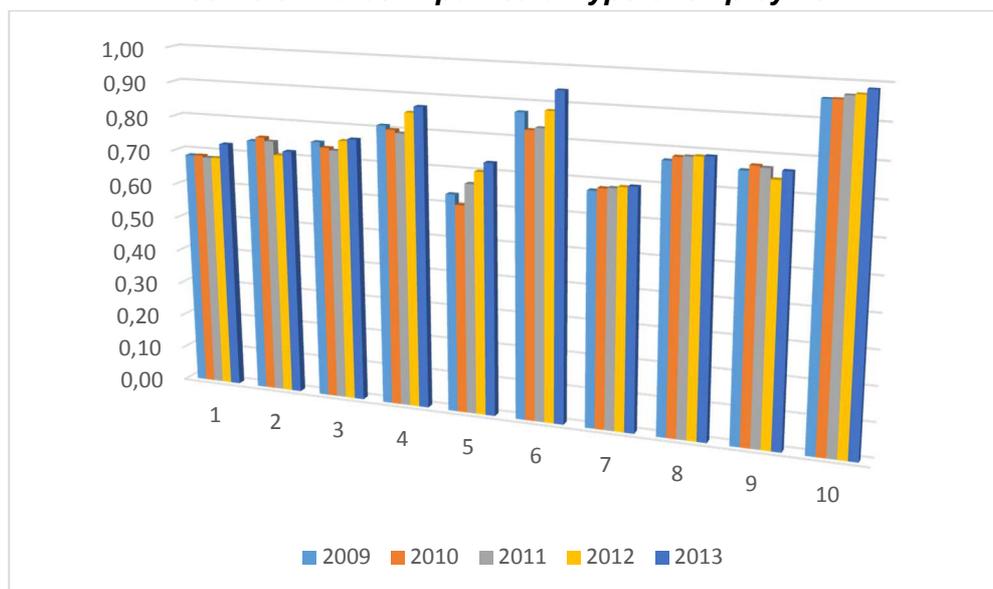
- a) Does not affirm that the income inequality between the highest and the lowest earning employees was greater which was established by the trend analysis of income development above. Income inequality among the borderline types is stable
- b) Shows a decrease of income inequality between the medium and higher earning employees
- c) Highlights different development of the male and female income compared to the Slovak average development. This knowledge gave another question and that is the income distribution between a man and a woman and its development which is shown in the picture 1.

The picture 1 shows the income of females in the Slovak Republic which oscillates around 63-99 percent of the male income level. In the monitored time period the inequality of income distribution between the sexes in most employments decreases, except the auxiliary and elementary employment (9) and scientific and mentation activity (2).

A very little difference between the sexes are recorded within income of employees in army (10). The share of average gross income of a woman in army was over 95 percent of the male income in the monitored period. Qualified work in agriculture and forestry belongs to the type of employment with a lower level of income disparity between the sexes (6) where the gross monthly income of a female is over 85 percent of the male income and administration (4) which is over 80 percent.

The higher rate of income disparity between the sexes is significant in legislation and management (1), in services and business (5), in craftsmanship and other qualified work (7) where the coefficient is below 70 percent.

**Picture 1 Income distribution between males and females in SR (measured by the share of average gross monthly income of females on the average gross monthly income of males in particular type of employment)**



Source: Authors` calculation

*Income inequality: Squared coefficient of variation, Theil Index*

The next method of income inequality development determination is the squared coefficient of variation (SCV). It shows what the share of the income variance among individual types of employment and the gross average income in Slovakia is. The higher the value of the coefficient, the higher is the income inequality.

**Tab. 3 Income inequality according to Type of Employment measures by SCV and Theil Index**

	Income inequality measure	2009	2010	2011	2012	2013
Females	SCV	0.14	0.14	0.14	0.13	0.14
	Theil index	0.10	0.10	0.09	0.09	0.09
Males	SCV	0.29	0.28	0.28	0.29	0.26
	Theil index	0.48	0.49	0.48	0.45	0.44
Together	SCV	0.20	0.20	0.20	0.20	0.19
	Theil index	0.10	0.10	0.10	0.10	0.09

Source: Authors` calculation

As for males and females together, the squared coefficient of variation reaches the value of 0.20 in each year. Variability of income in individual employments is, compared to average gross monthly income in the Slovak Republic, medium high. In 2013 the coefficient fell by 0.01. This movement was caused by the decrease in SCV coefficient of males. A similar development is recorded in the monitored time period by the Theil index. Income inequality of males, measured by SCV is only a little higher compared to the Slovak average with slightly falling tendency. Theil index reaches significantly different values in the monitored period of time and shows a higher rate of disparity of income distribution of males than the SCV coefficient. The value of this index also has a decreasing tendency. Income inequality of females among individual types of employments is, compared to the Slovak average, lower,

income of females reach lower variability around the Slovak average than the income of males. The given fact is proved by the development of both coefficients of income disparity.

### **Conclusion of squared coefficient of variation and Theil index.**

The values of squared coefficient of variation and Theil index show that the amount of income of males in individual types of employments differs more than the income of females. During the monitored time period there were no dramatic changes in income inequality development.

### **Conclusions:**

The main objective of the paper was to identify the level of disparity of income distribution in Slovakia. In connection with the main objective the partial goals were established. The first was to describe the income development of the employees for the past 5 years (2009-2013). From the analysis of the trend and the growth rate of income of the employees in individual types of employments we found out that the income of employees working in areas which are medium and higher evaluated grew more than the income of other employees. The second partial goal was to determine the level of income distribution disparity among different types of employments and employees together, partially within males and females. This objective was realized by computing the modified index of income inequality, SCV coefficient and Theil index. From the values of the modified index of income inequality we found out that among borderline types the income inequality was stable whereas among medium and higher earning employees it was falling in the monitored time period. Income inequality between the sexes is significantly high. Income of females is on the average 75-85 percent of the income of males. The exception is the income in army which is around 95-99 percent. Income of females shows lower variability than income of males. This fact was proved by either values of the modified index of income or the values of SCV coefficient and Theil index.

The paper is followed by numerous papers on a detailed research about income distribution disparity from a different point of view.

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# Investments into education in the Czech Republic

Iva ŽIVĚLOVÁ<sup>1</sup>

## Abstract

The contribution reviews the development of Czech elementary, secondary and university education between 2003 and 2013. It focuses not only on the numbers of educational institutions in the counties of the Czech Republic and numbers of students, but also on the costs on education from the state budget. The contribution also includes comparisons of selected indicators of Czech educational system with OECD and EU21 countries.

## Keywords

education, costs on educational system, education strategies

## Introduction

Development of human knowledge results in higher standards of education. Qualification demands are constantly changing. There is a decreasing demand for professions connected with manual skills, on the other hand, demand for complex communication and analytical knowledge is rising. The role of education, therefore, is becoming more and more important. Each developed society considers an investment in its inhabitants' education to be the investment in the future. Process of education mostly takes place in schools. Schools, however, have to do their job effectively, which is now becoming problematic due to demographic development in the Czech Republic and current economic situation.

EU strategies on education and professional preparation, referred to as Europe 2020, considers education and professional preparation to be crucial for assuring the sustainable development mainly because of the fact that it equips its inhabitants with skills and competencies required by European economic market. Education systems and professional preparation processes have to be adjusted to new demands and trends on the employment market, in compliance with social and cultural challenges of globalized world. In the Czech Republic, the importance of education for the development of society was also declared in Strategy of education politics of the Czech Republic until 2020.

The aim of the contribution is to review the development of elementary, secondary and university education from the point of view of number of students and school institutions as well as investments into educational system from state budget between 2003 and 2013. Development of selected indicators that characterize the situation in Czech educational system is considered within the context of development in selected countries.

## Material and methods

Situation in Czech educational system is reviewed using selected indicators. To review the development we used indicators telling number of schools, classes, number of students together and in one class in elementary and secondary education in the Czech Republic. For university education there is a number of universities, divided into public and private ones, number of students, divided again into those studying on public and private ones, and overall numbers. Costs on educational system are monitored in total as well as calculated per one student. Stated is also a portion of costs on educational system of GDP of the Czech Republic.

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The contribution also includes a comparison of selected indicators of Czech educational system with countries of OECD and EU21.

The contribution tells partial results of a research plan no. MSM 6215648904 The Czech Economy in the Process of Integration and Globalisation, and the Development of Agricultural Sector and the Sector of Services under the New Conditions of the Integrated European Market, thematic plan 05 Socio-economical relations of sustainable multi functional agriculture and precautions of agrarian and regional politics" at Mendel University, Brno.

## Results and discussion

The importance of education for the whole society can not be questioned, it interferes with all parts of life, and therefore education policy is becoming a priority economically developed countries. Education is generally considered to be one of the most important factors playing role in economic growth of a country. It manifests in competitiveness of economics, increase in labor production or employment and ability of an individual to find a job. (1)

The strategy of education policy of Czech Republic until 2020, prepared by MŠMT ČR, meets the requirements by the fact that based on the evaluation of the current state of educational system newly establishes the basic plan for its future development.

In the Czech Republic there were changes in numbers of pupils at different school levels during past years. Numbers of students at particular levels of educational system depend on different factors. Numbers of students at elementary schools directly depend on the size of corresponding population considering the fact that it is a compulsory school attendance and state is obliged to ensure corresponding number of posts at schools. In secondary education numbers of students are more influenced by education policy - program structures and length of the programs, demography also plays an important role. Each education policy has an ambition that almost the whole population finish at least secondary education which is essential for finding a job. University education is a specific area of education highly influenced by educational policy. The size of age-relevant population has a minor effect on number of students which is mainly affected by government priorities - strategies on how many people should have tertiary education and of what type. Labor market demands play also an important role, as well as level of knowledge and skills of job applicants. All developed economies follow this model, and Czech Republic is not an exception. Numbers of children, pupils and students in particular segments of Czech educational system depend on this model. (2) Development in elementary education, characterized by selected indicators, is in table no. 1.

**Tab. 1 Development in elementary education in the Czech Republic**

<i>School year</i>	<i>Number of schools</i>	<i>Number of classes</i>	<i>Number of students</i>	<i>Number of students in 1 class</i>
2003/2004	4 838	49 740	998 026	20.1
2004/2005	4 765	47,620	958,203	20.1
2005/2006	4,474	45,769	916,575	20.0
2006/2007	4,197	44,527	876,513	19.7
2007/2008	4,155	43,433	844,863	19.5
2008/2009	4,133	42,498	816,015	19.2
2009/2010	4,125	41,941	794,459	18.9
2010/2011	4,123	41,720	789,486	18.9
2011/2012	4,111	42,105	794,642	18.9
2012/2013	4,095	41,739	807,950	19.4
2013/2014	4,095	42,334	827,654	19.6

Source: own data processing <http://www.msmt.cz/vzdelavani/skolstvi-v-cr/statistika-skolstvi/statisticka-rocenka-skolstvi-soubor-ekonomickych-ukazatelu>

From a school year 2003/2004 to 2010/2011 the number of elementary school students is decreasing. Between years 2003/2004 and 2010/2011 the number of students decreased by 208,540, representing a decrease by almost 21 %. Simultaneously, there is also a decrease in number of students in one class till the school year 2011/2011. In 2012/2013 the decrease stopped and gradually there is a slow increase in number of students in one class. The size of classes is one of the main factors influencing the costs on education, as it implicates number of teachers and also other, mainly, operation costs.

The average size of one class in countries of OECD was less than 21 pupils, while it was 20 pupils in EU21 countries. Nowadays, the classes in OECD countries are gradually getting smaller (4). Czech Republic belongs to countries where there are less than 20 pupils in a class, similarly as Austria, Germany, Italy, Poland, Slovakia, etc. Far more pupils in a class (almost 40) are in China, Chile, Korea, Japan, etc.

Decreasing number of elementary school students is accompanied with a similar situation in secondary education (see table 2).

**Tab. 2 Development in secondary education in the Czech Republic**

School year	Number of schools	Number of classes	Number of students	Number of students in 1 class
2003/2004	2,006	21,909	576,615	26.3
2004/2005	1,966	21,879	579,505	26.5
2005/2006	2,004	21,797	577,605	26.5
2006/2007	1,482	21,805	576,585	24.6
2007/2008	1,447	21,726	569,267	24.3
2008/2009	1,348	21,640	564,326	24.2
2009/2010	1,433	21,540	556,260	23.9
2010/2011	1,423	21,176	532,918	23.3
2011/2012	1,393	20,400	501,220	24.6
2012/2013	1,347	19,440	470,754	24.2
2013/2014	1,331	20,192	448,792	22.2

Source: own data processing <http://www.msmt.cz/vzdelavani/skolstvi-v-cr/statistika-skolstvi/statisticka-rocenka-skolstvi-soubor-ekonomickych-ukazatelu>

Secondary schools include different types of schools, education with vocational list, grammar schools and vocational schools and institutes.

The main problem in secondary education is its structure which does not correspond to contemporary demands from the point of view of professional orientations as well as teaching realization. Nowadays, a big portion of a population year continues to study at university. This fact considerably changes the demands on secondary education, whose contemporary structure, however, represents state when most of the graduates go directly to the employment market. One of the aims of education policy of Czech Republic is to increase the number of secondary school programs and interconnect their structure with the needs of employment market.

At secondary schools the number of students in one class is a bit higher than at elementary school, it is around 24, which corresponds to average size of a class in OECD countries. In a school year 2013/2014 the number of students in one class decreased, this trend will continue as population years weaker in numbers come to secondary schools from elementary ones. Less than 20 students in one class can be found in Greece, Italy, Austria, Denmark, Finland, Switzerland, etc. Far higher average numbers of students are in China (more than 35), but also Korea, Japan, Chile, etc. Despite the fact that there are far more students in one class in these countries, they achieve very good results in international testings of students' abilities and knowledge.

Development of technics, technology and other areas highly influence the demand for qualified workers. Contemporary development prioritizes educated work force, equipped with adequate knowledge and skills. This fact resulted in increasing number of university students. From 2001 there is a gradual increase in both number of universities as well as number of university students, as can be seen in table 3.

**Tab. 3 Development of university education in the Czech Republic**

Year	Universities			Number of students at universities		
	total	public	private	total	public	private
200	52	24	28	243,719	230,983	12,944
200	60	24	36	264,785	246,976	18,040
200	64	25	39	289,472	265,378	24,359
200	63	25	38	316,176	285,148	31,376
200	68	26	42	343,938	303,129	41,300
200	71	26	45	368,050	319,155	49,529
200	71	26	45	389,006	333,150	56,547
201	70	26	44	395,992	339,353	57,337
201	71	26	45	392,099	339,030	53,731
201	70	26	44	381,047	333,304	48,355
201	69	26	43	368,304	325,171	43,710

Source: own data processing <http://www.msmt.cz/vzdelavani/skolstvi-v-cr/statistika-skolstvi/statisticka-rocenka-skolstvi-soubor-ekonomickych-ukazatelu>

Number of students at universities between 2003 and 2013 increased by 124,585 students, representing a rise of 51 %. It is also clear that from 2003 the number of private universities significantly increased, their portion on the total increase was 13 %. Since 2011, due to negative demographic development, the number of university students has started to decrease, mainly at private universities, where the decrease between 2010 and 2013 is 24 %.

The aim of the EU, according to strategic plans referred to as Europe 2020, is to increase the number of tertiary educated people aged 30 - 34 to at least 40 %. Although there is a gradual increase in the portion of tertiary educated people, with the portion of 25.4 % Czech Republic belong to countries with the worst results. Worse results achieve only Slovakia, Romania, Malta and Italy.

The increase in demands for secondary and tertiary education result in demands for higher costs on education. Development of public costs on education is in table 4.

**Tab. 4 Development of structure of public costs on education in the Czech Republic (in mil. CZK)**

Year	Total	from that			Portion of costs in % GDP
		elementary education	secondary education	tertiary education	
2003	115,856.6	39,042.8	26,536.7	20,506.3	4.3
2004	123,041.6	40,856.0	27,977.7	22,845.5	4.2
2005	130,319.2	39,818.7	29,350.8	26,442.5	4.2
2006	142,834.1	43,896.4	31,495.5	29,009.2	4.3
2007	152,987.8	43,518.7	32,395.0	34,603.9	4.2
2008	151,003.0	45,144.2	33,691.7	31,244.2	3.9
2009	163,943.0	49,409.4	35,585.9	33,710.3	4.4
2010	162,965.1	47,794.3	34,486.5	32,308.9	4.3
2011	173,722.0	49,807.5	33,965.6	34,225.0	4.5
2012	171,369.9	48,479.4	33,339.1	34,258.6	4.5
2013	172,805.2	50,299.9	32,118.3	34,229.4	4.4

Source: own data processing <http://www.msmt.cz/vzdelavani/skolstvi-v-cr/statistika-skolstvi/statisticka-rocenka-skolstvi-soubor-ekonomickych-ukazatelu>

The costs on education were gradually increasing during the observed time period. From 2003 to 2013 the costs increased by 56,948.6 mil. CZK, i.e. almost by 50 %. Calculated to one inhabitant, the costs on education increased from 11,356 CZK in 2003 to 16,438 CZK in 2013. Despite this increase, the situation in investments in education in the Czech Republic is not positive compared to other countries. According to MŠMT data (4) the Czech Republic invest on average on a single pupil less amount of money compared to other countries, whereby in elementary and tertiary education the costs are by 50 %, and in secondary education be one third lower than average in OECD countries. OECD countries invest in elementary, secondary and tertiary education on average 6.3 % GDP and EU21 countries 5.9 %. Czech Republic belongs to countries investing less than 5 %. Lower values can be found in e.g. Slovakia, Italy and Hungary.

## Conclusion

Qualification structure of inhabitants represent only one of the main factors influencing the competitiveness of a region. transfer of most of the job opportunities from traditional industrial activities to services is not accompanied with an increase in a portion of non-qualified work, on the contrary, new job opportunities are created in the regions where higher qualifications are required.

Qualification structure is also a motivating factor for inhabitants, as their chance to find a job increases with higher qualification. Higher achieved education not only increases level of knowledge, skills, abilities and attitudes, but also level of one's satisfaction with their position on employment market as well as with various non-economical benefits. People with higher education have nowadays better positions in employment market, have considerably higher income, are less threatened by long-term unemployment and show higher economic benefit for the whole society.

Strategies of education policy of the Czech Republic until 2020 predict a preparation of complex reformation of elementary and secondary education financing from the state budget, partial changes can be done also in the system of financing of public universities. Basic sources for education financing will mainly come from state budget and European investment and structural funds. The strategy also assumes a precise control of effectiveness of the costs.

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