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Hradec Králové, Czech Republic

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Preface

Ladies and gentlemen, dear colleagues,

The conference Hradec Economic Days 2018 has been traditionally and continuously organised since 2003 by the Departments of Economics and Management of the Faculty of Informatics and Management, University of Hradec Králové. The 16th year was held from January 30 – to January 31, 2018. Its aim was to promote the idea of communication and cooperation of scientists from various fields with experts from practical life. In 2018, the conference is subtitled **"Production Economics in the Context of Industry 4.0"**. Currently, not only macroeconomics but also microeconomics, including operational-level management, are facing a big challenge for the next generation. This year conference scopes are to address the following fundamental issues in production economics (both macro and microeconomics) under the concept of Industry 4.0:

- Changing roles of innovation, production, logistics, and the service processes
- Key management technologies and its empowerment in production economics
- Effective methodologies for the integration of physical, informational, and financial flows
- Big Data utilization to improve the efficiency of production and services
- Impact of Industry 4.0 on the design of manufacturing, services, and workplace
- Innovation and technology management
- New business models.

Since the Conference Hradec Economic days was organised for the first time it has undergone dynamic development. The organising committee has also undergone fundamental change in favour of substantial increase in the spectrum of international participants from the USA, China, Malaysia, Spain, Croatia, Slovakia, Rumania, Poland and the Czech Republic. For the year 2018 we also started to cooperate with publishers of selected journals. The highest quality papers are revised for possible inclusion in the special issue of *Economies* open access journal and *Systems* open access journal by MDPI (ESCI index) and Scientific Journal for Economics and Management - *Acta Universitatis Bohemiae Meridionalis*. The best conference paper is awarded by 300 CHF price provided by MDPI publishing.

All submitted papers underwent thorough selection and were reviewed by 2-3 reviewers. We selected the best 112 papers in English to be published in two proceedings volumes. The authors of the papers are scientists and practitioners from the Czech Republic, Slovakia, Russia, Kazakhstan, Poland, Norway, China, Hungary, Bulgaria and Mexico.

I am very pleased we succeeded in indexation of the 2017 proceedings and I firmly believe that the changes the conference has undergone will contribute to regular indexation also in the future. We are also grateful for a tradition of the plenary opening speech by the Czech National Bank representative.

I would like to thank all who participated in organising the conference: thank you for your high quality work. My thanks also go to the authors for their trust and support and I am looking forward to seeing you again at HED2019.

Hradec Králové, January 5, 2018

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CONTENT

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Social Media in Public Marketing: Facebook Pages of Regional Authorities

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Abstract. Social media has become a new phenomenon of the society, which significantly affects not individuals only, but also organizations, including public institutions. An article aims on identification of current role of social media in public marketing. Specifically, it focuses on the sample of 13 regions of the Czech Republic and analyzes Facebook pages of its regional authorities. The content analysis concentrates on five blocks (out of seven original ones) of Kietzmann´s honeycomb framework: identity, conversation, sharing, presence, and reputation. Findings confirmed that all the regions have their Facebook page set up, one third of regions react on citizen´s request up to few minutes, the other one third up to one day. Regional authorities regularly publish its posts (11 posts per week in average) and share their own content, mainly.

Keywords: Social Media, Public Marketing, Regional Authorities, Content Analysis, Czech Republic.

1 Introduction

1.1 Social media and its advent in a new millennium

An advent of Internet and, consequently, the emergence of social media can be considered as one of the most important changes in society at the end of the last millennium and beginning of a new one. Today, in developed countries, the social media affect not only every life of human beings, but also majority of activities in business, public as well as nonprofit sector.

Social media serves as a technology which facilitates the dissemination and sharing of information. Today, the social media tools are mainly represented by platforms as Facebook, Twitter, YouTube, and others. It also includes communication tools such as Skype, or SecondLife, or professional tools as LinkedIn or ResearchGate. Although these social network platforms are often considered individual-level tools, they are just as useful at the agency, community, and policy level [7].

2 Literature Review

2.1 Social Media in Public Marketing

Social media have commonly begun to be used in a various sectors of public agenda. In education are social media, mainly Facebook, designated as “ideal host for a blended learning environment” [6], in social work can social media improve awareness of addicted people problems or better mental well-being of adolescents as young males who reported speaking to online friends regarding personal problems recorded statistically significantly higher levels of mental well-being [2], in healthcare the patients can benefit from the use of social media through medical education, better information, or receiving support [4]. Thus, as many public activities are taking place on social networks, the public marketing activities naturally follow.

2.2 Use of Social Media in Czech Public Environment

In European countries, including the Czech Republic, social media is becoming a common communication platform for politicians as well as for public organizations. While, traditionally, social mainstream site for politicians was Twitter, the attention of them is already moving on Facebook, today. Interestingly, the popularity among politicians on social networks differ a lot. While current President Miloš Zeman has 101,774 friends, the currently leaving Prime Minister Bohuslav Sobotka got only 16,583 friends. Remarkably, much higher attention received upcoming Prime Minister Andrej Babiš with more than 140,000 friends. It is not only because the political figures itself, but rather marketing is what matters here. Naturally, Facebook sites are common not only for politicians but also for public institutions. The Facebook page has set up The Office of the Government of the Czech Republic or Prague Castle as the seat of the Czech President. Presentation of public institutions is quite common not only for national organizations, but also for regional self-governing units, cities, and municipalities.

However, no in-depth research studies in this field exist to describe presentation of public institutions on social networks in Czech Republic, yet. Moreover, there is only a little evidence, worldwide. For these reasons, the present study aims to determine current role of social media in regional institutions, specifically regional authorities in the Czech Republic.

3 Research Methods, Sample, and Data Gathering

3.1 Method, Social Media Indicators and Metrics

The research study is based on the content analysis of Facebook pages. This kind of analysis conducted in online environment is a part of so called Internet mediated research [3]. Kietzmann´s honeycomb framework [5] was used to investigate Facebook pages of regional authorities. This framework includes seven functional blocks of social media: identity, conversations, sharing, presence, relationships, reputation, and groups. Each block comprises (1) specific facet of social media user experience, and (2) its implication for firms. Kietzmann´s approach is illustrated by Fig. 1.

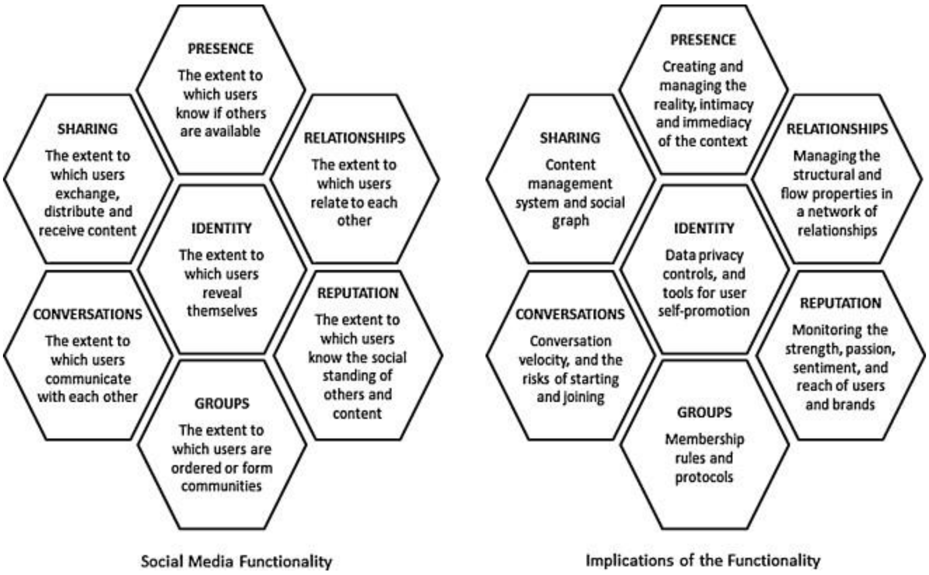
PRESENCE
The extent to which users know if others are available
SHARING
The extent to which users exchange, distribute and receive content
RELATIONSHIPS
The extent to which users relate to each other
IDENTITY
The extent to which users reveal themselves
CONVERSATIONS
The extent to which users communicate with each other
REPUTATION
The extent to which users know the social standing of others and content
GROUPS
The extent to which users are ordered or form communities
Social Media Functionality
PRESENCE
Creating and managing the reality, intimacy and immediacy of the context
SHARING
Content management system and social graph
RELATIONSHIPS
Managing the structural and flow properties in a network of relationships
IDENTITY
Data privacy controls, and tools for user self-promotion
CONVERSATIONS
Conversation velocity, and the risks of starting and joining
REPUTATION
Monitoring the strength, passion, sentiment, and reach of users and brands
GROUPS
Membership rules and protocols
Implications of the Functionality

Fig. 1. Honeycomb framework of social media [5]

For the content analysis, only five out of the seven blocks were chosen for identification of situation in regional authorities Facebook page presentations: identity, conversation, sharing, presence, and reputation. The data of analysed facets of individual blocks were gathered during a seven-day period between Dec. 1, 2017 – Dec. 7, 2017. Implications of the functionality of the pages are summarized in Table 1.

Table 1. Honeycomb blocks and their facets used in content analysis

Honeycomb block	Facets analysed
Identity	Existence of Facebook page
	Page verification
	Facebook page reference on the website of regional authority
Conversation	Speed of reaction of regional authority (determined by Facebook)
Sharing	Number of shared posts (in % of total posts)
	Number of posts shared from organizations administered by regional authority (in % of total posts)
	Number of posts shared from other organizations (in % of total posts)

Presence	Number of posts published in last 7 days
	Number of friends
	Number of followers
Reputation	Number of reviews
	Score of reviews

3.2 Research Sample

Research study focuses on regional authorities of the Czech Republic. According to the Act no. 129/2000 on Higher-level territorial self-governing units [1], the Czech Republic is divided in thirteen regions (kraje) and one capital city (hlavní město) with regional status of 1 January 2000. The capitol Prague was excluded from the sample due to several highly different facts: much higher tourist attention, almost doubled GDP per capita (547,096 CZK), as well as higher population (1,272,690 inhabitants) than in a majority of regions. The remaining thirteen regions were analyzed in detail. The main characteristics of all the regions researched are summarized in Table 2.

Table 2. List of regions included in the sample

Name of the Region	Population (2011 census)	Area (km^2)	GDP per capita (CZK)
Central Bohemian	1,274,633	11,014.97	253,912
South Bohemian	637,460	10,056.79	251,106
Vysočina	512,727	6,795.56	234,530
Plzeň	574,694	7,560.93	216,639
Karlovy Vary	310,245	3,314.46	216,639
Ústí nad Labem	830,371	5,334.52	229,146
Liberec	439,262	3,162.93	229,146
Hradec Králové	555,683	4,758.54	244,549
Pardubice	505,285	4,519	230,880
Olomouc	639,946	5,266.57	211,467
Moravian-Silesian	1,236,028	5,426.83	222,638
South Moravian	1,169,788	7,194.56	254,684
Zlín	590,459	3,963.55	222,885

4 Results

4.1 Identity

All 13 researched regional authorities have set up their Facebook page. However, no regions have used a Facebook option for page verification in a form of blue or gray badge. On the other hand, the majority of regions (11 out of 13, 84.6 %) put Facebook page reference on their websites, which also can help to increase an authenticity of the page. Interestingly, as an example of page verification importance can serve the Vysočina region. The region has both official and unofficial Facebook page where that unofficial one is much more followed by Facebook visitors than the official one.

4.2 Conversation

Regional authorities reply on citizen´s request variously. About one third of regions (30.1 %) replied in a few minutes after the request, one region replied in one hour (8.3 %). Another one third of regions replied in one day (30.1 %). In the remaining rest of regions the speed of reaction was not possible to identify. However, according to Facebook methodology of activation of this metrics, we can assume that these regions are replying more slowly than in one day. Complete results are summarized in Table 3.

Table 3. Conversation of regional authorities towards to public

Region	Speed of reaction of page administrators (measured by Facebook)
Central Bohemian	in a few minutes
South Bohemian	in one day
Vysočina	in one day
Hradec Králové	in one day
Karlovy Vary	in a few minutes
Liberec	in one day
Moravian-Silesian	in a few minutes
Olomouc	n/a (reaction is too slow to be measured by Facebook)
Pardubice	in a few minutes
Plzeň	n/a (reaction is too slow to be measured by Facebook)
South Moravian	in one hour
Ústí	n/a (reaction is too slow to be measured by Facebook)
Zlín	n/a (reaction is too slow to be measured by Facebook)

4.3 Sharing

Regional authorities shared mainly their own posts. Majority of regions published own posts exclusively, the other 40 % than published own posts mostly. Only Olomouc region shared majority of its posts from external sources. Among own resources were considered also sharing of regional TV broadcasts, regional magazines references, and broadcasting of the regional council meetings. Among external resources shared were either events of regional organizations as museums or schools, or regional/online mutations of the national newspapers. Complete results are summarized in Table 4.

Table 4. Structure of posts shared on the Facebook page of Regional authority.

Regional Authority	Number of posts published (last 7 days)	Own posts shared (in %)	Sharing of agenda of regional organizations (in %)	Sharing from other sources (in %)
Central Bohemian	20	65.0	30.0	5.0
South Bohemian	9	88.9	0.0	11.1
Vysočina	10	100.0	0.0	0.0
Hradec Králové	8	100.0	0.0	0.0
Karlovy Vary	17	100.0	0.0	0.0
Liberec	15	73.3	0.0	26.7
Moravian-Silesian	10	100.0	0.0	0.0
Olomouc	19	36.8	0.0	63.2
Pardubice	10	50.0	20.0	30.0
Plzeň	9	77.8	0.0	22.2
South Moravian	5	100.0	0.0	0.0
Ústí	4	75.0	25.0	0.0
Zlín	1	100.0	0.0	0.0

4.4 Presence

Regional authorities are present on the network when they are keeping contact with their citizens which can be expressed in the number of posts published. The regions published more than 10 posts per seven-day period in average. The most active were Central Bohemian, Liberec, and Olomouc regions with about 20 posts. The least active was Zlín region with only one post in last seven days.

Number of friends ranged from 862 in Zlín region up to 8,251 friends of Central Bohemian regional authority Facebook presentation. Interestingly, an official presentation of Vysočina region reached even higher number of friends – 9,913. Number of followers ranged in a very similarly to the number of friends. Complete results are summarized in Table 5.

Table 5. Posts, friends and followers on the Facebook page of the Regional authority

Regional Authority	Number of posts	Number of friends	Number of followers
Central Bohemian	20	8251	8258
South Bohemian	9	1080	1092
Vysočina	10	3370 (9913*)	3378 (9905*)
Hradec Králové	8	7664	7692

Karlovy Vary	17	3822	3789
Liberec	19	4876	4746
Moravian-Silesian	10	8089	8148
Olomouc	19	1898	1890
Pardubice	10	6640	6623
Plzeň	9	2228	2221
South Moravian	5	2343	2386
Ústí	4	3935	3969
Zlín	1	862	889

Note: Unofficial Facebook page

4.5 Reputation

Reputation of regional authorities can be expressed in several factors. Some of them as number of friends were already mentioned above in the text. The others as number of likes (or structure of reactions in general) could be a subject for another analysis. Therefore, regarding the reputation, the study focuses only on review score, which is given by page visitors that are, probably, also a region inhabitants.

An option to review Facebook page (or the region as it is) by the visitors was enabled by ten regions out of thirteen. A review score ranged from 3.9 in South Moravian region up to 4.9 in Vysočina region and 5.0 in South Bohemian region (only two reviews taken). Complete results are summarized in Table 6.

Table 6. Number of reviews and review score of Facebook pages of Regional authorities.

Regional Authority	Number of reviews	Review score
Central Bohemian	n/a	n/a
South Bohemian	2	5.0
Vysočina	14	4.9
Hradec Králové	26	4.8
Karlovy Vary	7	4.7
Liberec	7	4.7
Moravian-Silesian	41	4.7
Olomouc	10	4.2
Pardubice	n/a	n/a
Plzeň	14	4.3
South Moravian	15	3.9
Ústí	24	4.4
Zlín	n/a	n/a

5 Discussion and Conclusion

Research of regional authorities´ Facebook pages revealed several interesting insights of current behavior of regions on the social networks:

- Regions mostly actively use their Facebook pages for public marketing, all of them have established a Facebook page. However, no regions have their Facebook presentation verified. Moreover, ability to search such regional page is limited on the network itself despite of the fact that 11 regions from 13 referred its Facebook page on their website.
- Regions usually react on the citizens requests promptly. 30 % of them react even in a few minutes, another almost 40 % in one hour or in one day.
- Regions publish mainly posts associated directly with the regional authority: it is either own text content (mainly pictures), or sharing regional magazines, records, or broadcasting.
- Reputation of regions can be considered as good one. It ranged from 3.9 to 5.0 with an average score of 4.6. However, three regional disabled the option to review the reputation, which could affect the final score negatively.

In general, there were not important differences among regions´ activity found, with only the exception of Zlín region (lower number of posts as well as less friends and followers).

Despite the fact this study provides many interesting insights into the current use of social media for public marketing there are still many areas for consequent research. How the regions communicate with the visitors? How do they create a relationship with them? How they work with negative/positive comments? What is the structure of posts published? And many other issues.

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Educational Potential and the Situation of the Youth on the Labour Market in the European Union Regions

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Abstract. The study is focused on the relationship between educational potential and labor market. Educational potential is defined as the resource of knowledge and skills in the region expressed by the level of formal education, the scientific potential, and the tendency to continue to improve qualifications. The labour market is represented by the young people, who enter the labour market after obtaining formal education. The purpose of the study is to assess the spatial autocorrelation of educational potential and the situation of young people in the cross-section of the NUTS-2 European Union regions in 2016. The analytical tools were spatial statistics (local and global I Moran).

The obtained results indicate strong tendency for cluster development. This was very well visible in case of the long life learning indicator and employment rate of young people neither in education nor training. The lowest tendency for clustering was observed in case of early leavers form education and training. Furthermore the results suggest the significance of education for the development of labour market for young people.

Keywords: Educational Potential, Spatial Statistics, EU NUTS-2 Regions.

1 Introduction

The European countries and regions face numerous developmental challenges, covering environmental, social and economic spheres. Among them social cohesion and smart growth are listed, based on knowledge, innovation and skilled workers. It is owing to high quality human capital that achieving the goal of constructing a smart growth is possible, the development of which will result in improved competitiveness of the EU countries and the increased number of attractive workplaces. The development of high quality human capital, capable of creating innovations represents a capital-intensive and time-consuming process that should be already strengthened at the level of education.

Among the basic indicators to monitor the EUROPE 2020 Strategy there are two concerning education, which confirms the importance of this phenomenon for the development of countries. Among the phenomena selected for monitoring at the EU level the following are included: the share of early school leavers to be reduced under 10% and at least 40% of 30 to 34 years old to have completed tertiary or equivalent education. These values differ in the cross-section of particular countries and in case of youth dropping out of school prematurely from 4%-4.5% (Croatia, Poland) to 16% (Italy).

In the literature a differed aspects of education are underscored. Education could be consider as a factor influencing cultural and social change, level of economic and innovativeness development, as well as a quality of social and human capital.

Education is often considered as a proxy for the human capital accumulation in the economic growth model. The investigation of the relationship between education and economic growth started in 1960s and has become one of the mainstream of research in economics. Becker [1] takes into account varying cultures and political regimes, indicates that economic earnings tend to be positively correlated to education and skill level. Additionally, his studies indicate an inverse correlation between education and unemployment. Also Selowski [10] concentrate upon education as one means of improving the labor input. He tries to extend as precisely as possible this aspect of the human capital hypothesis within the aggregate production function approach to growth. His research focused on the observation the basis of educational capital postulate is an empirical one arising from two observations: there is a positive relation between the productivity of labor and the amount of education embodied in it, and countries spend relatively a big part of their resources on education. Oancea, Pospíšil, Drăgoescu [9] has investigated the causality and the long-run relationship between economic growth and higher education in the Czech Republic and Romania in the period of 1980–2013. The results showed that higher education has an important positive effect on economic growth, although the impact level of the higher education on economic growth is different in the two countries.

Some results of the research suggested that the education level is perceived as a precondition for entering the labor market. According to evaluation of employment policy by important institutional players in two Czech regions (the Ústecký Region and the Jihočeský Region), presented by Novák, Vokoun, Stellner, Vochozka [8], the unemployed usually have no previous job experience, completed only primary education and are not willing to travel to work. The pressing problem is also the quality of education and the generous social benefits. The author underline that all the institutional players stress the need for appropriate education, which is problematic.

Investigating the educational potential and its link with the labor market attention should be paid to the possible mismatches. The job mismatches can be define as the over or under education (over-education, describes the extent to which individuals possess a level of education in excess of that required in their specific job), alternatively as the difference between the field of study of graduates and the actual demand on the labour market (skill mismatch). This problem was discussed among others by Maršíková., Urbánek [6], Chevalier, Lindley [2].

Considering the job and skills mismatches also the spatial mismatches can be analysed. Spatial mismatches occur when the amount of human capital, presenting a certain educational potential is distributed in space differently than the demand for skilled workers. Equalling of such mismatches requires educational policy changes in a given region (matching possible over a long period of time) or workforce relocation between regions, which is connected with migration processes (matching possible in a short period of time).

In the hereby paper educational potential is understood as the resource of knowledge and skills in a region. Educational potential is measured by the level of formal education, the scientific capital represented by the number of scientists and engineers and the tendency to improve qualifications (trainings). The conducted analysis highlights the participation of people with the highest level of education and specialized qualifications, the tendency for continuous improvement of their qualifications, and the scale of early leavers of the education process. The research was based on the assumption that the regional educational potential depends on the people with the highest and the lowest qualifications.

At this background the situation of young people, who enter the labour market after obtaining formal education was presented. Both the percentage of unemployed and those professionally active were used to characterise the situation of young people on the labour market. The situation of people on the labour market is considered one of the priority objectives of the EU policy.

The purpose of the study is to assess the spatial distribution of educational potential and the situation of young people in the cross-section of the NUTS-2 European Union regions. The study covered 265 European Union regions (NUTS-2) in 2016. The research tool used in the study was local and global *I* Moran spatial statistics, which allowed answering the research question whether educational potential or situation of youth on the labour market indicates the regional tendency for clustering of the regions characterised by a similar situation or rather creating the so-called hot spots, i.e. regions presenting a different situation than their immediate milieu. The development of regional clusters, characterised by an expected and positive situation should be considered particularly beneficial and conductive for the creation of centres with high education potential, which can benefit from their own or their milieu resources. The clusters of regions characterised by low educational potential present a challenge for the regional socio-economic policy and require undertaking actions extending beyond the scale of one region. These activities should aim at introducing structural changes in the area of education and economy, focused on the labour market development for the highly qualified individuals.

2 The background information and methodology of the research

The identification of educational potential in the European Union regions was conducted using the below presented indicators:

- *SE* – % scientists and engineers of active population,
- *ETER* – population with tertiary education (levels 5-8) (%),
- *LL* – participation rate in education and training (last 4 weeks) of people aged 25-64 (%),
- *EL* – early leavers from education and training aged 18-24 (%),

and situation of youth at the labour market was described by:

- *YUEN* – youth aged 18-24 neither in employment nor in formal or non-formal education and training (%),
- *YEMPL* – employment rates of young people aged 15-34 neither in education nor training (%).

The statistical information, required for the empirical research, was obtained based on Eurostat database. The study covered 265 European Union regions selected based on NUTS 2 (*The Nomenclature of Territorial Units for Statistics*) classification. Due to the unavailability of statistical data the analysis did not cover 11 NUTS 2 regions.

The following research procedure were applied:

- The identification of educational potential indicators.
- The identification of indicators describing the situation of the youth at the labour market.
- The identification of spatial autocorrelation of educational potential and youth at the labour market indicators using Moran's I Global.
- The identification of spatial autocorrelation of educational potential and youth at the labour market indicators using Moran's Local Statistics.

Moran's *I* Global and Moran's Local Statistics were used in order to identify spatial autocorrelation. Moran's Global *I* describes the tendency across subjects to form groups of counties – clusters – characterised by a similar (favourable or unfavourable) situation [3, 7, 11, 12]. Moran's Local Statistics was used to identify clusters of units with extremely different situation from the neighbouring units (*hotspots*) and also clusters with similar values of the phenomenon. It was crucial to define the spatial dependence pattern and, as a result, the distance matrix. For this analysis the standardised weight matrix was applied with the first-order neighbors. R CRAN program was used to perform calculations [4, 5].

3 Empirical analysis results

The results of spatial autocorrelation analysis indicate the tendency towards development of the groups of regions characterised by a similar level of educational potential (tab. 1). Positive values of Moran's I Global of approx. 0,5 indicate strong tendencies for cluster development.

Having assessed the spatial distribution of identified spatial clusters for the particular measures of educational potential and the situation of youth at the local market a certain pattern appears, which indicates either strong or weak position of the selected European Union regions. The spatial distribution of particular variable values and the respective Moran's local statistics are presented on fig. 1-6. The presentation of the results includes the distribution of the phenomenon on the cartogram, which allows the observation of spatial differentiation and the cartogram with the values of local *I* Moran's statistics showing the groups of regions for which the statistically significant spatial relationship was confirmed at the significance level of 0.05.

Table 1. Values of Moran's I Global for educational potential indicators and situation of young people at the labour market in 2016.

***I* Moran (Global) year: 2016**					
SE	EL	LL	ETER	YEMPL	YUEN
0.5678	0.4882	0.8052	0.5896	0.6250	0.5153

Scientists and engineers as percentage of active population (SE) (fig. 1): NUTS-2 EU regions show a clear tendency towards developing groups. However, only in two thirds cases the grouping covers regions characterized by a favourable situation, i.e. high percentage of human resources for science and technology (HRST), which refers to regions in the northern EU part: a large group of British regions, southern part of Sweden and the third group of Belgian and Dutch regions.

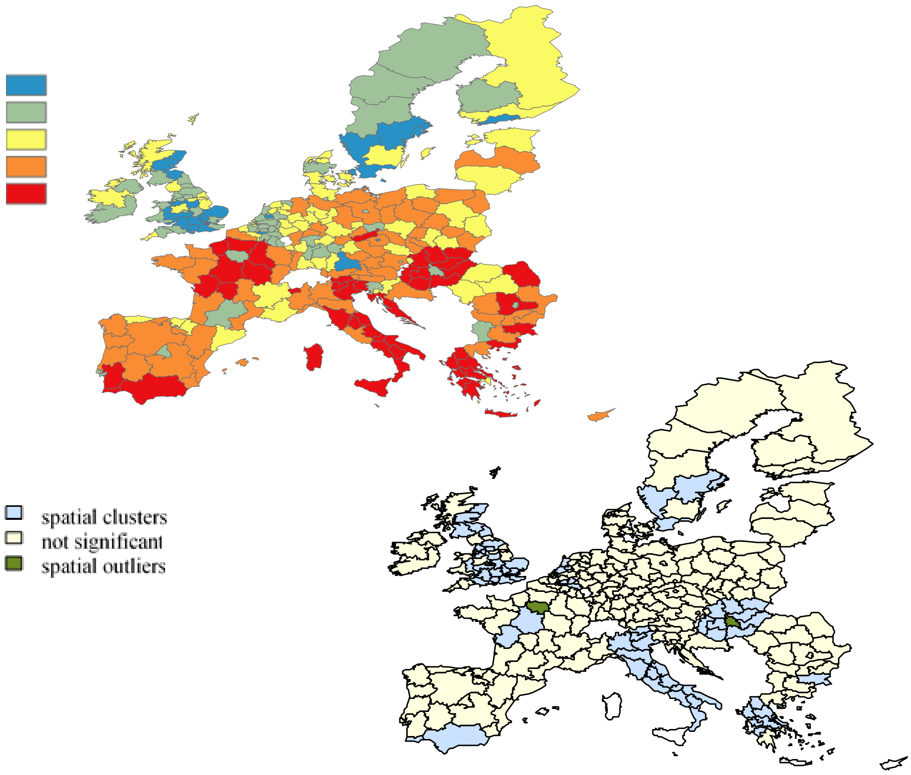

Fig. 1. Spatial distribution of Moran's local statistics (bottom) and clusters (upper) of NUTS-2 EU regions for the SE in 2016.

The other 6 clusters are created by regions featuring low human capital measured by SE, i.e.: (1) Slovak and Hungarian regions concentrated around the Hungarian region of Közép-Magyarország, which is a spatial outlier, (2) a small cluster of Bulgarian regions, (3) a very large group of regions in the tourist southern Greece, (4) in southern Italy, (5) in the southern part of Portuguese and Spanish border and (6) the region of Île de France to the east of the French capital, which just like the Hungarian Közép-Magyarország is a spatial outlier.In case of the regions presenting low educational potential, however clustered around the ones with high potential (e.g. Île de France, Közép-Magyarország), we can talk about the concentration of scientific activity in the centre, which can, to some extent, neutralise low scientific potential of the neighbouring regions.

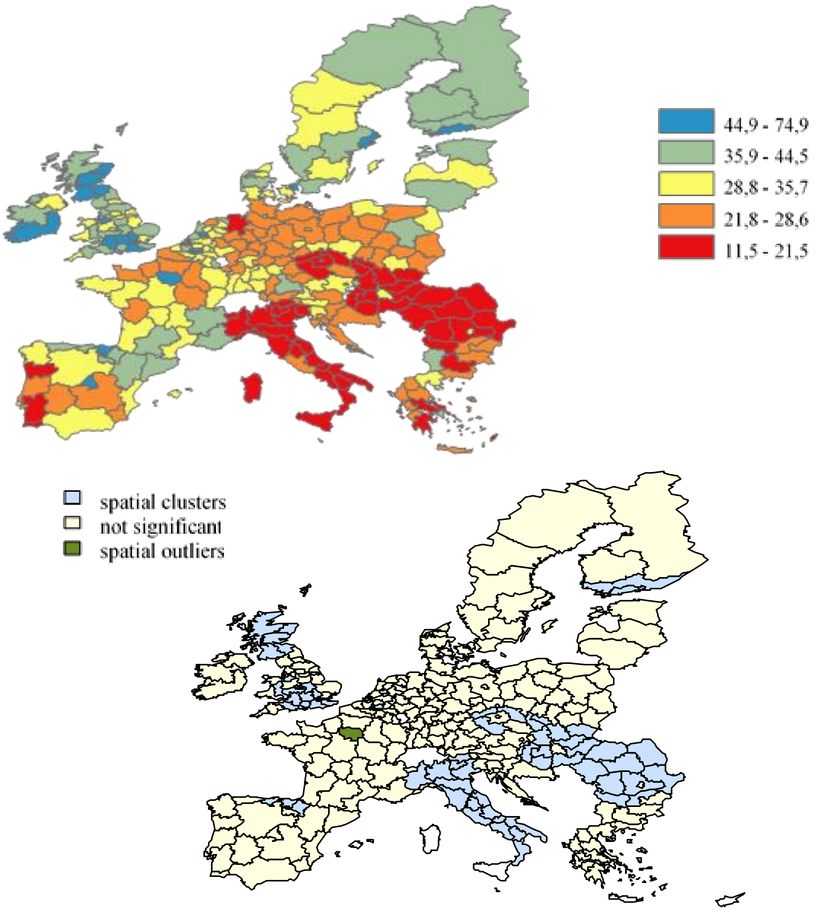

Fig. 2. Spatial distribution of Moran's local statistics (bottom) and clusters (upper) of NUTS-2 EU regions for the ETER in 2016.

The structure of population aged 25-64 by educational attainment level (tertiary education (levels 5-8)) (ETER): the level of population education is important from the perspective of strengthening regional smart specializations based on innovative solutions, knowledge and modern technology achievements. In case of this phenomenon the strong clustering tendency is presented by the regions characterised by a particularly low share of tertiary education graduates. Less than 20% population presenting tertiary education level lived in the regions creating clusters in the area of Italy, the Czech Republic, Slovakia, Hungary, Bulgaria and Romania. The most favourable situation, from the perspective of tendency towards creating regional clusters and characterised by the high level of population education (tertiary education) was recorded in British regions, in north-eastern Spain and in the south of Finland. In some of these regions the share of tertiary education graduates reached almost 75%.

Participation rate in education and training (LL): the inclination towards upgrading vocational qualifications shows very strong tendency towards creating spatial clusters which overlap the administrative borders of particular countries. The population of France, Denmark, Sweden, Finland, Belgium and the Netherlands are most willing to upgrade their qualifications. In these regions the percentage of population improving qualifications ranged from 17% to 31%.

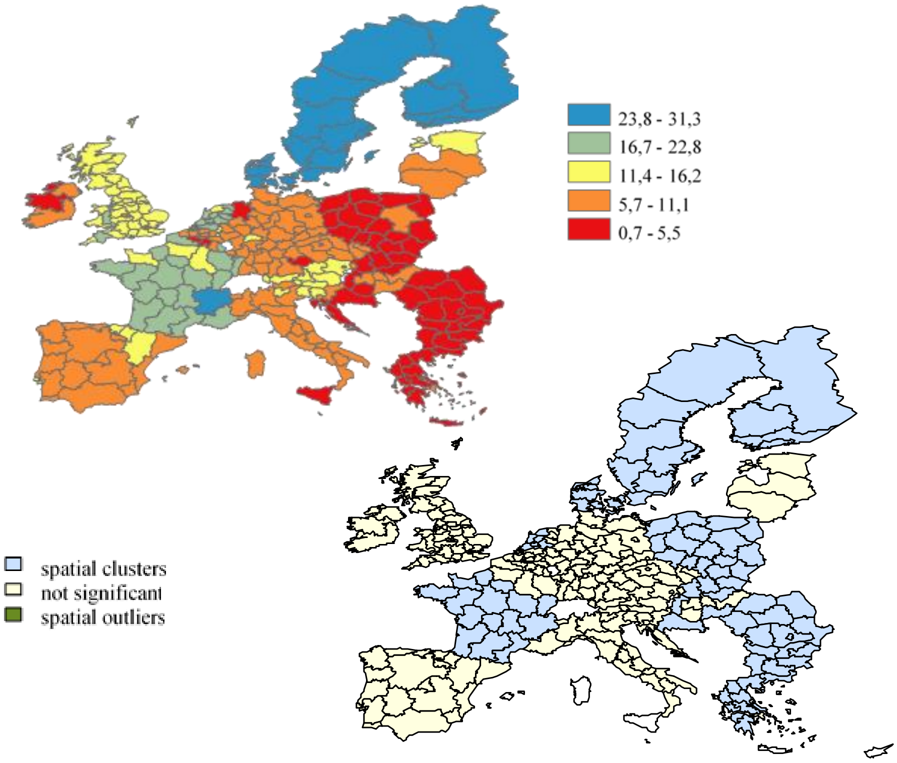

Fig. 3. Spatial distribution of Moran’s local statistics (bottom) and clusters (upper) of NUTS-2 EU regions for the LL in 2016.

The smallest number of population participates in life-long learning in the area of Poland, Slovakia, Hungary, Croatia, Bulgaria, Romania and Greece. In most regions of these countries the respective percentage is less than 5% of population.

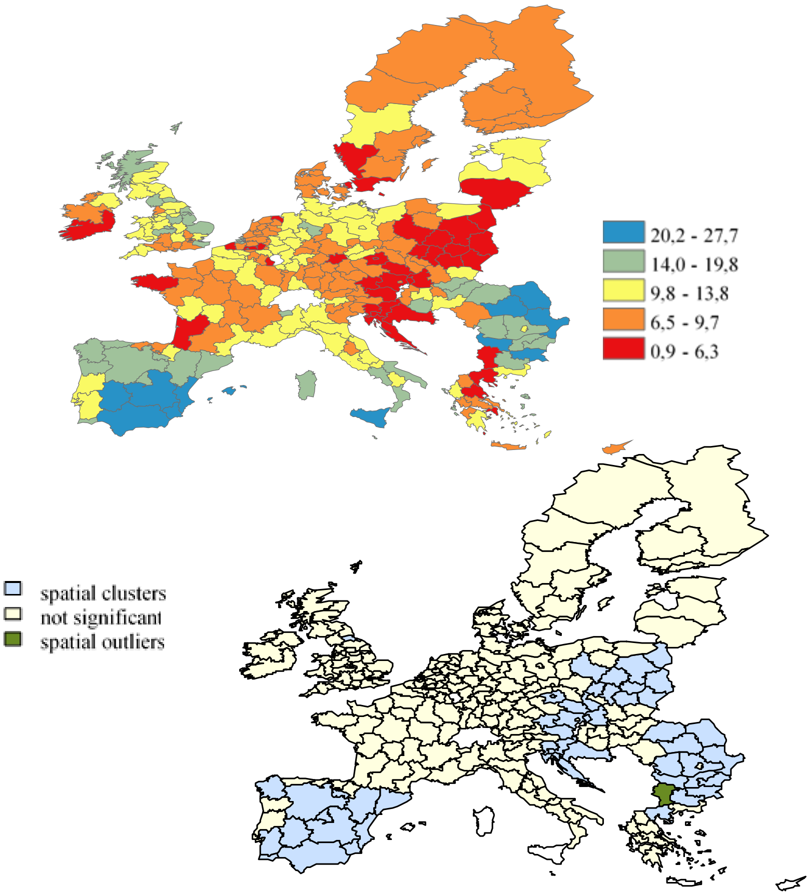

Fig. 4. Spatial distribution of Moran's local statistics (bottom) and clusters (upper) of NUTS-2 EU regions for the EL in 2016.

Early leavers from education and training (EL): in case of people aged 18-24 who leave education early two clusters presenting a very unfavourable situation are visible, where approx. 20% - 30% of people represent early leavers. These two spatial clusters cover (1) Romanian and Bulgarian regions and also (2) Spanish and Portuguese regions. A large cluster, characterised by a very favourable situation, is created by the regions located in the belt of Polish, Czech, Austrian, Slovenian and Croatian regions. Moreover, a small cluster in the area of Great Britain can be identified, around the region of Tees Valley and Durham.

Young people neither in employment nor in education and training (aged 18 - 24) (YUEN): The situation of young people aged 15-24 who have left formal education with at most lower secondary education and who are not employed nor engaged in any kind of further education or training in the European Union is spatially highly diversified. The most favourable situation is characteristic for middle areas of the Netherlands, Belgium, Germany and the Czech Republic. In turn, in the area of 3 southern European clusters (southern Spain, Italy and in the area of Greece, Romania and Bulgaria) the percentage of young people neither in employment nor in education and training frequently exceeds 20% reaching even 45%.

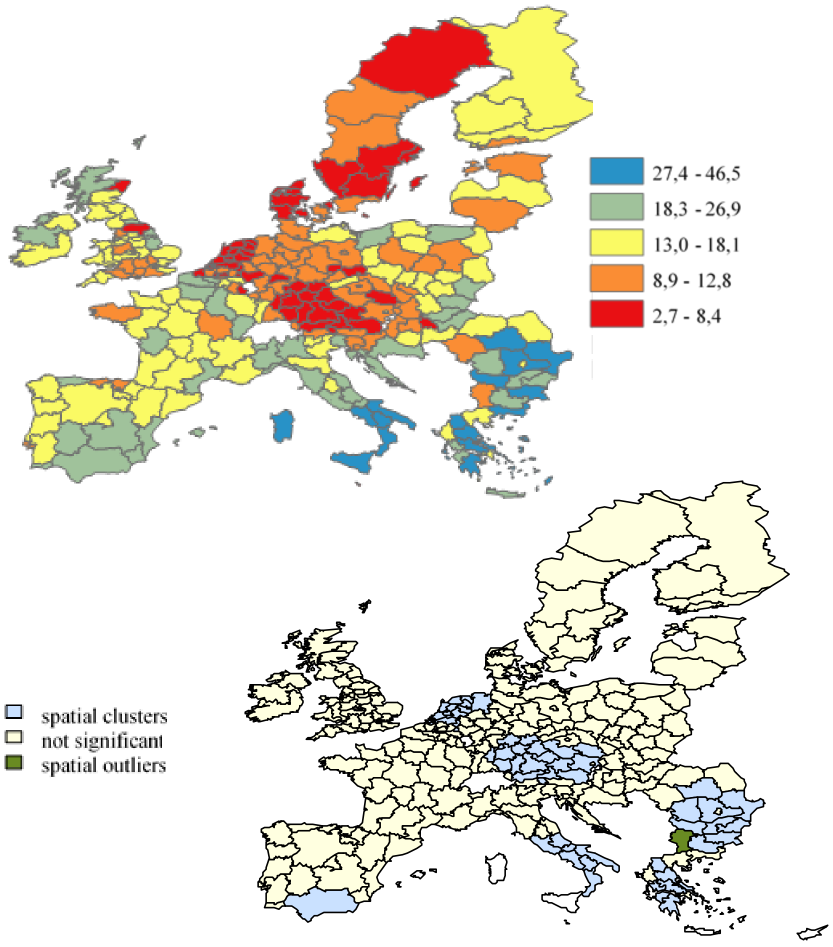

Fig. 5. Spatial distribution of Moran's local statistics (bottom) and clusters (upper) of NUTS-2 EU regions for the YUEN in 2016.

Similar conclusions can be drawn from the distribution of Moran's local statistics for the employment rates of young people neither in education nor training (aged 15-34). The difference is that there is an additional group of regions in southern Sweden characterised by a favourable situation.

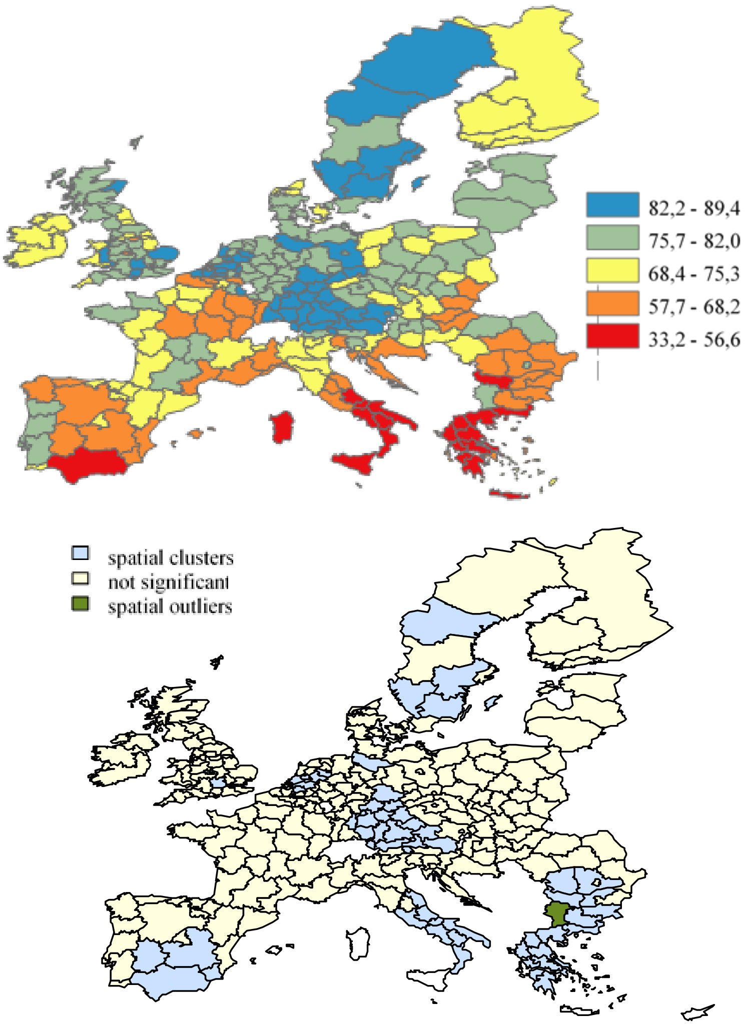

Fig. 6. Spatial distribution of Moran's local statistics (bottom) and clusters (upper) of NUTS-2 EU regions for the YEMPL in 2016.

4 Summary

The obtained research results facilitate defining the specific nature of regional groups identified with regard to indicators of educational potential and the situation of youth at the labour market.

Positive values of Moran's *I* Global indicate strong tendencies for cluster development, primarily in the participation rate in education and training and employment rates of young people neither in education nor training. The lower tendency for clustering was observed in case of early leavers form education and training.

The analysis of spatial autocorrelation of educational potential shows the development of clusters characterised by high or low level of its particular components. It seems, however, that the grouping tendency of regions featuring a favourable situation is smaller. More numerous clusters are created by the regions presenting an unfavourable situation.

The analysis shows a well-developed educational potential of the NUTS-2 European regions located in the northern and central part of Europe. The best situation is characteristic for the Scandinavian and British regions, whereas much worse is recorded in the southern ones, primarily Italian (south of the country), Greek, Bulgarian, Romanian and Spanish regions. Low educational potential was accompanied by a relatively weaker position of young people on the labour market, manifested by a higher unemployment rate along with low employment rates for those who did not continue their education.

The obtained results confirm the significance of education for the development of labour market for young people.

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Application of Modern Internet Tools in Business Marketing

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Abstract. The major objective of the paper is to examine the correlation between companies and brands with modern marketing and online promotion through the use of new opportunities and tools available on internet. At this moment we live in times when the fastest expanding and most important online tool are the social media sites. The popularity of those tools developed so quickly that they have not been yet well-defined although they are well known to our society and are used frequently. Often, all modern Internet tools are categorized as web 2.0 which defines all websites created after 2001 and which are focused on generating content created by users of this website. The paper is focused on new tools, ideas and prototypes that are available on the Internet and are used to promote company's businesses as well as improve its marketing strategies. The paper presents two case – studies of the companies which use internet tools for their promotion as well as the evaluation of their application.

Keywords: Internet Marketing, Social Media, Business.

1 Internet tools - introduction

Internet has become one of the most important tools for marketing and promotion of companies. Capabilities provided by Internet used in communication with customer are presently strongly promoted. The strength of the Internet is its diversity and rapid continuous development [9].

At this moment the fastest expanding and most important online tool are social media sites [1, 10]. The popularity of those tools developed so quickly that there is no single definition of that issue even if it's so well known to our society and used frequently [29]. Often, all modern Internet tools are categorized as web 2.0 which defines all websites created after 2001 and which are focused on generating content created by users of this website [3, 27].

Expression social media has many definitions but they all rely on the ability to create multimedia content such as texts, pictures, videos for personal use but also for sharing it to friends and other users of those social media websites [19].

The previous sentence fits well to the concept of UGC (user generated content). UGC is extension of WEB 2.0, which can be understood as technological and ideological basis and UGC as the methods of the various ways to use social media sites [13]. Shared content between users which can be considered as generated by the end user if it fulfils strict conditions defined by OECD (Organization for Economic Co-operation and Development): [24]

- Content created by the user is available to the public through internet (on the public website or social networking site available for a selected group of people);
- Content is at least partly the result of creative work of the user (content may only be processed, but in such a way as to be representative of the new value, e.g. a posting on YouTube a fragment of a television program does not involve the creation of new value for their contents);
- In most cases, content creation does not take place within the professional work (motivation is not the expectation of remuneration, profit financial, but more important is the contact with other users, the need for expression or desire to generate interest).

Modern Internet tools of web 2.0, due to its large variety can be divided into many categories such as:

- Social media websites and apps e.g.: Facebook, Twitter, Google+, Instagram,
- Snapchat
- Professional network sites e.g.: LinkedIn, BranchOut, GoldenLine
- Websites with content and information e.g.: Youtube, Reddit
- Internet community forums e.g.: Gaia online, 4Chan
- Blogs e.g.: Blogger, WordPress, Tumblr
- Streaming sites e.g.: Twitch, Youtube streaming, Justin.TV, Hitbox
- Virtual social worlds e.g.: Second Life

Some of those websites can be divided for even more categories such as Twitter or Blip can be named as micro blogs because they have restriction for number of characters in posts. Almost all of those websites listed above are used for marketing and promotion of companies some of them allow to create profile of company which are used as communication tool with customer and has many other useful options to improve company marketing and some are just used for advertising.

The number of social media users is still growing, and it’s not a surprise, there are still areas in the world where technology is not sufficiently developed and such places are constantly increasing the number of people using the benefits of the internet [15]. According to data provided by We Are Social and Hootsuite, the number of active users is about 2.8 billion, up 21% over the previous year. Most active in the social media is used in South America, North America and Eastern Asia. In terms of countries, the United Arab Emirates is the leading country where the percentage of people using social media regularly is 99%, South Korea is second with 83%. In Poland, it is 39% which is about the world average [14]. According to GlobalWebIndex data, average social media users spend 2 hours and 19 minutes a day, and the most commonly used platforms are Facebook, YouTube and Qzone (Chinese equivalent of Facebook) [14].

The choice of the paper's topic was justified by its actuality. The research method used in it is a critical analysis of the literature and internet resources as well as the case study. Case study is a method used in the study of poorly researched phenomena so the authors considered descriptive approach as appropriate followed by the deductive approach.

2 Ways of using modern internet tools by companies

Nowadays, consumers want to be well informed about the world around them, but it is not enough for them to receive provided information once in a while - it is important now to get information on the topics they are interested in on a regular basis. Technological advances and globalization have changed the way people get information from the public, and more often we hear that traditional media such as newspapers, television and radio have been replaced by people by the Internet and in particular by social media [30, 21].

To meet the expectations of consumers, companies have decided to appear on major social media sites to promote their business and to establish communication with their customers or prospective buyers. Promotion and marketing have consistently taken root in social media despite the numerous disadvantages, these sites still offer enormous opportunities for businesses and nowadays every major business must exist there.

In times when society is changing dynamically, the use of old methods of communication is not only ineffective, but it can also come with complete rejection of the content and values that we pass on. Looking at this aspect from the perspective of public relations, where until recently, the role of the Internet was not recognized, there were fears that Public Relations might soon be forgotten for being out dated and ineffective [6].

The main reason why Public Relations has returned to grace is the ability to have unrestricted access to up-to-date information at any time of the day or night anywhere on earth and what is an important distinguishing feature of the internet from other media communication opportunities with recipients in the form of dialogue. This form of communication gives the company incredible ability to transmit information, advertise and make direct contact with the customer. This dialogue today seems to be one of the most important solutions that the Internet provides, especially in the context of the development and strong growth of social networking sites, where you can easily read the opinions of other people on the subject share your insights and get feedback on them. Using these pages gives you another possibility, namely the word of mouth, which means that Internet users refer to certain products, companies and services and send interesting information to friends and anyone who may be interested in it. All this gives you new opportunities and a field to communicate the business world with a direct recipient. Therefore, public relations, whose basis of functioning is just shaping relations through communication, has again returned to grace. With a modern online tool such as social media, direct dialogue between the business and the customer has a chance to achieve a completely new dimension [6].

In communication with consumers in public relations marketing, companies can act proactively, posting content on their social media profiles, and reactively – responding for comments, remarks or messages of buyers. Numerous, accessible social media allow organizations in direct contact with consumers to present their business, offer it, engage in relationships with customers, and shape the company's image and products [31].

Creating own business profiles enables to [31]:

- reach out to a wider audience,
- fast, two-way communication with consumers,
- Reduce spending costs on other promotional tools.

The advantages of social media in marketing public relations are undisputed. Companies are quickly recognizing and increasingly emphasizing their presence on social networking sites. However, creating business profiles in social media requires a constant commitment to dialogue with the audience. What is more, the core of social networking sites is the active participation of network users, so it is necessary to take action to ensure that consumers want to engage in business relationships [2].

The most important rules of communication in social media [31]:

- Understand difference between a private profile and a public profile - It is crucial to pay attention to the nature and context of photos or content posted on website.
- Define the audience to which the company wants to reach.
- Employ the right person to manage company profile in social media website - communication in social media speaks volumes about the approach to business and customers. It is important that published content is best written by one or two people. Communication is coherent, in one style. It is important to share the responsibilities and tasks of those involved in social media.
- Monitor business activities on the web – by monitoring communication in social media, we can monitor and evaluate online activities on-the-go. Monitoring also allows evaluating what goes according to plan, whether the specific goals of business are being met, what needs to be improved, and what needs to be repeated and stopped.

Social media is commonly used to communicate with consumers mostly for marketing purposes. The specific character of these media gives companies unprecedented opportunities for direct dialogue with their customers. As indicated by widely available researches, public relations activities should be explained to consumers and buyers that they are the source of positive feedback for other network users. Social media can thus play a dual role in the communication process: they become a channel to reach targeted groups and at the same time they are a platform for sharing knowledge, experience and consumer opinions. According to both purchasers and journalists, consumer feedback is considered more reliable than the message conveyed directly from the company [31].

Communication with the use of social media enables organizations to build relationships with consumers, create the right image of brands or products, and provides the opportunity for quick dialogue at relatively low cost. It should be stressed, however, that simultaneously communication with the expected effects requires discerning the specifics of social networking sites, skillful use (both technical and substantive) and constant employee engagement. Social media users tend to eagerly disclose and comment on business mistakes, which in extreme cases can lead to serious emergencies [31]. Apart from communication and marketing on social media websites, internet gives us the opportunity to use many other internet channels for advertising purposes. Currently the most important methods of promotion are divided into [17]:

- SEM – Search Engine Marketing
- SEO – Search Engine Optimization
- WSO – Website Optimization

The other important concepts are models of online advertising billing [20]:

- PPC/CPC – Pay per cost/Cost per Click
- CPA - Cost Per Action
- CPM – Cost Per Mile

Search Engine Marketing, that is all that is associated with internet search engine marketing. This concept contains both SEO and WSO and dozens of others terms, service and product names. It serves to improve the user's access to the website by increasing its visibility in the search engines [8].

Search Engine Optimization - It's optimization for search engines or simply positioning. The purpose of SEO is to increase and improve the quality of traffic that comes from organic search results. Organic search results are all the results that most closely match the phrase entered by the user in the search box [17].

Website optimization - involves applying a series of activities directly to the on-page website itself. This is about modifying content as well as applying changes to the code. It is used only for private websites [17].

Models of online advertising billing are [20]:

- CPM - "Per mile" means "per thousand". One thousand is to represent a large number of views or advertisements. The principal of the promotion pays for placing the advertisement for specific visitors of the website.
- CPA - Is a common strategy in the affiliate marketing that is based on effects. The advertiser pays for the number of active users who have taken the following steps: purchase, sign up, fill the survey or read specific text.
- PPC/CPC - The advertiser pays for each click on the hyperlink which redirect user to another website. This method allows refining search criteria as well as receiving sales data.

There are many other methods of promotion but most of them are based on advertising business on some websites, currently social media sites are the most popular websites used for promotion and marketing purposes. One of the first methods that is still used today is e-mail marketing. It is a form of direct marketing, which uses e-mails as a communication tool. The basic tasks of email marketing are: building consumer loyalty, creating specific relationships with customers, building the desired image, selling [18].

3 Examples of effective use of internet tools

The first case presented here is the huge unplanned success of the Polish brand Cacao DecoMorreno from Maspex Company, which is an example of viral marketing. Viral marketing is about to infect information about company, products, services, so that it spreads like a virus. This is a great and cheap mean of promotion. Information is not associated with advertising because the internet user decides whether to read it or not. Usually he gets her from a friend. It's a more reliable source than the company ad [28].

The popularity of cacao DecoMorreno started on the group: “500+, Becikowe, MOPS, Alimenty – Pytania i Odpowiedzi“ on Facebook. One of the users of this group wrote a post with a picture of Cacao DecoMorreno and asked: “Hello I have a question does anyone knows more books of this author”. Fate wanted someone made screenshot, and this quickly circulated social media websites to become a viral [7, 23]. The description on the cocoa pack was considered to be: Author: Cacao DecoMorreno, Title: “Najwyższa Jakość”, Publishing house: “Extra Ciemne”.

To this day it is not known whether this event was set by the company or it was just a joke. The company itself claims that it did not take part in this event and that it is a very successful joke made by some outsider user. The joke went so far that the next day began to appear a lot of reviews of the book on the popular site for appreciating literature (lubimyczytac.pl) on which DecoMorreno quickly became one of the best rated books on the website.

Every business would wish for such advertising, and this was created entirely spontaneously. Internets users started to comment, play, joke and talk about DecoMorreno. They throw photos of the products of this brand, buy them and review them at home. The person taking care of Facebook’s page DecoMorreno also was up to the task. They started talk to fans, make fun and improvise by commenting on profiles of other famous people and brands that also joined the DecoMorreno viral. They even decided to prepare few contests for Cacao fans [22]. Although the company probably has not recorded a steady increase in product sales but only a temporary boom, it certainly gained a lot of likeness in the eyes of all Internet users [12].

Another example is Red Bull which is an Austrian brand that sells 2 billion cans of non-alcoholic stimulant a year. It was established in 1962, but in Poland it appeared in 1995. The company has taken a very interesting strategy, promoting it as being associated with extreme sports, such as car racing, slagging and ski jumping. The brand sponsors many clubs (e.g. The Austrian Bundesliga Red Bull Salzburg and the American MLS, Red Bull New York). In addition, the company has acquired rights to three names of sports facilities - the Red Bull Arena. All these activities arouse the associations and positive feelings among sports fans [26]. The company in the past were sponsoring and organizing numerous extreme sports events e.g. jumping through the Corinthian Isthmus, diving in Voullagmeni Lake or many Formula 1 races. This time, Red Bull Company and Felix Baumgartner's team (Team of a man who, as part of the Red Bull Stratos missions, jumped from a height of 39 kilometres, almost from the "edge of the cosmos") [16] reached the new level of marketing [11].

On Sunday evening of 14 October 2012, all biggest TV stations and radio stations around the world have been talking about Red Bull Stratos. Felix Baumgartner made a jump from a height of about 39 km and fell freely for 4 minutes and 22 seconds, beating the speed of sound. The required height balloons rose 2 h and 20 min. The Austrian managed to beat three records: the highest balloon flight of 39,045 m, the highest parachute jump and the highest free flight speed [25].

Besides traditional media, the space jump was also invading whole internet and social media websites. Red Bull managed to set record of YouTube viewership: the peak of live streaming on the Red Bull channel was viewed by nearly 8 million Internet users, a 5-day jump relation was viewed over 20 million times. The social media websites about this was liked so far by nearly 850,000 people [25]. Of course, at the same time this event was broadcast on many TVs, on blogs, social networking sites, etc. The Austrian a few moments after the leap took over all the main pages of information portals. The whole world cheered Felix, who for couple of days became the bravest and most popular man in the world [26].

With this marketing campaign Red Bull sets a new standard: in the case of Felix jump, a lot could go wrong, the risk was enormous. Yet the danger was accepted. But it paid off and in opinions of many marketing experts Red Bull has just set the direction of advertising campaigns of the 21st century, campaigns that will be built on the basis of innovative technology and viral marketing. It was not about media planning but about the emotions that winded up discussions. And of course the development of technology that has allowed the whole world to watch this “Space Jump” with bated breath [25].

Despite the fact that Red Bull has always managed to excel in social media (they are currently the number one beverage on Facebook according to the Unmetric Score), Space Jump has recorded a huge increase in the popularity of Red Bull pages on social media websites. Especially on Facebook and Twitter, where people were discussing event and asking questions about it [4].

The “Space Jump” was talked about by people, media, and even brands. Kit Kat brand owned by Nestle Company decided to use the Red Bull Stratos event for advertising purposes of their by posting image on their Facebook page with text: “It could be a long wait Felix… and their advertisement slogan: Have a break, have a Kit Kat” when the first jump was called off due to bad weather [5].

Kit Kat reacted dynamic enough to create own space launch video abut the first chocolate bar to be launched in to space. They succeeded in using the success of the red bull and created video received attention from the mainstream media, but not on the scale of Felix’s space jump. Even that, it still was the most popular video Kit Kat have ever done on YouTube [4].

This shows that viral marketing is often also used by other companies to get a bit of the popularity of viral event. Despite the high risk of the project, Red Bull's advertising campaign has paid financially and the company itself has gained a lot positive image which allowed the company to grow faster and conquer new markets.

4 Summary

The changing realities in online promotion and marketing forced investigation of internet user’s feedback to compare the expectations of customers with the efforts of companies in this field. Despite the fact that the internet is not a new invention, we are still encountering many new improved solutions to it. That is why Internet marketing is still improving and each company is using it in many other ways. It is true that it is most often used for advertising purposes and such are most often seen by internet users. But the great benefits of collaborative marketing with the internet are not recognized as much, and they are not just for businesses but for every person who spends time online.

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The Analysis of De Minimis Aid Granted in Poland in Years 2008-2015

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Abstract. When state provides state aid it interferes in the market mechanism. Providing support without any restrictions could lead to adverse changes in the market. De minimis aid is a type of support that is allowed under European law. De minimis support is given in small amounts, which results in negligible impact on competition. Monitoring de minimis aid is very important issue. This will allow to show us the main directions of the support, as well as changes in the allocation of support in different years. The main aim of the article is to make analysis of de minimis aid granted in Poland in years 2008-2014. The analysis covers the structure of granted aid and also an analysis of dynamics.

Keywords: State Aid, Poland, De Minimis Aid.

1 Introduction

State aid is a term introduced by the European Commission and regulated in Art. 107 paragraph 1 TFEU [3]. To the measure could be regarded as state aid under this article must be met including four conditions: intervention by the state or through state resources, the intervention gives the recipient an advantage on a selective basis, competition has been or may be distorted and the intervention is likely to affect trade between Member States.

In the article was made the analysis of the de minimis aid granted in the years 2008-2015. This analysis was carried out in relation to the total value of the aid, dynamics analysis of granted state aid, the forms in which this support was given, methods of financing aid and its destination.

2 Methods, literature overview

Contemporary economic reality is so complicated that it is difficult to imagine the functioning of the market mechanism in isolation from the state. One of the instruments through which the state can intervene in a market economy is state aid. In Europe the provision of subsidies and other forms of aids by the State or through State resources still form an accepted part, indeed often a central part, of economic policy, even in those countries most attached to the model of the free market. [1] It shall be considered part of the economic state intervention, which aims to stimulate positive economic developments or prevention of negative processes [7]. The concept of state aid is wider than a subsidy because it embraces not only positive benefits, such as subsidies themselves, but also interventions which, in various form, mitigate the charges which are normally included in the budget of the undertaking and which, without therefore being subsidies in the strict sense of the word are similar in character and same the same effect [19]. This aid can be considered as a tool in the hands of public authorities, which is used to achieve different objectives and tasks of social and economic policy. Governments grants state aid for many reasons: economic, social, political and strategic [2]. Despite the widespread occurrence the phenomenon of state aid there is no legal (normalized by law) the definition of that term. State aid policy is still changing. Public authorities find new methods of supporting entrepreneurs. So we still need to assess and re-interpret state aid rules [8]. State aid could be understood as one of the remaining difficulties in creating an integrated single market [10].

Issues concerning the admissibility of state aid are governed by Art. 107-109 Treaty of Functioning European Union [5]. Article 107 paragraph. 1 indicates only that „save as otherwise provided in the Treaties, any aid granted by a Member State or through state resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, in so far as it affects trade between Member States, be incompatible with the internal market". Analysis of the provisions of this article allows to conclude that it would be prohibited to provide aid if the conditions referred to therein are together fulfilled. For these circumstances include the transfer of state resources, obtaining economic benefits, the selective nature and occurrence of the effect on competition and trade.

Despite its distortive effects on competition, it has to be acknowledged that some state aid when granted digressively and limited in time, can contribute to stimulating certain activities or ease structural changes in the economy [9]. De minimis aid because of the low unit value, not are a threat to competition disruption to the market European Union. Aid of this kind does not constitute state aid within the meaning of Article 107 Paragraph 1 TFEU . Matters relating to de minimis aid are governed by the Council Regulation on the application of Articles 107 and 108 of the Treaty to de minimis aid [4]. According to this regulation:

- the total value of the de minimis rule for a beneficiary cannot exceed 200 thousand euro in the period of three years,
- support the entrepreneur cannot get threatened by the guidelines on State aid for rescuing and restructuring firms in difficulty ,
- aid must be "transparent", ie it must be possible to calculate the ex ante gross grant equivalent without the need for risk assessment,
- in some sectors (agriculture, fisheries, aquaculture, transport and coal) to grant de minimis aid shall be subject to special rules, exclusionary or limiting the possibility of granting it.

The research period covered the years 2008-2015. The data needed for the analysis come from the reports on de minimis aid granted in Poland in subsequent years, which were published annually by the Office of Competition and Consumer Protection. In the paper were used methods of statistical analysis and an analysis of the dynamics of the structure of the support.

3 Results

The value of de minimis aid increased very rapidly from 2008 to 2010 (Tab. 1). In 2009, it was more than twice as high as the previous year (having increased by over 133%), and in 2010, it grew by 50% in comparison with 2009. In 2011, the value of de minimis aid fell by about 28% compared with the previous year, returning to a level comparable with 2009. 2012 saw a rise in the total value of de minimis aid by about 24% in comparison with 2011. The upward trend continued for the next two years. In 2013, the value of de minimis aid increased by more than 40% compared with 2012, and in 2014 – by more than 11% compared with 2013. In 2015, much like in 2011, the value of the aid provided decreased by about 28% in comparison with the previous year.

Table 1. Value of state aid and de minimis aid from 2008 to 2015 (in millions of euro) [11,12,13,14,15,16,17,18].

Specification	2008	2009	2010	2011	2012	2013	2014	2015
Value of state aid (in M EUR)	4090.1	4394.5	6030	5211.2	4873.9	4912.1	6036.2	4626.7
Value of de minimis aid (in M EUR)	329.7	770.7	1156.2	836.6	1034.5	1463.5	1630.9	1169.5

A comparison of the amounts of state aid provided in accordance with the requirements of Article 107 of the TFEU [5] and de minimis aid shows that the amount of the latter is considerably smaller, which is understandable considering the limitation of the amount of de minimis aid a single entrepreneur can receive.

In 2008, de minimis aid accounted for 8% of the total value of the aid provided to entrepreneurs. Between 2009 and 2011, it constituted, on average, just under 17%. In the following years, its percentage exceeded 20%, peaking at nearly 30% in 2013. This was a result of the considerable increase in the value of de minimis aid in 2013 and 2014 in comparison with 2012. It is worth noting that despite the decline in the total value of aid provided, the percentage of de minimis aid in 2015 remained at roughly the same level as in the two previous years. It was affected neither by the significant surge in state aid in 2014 nor by its sharp fall in 2015.

It is also worth noting that between 2008 and 2015, the trends (upward/downward) in state aid value and de minimis aid value were mostly concurrent. The only exception was 2012, when the value of state aid fell by just under 7% and de minimis aid increased by nearly 24% compared to the previous year.

In 2009, the rate of change of the value of de minimis aid (an increase by more than 123%) was higher than in the case of state aid (an increase by about 7%). In 2010, the rates were similar (37% increase in total aid, 50% increase in de minimis aid). This was also the case in 2011 (a decrease by about 14% and 28% respectively). In 2013, the rise in the value of de minimis aid was significantly larger than in the case of state aid: 40% as opposed to less than 1%. In 2014, the rate of change of the value of de minimis aid (an increase by about 11%) was lower than in the case of state aid (an increase by almost 23 %). In 2015, in turn, the rates were similar (a decrease by about 26%).

Table 2 presents data concerning forms of de minimis aid divided into four groups marked with the letters A, B, C and D. Subgroups were identified within each group and marked with the number 1 or 2 depending on whether they involve a payout of funds from the budget (1) or a reduction of budget contributions (2).

Table 2. Forms of de minimis aid between 2008 and 2015 (in millions of euro) [11,12,13,14,15,16,17,18].

Specification	2008	2009	2010	2011	2012	2013	2014	2015
A: grants and tax exemptions	303.4	741.5	1117.1	795.3	968.3	1138.8	1342.2	936.1
A1: grants	232	662.1	1038.5	704.2	911	1070.6	1268	863.2
A2: tax exemptions	71.4	79.3	78.6	91.1	57.2	68.2	74.2	72.9
B: state equity participation	0.3	0.2	5.3	4.4	12.1	24.6	17.4	41.7
B1: contribution of capital	0.3	0.2	5.3	4.4	12.1	24.6	17.4	41.7
C: soft loans	19.2	20.7	21.3	21.4	27.1	44.3	49.7	45.5
C1: participatory loans	10.9	9.5	9.8	12.5	11.6	24.7	28.5	30
C2: tax deferral or division into instalments	8.3	11.2	11.5	8.9	15.6	19.6	21.2	15.4
D1: guarantees	0	0.1	1.6	5.7	10.5	235.7	189.6	110.7
E: others	6.8	8.3	10.9	9.7	16.5	20.1	32.1	35.4
Total	329.7	770.8	1156.2	836.5	1034.5	1463.5	1631	1169.4

In terms of the size of the beneficiary, it can be noticed that in each of the years analysed, a majority of the aid was provided to micro-enterprises, which received more than 72% of the total aid (Tab. 3). The combined amount of aid provided to micro, small and medium-sized enterprises during the period analysed constituted 95% of the total. Reasons for this phenomenon may include the fact that de minimis aid is provided under simple rules, often with no connection to a particular project, as well as the fact that the capital absorption capabilities of such companies are limited. Most of the entities classified as large enterprises are communes. In 2015, seven of the ten beneficiaries classified as large enterprises that received the most aid were communes (local governments that engage in business activity are enterprises according to EU law), which received de minimis aid mainly pursuant to the Act of 7 March 2007 on support for the development of rural areas using resources of the European Agricultural Fund for Rural Development as part of the Rural Development Programme for 2007-2013 [24] and the Act on the principles of development policy [31].

Table 3. Structure of de minimis aid by size of the beneficiary between 2008 and 2015 (%) [11,12,13,14,15,16,17,18].

Size of the beneficiary	2008	2009	2010	2011	2012	2013	2014	2015
micro	63.2	77.4	76.9	77.3	77.3	69.0	70.3	65.5
small	15.5	11.5	11.2	9.5	11.1	16.7	17.5	19.5
medium	13.8	6.9	7.3	8.1	6.9	10.5	9	9.8
large	7.5	4.2	4.6	5.1	4.7	3.8	3.2	5.2
Total	100	100	100	100	100	100	100	100

Data concerning the legal frame of business activity of the beneficiaries of de minimis aid is available for the years 2012-2015 (Tab. 4). In each of these years, a vast majority of the aid was provided to private entrepreneurs – on average, it constituted 96,1% of the total. The percentage of other beneficiaries was minimal.

Table 4. Structure of de minimis aid by legal frame of business activity of the beneficiary between 2012 and 2015 (%) [11,12,13,14,15,16,17,18].

Legal frame	2012	2013	2014	2015
Private entrepreneurs	95.3	96.5	96.4	94.68
Joint-stock companies and limited liability companies for which the State Treasury, a local government unit and a state or communal organisational unit are dominant entities	4.0	2.9	3.1	3.25
Companies and partnerships in which a local government unit holds 100% of the stocks or shares	0.3	0.3	0.2	1.5
Public finance entities as defined by the Act of 27 August 2009 on public finance (Journal of Laws 2013, item 885, as amended)	0.2	0.2	0.2	0.4
State enterprises	0.2	0.1	0.1	0.13
Single-member companies of the State Treasury	0.1	0.1	0	0.04
Total	100.1	100.1	100	100

Table 5 presents the amount of aid by voivodship. The criterion for the determination of the amount of aid provided to individual voivodeships was the location of the registered office of the enterprise that received the aid. As a result, the high value of de minimis aid assigned to some voivodeships may stem from the fact that many entrepreneurs choose to establish their head offices in large cities. There is, however, a possibility of an enterprise whose registered office is located in one voivodeship receiving de minimis aid in connection with business activity conducted in another voivodeship (e.g. maintaining a branch there) [18]. In each of the years analysed except 2011, the largest amount of aid was provided to enterprises operating in Mazovian Voivodeship. In 2011, entrepreneurs from Greater Poland Voivodeship received the most aid. In the remaining years, Greater Poland was either second or third, alternating with Silesian Voivodeship.

Table 5. Share of individual voivodeships in the total amount of de minimis aid provided from 2008 to 2015 (%) [11,12,13,14,15,16,17,18].

Voivodeships	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Wielkopolskie	10.8	8.6	11.8	13.7	11.4	11.8	10.2	10.9
Kujawsko-Pomorskie	4.9	6.8	6.1	6.7	5.6	5.1	5.7	6.2
Małopolskie	7.2	8.4	8.4	9.4	9.2	7.7	8.9	8.2
Dolnośląskie	8.8	6.4	6.4	6.1	6.6	6.8	6.8	7.5
Lubelskie	4.2	5.3	5.3	5.8	6.3	5.3	5.5	4.4
Lubuskie	3.1	2.6	2.7	2.4	2.5	2.3	2.6	2.6
Łódzkie	7.9	6.3	6.9	6.2	6.4	6	6.1	5.8
Mazowieckie	11.4	13.7	12.2	12.4	13.6	16.6	14.5	15.0
Opolskie	2.9	3.3	4	2.2	2.7	2.3	2.3	2.7
Podlaskie	2.4	2.5	2.9	3.4	3.6	2.6	3	2.7
Pomorskie	7.6	7.3	5.8	5.5	5.3	6	5.9	6.5
Śląskie	10.2	9.7	9.6	7.6	8.1	9.6	9.9	10.2
Podkarpackie	5.4	6.9	7	6.4	6.4	6.2	7.2	5.8
Świętokrzyskie	4.2	4.1	3.6	4.2	3.4	3	3.1	3.1
Warmińsko-Mazurskie	4.9	4.4	4	4.2	4.8	4.3	3.9	4.3
Zachodniopomorskie	4	3.7	3.5	3.8	4.3	4.5	4.4	4.3
Total	100	100	100	100	100	100	100	100

The variation in the amounts of aid provided to enterprises in individual voivodeships may stem from the fact that voivodeships differ significantly in terms of their level of entrepreneurship understood as the percentage of entrepreneurs operating in a given voivodeship in the total number of entrepreneurs registered in Poland. This means that conducting analyses based solely on the total values of aid provided in each voivodeship may be misleading. Levels of entrepreneurship in each voivodeship are therefore presented in Table 6.

The level of entrepreneurship was higher than the voivodeship's share in the total aid provided in Poland in 6 voivodeships in 2009, 7 in 2010 and 2011, 6 in 2012 and 8 in 2014 and 2015. In the remaining voivodeships, the level of entrepreneurship was lower than the percentage of the aid provided to a given voivodeship. In each of the years analysed – except 2013 – the largest difference between the level of entrepreneurship and the share in the total state aid provided in Poland could be observed in Mazovian Voivodeship.

Table 6. Level of entrepreneurship in Polish voivodeships between 2009 and 2015 (%) [11,12,13,14,15,16,17,18].

Voivodeship	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Wielkopolskie	-	9.6	9.6	9.7	9.8	9.8	9.8	9.9
Kujawsko-Pomorskie	-	4.9	4.8	4.8	4.7	4.7	4.7	4.7
Małopolskie	-	8.4	8.5	8.6	8.6	8.6	8.7	8.7
Dolnośląskie	-	8.5	8.5	8.5	8.5	8.5	8.5	8.5
Lubelskie	-	4.2	4.2	4.2	4.2	4.2	4.2	4.1
Lubuskie	-	2.7	2.7	2.7	2.7	2.5	2.7	2.7
Łódzkie	-	5.9	5.9	5.9	5.9	5.8	5.8	5.8
Mazowieckie	-	17.3	17.4	17.4	17.6	17.8	18	18.4
Opolskie	-	2.6	2.5	2.5	2.5	2.7	2.4	2.4
Podlaskie	-	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Pomorskie	-	6.7	6.7	6.7	6.7	6.7	6.7	6.6
Śląskie	-	11.5	11.6	11.5	11.4	11.3	11.2	11.2
Podkarpackie	-	3.9	3.9	3.9	3.9	3.9	3.9	4.0
Świętokrzyskie	-	2.82	2.8	2.7	2.7	2.7	2.7	2.6
Warmińsko-Mazurskie	-	3.1	3.0	3.0	3	3	3	2.9
Zachodniopomorskie	-	5.8	5.6	5.5	5.5	5.4	5.3	5.2
Total	-	100	100	100	100	100	100	100

Table 7 presents information regarding the value of de minimis aid by legal basis for its provision. From 2008 to 2010 and from 2013 to 2015, the most aid was provided pursuant to the Act on employment promotion and labour market institutions [23]. Pursuant to the Act, aid is provided by Voluntary Labour Corps in the form of reimbursement of the remuneration of adolescent workers and by starostes as part of intervention works. From 2011 to 2012, most of the aid was provided pursuant to the Act on support for the development of rural areas using resources of the European Agricultural Fund for Rural Development as part of the Rural Development Programme for 2007-2013 [24]. Analysing the presented data, one can conclude that the value and the changes in the value of aid provided pursuant to a given legislative act were principally determined by the redistribution of funds originating from the budget of the European Union.

Table 7. Value of de minimis aid by legal basis for its provision from 2008 to 2015 (%) [11,12,13,14,15,16,17,18].

Act	2008	2009	2010	2011	2012	2013	2014	2015
on employment promotion and labour market institutions [23]	596.9	1452.2	2121	613.8	1100	1319.6	1787.5	2252.7
on the principles of development policy [31]	11.1	364.5	728	603.9	734.1	1198.5	1398.6	618.9
on guarantees issued by the state treasury and some legal entities [21]	-	-		-	-	932.6	745.7	421.6
on the creation of the Polish Agency for Enterprise Development [33]	3.2	451.9	576.9	307.2	406.4	1027.9	936.5	397
Environmental Protection Law [26]	65.9	97	121.6	132.1	156.7	188.6	201.9	272
on the system of education [32]	-	-	-	-	191	224.5	184.4	212.2
on support for the development of rural areas using resources of the European Agricultural Fund for Rural Development as part of the Rural Development Programme for 2007-2013 [24]	-	325.5	448.3	1165.5	1228.2	708.4	963.8	163.4
on vocational and social rehabilitation and employment of persons with disabilities [27]	99.3	191.9	196.8	196.4	176.1	143.1	154.9	147.8
Tax Ordinance Act [29]	65.5	75.4	71.2	73.3	73	84.2	95.1	87.8
on local taxes and charges [20]	78.4	90.5	104.4	102.5	63.4	70.7	80.4	81.7
on personal income tax [25]	96.3	105.8	121.4	183.9	91.4	83.4	83.1	74.9
on the National Centre for Research and Development [30]	-	-	-	-	-	-		23.1
on the conversion of the right of perpetual usufruct into an ownership title to real estate [28]	-	-	-	-	-	-	62.2	22.5
on the National Development Plan [30]	47.7	-	-	-	-	-	-	-
other legislative acts	95.1	129.0	-	68.0	109.2	161.5	131.3	117.2
Total	1159.4	3283.7	4489.6	3446.6	4329.5	6143	6825.4	4892.8

4 Discussion

The conducted analysis show that in Poland in years 2008-2015 nearly 8,4 bln euro of de minimis aid were granted. The main form of granted aid were grants. A majority of the aid was provided to micro-enterprises, which received more than 72% of total aid. A vast majority of the aid was provided to private entrepreneurs – 96,1% of the total aid. Reasons for this phenomenon may include the fact that de minimis aid is provided under simple rules, often with no connection to a particular project.

5 Conclusion

Current economic reality is so complicated that it is difficult to imagine the functioning of the market mechanism without state intervention. This intervention, however, can lead to significant distortions in the market. Therefore so important is to monitor of granted state aid.

It should be emphasized that the state also operates imperfectly, with the result that its intervention should be limited only to those cases where it can be an effective tool for solving specific problems. This makes it necessary to restrict and monitor granted state aid.

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Agriculture and Food Sector in Slovakia and Czech Republic

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Abstract. The input-output analysis is based on the analysis of the various multipliers. Together with the analysis of the coefficients of intermediate production it allows to evaluate the structure of the economy, the impacts of changing demand in various sectors in national economy. IOT framework also offers a very detailed image of intersectorial economic linkages, either backward or forward oriented. It helps to understand the impacts of the changing structure of the national economy. The aim of this paper is to look closely at the evolution of two selected industries (agriculture and food production) in Slovak and Czech Republic over the period 2000-2014. We compared the evolution of technical, allocation and import coefficients as well as output, input and import multipliers in case of these two industries in order to verify the similarities in their development.

Keywords: IOT Analysis, Multipliers, Sectors, Slovakia, Czech Republic.

1 Introduction

The basic structure of an input-output table (IOT) is the transaction matrix where rows represent suppliers and columns represent users. By converting the initial monetary values in the transactions matrices to ratios (coefficients), it is possible to examine the underlying system of interactions and interdependencies. This paper uses the basic IOT methodology in order to assess the importance of output, input and import multipliers for selected sectors. With regards to general trend of decrease of importance in the traditional sectors, we have chosen two, so-called basic sectors - agriculture and food production. The analysis should illustrate how these two sectors evolved and whether their position and importance in Slovakia and Czech Republic changed in the years following 2000. We would also like to verify the stability and similarity in their evolution.

2 Literature review

The fundamental information used in input–output analysis concerns the flows of products from each industrial sector, considered as a producer, to each of the sectors, itself and others, considered as consumers. This basic information, from which an input–output model is developed, is contained in an interindustry transactions table.

The rows of such a table describe the distribution of a producer's output throughout the economy. The columns describe the composition of inputs required by a particular industry to produce its output. [4] The necessary data are the flows of products from each of the sectors (as a producer/seller) to each of the sectors (as a purchaser/buyer). These flows (interindustry or intersectoral) are measured for a particular time period (usually a year) and in monetary terms. The intersectoral flows of products and services are registered, simultaneously by origin and by destination. [1] Based on these linkages, it is possible to evaluate the structure of the economy, or overall impacts of changing demand in various sectors in national economy. Input-output framework evaluates two kinds of economic linkages between sectors, i.e. backward linkages, representing demand side, and forward linkages, representing supply side. [2] The analysis of the strengths of BLs and FLs allows to identify the most important sectors in the economy. The study of BLs and FLs allows to determine which industries can be considered as key industries in terms of demand and supply. [6, 7] In case of an open economy, the imported products should be also taken into account. Increases in production will equally generate additional imports to support it. [10]

3 Methodology

Using the demand-side model, different kinds of input-output multipliers can be generated, i.e. output multipliers, input multipliers, income multipliers, employment multipliers and import multipliers. They can be viewed as summary measures used to estimate the likely effects of economic change. Various multipliers generally remain fairly stable over time. Technological change does not occur very rapidly in most industries therefore it is possible to obtain reasonable results for the latest year even though the latest IOTs may be a few years old. [3]

Assume a national economy is divided into "n" sectors. If "Xi" represents the total output of sector "i", "Yi" the total final demand for sector "i's" product, and "Zij" the inter-industry flows between sectors, we can describe economy by following set of equations [4]:

$$
\begin{gathered}
X_1=Z_{11}+Z_{12}+\ldots+Z_{1j}+\ldots+Z_{1n}+Y_1\\
X_2=Z_{21}+Z_{22}+\ldots+Z_{2j}+\ldots+Z_{2n}+Y_2\\
X_i=Z_{i1}+Z_{i2}+\ldots+Z_{ij}+\ldots+Z_{in}+Y_i\\
\ldots\\
X_n=Z_{n1}+Z_{n2}+\ldots+Z_{nj}+\ldots+Z_{nn}+Y_n
\end{gathered}
\tag{1}
$$

When we divide the flows of input from "i" to "j" ("Zij") by the total outputs of "j" ("Xj"), we obtain ratios of input to output, so-called technical coefficients. According to Pissarenko [5], they also represent cost structure of the industry. The equations can be also expressed in matrix notation as $\mathrm{X} = \mathrm{AX} + \mathrm{Y}$. We obtain $\mathrm{X} = (\mathrm{I} - \mathrm{A})^{-1}$, where the inverse matrix $(\mathrm{I} - \mathrm{A})^{-1}$ is also referred to as Leontief inverse matrix L (e.g. [2]:

$$L = (I - A)^{-1} \tag{2}$$

By adding up each column vector of the matrix L, we obtain simple output multipliers (SOMs). The simple output multiplier can be equally viewed as the backward linkage of the particular sector, [6, 4] The output multiplier measures the effects of one monetary unit change in the final demand for each sector on total output of all sectors (including the sector itself). Assessing impacts of imports requires knowing the vector of import coefficients "im", then calculating the matrix $\mathrm{im}(\mathrm{I} + \mathrm{A})^{-1}$, and lastly adding up column vector of this matrix. Simple import multipliers (SIMps) can be defined as the total change in imports (endogenous variable) when the final demand (exogenous variable) changes by one unit. [3, 8]

The IO tables equally allow studying the supply-side perspective, i.e. the relationship between output and primary inputs. This type of analysis provides data for allocations coefficients and input multipliers (SIMs) of the economy, reflecting the forward linkage of the particular sector. [6, 4] However, in this case the coefficients and multipliers are calculated using the row vectors.

Once calculated, output and input multipliers (backward and forward linkages) can be used to determine the key sectors of the economy. According to Rasmussen (1956, in [6]) if normalised values of both multipliers are higher than 1, the sectors can be classified as key sectors. If only one of the values is higher than 1, the sector is either backward or inward oriented, meaning it serves as an important purchaser or supplier for other industries of analysed economy.

4 Results

With regards to the limited extent of this paper, we decided to analyse only the evolution of two production sectors that correspond to Agriculture and Food production – sectors A01 and C10-12 according to the International Industrial Classification, revision 4 (ISIC Rev.4). We used data from the WIOD Database covering the period 2000-2014. [9, 11]

The choice of sectors can be linked to the general trend of decline of domestic production in these sectors even though they can still be considered as basic sectors of each economy. Therefore we would like to verify what is the place and position of these sectors in selected countries; whether they underwent some significant changes. We would also try to look for similarities in their evolution between countries.

Firstly we looked closely at the coefficients that represent intermediate production, i.e. technical coefficients (for output), allocation coefficients (for input) and import coefficients (for import). The next step was the analysis of the output, input and import multipliers. And lastly we used statistical tests in order to verify the similarity of the evolution of analysed times series.

As we can see on Fig. 1 (sector of agriculture, A01), the highest values of coefficients can be observed for the allocation coefficients (symbol line) that exceed the values for technical coefficients (black line) as well as the import coefficients (grey line). It means that the agriculture sector serves rather as the supplier of inputs than the purchaser of the intermediate production. In case of Slovak Republic (first graph) we can clearly see the decrease of importance in domestic production (both demand and supply side view, i.e. black and symbol line). This is compensated by the increase in import coefficients (grey line), meaning that Slovakia is becoming more and more dependent on the imports of inputs from abroad. The values and evolution of these coefficients for Czech Republic (second graph) seems more stable than in case of Slovakia.

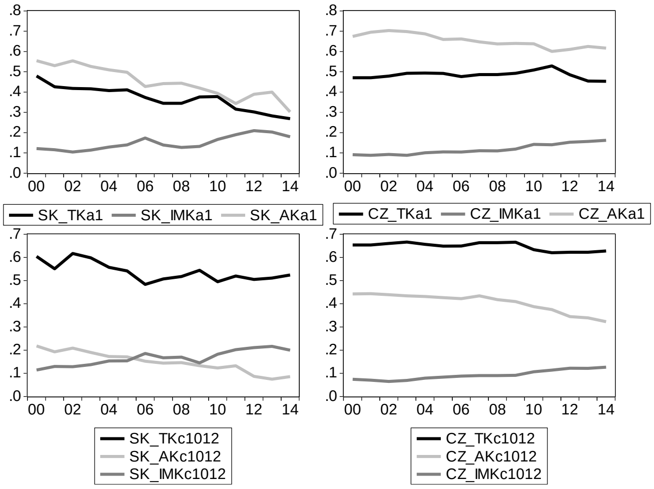

Fig. 1. Technical, allocation and import coefficients, sector A01 (left) and sector C1012 (right). [11]

The evolution of values in Food production (sector C1012) is slightly different (Fig. 1 - third and fourth graph). Over this period, the values of technical coefficients (black line) exceeded the other two for both economies. The values were from the range 0.5-0.7; the lowest values were observed in case of Slovakia (third graph) where we can also see a slight decrease in values as well as a distinctive growing trend for import coefficients (grey line). Again, it signifies the increase of the dependency of domestic food industry on the foreign suppliers. Evolution in Czech Republic (fourth graph) seems again more stable; however, the increase for import coefficients is also present even though it is less steep.

In order to see the overall positions of these sectors, we should also analyse how the values of the multipliers evolved over the observed period. The Fig. 2 shows the boxplots of output and input multipliers for both sectors and both countries. Here we can see several interesting facts. In case of Slovakia, distributions of values for both multipliers are almost identical for agriculture and rather similar (when we omit few far outlier values) for food production. The evolution in A01 can be considered as mostly stable, as indicated by the symmetric distribution of values and closeness of median and mean. In C1012 the mean and median are different, indicating some fluctuations in the evolution of the values.

In Czech Republic the values for A01 multipliers are slightly higher than in Slovakia. What is more, the output multipliers are lower than the input multipliers. This suggests a higher importance of the supplies from the industry. However, in case of C1012 sector, the output multipliers highly exceed the input multipliers. The values thus confirm the fact that the agriculture production serves mainly as inputs to other industries while food industry, on the other hand, produces mainly for the final consumption.

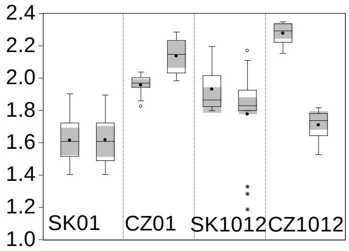

Fig. 2. Output (left) and input (right) multipliers, sector A01 and C1012. [11]

The next set of boxplots on Fig. 3 depicts the distribution of values of import multipliers for both sectors. The left side of the graphs illustrates the situation for agricultural production.

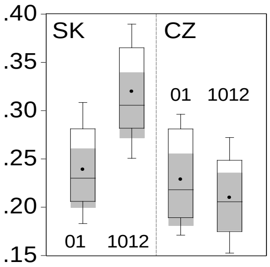

Fig. 3. Import multipliers, sector A01 and C1012 for Slovakia (left) and Czech Republic (right). [11]

Here we can see that the countries are rather similar with the majority of the values from the range (0.20 – 0.26). The lowest values of import multiplier appear in case of Czech Republic (0.18 – 0.24). Values of import multipliers for Slovakia are almost twice as high (0.27 – 0. 36). This shows that Slovakia imports more food production that Czech Republic.

Graphs on Fig. 4 show the evolution of normalised backward (nBL) and forward linkages (nFL) in sector of agriculture and food production (normalised output and input multipliers). Values of nBLs and nFLs higher that 1 indicate the orientation of the sector either backward (strong demand linkage) or forward (strong supply linkage). If both linkages exceed 1, this sector can be considered as key sector to the economy. As we can see on the following graphs, the agricultural production (a01) could be considered as key until around 2005-2006 for both Slovakia and Czech Republic.

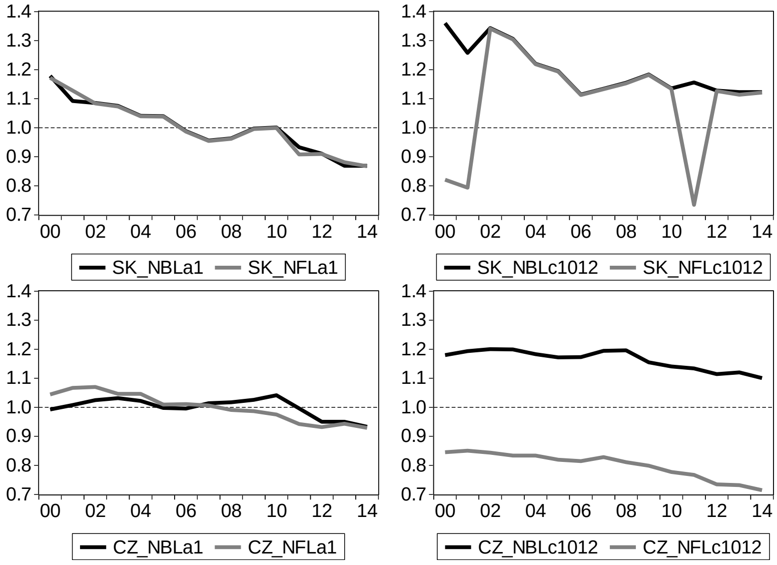

Fig. 4. Normalised BLs and FLs, sectors A01 and C1012 for Slovakia (left) and Czech Republic (right). [11]

The nBLs and nFLs for food (c1012) production show different characteristics of this sector. While in case of Czech Republic this sector is clearly backward oriented and rather stable, in Slovakia the evolution is marked with several fluctuation. However, in general it could be considered as one of the key sectors for most of the observed years. The evolution of both sectors seems to be more stable in Czech Republic.

The last part of the analysis consisted of the statistical testing in order to verify the similarity in evolution of the values of time series. We used Mann-Whitney-Wilcoxon test of equality of medians between series. It enables to test whether the distributions of the series are identical or very similar and is usually use in case of two independent data samples that do not influence each other. This test also does not require that the time series are normally distributed. The null hypothesis H0 is that the distributions of two tested series are identical. We chose the 0.05 significance level. In case H0 is rejected, we assume that evolutions of tested variables in different countries can be considered neither as identical nor similar.

In each case we compared Slovak and Czech time series. The following table presents the results of the tests. In all cases when the H0 hypothesis was confirmed (the identic or very similar development of the time series), it was marked by H0 in the table. If H0 was rejected, the table cell was marked H1 meaning that two time series were different in their evolution.

Table 1. Tests for equality of medians between time series – comparison between countries [11]

	SK	**Som c1012**	**Som a01**	**Sim c1012**	**Sim a01**	**Simp c1012**	**Simp a01**
CZ		H1	H1	H1	H1	H1	H0
	SK	Tk c1012	Tk a01	Ak c1012	Ak a01	Impk c1012	Impk a01
CZ		H1	H1	H1	H1	H1	H1

According to the test, the null hypothesis was accepted only in the case of import multiplier and only for the agricultural sector. This confirmed similarities only in this one case, the evolution for other times series cannot be considered identic, as the tests did not confirm the similarities in their distribution. We accept the alternative hypothesis; the evolution of other multipliers as well as three coefficients of intermediate production did evolve neither in the same nor in the similar way.

Table 2. Tests for equality of medians between time series – comparison within countries [11]

	SK	**Som c1012**	**Som a01**	**Sim c1012**	**Sim a01**	**Simp c1012**	**Simp a01**
CZ		H1	H1	H1	H1	H1	H0
	SK	Tk c1012	Tk a01	Ak c1012	Ak a01	Impk c1012	Impk a01
CZ		H1	H1	H1	H1	H1	H1

As for the coefficients, the results should mainly correspond to the results of testing for multipliers. However, here the similarities were not confirmed for none of the tested pairs of coefficients.

5 Conclusion

The aim of this paper was to look closely at the evolution in the food (c1012) and agricultural (a01) sector in two of V4 countries, namely Slovakia and Czech Republic. We analysed the evolution of technical, allocation and import coefficients as well as the output, input and import multipliers over the period of 2000 – 2014.

The comparison of the coefficient values confirms that in general the agriculture sector serves rather as the supplier of inputs that the purchaser of the intermediate production, as confirmed by higher values of allocation coefficients (in comparison with technical and import coefficients). Slovak Republic was marked by the significant decrease of importance in domestic production that was compensated by the increase in import coefficients. Czech Republic is still less dependent on the imports of foreign inputs. Increase in domestic dependence on imports appeared also for Slovak food sector.

As for the stability of both sectors, we could see that the ranges of multiplier values are different, with higher differences for Czech Republic. The distribution of values of import multipliers showed that Slovakia import more food production than Czech Republic.

The analysis of backward and forward linkages showed that the food production in case of Czech Republic is clearly backward oriented with a stable evolution. In case of Slovakia the evolution was marked with several fluctuations. However, in general, it could be considered as one of the key sectors for most of the observed years.

The last part of the analysis consisted of statistical testing of similarity of evolution in time series. We used the Wilcoxon – Mann - Whitney test for equality of medians between series. Firstly we compared the evolution of Slovak and Czech time series, then the evolution of time series within each country. The test results indicate similarities between Slovak and Czech economy only to a certain extent (agricultural sector). However there were no similarities between time series of food production.

In future it would be interesting to carry on this analysis with the comparison of other industries.

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Changes in the Attitudes of Y Generation Members towards Participation in the Activities of Municipalities in the Years 2008-2017

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Abstract. The presented research results cover a comparative analysis of cyclical surveys about attitude to social participation conducted among students (members of Y generation) of Wroclaw's economic universities in 2008, 2013 and 2017. The basic purpose of the study is to compare the attitudes to social participation of students at similar stages of life (students) and at similar age over the years 2008-2017. The second aim is to answer the question whether these attitudes have changed with the introduction of active participation of citizens through the use of the participatory budget. The survey included 40 problematic questions. In the majority of them a five-step Likert scale was applied.

The results of the survey show that the dating analysed period surveyed groups of questioned young Poles had very low interest in gmina financial activity but it was slightly rising. The feeling of real influence on local issues among the respondents is slowly rising what may result, among other things, from the fact that the processes of participatory budget in municipalities became widespread. Additionally, the percentage of people who do not feel the need to increase their impact on municipal affairs continues to raise what can be caused by existing more satisfactory possibilities for citizens to participate in the activities of municipalities.

Keywords: Social Participation, Local Government Budget, Generation Y.

1 Introduction

The notion of the citizens' participation in the state activities is an ambiguous one. One should refer here to one of the basic means of defining the essence of social participation proposed by Sherry R. Arnstein in 1969 [1]. According to this concept, participation refers to the influence of the "minority" (i.e., part of the local community) on management decisions. The typology of the kinds of participation was hierarchically structured along with the increasing strength of stakeholders' decision-making capacity. The lowest levels of the "ladder" - manipulation and therapy do not constitute the real participation since they aim at shaping the stakeholders` attitudes by managers (they are merely an "illusion of participation" - they can take the form of consultative groups or discussion panels moderated by managers and propagating their ideas). Further levels of participation - information, consultation and mitigation are the substitute of proper participation, since obtaining information on the tasks being carried out is not followed by the possibility of people to have an influence on their form (informing) or despite listening to stakeholders, collecting surveys, carrying out other studies, the authorities do not take any actions aiming at realization of the collected suggestions (consultations) or there is a lack of possibility to influence the representatives of stakeholders participating in the planning and implementation of the tasks on the actual activities of the authorities. The above three levels of participation represent only a "safety valve", creating an illusion that government deals with issues reported by residents. Whilst the actual participation will take the form, first of all, of partnership - where in the process of negotiation and co-responsibility stakeholders are able to influence the decisions of the authorities; secondly, it will take the form of delegated power - where stakeholders will primarily decide on the shape of the particular project; thirdly, in extreme form, participation will mean taking control of a part of the management activities in a relevant and important area.

The goals of social participation are, for example,: firstly, to inform and educate the society; secondly, to involve in the decision-making process of the managing bodies the values, suggestions and preferences of the society, thirdly, to increase the substantive character of the decisions; fourthly, to increase the confidence in the authorities; fifthly, to defuse conflicts between the negotiating parties (stakeholder groups, governing bodies and stakeholders) and sixthly, to improve the cost-effectiveness of making decisions [5]. It should be noted that the sixth goal is a measure of the legitimacy of the particular forms of social participation. The breakdown of costs of the individual types of participation with achievable or expected effects often gives the opportunity to choose a more profitable form of participation.

2 The purpose and research method

The presented research results cover a comparative analysis of cyclical surveys about attitude to social participation conducted among students of Wroclaw's economic universities in 2008, 2013 and 2017 (unpublished yet). The findings of these examinations were published by the authors in separate papers [3,4], however, no comparative analysis has been performed. Thus, the basic purpose of the study is to conduct comparative analysis of the attitudes to social participation of members of this generation at similar stages of life (students) and at similar age over the years 2008-2017. The second aim is to answer the question whether these attitudes have changed with the introduction of active participation of citizens through the use of the participatory budget. It should be noted that, as a result of the deliberate selection, the conclusions of the comparative analysis may only be considered as an introduction to the discussion on the subject matter raised in the study.

Surveys were carried out among students of two biggest economy schools in Wrocław (in 2008 year - 288 surveys, in 2013 year - 142 and in 2017 - 208 surveys were completed). The survey included 40 problematic questions (in 2017 it had 20 additional questions). In the majority of them a five-step Likert scale was applied. 30 questions referred to issues connected with a gmina inhabited by these students. The next 8 referred to an ideal gmina. The questions can be divided into several categories: about satisfaction about living in this gmina, knowledge of problems this gmina faces, about participation in local affairs and activities, about possibility and will to influence local finances, investments and services offered by this gmina, about information policy concerning investments, finances and budget.

3 Forms and scale of citizens' participation

Nowadays, in most of developed countries there are various forms of citizens' participation in the activities of the authorities. The solutions which function in Poland, however, can be considered as very limited. The basic form regulated by the law is information (through Public Information Bulletins, websites and the access to public information) and consulting processes resulting from e.g. the Act on Municipalities. Since 2012, we can observe more possibilities of participation of citizens in creating the activities of municipalities as a result of the introduction of the participative budgets by the local governments. In Poland, these procedures are usually connected with the "good will" of the authorities of individual local governments units – mainly due to the continuous lack of systemic solutions included in normative acts. However, considering the placement of this form of participation discussed above in the participation ladder, it should be noted that the features of participative budget presented in literature – especially the real impact (though usually poor in quality) of stakeholders on the direction and form of public expenditure place this form of participation at least at the level of partnership. The analysis of the projects implemented by the local government units referred to in the documents as a civic or participatory budget [2] indicates that they most often relate to the functionality or improvement of life quality of members of the local communities by realization of various investment tasks. In Poland, participatory budget is a subject of research conducted by various authors. However, this subject has not yet been analyzed profoundly. From the point of view of the analyzed issue of participatory budget researches in Poland have been carried out in the area of legal aspects and public consultations [9, 14] and the meaning and procedures of social participation [7, 12], however, they are mainly of pilot or review nature.

The desire to cooperate, to consociate, to work for common good, to work for others – these are important features of civil society which serve both to build positive social relationships and in addition, to raise the level of social capital, whose role in the socioeconomic development of the country is more and more often emphasized in the literature [11]. The profile of the state of civil society in Poland is one of the elements of the cyclically-published report: „Diagnoza społeczna. Warunki i jakość życia Polaków" (eng. Social Diagnosis. Conditions and quality of life of Poles). The

2015 report [6] characterizes among other attitudes of Poles towards the common good. One of the examined issues was civil experience and competence. The places of acquisition of civic experiences and skills are voluntary organizations, activities and contacts which fill the space between the individual being and the society and between the citizen and the state [6]. The simplest measure of the state of civil society is the degree of association, the percentage of citizens who belong to voluntary organizations. In Poland in 2015, only 13.4% of respondents belonged to any organizations, associations, parties, committees, councils, religious groups, unions or circles. The analysis of the percentage of people belonging to different socio-demographic groups in 2011 and 2015 again presents the lowest share of the youngest age groups (respectively in 2011: to 24, 13.5%, 25 to 34, 10.3% and in 2015: up to 24 years old, 10.7%, from 25 to 34 years old, 11.8%). All other age groups showed more activity in the study area. Acts on behalf of one's own community, often undertaken individually, without a formal association, remain a separate matter. Social Diagnosis indicates that this activity is just as unpopular as being affiliated to an organization. In the surveyed period, only 15.4% of the respondents were involved in activities for the benefit of the local community - the municipality, housing estates or the localities in the nearest neighbourhood. The index of social experiences and civic actions (This is an aggregate measure of social and civic experiences related to 1) voting in local elections 2) activity for the good of society 3) participation in meetings 4) work for other people or social organizations, 5) performing functions in the organization) adopted in the "Social Diagnosis" indicates a very limited range of these experiences. Poles are relatively rarely involved in activities in organizations, participation in grassroots social initiatives, public meetings or volunteering. The presented results indicate that the state of civil society and social attitudes in Poland is unsatisfactory. The youngest generation (Y generation) is characterized by the lowest level of vulnerability to violation of the public goods. Due to the prospective importance of the millennium generation for shaping the future social life and the potential of having skills and attitudes different from the previous generations, it seems justified to undertake research on the changes in attitudes of young Poles towards the idea of social participation.

4 Characteristics of Y generation

The ability to participate actively in shaping the activities of the municipality refers to all its inhabitants but, as the "Social Diagnosis" states, not everyone expresses the same desire and willingness to undertake such activities. Particular attention should be paid to the dedication to social participation of the young generation, which on the one hand possesses significant potential in the form of modern knowledge, entrepreneurial attitudes, and openness to innovative solutions, and on the other hand it is commonly associated with attaining self-interest rather than social one. Such opinions derive from the characteristics describing the behavior and traits of the young generation. Literature of the subject indicates particular differences between generations present in Poland and in the world which translate into different professional, economic and social behaviors of these groups. Four generations are most often indicated:

- Veterans (Radio Babies, The Silent Generations) – born in 1939-1945,
- Baby Boomers – born in 1946-1969,
- Generation X (Baby Busters) – born in 1970 - 1979,
- Generation Y (Millennials) – born after 1980 [10].

The youngest generation which is the subject of analysis of this paper, is generation Y, described also as millennials, "network generation" or generation "I". This group contains people born in 1980-2000 (those boundaries should be considered as conventional; in other literature one may encounter other date indications, such as 1980-1994, 1977-1997), brought up in the era of technological revolution, which translated into their lifestyle, work and consumption. The time when Y generation members grew up is extremely important because it shaped their identity and attitudes. Systemic transformation from 1989, the accession of Poland to the European Union, the opening of borders within the Schengen area – these are some of the key events shaping the generation open to new experiences, which is mobile and capable of functioning in a multicultural environment. The earlier generations created their identity in the face of the war (Baby Boomers) or in the conditions of the confrontation of the capitalist and the communist bloc, the Solidarity movement and martial law (X generation) [8]. Key features and experiences of Y generation include:

- growing up in the free market conditions,
- contact with new technology, whose intensive development has accompanied the development of generation Y,
- increasing standard of living and consumption,
- greater choice of education and career path,
- greater mobility and openness - easier travelling and contact with other cultures (also through the Internet and language skills),
- an excellent knowledge of the new technologies - quick acquisition of needed information, creating virtual communities, but often difficulties in direct interpersonal contacts,
- fast pace of life - change as a normal state, the ability to communicate and move quickly, do several things at once but also impatience and the desire to have everything immediately,
- change of approach to one's own life - greater individualism, self-reliance, high self-esteem and the desire for self-realization [11].

The characteristics of the Y generation taking into account the demographic, historical, technological and social dimensions, have been presented in Table 1.

Table 1. Characteristic of Y generation.

Characteristics	Description
Demographic dimension	In Poland the Y generation comprises over 11 million people, which constitutes one quarter of the population. The situation is similar in other key regions of the world. Massive generation which is significant for shaping the future social realities.
Historical dimension	The generation growing up after systemic transformation having no experience with the communist system and command and control economy which hinders the understanding of older generations. The first generation creating their consciousness in Europe without territorial divisions and convinced that living in another country may be easier but, on the other hand, proud of its origin and faithful to local traditions.
Technological dimension	The generation brought up in the age of technological and information revolution. An excellent knowledge of modern technologies and intensive use of them in a private and professional life. Virtual reality is a complement to the real world, and full participation in the social world requires parallel presence in both worlds. Rich Internet resources and ease of use are conducive to creating millennials` illusion of continuous access to knowledge and competence and, as a result, of rapid self-resolution.
Social dimension	The priorities of the Polish Y generation are: having a wide circle of friends and acquaintances, health, fame and material success. Compared to older generations, millennials have more friends (on average more than 40) and a larger network of acquaintances (on average more than 200) with which they maintain constant contacts. Polish millennials are more sensitive to economic stimuli than their western counterparts living in the conditions of the economic prosperity and stable economic situation. Y generation is convinced that life success is a consequence of diligence and the acquisition of the necessary competences which means continuous improvement and participation in various types of courses.

It should be noted that in the case of Y generation there is a large age span between its members. Therefore, it appears to be a good basis for undertaking research into the evolution of attitudes of members of this generation at similar stages of life (studies) and at similar ages over the years. Taking into consideration the characteristics of Y generation, its age range and the role it will play in shaping the future socio-political realities, the issue of how millennials are willing to contribute to shaping the activities of the communities in which they live seems to be important. The next part of the article will discuss this topic.

5 Results and discussion

The primary concern for reflecting the level of awareness of being a member of a local community and feeling connected with it is the participation of the respondents in local elections. The comparison of the 2008, 2013 and 2017 survey results shows a gradual decrease in the proportion of people participating in these elections in the following years (question 5, fig. 1). This signals a potential decrease in citizens' interest in participation in municipal activities. At the same time, this constitutes a reflection of general tendency in the Polish society. It means a decreasing interest in public affairs, which may result from many factors, both related to the characteristics of Y generation and stemming from external factors.

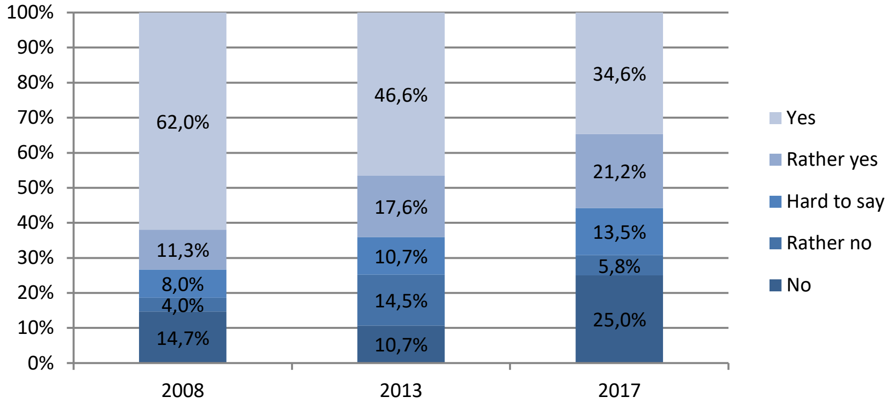

Fig. 1. Q5 I'm participating in local government elections.

While comparing the subsequent groups of respondents, it should be noted that low feeling of real influence on local issues among the respondents was observable (from 13 to 18% of them stated that they have an impact – fig. 2) - but in 2017 it was higher than in previous years. This may result, among other things, from the fact that the processes of participatory budget in municipalities became widespread. On the other hand, researches show (fig. 3) that the percentage of people who do not feel the need to increase their impact on municipal affairs continues to raise (from 10.7% in 2008 to 29% in 2017). This may partially stem from the fact that current possibilities for citizens to participate in the activities of municipalities are becoming satisfactory, and partially that the respondents' interest in local affairs diminishes.

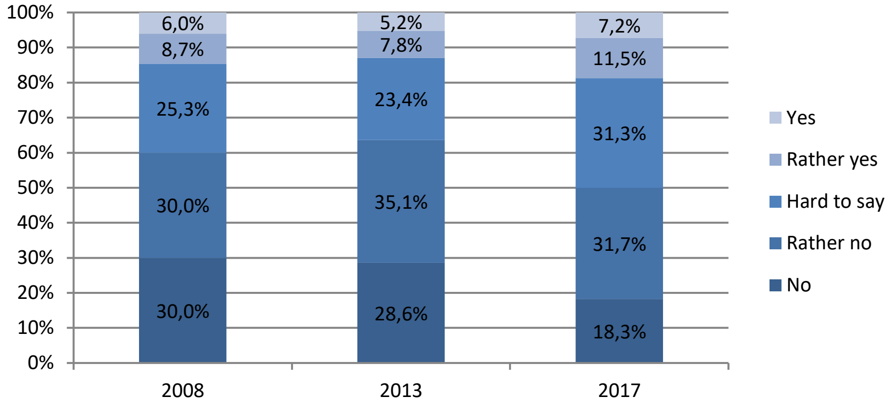

Fig. 2. Q19 I can have a real influence on municipal affairs.

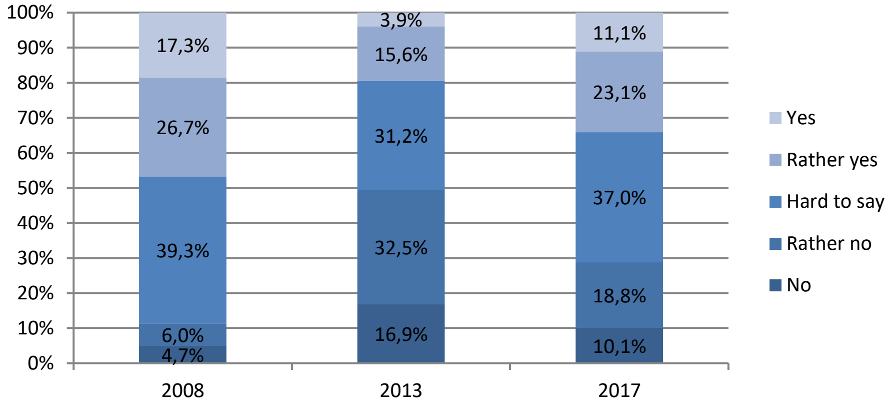

Fig. 3. Q22 I would like to have bigger influence on municipal affairs.

The survey results clearly show a negative trend - the interest in expenditure directions and investment activities of municipalities is decreasing. Between 2008 and 2017 it was a decline of 9 to 10 pp (questions 9 and 10 – fig. 4 and 5). As it can be observed, less than one third of the respondents were interested in how municipalities distribute public money. On the other hand, the confidence in the effectiveness of consultative processes introduced by local governments grew slowly from about 11% in 2008 to more than 16% in 2017 (fig. 6). Nevertheless, still more than half of the respondents pointed out the lack of effective communication procedures with officials in this regard.

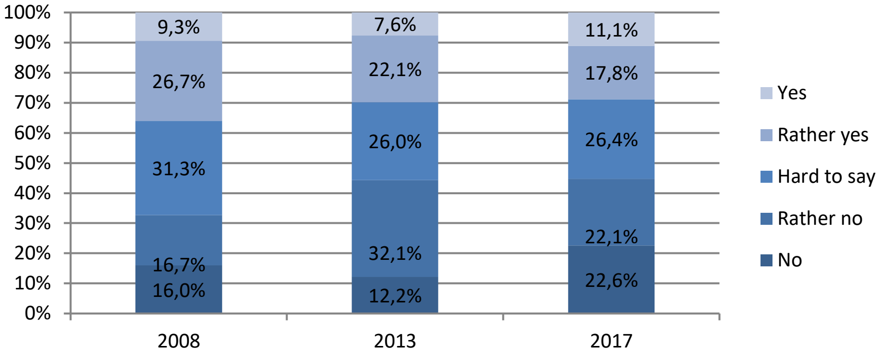

Fig. 4. Q9 I follow expenditure dimensions of local authorities.

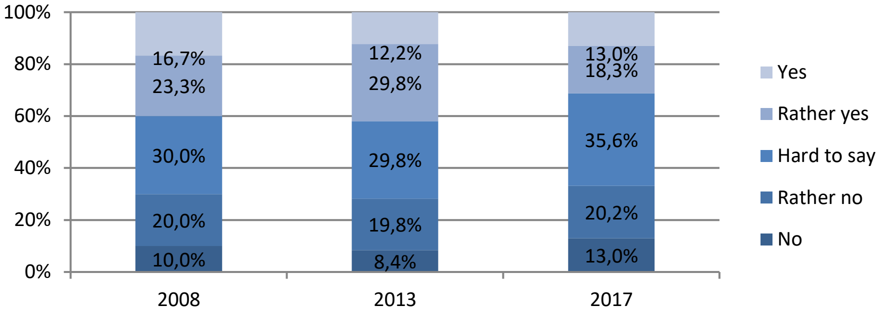

Fig. 5. Q10 I follow investments plans and activities of local authorities.

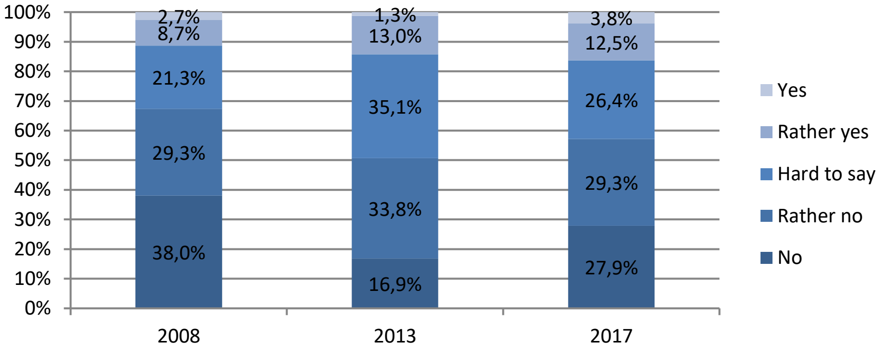

Fig. 6. Q24 There are effective communication procedures with officials concerning investment plans.

The last issue which is worth mentioning is the level of social activity of the respondents. As it can be seen, the majority of the respondents basically do not participate in processes of public consultation conducted by municipalities. Naturally, there was more than twofold increase in the percentage of respondents declaring participation in consultations (from 6.7 to 13.9% of respondents), but this is still a very poor result. The level of participation is in this case similar to the level of participation of respondents in the activities of municipal social organizations - approximately double increase as well (from 5.4 to 11.1%).

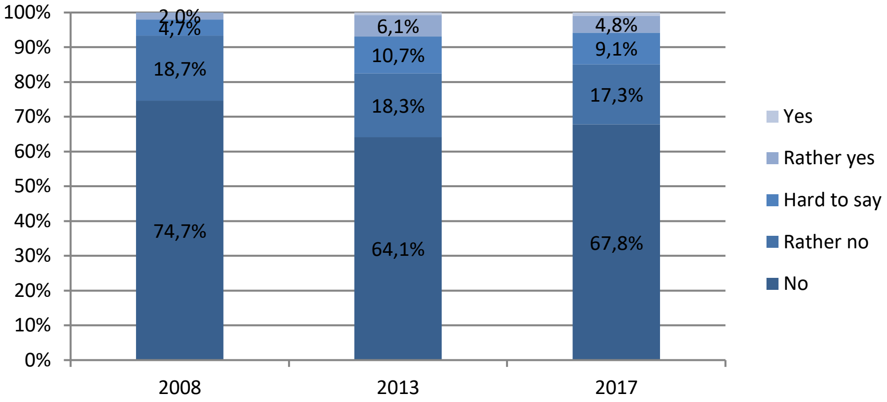

Fig. 7. Q3 I participate in processes of public consultation conducted by municipalities.

6 Conclusion

The results of the survey show that the dating analysed period surveyed groups of questioned young Poles had very little interest in gmina financial activity but it was slightly rising despite a gradual decrease in the proportion of people participating in municipal elections in the 2008, 2013 and 2017. The feeling of real influence on local issues among the respondents is slowly rising what may result, among other things, from the fact that the processes of participatory budget in municipalities became widespread. Additionally, the percentage of people who do not feel the need to increase their impact on municipal affairs continues to raise what can be caused by existing more satisfactory possibilities for citizens to participate in the activities of municipalities. The other thing is general attitude of Y generation to citizen (social) participation - millennials are not willing to contribute to shaping the activities of the communities and they generally are not interested how municipalities distribute public money.

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Benefits of Implementing a System of Periodic Evaluation of Employees in an Organization – the Results of Empirical Research

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Abstract. If an organization wants to implement a system of periodic evaluation of employees it needs to define its adequate objectives. It is crucial that the objectives formulated for a particular organization are achievable. Only then can one talk about real benefits of implementing such a system. The literature concerning organizational and management theory provides insufficient analysis of this matter. The need to fill this gap with the latest empirical data prompted the authors to conduct pilot research in companies operating in Poland with the use of a survey as a tool. It was built on the basis of the objectives of the evaluation system which were previously classified in a query. The purpose of this article is to describe and analyse the empirical research concerning possible benefits of the implementation of an evaluation system in an organization. 48 out of 100 studied organizations declared the implementation of the system. Student's t-test did not show statistically significant differences between the organizations analyzed for each statement in terms of the evaluation of selected performance parameters of a given organization. In such a situation further research is essential. There are some inclinations that the system does have a curing effect on the organisation. One can risk an interpretation that the greater the knowledge of the employees' potential and their development opportunities, the more accurate and reliable decisions and the more effective the human resources management is. The results showed that the larger the organization, the more often it implements the system.

Keywords: Employees, Evaluation, Organisation.

1 Introduction

Verifying human activity in the world happens on a regular basis. Systems of periodic evaluation of employees trigger ambivalent feelings. An employee, according to Pascal's thought [15], is a man full of doubt. Those who are against evaluation per se, see it as an inconsistent set of actions which are taken suddenly. The dilemma of each manager is thus the choice between this kind of evaluation and the implementation of a formal system of periodical evaluation of employees [21]. M. Łojko refers to the call of American scientists for the management and employees to join the sui generis psychological pact, which would be beneficial for both sides of the deal: mutual respect an+ád sense of responsibility for the success of their organization [11], the acceptance of judgments premises, belief in the meaning of its practical use and the involvement of the participants that is the sine qua non of the correct course of an employee evaluation process [12]. These issues, focussed on the system of periodic evaluation of employees, are not free from controversy. One the one hand the system has its advocates seeking continuous improvement of the system [4] and, on the other, there are negative voices which state that these evaluation systems should not be used at all (cf. [3, 19]). This very divergence of opinions results in discovering new problems. In this context, the purpose of this article is an attempt to identify the consequences of implementing a system of periodic evaluation of employees in organisations and a hypothesis has been formulated that this system does have a curing effect on the way an organisation functions. Detailed objectives:

- finding an answer to the following question – How widespread is the use of the system of periodic evaluation of employees in all organizations, regardless of their size, and then taking into account their size?
- juxtaposing organizations that have adopted the system with those that have not implemented it, to illustrate the scale of the impact of implementing the system of periodic evaluation of employees on organizational performance indicators.

2 Research method

The research process consisted of the following parts:

- analysing the literature focused on a system of periodic evaluation of employees;
- selecting a research gap by identifying divergent views concerning the issue;
- preparing an in-depth research query on the basis of which the objectives of the evaluation system implementation in an organization were classified;
- analysing the classification which revealed directions of impacts of particular system implementation goals on others;
- capturing the goals tendency to influence other goals, which led to the formulation of the original research hypothesis: the evaluation system does have a curing effect on the way an organisation functions;
- formulating five theses concerning the objectives of the system implementation regarding the functions of an organization (performance parameters of an organization);
- choosing a quantitative method as an adequate one to explain this phenomenon;
- constructing a research tool – a survey – consisting of five statements, evaluated in a five-point Likert scale, and three demographic-background questions;
- conducting pilot research in companies operating in Poland with the use of a survey as a tool;
- conducting a general analysis of empirical research findings on the benefits of implementing evaluation systems in respondents organizations, and verifying the

impact of an organization size on the system use where crosstabs were used with statistic $\chi 2$, assuming a critical significance level of 0.05;

- analysing the impact of the implementation of the system of periodic evaluation of employees on organizational performance;
- analysing the results of performance parameters for organizations with and without the system of periodic evaluation of employees with the use of Student’s t-test for independent tests;
- analysing the relation between the performance parameters of the surveyed organizations in total using Pearson's correlation;
- analysing the impact of an organization size on organizational performance, in the context of the evaluation system implementation (descriptive statistics for individual statements in organizations employing up to 100 and over 100 employees, the analysis of performance parameters for organizations employing up to 100 and over 100 employees with the use of Student’s t-test for independent tests;
- gathering conclusions allowing to accept the proposed research hypothesis;
- performing a thorough analysis of the implementation of the evaluation system in respondents organizations in order to fill the research gap;
- interpreting the limitations of the survey (stemming from an innovative construction of the questionnaire) as a need to continue the process;
- noticing inclinations suggesting that the evaluation system does have a curing effect on the way an organisation functions and seeing it as a prerequisite for deepening the research on the subject matter;

3 Implementing systems of periodic evaluation of employees in an organization

The concept of a periodic evaluation system of employees should be understood as "a system of consciously and logically selected, internally organized techniques, criteria and principles regarding employees evaluation considered appropriate for: objectives, business and job groups, used to meet their objectives" [13]. The above definition shows the purposefulness of the periodic evaluation system in an organization. Objectives of the evaluation must be defined (like all elements of the system) and they must take into account the specificity of a given organization. Therefore, the implementation of the periodic evaluation system involves identifying adequate evaluation objectives and providing information to employees.

The subject literature for the implementation of the system of periodic evaluation of employees includes both long-term ones, that is, enabling the implementation of personnel policy, or shaping attitudes and behaviours [17] as well as current ones, including: determining the grounds for wage differentiation, justification of personnel decisions, obtaining information regarding their needs, providing feedback to an employee about the course and results of his or her work [17]. For T. Rostowski and Ł. Sienkiewicz, the main objective of the system of periodic evaluation of employees is "a sound analysis of their performance, needs and development of employees potential necessary to make a proper plan and manage human capital in line with its mission and strategy" [17]. This way, the authors combine the current aspect with the long term one.

During these theoretical investigations objectives of the system of periodic evaluation of employees were classified and a dual dualism concept was adopted. The first – horizontal one – implies the coexistence of two recipients of the system, that is, an employee and an organization. However, the second – vertical one – takes into account the separation of these objectives into independent ones, that is, direct ones, and those which constitute their development, so indirect ones. In addition, we discovered a significant tendency – specific objectives have an impact on other objectives. This phenomenon is illustrated in Table 1.

Table 1. Classification of the objectives regarding the implementation of the system of periodic evaluation of employees in an organization

	The objectives of systems of periodic evaluation of employees (employee's perspective)	The objectives of systems of periodic evaluation of employees (organisation's perspective)
Direct	Obtain information about the performance and the strengths and weaknesses of an employee, to provide information to both an employee and the management of a given organization	Identify staff potential of an organization
	Identify opportunities for development of an employee	Identify the developmental potential of the organization's staff
	stimulation and/or boost of employees' motivation	developing a pro-efficient organizational culture, improving communication within an organization
	Increase worker's efficiency and effectiveness	Make good HR policy decisions possible
		Increase the quality and/or effectiveness of organization management, including HR management
Indirect		Increase organizational efficiency and organizational effectiveness as a whole

Table 1 graphically highlights the directions of impacts of individual objectives: From an employee’s perspective direct objectives of the system of periodic evaluation of employees affect their exact counterparts from an organization’s perspective; direct objectives in both categories affect indirect objectives; indirect objectives from an employee’s perspective affect indirect objectives from an organization's perspective.

Two direct objectives from the perspective of an employee are to be in the possession of reliable descriptions of their or her functioning in an organization. The first description is a diagnosis of their achievements and an updated characteristic of predispositions, which is a source of knowledge for an employee and his superiors. In this table, the objective was placed on the employee's side in section 1) obtain information about the performance and the strengths and weaknesses of an employee, to provide information to both an employee and the management of a given organization Its shape was influenced by the opinions taken from the publication: R. Griffin – "feedback for subordinates" [5]; B. Pawłowska – "accurate measurement of results", “pointing strengths of an employee" [16]; A. Bieńkowska and MW Brola – "obtaining information on performance" [1]; J. Koziński – "determining the value of each individual employee (its advantages and disadvantages)" [9]; T. Listwan – "information on strengths and weaknesses of an employee", "providing information on the quantity and quality of work performed by an employee" [10]; K. Padzik – "finding work results", "gathering materials regarding an employee", "determining the way of functioning and the role" [14]. The second description is a sketch of the perspective of an employee: point 2) defining the potential for improvement and development of an employee. Inspiring issues were found in the work of M. Kostera and S. Kownacki, who, in this matter, discussed "individual career planning, pathways for training and development", "formulating advice for individual participants," "helping an employee determine the right direction of actions" [8] also B. Cherniachowicz and A. Wieczorek-Szymańska set such objectives as "indicating the developmental opportunities of an employee", "determining what kind of knowledge a person should possess", "determining what skills to develop" [2]; (See [1].). In the section of employee’s objectives there are two more indirect objectives. In point 3) stimulating and/or boosting motivation of an employee’s, inclinations are as follows: "motivating" [21]; “providing basis for rational development of motivational systems" [18]; “establishing sources of employee’s motivation" [2]; “motivational influence on an employee", “improving the material motivation system" [9], "proper motivation of employees", "creating a rational remuneration system" [20]; (cf. [10, 14, 16]).

In the last point in employees’ section one can find one indirect objective 4) increase worker’s efficiency and effectiveness. This point is influenced by the following: “improving the efficiency of work" [6]; "analyzing the achieved effects in the context of the competence of employees", "evaluating employee's performance in terms of quantity and quality" [8]; “estimating the work done by an employee at a given time" [2]; “comparing the results of work", "help in removing defect" [9]; “defining current and achievable performance levels" [20]; (cf. [10, 14, 16, 18]).

The second recipient, according to the concept of horizontal division of the system objectives, is an organization. On its side in Table 1 there is point 1) defining HR potential of an organization, which at the same time, according to vertical duality, is a direct objective. This point is the résumé of the statement: “diagnosing staffing potential", [6]; “verifying the adequacy of competence profiles" [1]; "evaluating competencies" [18]; “diagnosing personnel staff capacity" [9]; “identifying current and future potential of an employee" [10]; “predicting the use of existing potential to achieve enterprise goals" [20]; (cf. [2, 3, 8, 14]).

Point 2) identify the developmental potential of the organization's staff – similar to the above, it has objectives from an organization perspective (horizontal division) and direct objective (vertical division), and it is built as a synthesis of the following issues: "organizing career planning" [16]; “identifying new ways to support an employee in career development" [3]; “identifying a competence gap", [1]; “using the evaluation system materials to develop general development plans for organization members" [8]; “directing future personal development" [20]; "Gathering information to summarize plans regarding the development of all employees" [14]; [6, 9, 18]).

Table 1 shows indirect objectives in the evaluation system section from an organisation perspective –3) developing a pro-efficient organizational culture, improving communication within an organization This is a summary of the following scientific views: "modelling certain behaviours" [22]; “strengthening the sense of bond with an organization", "establishing a rapport between an employee and an employer" [18] “supporting a promoted organizational culture", "improving communication", "building multi-layered relations that develop all participants in the evaluation process" [6]; “determining the degree of compatibility between employee values and organization values", “providing information about how an employee identifies with an organization" [18]; “shaping employees and making effective, satisfied and loyal people" [14]; “substituting subjective – random opinions with objective criteria for performance evaluation", "caring for the quality of working life of an employee" [20]; (cf. [3, 8, 9, 10]).

In the analysis of point 4) make good HR policy decisions possible was inspired by the following postulates: “predicting a success in a particular position on the basis of past performance" [3]; “building the basis for decisions on promotion, degradation, transferring", "influencing the development of selection criteria" [8]; “selecting the best candidates for managerial vacancy", “influencing decisions about the rotation of an employee" [9]; "Providing information needed to plan and conduct a proper personnel policy" [20]; (see [2, 6, 7, 10, 16, 18]).

Point 5) increase the quality and/or effectiveness of organization management, including HR management, was influenced by the following aspects: "improving organization management", "verification of the efficiency of procedures and personnel management tools" [6]; “improving organizational efficiency", “generating information for day-to-day management", "enabling management decisions" [18]; “preparing necessary steps to improve an institution's management system" [9]; “enabling the effectiveness of human resources management instruments: procedures, selection of candidates for employment, selection, assignment of employees to other posts, all kinds of steps improving work organization and its effects" [10]; (cf. [1, 2, 3, 8, 14, 20]).

Point 6) increase organizational efficiency and organizational effectiveness as a whole has been constructed under the influence of the following issues: "recognizing the dependence present in the company" [16]; “correcting unwanted organizational behaviour" [3]; “improving cooperation" [6]; “facilitating the procedures of planning the process aimed at achieving higher efficiency" [9] (see [7, 14, 18, 20,]).

As far as effectiveness of implementing the employee's periodic assessment system is concerned, it is crucial that the objectives formulated for a particular organization are in fact achievable (and correctly defined). Only then can one talk about real benefits of the system implementation. Indirect objectives listed in Table 1 became a precondition for the design of precise questionnaires.

4 Methodology of empirical research

The authors conducted pilot research in companies operating in Poland with the use of a survey as a tool. In order to build this instrument the authors used previously classified system implementation objectives for an organization. It was assumed that one survey would be done in one organization, and therefore it was not impossible to verify employee perspectives (in this case a representative group of employees should be examined in each of the surveyed organisations). On the basis of the objectives regarding the implementation of the system of periodic evaluation of employees, five statements were made and they referred to:

- knowledge about the potential and development perspectives of employees,
- the quality of human resources management in an organization,
- effectiveness of staff management,
- communication between management and subordinates,
- the culture human resources management.

The statements were as follows:
Statement 1. (S1): Our organization has full knowledge about the potential of employees and their development opportunities (Objective 1 and 2, organization’s perspective).
Statement 2. (S2): Our organization makes good human resource management decisions (Objective 4, organization’s perspective).
Statement 3. (S3): Our organization effectively manages human resources potential (Objective 5, organization’s perspective).
Statement 4. (S4): In our organization the process of communication between management and subordinates is correct (Objective 3, organization’s perspective).
Statement 5. (S5): Our organization is concerned about a high level of management culture (Objective 3, organization’s perspective).
The ratio of the respondents to the taxonomically enumerated statements was measured in a five-point Likert scale. In addition, the questionnaire included three questions regarding:

- the size of an organization,
- the ways its employees are evaluated,
- the environment in which the company operates.

The launch of the research was scheduled for 1st March 2016. A randomly selected group of companies from a database of 928 branches was called. The action finished 4th March 2016 when the number of records in the base was 781, and 100 respondents sent a response, which constituted 12.80%.

5 Analysis of the results of empirical research – the benefits of implementing a system of periodic evaluation of employees in an organization

The analysis of the results of empirical research was divided into three stages:

Stage 1. General analysis of the system in the surveyed organizations – The purpose was finding an answer to the following question: how widespread is the use of the system of periodic evaluation of employees in general, so in all studied organizations, regardless of their size, and then taking into account their size.

Stage 2. Analysing the impact of the implementation of the system of periodic evaluation of employees on organizational performance. The main purpose was to juxtapose organizations that have adopted the evaluation system with those that have not implemented it. The discrepancies observed during this comparative process have illustrated the scale of impact of the system implementation on organizational performance indicators.

Stage 3. Analysing the impact of organization size on its performance parameters in the context of the implementation of the system of periodic evaluation of employees. During this stage the analyses were to provide detailed empirical data indicating a measure of the impact of an organization’s size on its indicators with the implementation of the system of periodic evaluation of employees.

5.1 Stage 1. General analysis of the use of the system of periodic evaluation of employees in surveyed organizations

This study analyzed the variable of system use. 48 out of 100 studied organizations declared the implementation of the system of periodic evaluation of employees. Due to the non-random selection of the sample, it is not possible to draw conclusions with regard to the use of the system in the population of all organizations operating in Poland. To verify the impact of organization size on the system use, crosstabs were used with statistic χ^2, assuming a critical significance level of 0.05. The use of the system of periodic evaluation of employees in organizations of all sizes is presented in Table 2.

Table 2. The use of the system of periodic evaluation of employees in organizations of all sizes

Number of employees	the implementation of the system of periodic evaluation of employees	Frequency	Percent
up to 100 people	no	39	54.9
	yes	32	45.1
	total	71	100
over 100 people	no	13	44.8
	yes	16	55.2
	total	29	100

Analysis of χ^2 test showed statistically significant differences between organizations of different sizes in terms of their frequency of using the system of periodic evaluation of employees ($\chi^2(5, N = 412) = 110.16$; $p < 0.001$). The larger the organization, the more likely it is to implement the system.

5.2 Stage 2. Analysing the impact of the implementation of the system of periodic evaluation of employees on organizational performance.

In this part of the analyses (regarding statements S1-S5) organizations that implemented the periodic assessment system are juxtaposed with those who did not. The basic descriptive statistics for each statement are shown in Table 3.

Table 3. Descriptive statistics for individual statements in organizations that implemented system and those who did not

Statement	Has the system of periodic evaluation of employees been implemented in the organization?	N	Mean	Standard deviation	Standard error of the mean
S1	yes	48	4.063	0.783	0.113
	no	52	3.789	0.915	0.127
S2	yes	48	3.896	0.805	0.116
	no	52	3.865	0.817	0.113
S3	yes	48	4.000	0.899	0.130
	no	52	3.865	0.841	0.117

S4	yes	48	4.104	1.077	0.155
	no	52	3.962	0.816	0.113
S5	yes	48	4.229	0.857	0.124
	no	52	4.115	0.758	0.105

In order to verify whether the evaluation of selected performance parameters in the organizations, which implemented the system is higher than the evaluation of selected performance parameters in organizations that did not implement it, a Student's t-test for independent tests was adopted, assuming a critical significance level of 0.05. Performance indicators of organizations with the system of periodic evaluation of employees were compared with those without. Student’s t-test for the 100 organizations did not show statistically significant differences between the organizations analyzed for each statement in terms of the evaluation of selected performance parameters of a given organization. However, it should be stressed that:

- for every statement (S1-S5) the mean was higher for those organizations that implemented the system;
- the highest difference in means (in organizations with the system and those without) was obtained for S1, the one referring to the direct objective of the implementation of the system of periodic evaluation of employees – that is, having knowledge about the potential of employees and their development opportunities.

The results of Student’s t-test analysis are presented in Table 4. In addition, Pearson correlation analysis of performance parameters was performed, as shown in Table 5.

Table 4. The analyses results of performance parameters for organizations with and without the system of periodic evaluation of employees

Statement	Results of Student’s t-test for independent tests
S1	t(98) = 1.603; p = 0.112
S2	t(98) = 0.852; p = 0.852
S3	t(98) = 0.770; p = 0.441
S4	t(98) = 0.750; p = 0.455
S5	t(98) = 0.705; p = 0.583

Table 5. Relation between the performance parameters of the surveyed organizations in total

		S1	S2	S3	S4	S5
S1	Pearson's correlation	1	0.538^{**}	0.344^{**}	0.176	0.253^{*}
	significance (two-sided)		0.000	0.000	0.079	0.011
	N	100	100	100	100	100
S2	Pearson's correlation	0.538^{**}	1	0.666^{**}	0.467^{**}	0.405^{**}
	significance (two-sided)	0.000		0.000	0.000	0.000
	N	100	100	100	100	100
S3	Pearson's correlation	0.344^{**}	0.666^{**}	1	0.261^{**}	0.437^{**}
	significance (two-sided)	0.000	0.000		0.009	0.000
	N	100	100	100	100	100
S4	Pearson's correlation	0.176	0.467^{**}	0.261^{**}	1	0.430^{**}
	significance (two-sided)	0.079	0.000	0.009		0.000
	N	100	100	100	100	100
S5	Pearson's correlation	0.253^{*}	0.405^{**}	0.437^{**}	0.430^{**}	1
	significance (two-sided)	0.011	0.000	0.000	0.000	
	N	100	100	100	100	100

** significant correlation at 0.01 (two-sided)

** significant correlation at 0.05 (two-sided)

Pearson's correlation analysis shows that practically in the case of each surveyed organisation there is a strong positive relation between the individual results. This means that generally high scores for one of the analyzed parameters are accompanied by high scores for another parameter. It is difficult to judge the direction of this influence as it requires an in-depth literature analysis. However, one can risk a statement (referring to the direct and indirect objectives of employee periodical evaluation) that the greater the knowledge of the employees' potential and their development opportunities, the better the decisions made with regard to human resource management and the more effective performance in this field. However, there is one exception, namely the relation between the impact of knowledge about the potential of employees and the process of communication in an organization.

5.3 Stage 3. Analysing the impact of organization size on its performance parameters in the context of the implementation of the system of periodic evaluation of employees.

In this part of the analysis, similar calculations were made as in Step 2, separately, however, for organizations employing up to 100 people as well as above that number. The results are shown in Tables 6-9.

Table 6. Descriptive statistics for individual statements in organizations employing up to 100 people

Statements	Has the system of periodic evaluation of employees been implemented in the organization?	N	Mean	Standard deviation	Standard error of the mean
S1	yes	32	4.094	0.734	0.130
	no	39	3.821	0.914	0.146
S2	yes	32	3.938	0.840	0.149
	no	39	3.795	0.894	0.143
S3	yes	32	4.094	0.893	0.158
	no	39	3.795	0.923	0.148
S4	yes	32	4.063	1.076	0.190
	no	39	3.974	0.873	0.140
S5	yes	32	4.250	0.842	0.149
	no	39	4.103	0.718	0.115

Table 7. The analyses results of performance parameters for organizations employing up to 100 people

Statement	Results of Student’s t-test for independent tests
S1	t(69) = 1.367; p = 0.176
S2	t(69) = 0.687; p = 0.494
S3	t(69) = 1.378; p = 0.173
S4	t(69) = 0.381; p = 0.704
S5	t(69) = 0.796; p = 0.429

Table 8. Descriptive statistics for individual statements in surveyed organizations employing over 100 people

Statement	Has the system of periodic evaluation of employees been implemented in the organization?	N	Mean	Standard deviation	Standard error of the mean
S1	yes	16	4.000	0.894	0.224
	no	13	3.692	0.947	0.263
S2	yes	16	3.813	0.750	0.188
	no	13	4.077	0.494	0.137
S3	yes	16	3.813	0.911	0.228
	no	13	4.077	0.494	0.137
S4	yes	16	4.188	1.109	0.277
	no	13	3.923	0.641	0.178
S5	yes	16	4.188	0.911	0.228
	no	13	4.154	0.899	0.249

Table 9. The analyses results of performance parameters for organizations employing over 100 people

Statement	Results of Student’s t-test for independent tests
S1	t(27) = 0.897; p = 0.377
S2	t(27) = -1.092; p = 0.285
S3	t(27) = -0.939; p = 0.356
S4	t(27) = 0.761; p = 0.453
S5	t(27) = 0.100; p = 0.921

In both groups there were no statistically significant differences between the organizations that implemented the system of periodic evaluation of employees and those that did not. At the same time, in the group of organizations employing up to 100 people, there was a higher mean for performance parameters for all statements when an organization implemented the periodic evaluation system. In the case of organizations employing more than 100 people, this impact is not clear, which may be due to the fact that the sample is too small in this group of organizations.

6 Conclusion

48 out of 100 studied organizations declared the implementation of the system of periodic evaluation of employees. Student’s t-test did not show statistically significant differences between the organizations analyzed for each statement in terms of the evaluation of selected performance parameters of a given organization. This forces us to continue research, especially for (S1), (S2), (S3), (S4) and (S5), showing a higher mean in organizations that implemented the system of periodic evaluation of employees. As a result, there are some inclinations that the system does have a curing effect on the way an organisation functions. One can risk an interpretation, in the context of direct and indirect objectives of periodic evaluation of employees, that the greater the knowledge of the employees' potential and their development opportunities, the more accurate and reliable decisions are made and the more effective the human resources management process is (however, it does not refer to the correlation of the impact of knowledge about the potential of employees with the communication process in an organization). The analysis of the results showed the impact of the size of an organization on the use of the system of periodic evaluation of employees: the larger the organization, the more often it implements the system of periodic evaluation of employees. The argument supporting the hypothesis was provided by empirical data from research regarding organizations employing up to 100 people, since in this group the mean for the performance parameters was reported higher for all statements if the organization implemented the system of periodic evaluation of employees. However, this was not observed in the case of a group formed by organizations with a minimum of one hundred people. This may be due to too small test sample as it was a pilot research.

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Wage Level Comparison in the OECD Member States

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Abstract. This paper focuses on the analysis of wage levels and other related indicators, such as the minimum wage, GDP per capita and unemployment rate, of 32 selected OECD member countries. The countries were chosen from both the 20 founding states in 1960 and the latter acceding countries, including the former Socialist bloc countries. The main aim of this paper is to create clusters of selected OECD member states that are similar as possible in terms of these variables. Cluster analysis was used for this purpose. No less important objective of this research was to find out, which of these variables affect the wage levels in these countries, including the type of dependency. Special attention has been paid to comparing wage developments in recent years between G7 and V4. We have found that dividing line between Western and Eastern European countries still persists and will likely to remain so for some time to come.

Keywords: Wages and GDP in the OECD Member States, Cluster Analysis, Ward’s Method and Euclidean Distance, Stepwise Regression and Forward Selection, Linear Regression Hyperplane, Polynomial Regression.

1 Introduction

All OECD member countries are economically mature. Despite this fact, large differences in citizens' living standards are among them, as evidenced inter alia by the average gross wage. The average wage is overestimated by the wages of the best-paid professionals in all OECD member countries, so the average wage does not correspond to the vision of so called common wage. Wages of the worst-paid employees mostly stagnate. About one third of employees work for average or higher wage, a specific number is different in each country. Scandinavian countries, the Czech and Slovak Republics are among the countries with the lowest wage differences. More employees then achieve average and higher wage in these countries than in especially non-European OECD member states. For this reason, both European and non-European OECD countries have been included into the research. Increase in minimum wage also contributes to reducing wage differentials, when wage restriction comes from below. For this reason, one of explanatory variable was chosen the minimum wage. The highest wage differences are in Mexico and Chile. The highest average wages are in the most economically advanced countries in the world. The wage growth is based on a high degree of personal and economic freedom, a sophisticated educational system preparing skilled employees, excellent business conditions and functional public administration. If the firms are successful, there is also high labour market supply and capable employees can find more interesting or better-valued jobs.

For this reason, the wage and related indicators issue is still topical and it is matter of interest for many researchers. For example, [1] describes the history of attempts to measure poverty prior to the split. Their analyses are focused on monetary poverty, relative material deprivation and subjective perception of poverty in two countries fifteen years after the split; [3] analyses the development of wages in the Czech Republic by education level; [6] analyses the equivalized total net annual incomes of the Czech households (in CZK) in 2007–2010.

This paper deals with the situation regarding wage levels in 32 chosen OECD member states, which were selected from a total 35 OECD member states. Countries like Iceland, Latvia and Turkey have not been included in the research because of insufficient data in purchasing power parity in USD with constant prices in 2015. Special attention is paid to the context of employee' average annual gross wage with other economic indicators, such as real minimum wage, structural unemployment rate, GDP per head of population. The minimum wage is not set by legislation in some countries, such as Austria, Denmark, Finland, Italy, Norway, Sweden and Switzerland. The minimum wage is considered zero in these countries. In Nordic countries, it is usually negotiated in collective agreements. This research has several aims. Selected OECD member as the objects were clustered into groups of similar countries in term of the above variables. Cluster analysis and within that Ward’s method and Euclidean distance were used for construction five, seven, nine and eleven clusters. There are various methods for determining the optimal number of clusters in cluster analysis. However, there is no definitive answer to the question of determining the optimal number of clusters. The problem lies in that cluster analysis is basically an exploratory approach. Linear regression hyperplane was used to research the dependence of the average annual gross wage on the remaining three variables. Normality of the variables was verified using both Kolmogorov-Smirnov goodness of fit test and the visual one. The issue of heteroscedasticity was verified using Glejser test and visual manner (random course of residues). The variables were put into model using stepwise regression and forward selection. Only one variable is suitable in this sense, namely GDP per head of person. Multicolinearity exploration was unnecessary, since only one independent variable was inserted into a model. Polynomial regression of the second stage was found to be better than linear regression. The suitability of the model chosen of dependence of average annual gross wage on GDP per head of person was subsequently verified using both by individual t-tests, through by the overall F-test and using the adjusted determination index. All these results are for 2015.

The main research hypothesis consists in the statement that division into Western European countries on the one hand and Eastern European countries on the other hand is still holding.

2 Database

Table 1 gives an overview of the choice of 32 member states and their two-letter abbreviations according to the norm number ISO 3166-1 alpha-2.

Table 1. Alphabetically arranged two-letter country abbreviations by norm number ISO 3166-1 alpha-2.

Marking	Country	Marking	Country
AU	Australia	IE	Ireland
AT	Austria	IL	Israel
BE	Belgium	IT	Italy
CA	Canada	JP	Japan
CH	Switzerland	KR	South Korea
CL	Chile	LU	Luxembourg
CZ	Czech Republic	MX	Mexico
DE	Germany	NL	Netherlands
DK	Denmark	NO	Norway
EE	Estonia	NZ	New Zealand
ES	Spain	PL	Poland
FI	Finland	PT	Portugal
FR	France	SE	Sweden
GB	Great Britain	SI	Slovenia
GR	Greece	SK	Slovak Republic
HU	Hungary	US	United States

Data for this paper come from the official website of the Organization of Economic Cooperation and Development (OECD), see [9]. There are data of average annual (gross) wage after conversion into purchasing power parity (PPP) in USD with constant prices in 2015, real annual minimum wage after conversion into PPP in USD with constant prices in 2015, structural unemployment rate in percentages and GDP per head of population after conversion into purchasing power parity (PPP) in USD with constant prices in 2015. The conversion to purchasing power parity allows comparing the purchasing power of the population of different countries. Data are for the period since 2000 to 2015 and average annual wage represents the main variable.

The research data include wages and salaries paid to employees for work performed in the private (business) and public (state budget, non-business) sectors, respectively. In terms of the data presented on the CSO website, “wages” cover remuneration for work done in both the sectors. Data were processed using statistical program packets SAS and Statgraphics and Microsoft Excel Spreadsheet.

3 Theory and Methods

3.1 Cluster Analysis

Cluster analysis was used to divide the selected OECD member states into relatively homogeneous groups according to their respective gross monthly wage levels. Multidimensional observations can be used when classifying a set of objects into several relatively homogeneous clusters. We have a data matrix $\boldsymbol{X}$ of n X p type, where n is the number of objects and p is the number of variables. Assuming various decompositions $S^{(k)}$ of the set of n objects into k clusters, we look for the most appropriate decompositions. The aim is to find the objects within certain clusters that are as similar as possible to those from other clusters. Only decompositions with disjunctive clusters and tasks with a specified number of classes are conceded.

Criteria for Assessing the Quality of Decomposition. The general task is to assess to what extent the cluster analysis aim has been achieved in a given situation, while applying a specific algorithm. Several criteria – decomposition functions – are proposed for this purpose. The most frequently used ones exhibit the following characteristics. They are the matrices of internal cluster variance

$$\boldsymbol{E} = \sum_{h=1}^{k}\sum_{i=1}^{n_h}(\boldsymbol{x}_{hi} - \bar{\boldsymbol{x}}_h)\cdot(\boldsymbol{x}_{hi} - \bar{\boldsymbol{x}}_h)^{\prime} \tag{1}$$

and between-cluster variance

$$\boldsymbol{B} = \sum_{h=1}^{k} n_h\cdot(\bar{\boldsymbol{x}}_h - \bar{\boldsymbol{x}})\cdot(\bar{\boldsymbol{x}}_h - \bar{\boldsymbol{x}})^{\prime}, \tag{2}$$

whose sum is the matrix of total variation

$$\boldsymbol{T} = \sum_{h=1}^{k}\sum_{i=1}^{n_h}(\boldsymbol{x}_{hi} - \bar{\boldsymbol{x}})\cdot(\boldsymbol{x}_{hi} - \bar{\boldsymbol{x}})^{\prime}. \tag{3}$$

There are vectors of the observations for the i^{th} object and h^{th} cluster $\boldsymbol{x}_{hi}$, the averages for the h^{th} cluster $\bar{\boldsymbol{x}}_h$ and those for the total set $\bar{\boldsymbol{x}}$. There are p^{th}-membered vectors, $\boldsymbol{E}$, $\boldsymbol{B}$ and $\boldsymbol{T}$ being symmetric square matrices of the p^{th} order. The principal aim, consisting in the creation of mutually distant compact clusters, is fulfilled by reaching the minimum of the total sum of the deviation squares of all values of corresponding cluster averages

$$C_1 = \operatorname{st}\boldsymbol{E} = \sum_{h=1}^{k}\sum_{i=1}^{n_h}\sum_{j=1}^{p}(x_{hij} - \bar{x}_{hj})^2 , \tag{4}$$

i.e. the Ward criterion. Since the st $\boldsymbol{T}$ is the same for all decompositions, the minimization of the st $\boldsymbol{E}$ means the same as that of the st $\boldsymbol{B}$. In order to become independent on the used units of measurement (or, more generally, the invariance to the linear transformations), it is recommended to minimize the determinant of the matrix of the internal cluster variance

$$C_2 = |\boldsymbol{E}|$$

or to maximize the trace criterion

$$C_3 = \mathrm{st}\,(\boldsymbol{BE}^{-1}) \text{ or else } C_4 = \mathrm{st}\,(\boldsymbol{BT}^{-1}).$$

The criteria mentioned above are employed not only retrospectively to assess the decomposition quality accomplished, changes in criterion values also guiding the creation of clusters. Since the criteria ultimately reach the limits (C_1 and C_2 the minimum, C_3 and C_4 the maximum) at $k = n$, it is necessary to find the extreme of the purpose function that properly includes the loss following from the growth in the number of clusters. The Ward criterion, for instance, is proposed to move towards the minimization of the quantity

$$Z_1 = C_1 + z \cdot k \ , \qquad (5)$$

where constant z represents the loss resulting from an increase in the number of clusters by one.

Distance and Similarity of Objects. Having selected the variables characterizing the properties of the clustered objects and found their values, we decided on the method of the evaluation of distance or similarity of objects, the calculation of appropriate measures for all pairs of objects often being the initial stage of clustering algorithm implementation. The symmetric square matrix of n X n type has zeros or ones on the diagonal, depending on whether it is the matrix of distance ***D*** measures or that of similarity ***A*** measures, respectively.

Let us now focus on measuring the distance of the objects described by quantitative variables. The Hemming distance can be used when individual variables are roughly on the same level or at least expressed in the same units of measurement

$$D_{\mathrm{H}}(x_i , x_{i'}) = \sum_{j=1}^{p} \left| x_{ij} - x_{i'j} \right| . \qquad (6)$$

The Euclidean distance can be applied in the same case

$$D_{\mathrm{E}}(x_i , x_{i'}) = \sqrt{\sum_{j=1}^{p} (x_{ij} - x_{i'j})^2} \qquad (7)$$

as well as the Chebyshev distance

$$D_{\mathrm{C}}(x_i , x_{i'}) = \max_{j} \left| x_{ij} - x_{i'j} \right| . \qquad (8)$$

All the above mentioned, measurements have some common drawbacks – the dependence on the used measuring units that sometimes hinders the meaningful acquisition of any sum for different variables and the fact that if the variables are considered in sum with the same weights, the strongly correlated variables have a disproportionately large effect on the outcome. The starting point is the transformation of variables. The adverse effect of the measuring units can be removed by dividing all the values by the balancing factor, which can be presented with the corresponding average $\overline{x}_j$, standard deviation s_j or the range after deletion of extremes

$$\max_i x_{ij} - \min_i x_{ij} .$$

Particular variables can be also assigned more weight – having decided subjectively or on the basis of relevant information – their values then appearing in the formulas for the calculation of distance

Other measurements of distance and similarity of objects for numerical, ordinal, nominal and alternative variables are described in the professional literature. When dealing with variables of a different type, the Lance-Williams distance is recommended

$$D_{\mathrm{LW}}(x_i, x_{i'}) = \frac{\sum_{j=1}^{p} \left| x_{ij} - x_{i'j} \right|}{\sum_{j=1}^{p} \left(x_{ij} + x_{i'j} \right)} . \qquad (9)$$

Algorithm for the Creation of Hierarchical Sequence of Decompositions. The creation of a hierarchical sequence of decompositions belongs to the most widely used techniques applied in the cluster analysis, occurring sequentially in the following steps:

- $\boldsymbol{D}$ matrix calculation of appropriate measurements of distances,
- the start of the decomposition process $\boldsymbol{S}^{(n)}$ from n clusters, each of them containing one object,
- the assessment of the symmetric matrix $\boldsymbol{D}$ (a lower or upper triangle), finding two clusters (the h^{th} and $h'^{\,\mathrm{th}}$ ones) whose distance $D_{hh'}$ is minimal,
- the connection of the h^{th} and $h'^{\,\mathrm{th}}$ clusters into a new g^{th} cluster, the replacement of the h^{th} and $h'^{\,\mathrm{th}}$ row and column in the matrix $\boldsymbol{D}$ with those of the new cluster, the order of the matrix being reduced by one,
- renumbering of the order of the cycle $l = 1, 2, \dots, n - 1$, the identification of the connected objects h, h' and the level of the connection $d_l = D_{hh'}$,
- returning to step (3) if the creation of decompositions has not been completed by connecting all objects into a single cluster $S^{(1)}$.

A divisive hierarchical procedure, contrary to the agglomerative hierarchical one, is less-used, starting from a single cluster $S^{(1)}$, splitting one of the clusters into two in each step and obtaining $S^{(n)}$ at the end of the process. The results of hierarchical cluster procedures can be effectively displayed in the form of a graphical tree dendrogram.

Given the choice of variables $x_1, x_2, \dots, x_p$ and the matrix of distances $\boldsymbol{D}$, the results of applying the described algorithm vary according to the way the distance between clusters is evaluated.

Nearest Neighbour Method. Within the nearest neighbour method, both clusters, whose connection is considered, are represented by objects that are the closest to each other. The $D_{hh'}$distance between the h^{th} and $h'^{\,th}$ clusters therefore represents the minimum of all $q = n_h n_{h'}$ distances between their objects, the procedure of the third phase of the above algorithm thus being specified. In the fourth step, the h^{th} and $h'^{\,\mathrm{th}}$

rows and columns in the distance matrix are replaced with the new g^{th} cluster's row and column of distances. In the l^{th} cycle, total $n - l - 1$ distances determined by

$$D_{gg'} = \min(D_{g'h}\ , D_{g'h'})\ . \qquad (10)$$

can be written.

If the way of evaluation of the proximity or similarity of clusters is given, which also determines the conversion of the distance matrix in each cycle, the above algorithm allows for the creation of a hierarchical sequence of decompositions and construction of the dendrogram.

When using this method, even considerably distant objects can get together in the same cluster if a large number of other objects create a kind of bridge between them. This typical chaining of objects is considered as a drawback, especially if there is a reason for the clusters to acquire the usual elliptical shape with a compact core. This method, however, possesses many positive features that outweigh the above disadvantage.

Farthest Neighbour Method. The method of the farthest neighbour is based on the opposite principle. The criterion for the connection of clusters is the maximum of q possible between-cluster distances of objects. When editing the matrix of distances, we proceed according to

$$D_{gg'} = \max(D_{g'h}\ , D_{g'h'})\ . \qquad (11)$$

An adverse chain effect does not occur in this case. On the contrary, there is a tendency towards the formation of compact clusters, not extraordinarily large, though.

Average Linkage Method (Sokal-Sneath Method). As a criterion for the connection of clusters, this method applies an average of the q possible between-cluster distances of objects. When recalculating the distance matrix, we use

$$D_{gg'} = \frac{n_h \cdot D_{g'h} + n_{h'} \cdot D_{g'h'}}{n_h + n_{h'}}\ . \qquad (12)$$

The method often leads to similar results as the farthest neighbour one.

Centroid method (Gower method). Unlike the above methods, this one is not based on summarizing the information on between-cluster distances of objects, the criterion being the Euclidean distance of centroid

$$D_{\mathrm{E}}(\bar{x}_h, \bar{x}_{h'}) = \sum_{j=1}^{p} (\bar{x}_{hj} - \bar{x}_{h'j})^2\ . \qquad (13)$$

The recalculation of the distance matrix is done as follows

$$D_{gg'} = \frac{1}{n_h + n_{h'}} \cdot \left(n_h \cdot D_{g'h} + n_{h'} \cdot D_{g'h'} - \frac{n_h \cdot n_{h'}}{n_h + n_{h'}} \cdot D_{hh'} \right)\ . \qquad (14)$$

ard Method. The method uses a functional of the decomposition quality C_1 in formula (4). The criterion for the cluster connection is an increment to the total intra-group sum of the squares of observation deviations from the cluster average, thus

$$\Delta C_1 = \sum_{i=1}^{g}\sum_{j=1}^{p}(x_{gij} - \overline{x}_{gj})^2 - \sum_{i=1}^{h}\sum_{j=1}^{p}(x_{hij} - \overline{x}_{hj})^2 - \sum_{i=1}^{h'}\sum_{j=1}^{p}(x_{h'ij} - \overline{x}_{h'j})^2 \ . \qquad (15)$$

The increment is expressed as a sum of squares in an emerging cluster which is reduced by the sums of squares in both vanishing clusters. Using arithmetic modifications, the expression can be simplified into the form

$$\Delta C_1 = \frac{n_h \cdot n_{h'}}{n_h + n_{h'}} \cdot \sum_{j=1}^{p}(\overline{x}_{hj} - \overline{x}_{h'j})^2 \ . \qquad (16)$$

This equation is a product of the Euclidean distance between the centroids of clusters considered for the connection and a coefficient depending on the cluster size. The value of this coefficient grows with an increasing size of clusters, and for fixed $n_h + n_{h'}$ it represents the maximum in the case of same-size ($n_h = n_{h'}$) clusters. Since we create the connections to ensure the minimization of the criterion $\Delta\, C_1$, the Ward method tends to eliminate small clusters, i.e. to form those of roughly the same size, which is often a desirable property. Starting from the matrix of Euclidean distances between objects in the process of its modification, we can use the formula

$$D_{gg'} = \frac{1}{n_h + n_{h'} + n_{g'}} \cdot [(n_h + n_{g'}) \cdot D_{hg'} + (n_{h'} + n_{g'}) \cdot D_{h'g'} - n_{g'} \cdot D_{hh'}] \ . \qquad (17)$$

The essence of this multidimensional statistical method is explained in detail in [7], [5] or [8]. Ward’s method and Euclidean distance metric are the most used and have been also used in this analysis. Cluster analysis was based on data for 2015. There are various methods for determining the optimal number of clusters in cluster analysis, see for example [4]. However, there is no definitive answer to the question of determining the optimal number of clusters. The problem lies in that cluster analysis is basically an exploratory approach. Interpretation of the resulting hierarchical structure depends on the context, and there are often several solutions from the theoretical point of view.

3.2 Regression Analysis

The essence of regression and correlation analysis is explained in detail for example in [2] and this analysis was made on data for 2015, too. Average annual wage (only “average wage” in further text) was considered as dependent variable, real minimum wage (only “minimum wage” in further text), structural unemployment rate (only “unemployment rate” in further text) and GDP per head of person (only “GDP” in further text) were considered as independent variables.

The normality of all variables was verified in both ways, visually and using the Kolmogorov-Smirnov goodness of fit test. All variables were verified, Figure 1 and Table 2 present the results for variable „average wage”.

Although the variable “wage” is mostly lognormally distributed (i.e. with positive skewness), the variable “average wage” has a symmetrical distribution, which is in favour of the normal distribution, see Figure 1. P-value = 0.693242 shows that the hypothesis assumed normal distribution of average wage was not rebut at 5% significance level. Similar results were obtained from other variables.

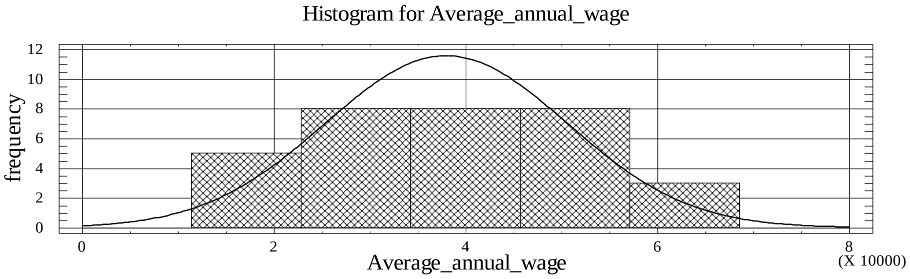

Fig. 1. Frequency histogram used for optical assessment of the normality distribution of average annual gross wage.

Table 2. Results for Kolmogorov-Smirnov goodness of fit test of normality for average annual gross wage.

Estimated Kolmogorov statistic DPLUS = 0.125647
Estimated Kolmogorov statistic DMINUS = 0.115313
Estimated overall statistic DN = 0.125647
Approximate P-Value = 0.693242

Table 3. Results for multiple linear regression analysis using the method of stepwise regression, forward selection (backward selection provides the same).

Multiple regression analysis					
Dependent variable: Average annual wage					
Parameter	Estimate	Standard error	T statistic	P-value	
CONSTANT	8609.67	3356.31	2.56522	0.0156	
GDP per head	0.76987	0.0826229	9.31788	0.0000	
Analysis of Variance					
Source	Sum of Squares	DF	Mean Square	F-Ratio	P-Value
Model	3.67012E9	1	3.67012E9	86.82	0.0000
Residual	1.26814E9	30	4.22713E7		
Total	4.93826E9	31			
R-squared = 74.3201 percent R-squared (adjusted for d. f.) = 73.4641 percent Standard Error of Est. = 6501.64 Mean absolute error = 5323.46 Durbin-Watson statistic = 1.62887					
Stepwise regression					
Method: forward selection F-to-enter: 4.0 F-to-remove: 4.0					

Step 0:
0 variables in the model. 31 d. f. for error. R-squared = 0,00 % Adjusted R-squared = 0,00% MSE = 1.59299E8
Step 1:
Adding variable GDP per head of population with F-to-enter = 86.8228 1 variables in the model. 30 d. f. for error. R-squared = 74.32 % Adjusted R-squared = 73,46% MSE = 4.22713E7
Final model selected.

At the beginning, a linear regression hyperplane was considered. Stepwise regression with forward selection was used for determining a set of independent variables that have a significant effect on the dependent variable, see Table 3. It is clear from this table that only independent variable “GDP” was inserted into model, which narrows the model into straight line. Both individual t-tests and total F-test are significant. Durbin-Watson statistic is 1.62887, so in the interval (1,4; 2,6), which indicates that there is no problem with autocorrelation, and we can treat the residuals as independent. Determination index shows that 74.3201 percent of variability of average wage values is explain using linear regression model. Table 4 represents the results of quadratic regression function. Adjusted determination index of quadratic function is 87.2981 percent and that one of linear function is only 73.4641 percent. All individual t-tests and total F-test are significant at 5% significance level and the value of Durbin-Watson statistic 2.07188 shows that we have not a problem with autocorrelation. Thus, the polynomial regression function of the second degree better captures the dependence of “average wage” on “GDP”.

Table 4. Results for polynomial regression analysis.

Polynomial regression analysis				
Dependent variable: Average annual wage				
Parameter	Estimate	Standard error	T statistic	P-value
CONSTANT	-18289.0	5184.46	-3.52765	0.0014
GDP per head	2.04375	0.226843	9.0095	0.0000
GDP per head^2	-0.000013	0.000002268	-5.80293	0.0000

Analysis of Variance					
Source	Sum of Squares	DF	Mean Square	F-Ratio	P-Value
Model	4.35147E9	2	2.17574E9	107.53	0.0000
Residual	5.86783E8	29	2.02339E7		

Total (Corr.)	4.93826E9	31

R-squared = 88.1176 percent
R-squared (adjusted for d.f.) = 87.2981 percent
Standard Error of Est. = 4498.21
Mean absolute error = 3612.72
Durbin-Watson statistic = 2.07188

Figures 2 and 3 represent the course of both types of dependencies considered and Figures 4 and 5 show the corresponding residual charts. It is clear from Figure 4 that residuals have not random character in the case of linear regression. In the case of polynomial regression, we can consider the course of residuals as satisfactory. In Addition to the visual approach, Glejser's test was used for heteroscedasticity testing in the case of polynomial regression. It was found on this basis that we have no problems with heteroscedasticity. For this reason, the polynomial regression function is more suitable model of dependence of “average wage” on “GDP”. The sample regression parabola has the form

$$Average\ wage = -18{,}289.0 + 2.04375*GDP - 0.000013*GDP^{\wedge}2. \qquad (18)$$

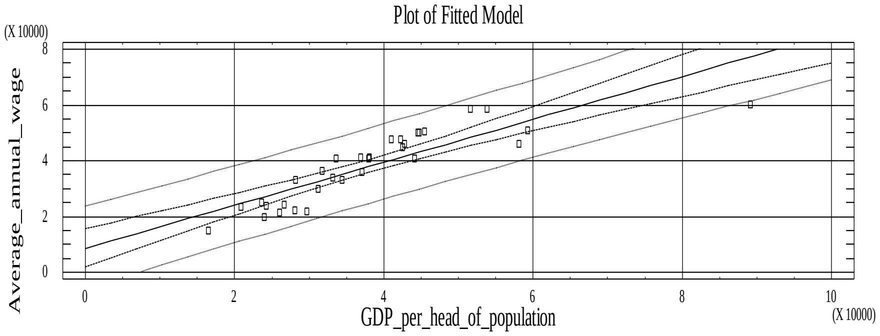

Fig. 2. Plot of fitted model – linear regression.

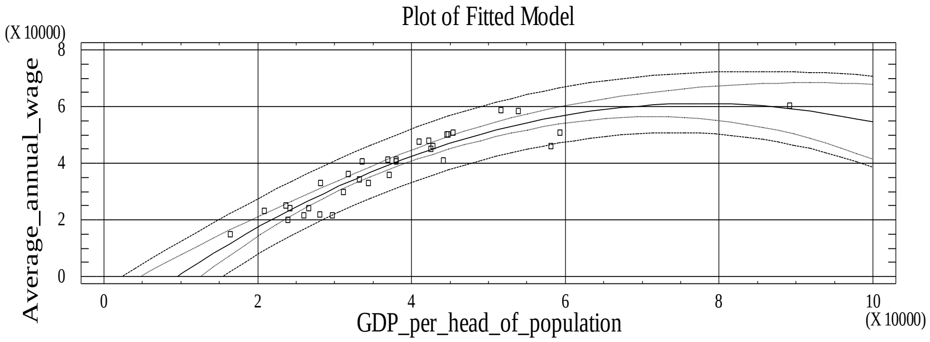

Fig. 3. Plot of fitted model – polynomial regression.

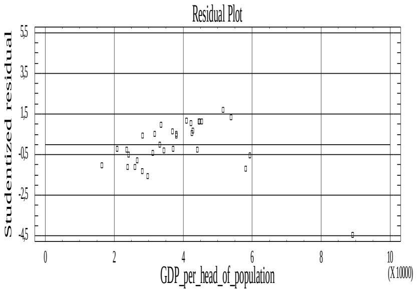

Fig. 4. Plot of residuals – linear regression.

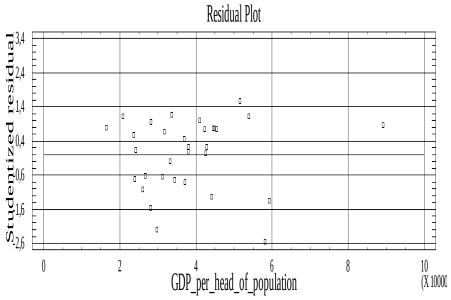

Fig. 5. Plot of residuals – polynomial regression.

4 Results and Discussion

Total 32 member states of OECD were chosen. There are covered three groups of states in total: non-European OECD member countries, developed Western European Countries and the former socialist bloc countries, see Table 1. Figures 6–9 presents the results of cluster analysis. Individual countries have been aggregated into five, seven, nine or eleven clusters to create clusters of the most similar countries in terms of average wage, minimum wage, unemployment rate and GDP in 2015.

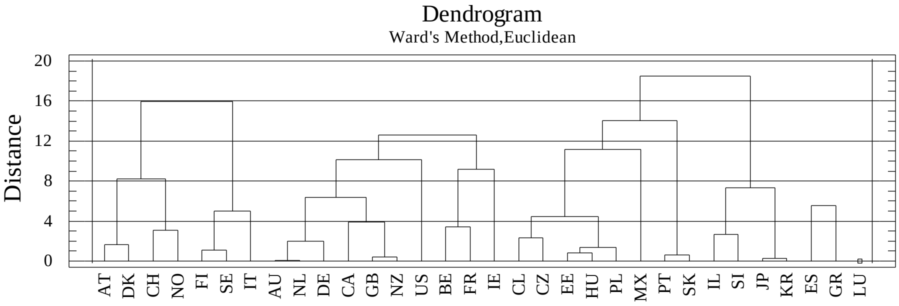

Fig. 6. Results of cluster analysis using Ward's method, Euclidean distance metric and five clusters.

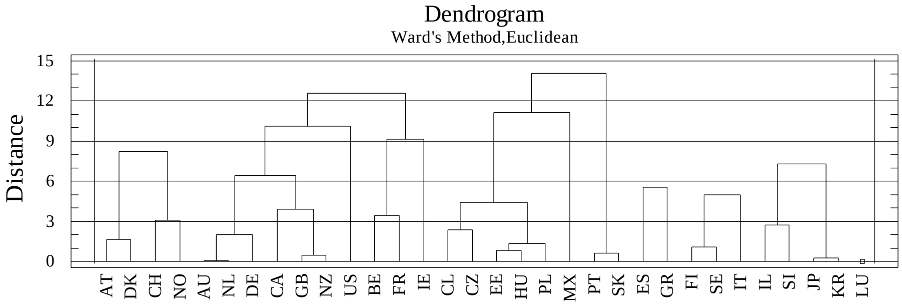

Fig. 7. Results of cluster analysis using Ward's method, Euclidean distance metric and seven clusters.

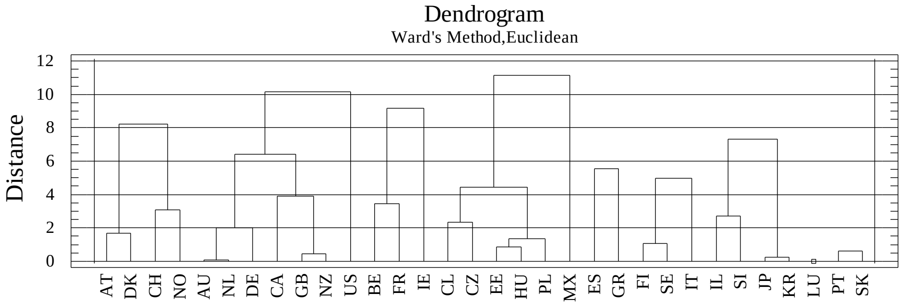

Fig. 8. Results of cluster analysis using Ward's method, Euclidean distance metric and nine clusters.

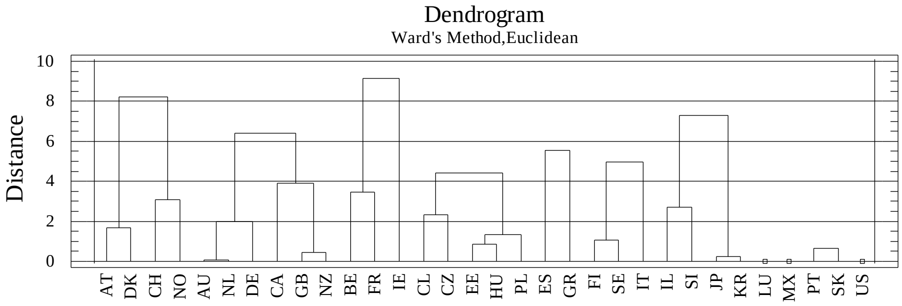

Fig. 9. Results of cluster analysis using Ward's method, Euclidean distance metric and eleven clusters.

When 32 selected countries are divided into five clusters in Figure 6, the first cluster is made up of seven countries, such as Austria, Switzerland, Denmark, Finland, Italy, Norway and Sweden. There are the Northern European countries and the most developed European countries. Another ten countries represent the second cluster: Australia, Belgium, Canada, Germany, France, Great Britain, Ireland, Netherlands, New Zealand, and United States. There are high-developed European and non-European countries. The third cluster is made up of twelve countries. There are except for minor exceptions less developed non-European countries, states of the former socialist bloc and countries that solved substantial debt problems. There are Chile, Czech Republic, Estonia, Hungary, Israel, Japan, South Korea, Mexico, Poland, Portugal, Slovenia and Slovak Republic.

Table 5. Real and theoretical value of "average wage" in 2015 after conversion into purchasing power parity in USA calculated using regression function selected and variable "GDP".

Country	Reality	Model	Country	Reality	Model
AU	50,167	47,157	IE	46,074	56,579
AT	46,084	45,368	IL	29,794	32,796
BE	47,702	43,629	IT	34,140	35,211
CA	47,843	44,872	JP	35,780	39,606
CH	58,389	54,075	KR	33,110	36,649
CL	23,247	18,619	LU	60,369	60,592
CZ	21,689	30,959	MX	14,867	11,809
DE	44,925	45,109	NL	50,670	47,718
DK	50,024	46,958	NO	50,908	57,178
EE	21,564	26,098	NZ	39,888	35,708
ES	36,325	33,466	PL	23,998	23,568
FI	40,731	40,573	PT	24,105	26,968
FR	41,252	39,455	SE	40,909	46,592
GB	41,384	40,640	SI	33,085	29,009
GR	25,211	22,783	SK	22,031	28,869
HU	19,999	23,183	US	58,714	52,550

The fourth cluster has only two members Spain and Greece, which solved extensive debt problems recently. Only one state Luxembourg with absolutely the highest average wage represents the fifth cluster. Figures 7–9 show division of 32 selected countries into seven, nine or eleven clusters.

From the results of regression and correlation analysis made for 2015 is clear that only variable "GDP" from considered three independent variables influences statistically significant dependent variable "average wage". Determination index acquires the value 88,12 %. It means that 88.12 % of variability of observed values of "average wage" contrived to explain using selected quadratic regression function and "GDP" variable. The concave parabola with the maximum for 157,212 USD PPP of "GDP" represents a regression function describing the dependency of "average wage" on "GDP". It means that "average wage" increases with increasing "GDP" as far as 157,212 USD PPP. As soon as this point is reached, the "average wage" would start to decline with "GDP" growth. On the other hand, none of the countries is far below such a high "GDP". Table 5 represents the real and theoretical values of "average wage" calculated using "GDP" in 2015.

5 Conclusion

The highest average wages are in the most economically advanced countries in the world. The average wage represents a criterion of financial prosperity of the country. Average wage after its conversion into purchasing power parity reflects different living costs in individual countries. Wage distribution is positively skewed and so, the most of people do not reach the average wage.

Income differences between individual OECD member countries are lower taking into account the prices of goods and services than in the case of the comparison of nominal average wages. Even in purchasing power parity, the highest average wage is in Luxembourg, United States and Switzerland. On the contrary, we can see the lowest average wage in Mexico, and Hungary. The highest costs of living are also in the OECD member countries with the highest average wage. Especially, expenditures on housing and services are considerably higher in Luxembourg, United States, Switzerland Norway or Germany than for example Mexico, Chile or Hungary. For example, while the average wage in Switzerland is higher than in Mexico 15.4 times when comparing the absolute values, the average wage in purchasing power parity is only 5.4 times. However, the gap has been steadily risen in recent years. When comparing gross wages in absolute values, Luxembourg's, United States's, Switzerland's or Norway's financial advantage is very high, in purchasing power parity this is not true so much, because these countries have also the highest prices for goods and services in the OECD member countries.

The lowest wage differences are in the Czech and Slovak Republics and in the Scandinavian countries. This means, among other things, more employees reach average and higher wage than in other countries. The highest wage differences are in the Mexico. Lower wage differences and a functional social network are the reasons, why the least poor OECD citizens are in the Czech Republic. The poor is considered a citizen with an income of less than 60 % of the median wage. For households, the income is calculated for determining the poverty line.

In the European OECD member countries, employees pay more for income tax and compulsory insurance than in the non-European countries. From the financial point of view, it would be the best to get an average wage for example in Switzerland, to pay a tax in Chile and to spend a net wage on the purchase of goods and services in Mexico.

The main research hypothesis (division into Western European countries on the one hand and Eastern European countries on the other hand is still holding) can be considered proved.

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Deployment of New Technologies as an Integral Part of Secure Information Systems Environment

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Abstract. A proposal of the information system is a complicated process. It has to comply with an environment, where it is to be applied, and the legislation and norms have to be taken into account. Potential security risks have a significant impact on the IS proposal itself. Besides requirements for main functional units, aspects, which could affect development, implementation and a safe routine operation, have to be taken into consideration. Application friendliness, which clearly influences a margin of safety, cannot be forgotten. The modern IS has to rely on current knowledge in the area of hardware and software and use to the utmost its potential. Present manuals and guidelines for the development of information system are either on a general level and do not affect technology development or they go into details and thus topicality of content is related to the time of its creation. This article is focused on bonds between dynamically developing areas which have a significant impact on the creation of the modern IS and its security.

Keywords: Information System, Smart Devices, IoT, Security

1 Introduction

Information systems (IS) based on information technology in the environment of computer networks brought both simplification of routine activities and availability of information between workplaces where a particular system is used [8]. Apart from original autonomous applications that cover management needs and simplification of the routine activities thanks to increasing hardware (HW) capacity and building of network infrastructure led to centralized systems the primarily benefit of which was continuity of individual modules outputs and centralization of generated and processed data storage.

Presently, the infrastructure of many companies lies not only in internal enterprise networks, it crosses their boundaries and uses dynamic services of public clouds. With price decrease, this trend is not connected with multinational and large companies only. The offer of different variants of cloud services is attractive even for many medium-sized companies. Modern SMART devices [2], which are able to supply a great deal of information from various areas of human activities, are connected to the infrastructure of companies and their private or hybrid clouds. Understanding of production processes have changed with coming the Industry 4.0 [10] initiative. It represents maximum automation and robotization which is connected with high utilization of SMART technologies, high data flow, and data storages at the level of IT environment [23].

Technologies development brought concentration of computer capacity into Clouds which resulted in the availability of many services that could be dynamically modified in compliance with topical requirements [1]. Thus, users have had an opportunity to use just as many systems means as necessary to complete a particular task without interfering into their own information technologies (IT). The latter applies if the user uses either powerful enough private cloud or paid services of the public cloud [17]. Early experience showed that temporary use of the cloud services could provide dynamic workspace for applications beyond the functions of the used company IS. For instance, it is an effort to enable work groups from the company infrastructure a cooperation with other subjects that otherwise, thanks to the company policy, would not have access to the internal IS [20]. Unrestrained decentralization brought along complications with duplicate data processing in the traditional company IS and in the parallel system about which the IT department was not informed. A security problem regarding a possible unauthorized use of data emerged because they were not stored in the secure environment under the administration of the given organization [19].

With the access to services organization, two new concepts occurred. The first one, the Lightweight IT contains a variant which is a conceptual antipole of the traditional concept of the company IT which is the Heavyweight IT [7]. While the Lightweight IT is able to satisfy users´ needs in a short period of time with applications, which are developed for the mobile platform mainly outside the company IT department, the Heavyweight IT is centralized complex and fully based on standards, which makes it slow in response to desired changes.

2 Problem definition

It is common for both centralized and decentralized systems that the technological progress is accompanied by the risk of security incidents with different impacts on the stability of the company. Almost every new element and access to the data network results in a potential resource of a security risk for the company. Responsible persons face the task of effective security which is not easy to meet due to a dynamic variability of potential attacks which require proper evaluation. Thanks to the functional connection between these two models, the security solution has to be beyond them with the use of their potentials.

The mobile platform is formed by smart systems [2] and monitoring devices where the security measures, commonly used on the PC platform, cannot be implemented. Their protection has to be performed on to this purpose designated network elements. These devices send quite a huge amount of data to the central storages with the use of standard or proprietary protocols [13]. The transmitted data have to be safely transferred and stored.

In the environment of decentralized systems, the users can combine work in applications needed for their professional activities and simultaneously, they can have another running program which has nothing common with their duties, but it enables to send sensitive data outside the corporate environment without their knowledge [14]. Nevertheless, there are application modules which are able to separate store data in a mobile device to private and enterprise, it is necessary to install and configure them into the private persons´ device. This step is not possible without their agreement [27].

In general, the person with authorized access to sensitive data should be considered a potential source of the threat. The proven and trained worker does not have to be pressure resistant and does not have to recognize the use of social engineering techniques. For this reason, it is necessary to take into consideration to what depth and breadth of the data structure the access permissions should be set up.

From the perspective of the company, the data have to be treated cautiously not only due to a business secret but also they have to be pursuant to laws and norms. Regarding the processing of patient information, the European Union released standards dealing with privacy and security of personal data in the Directive 95/46/EC, on the basis of which the member states amended their legislation. Subsequently, the Czech Republic Ministry of Health prepared the medical document, Regulation 98/2012 Coll. Data for research are possible to transfer after so-called deidentification [4]. Processing of personal data anticipated changes due to the implementation of the Regulation (EU) 2016/679 known as GDPR - General Data Protection Regulation [25]. This document concerns not only information technologies but also has impact on its functioning.

3 Focused areas

Besides others, IT management methodology, in which the system is studied from the perspective of IT organization in the company structure, deals with IT security in new conditions [6], [28]. Encryption is used at different levels in order to reach data protection. The crypto protection of data stored in the public cloud or encryption of the transmission channel between the source and destination of transmitted data can be concerned [3].

A process of user authentication in the system is commonly treated by verification of username and password. In modern systems especially where sensitive data are processed, it is an effort to implement a multilevel variant. A combination of password, biometrics, generated token or RFID chip can be used [12]. A security level is done by a level of knowledge about security risks [24] and loyalty of an employee – a user. Successful implementation is based on a simple and user-friendly control.

A breach of company systems security arises from the finding the loopholes. Traditional and newsworthy is the attack led by a group or by individuals in order to breach protection and get information which can be sold on the black market or to threaten the organization with disclosing the information to the public. Different methods can be used for the attack in dependence on the target. The reason could be rapid technical development and unsuitable implementation of technologies leading some companies to a vision of gaining a competitive advantage [18]. One reason could be the onset of bring your own device (BYOD) [9] philosophy which allows users to work on their own devices in the company environment. The IT department faced the assignment to integrate tablets and smartphones into the company IT infrastructure which was often in a fundamental contradiction with the company policy [2]. The connection of mobile devices and notebooks meant the extension of existing network with wireless technologies which is accompanied by the entire readjustment of security policy.

Recently, the start of clouds has brought another problem as a result of technical progress. Company departments, without knowledge and agreement of the IT department, hired services and data spaces while fulfilling their tasks which led to the decentralization of user accounts management and data duplicity. The data decentralization itself is not a new issue emerging in providing cloud services. If the information system is considered the element that has a function to centralize data flows for more effective usage then decentralized processing is related to the beginning of IS development and to the environment where IS were not for some reason applied.

4 Information system extension

Securing information processed within a modern company infrastructure faces new challenges and it is necessary to divide it into categories so that these categories follow logically one after another. The division is as follows:

- physical security,
- users policy,
- hardware and Network stability,
- software vulnerability.

There exist, traditional, mostly autonomous solutions for them.

Within the physical security of workplaces with expensive technologies or workplaces processing sensitive data, it is necessary to implement an adequate protection focused on limiting access to these sensitive data and on monitoring the movement of persons in a given locality. The access to specified areas can be verified via electronic security system, the movement of persons can be monitored by cameras.

Users are authors and processors of data. Damages caused by laxness or by ignorance can have a fatal influence on the existence of the whole company [16]. To avoid this security gap, it is necessary to organize in accordance with the company´s rules and policies not only introductory training while hiring new workers, but also regularly updated trainings aimed at clarifying current threats, duties during the data processing and possible impacts in case of information leak.

Every part of the company´s technological equipment including backup power supply systems, network security by current technologies and recommended procedures requires a specific protection.

A similar situation is in the software (SW) category. It concerns an antivirus protection of workstations and servers and performing a regular update of operating systems and applications.

4.1 Initial studies

As part of independent projects were realized studies in two different entities with different areas of activity. The first one was a laboratory at the Department of Toxicology, the second one the Klokočka car store. These studies were aimed at assessing the state of protection of the intellectual and physical property of the discussed subjects. Within them, selected processes and their follow-up internal regulations relating to sensitive data as well as the level of technical equipment that prevents the physical handling of data or material of entities have been investigated.

The Laboratory of the Department of Toxicology as the non-commercial subject is a part of University of Defense structure. Its environment is less structured in all explored fields and it primarily uses features of the university information system. However, its functions are focused only on organization management and do not include support modules for scientific activities. Support for research consists of separate applications installed on user workstations. Access to all department computers is secured by the login name and password. PCs connected directly to the laboratory apparats on some laboratories are password-free. The building is monitored by a security camera system. Connectivity to the Internet is through the network elements in the IT department of the University. Their configuration could not be detected in detail. Department is located in a building under the supervision of security guard agency. Movement of persons is limited by entry guard system, based on ID cards with RFID chips that are also valid for entry to other parts of the university. Admission is granted to ID cards holders of the department and to persons accompanied by them.

Klokočka car store is focused on business and service activities. The headquarters and three branches are located in different locations in Prague. A unified data network is created by using a secure Virtual Private Network (VPN) technology to allow connection for branches to the company IS. Company headquarters includes an IT center with a point of access to the Internet. Enhanced internal network protection is realized by commercial New Generation Firewall and IPS / IDS solutions. Computers involved in IS environment are situated in offices and in client centers. Diagnostic computers in the workshops are connected to the data network too. It comes from necessity of connectivity to the manufacturer's service database. Access to the IS is protected by username and password. Computers in the workshops are kept out of the information system and their security is a based on a shared password. Protection is addressed here by the separation of the workshop zone and the public zone. Client center computers are physically at less secure location. Because they are part of the IS, not only the username and password knowledge is needed. Persons working with them are specially trained for possible risks. The entry system is based on employee ID cards. As usual it is decentralized system with its own user DB. Entry permission for individuals is defined by its work position. The company premises are monitored by a camera surveillance system.

In both cases securing of information technologies, saved data in the system and connection to the Internet were discussed, including possibilities of a remote access for external workers or business partners. The system of access to different parts of the buildings, where the above mentioned subjects have their seats, and monitoring of the movement of the workers, used systems and their adjustment were discussed as well.

Although both subjects could be understood as diametrically different, they have common global features – putting effort into continuous development, securing information and material values. On one hand, for a research laboratory, it is important to protect material and knowledge connected to a research, on the other hand, for a car store, it is important to secure know-how and information concerning financial results of its business.

4.2 Initial Security Conception

In both subjects, the concept is based on physical security and monitoring of the persons´ movement by the autonomous camera system. Entry system of authorized persons into the areas which are related to their activities is controlled by an autonomous system using identification cards. The reason is that both subjects use in their areas specific devices and equipment of a high acquisition value.

Information system for the car store was more complex than that for the laboratory, but application equipment of laboratories was closely connected to experiments which were performed here and it is unlikely that they would be fully represented in available LIMS.

The user interface for access to applications and information system is secured by verification of the logged-in user in a uniform account database with the LDAP technology which enables Single Sign-On to computer technology and applications. Event logging at workstations is set as initial, servers were adjusted according to the company´s policy.

At the car store there were the segment of workstation network and the segment of servers providing services to employees and customers separated from each other by a router with adjusted policies filtering the required service. The access to the Internet was influenced in a similar way. A commercial protection system with a high permeability was introduced here [5]. The laboratory was separated from the servers and the Internet by a router and a system based on customized open source solution [11].

The view on both the systems at the moment of solving a security incident is similar. In all the above mentioned systems it is necessary to find out a given time interval and records connected to it. Logs of the IT system are extensive and it could not be possible to be oriented if we do not have a further tool which would be able to find events in real time and with minimum effort. It is possible to draw conclusions only after finding out the data in all the systems.

4.3 New technologies

Although IP cameras are already a commonly used technology, they have not fully replaced analogue forerunners yet. An advantage of a camera recording system is segmentation of the records into files with a fixed record length. The length is recorded into the file name according to a single code together with the date and time of the recording and the file is saved into a data storage. An important parameter for an IP camera is the resolution of its chip scan/ scan chip which significantly influence the legibility of the recorded event.

LDAP database is the place where it is possible to save not only the username and the password but also the card code and the key tag with a RFID chip [21]. The above mentioned technology can be used for multi-level authentication of the person who is trying to log into a computer, enter a building of the company or collect material from the warehouse. Card readers of electronic locks located at the doors are equipped with a network interface which enables them to be interlocked with a switchboard of the safety and attendance system through structured cabling system that means through omnipresent network cables. The switchboard is a server application collecting, saving and evaluating information from the readers.

4.4 Protected information and management system.

The connection of mentioned above technologies into the centrally controlled system and expansion of information and management system (IMS) with events audit database and with the module of audit evaluation, we acquire a significant source of information. Time sequence of records represents the basis for setting up the maintenance of database particularly its size. To achieve that, it is necessary to meet needs of both the operator and legislation mentioned in the introduction.

With the advent of Artificial intelligence technologies and their availability [15], an opportunity to implement the mentioned data collection has emerged. Algorithms similar to those which reveal anomalies in communication network devices and detect the attack on the infrastructure can cause anomalies in the behavior of individuals and prevent losses of material and intangible possessions of a particular company.

Global successful implementation is considered the interface definition between information management modules and SMART technologies [22], [26] for its easy connection with required functionalities. As far as the construction IoT technologies were mentioned above, there is an option to insert HW solution, the concentrator which would modify input data for the IS.

Evaluation of data collection available in the given system brings a lot of information inaccessible in other systems (Fig.1). A drafted workflow proposal of the secured laboratory information management system (LIMS) may be primarily divided into three groups:

- security,
- logistics,
- management.

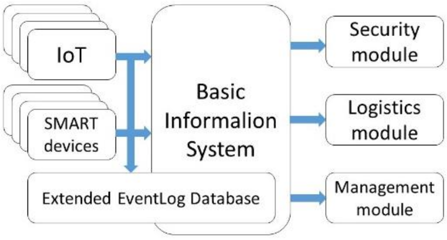

Fig. 1. Functionality extension of Basic Information System

For evaluation of security events either processed by an operator or by algorithms, there are records available from different sources with a timestamp which allow to put them in chronological order which results in a fast and easy evaluation.

For logistics, connection to the database of data from sensors brings immediate overview on material consumption and defects. Purchases may be planned and provided more easily and with early intervention on places where disrepair appears and the remedy may be made with lower money spent.

An extended system of information on persons productivity while performing their tasks is offered for the company management in overall terms the materials for the proportional burden of workers and for their evaluation.

The aim of the above mentioned solution is to effectively cover areas connected with company work activities. Specific areas of operation which involve for example monitoring and evaluation of data flow are IDS/IPS systems or New Generation Firewall /NGFW). Monitoring and evaluation of technologies and applications state are suitable to leave the System Centre for applications. It would not be suitable to bind closely the information system with platforms on which it runs independently.

5 Conclusion

Modern protected information and management systems are to be understood in a broader context than only as a support of routine activities and management. They are global immediately following units of HW and SW components and they have to comprise a functionality extended by a security audit. Its function is to create a track of events leading to the studied incident and to clarify the given event. The functionality of the model described in this article is obvious. It can be applied in different areas of activities, wherever the data from logs and sensors linked to the given information system can be used.

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Labor Market in Multi-agent Environment Modeling Virtual Economy

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Abstract. The paper is focused on the detailed overview of the part of the virtual economy project (VEP) which is developed within the research program at the University of Hradec Kralove. The introduction is mainly about the principles of the multi-agent system and how the economic methods could be developed by this approach and related works. The VEP project is described to better understanding the author’s motivation and continuity for the previous research. The practical part is focused to explain how exactly these principles are used in the VEP project (what methods and technologies were used, or what influences were not been taken into account). The paper provides the graphical samples of the labor market behavior displayed as sequences of the steps by state diagrams. For the verification of the right behavior of the labor market implementation, some tests were performed and the results were analyzed. The summarization of the measured results with the relation for the future research is described at the end of the paper.

Keywords: Agent, Virtual Economy, Labor Market, Agent-based Economic Model.

1 Introduction

The agent-based computational economies represent a bottom-up approach for developing economic systems, where is desired behavior achieved through the interaction of its individual components – agents [6]. In this paper, the main attention is focused on an overview of the labor market in an agent-based economic sandbox environment, currently under development at the Faculty of Informatics and Management of the University of Hradec Kralove.

1.1 Economy in Multi-Agent systems

The economic influence is the important part of the most of the models (agent-based, mathematics, evolutionary, experts…) [5] which is trying to simulate the behavior of the real world.

The popular area of the modeling economy in the virtual environment is Agent-based computational economics (ACE). Much of existing literature indicates that ACE is a powerful tool for the ex-ante analysis of market power, and consequently for policymakers when evaluating structural changes and market policies. The area describes the individual economic subjects (i.e. labor market, consumer, provider…) as separate agents which can interact with each other according to its goals [4].

Gehrke in [3] explains the logistics as an important economic integral part of internal business processes which is crucial for efficient supply chain management and smooth business operation.

The Virtual Economy Project (VEP) is based on the principles of Agent-based computational economics.

2 Virtual Economy Project

The model described in this paper is a part of agent-based computational economics project “Virtual Economy Project” (VEP) which is primarily focused on the effective distribution of all types of products throughout the model [1].

The economic model does not aspire to be an all-inclusive real-world simulation. Some areas important for real-world economies have been deliberatively omitted, like currency markets, stock market trading, many financial services, etc., in order to keep model viable and comprehensible. Although some level of abstraction was necessary, there has been on the other hand shown a considerable effort to utilize real statistical data (from sources like Czech Statistical Office, see www.czso.cz webpage) as much as it has been relevant and useful for the functions of the model. Also, although simplified for the same reasons as mentioned above, official classifications were used to classify model components/activities plausibly (e.g. CZ-NACE classification of economic activities or RAMON – Eurostat`s Classification Servers). This helped to clarify the model while maintaining a reasonable level of detail at the same time [8].

The model is developed on Anylogic developer tool which runs on the JAVA platform. There are several agents which represent economic entities:

Table 1. Agent’s overview of the Virtual Economy Project.

Agent	Description of behavior	Number of agents in model
Mine (MA)	Mining materials, distribute materials	200 – 2000
Factory (FA)	Ordering inputs, producing and distribute products to FA, SA	500 – 5000
Store (SA)	Ordering products, selling products to CA	50 – 1000
Consumer (CA)	Consume products, represent workforce	1000 – 500 000
Transport (TA)	Transport CA or products	50 - 10000
Company (CoA)	Own MA, FA, SA or TA. Planning company expansion	1 - 100
Broker (BA)	Manage markets – products, services, and labor	1 per city
City (CiA)	Area unit. Represent city and its services.	1 - 100

In the model, the indirect communication is used. This approach is used in trading with products or workforce. In principle, the agent needs to distribute the product which was produced on the wholesale market. The order must be created in the standard form: name of product, amount, price and seller. This order is sent to facilitation agent Broker which decide what will be done next (add order on the wholesale or retail market) [7]. The principle of the communication is described in the picture below.

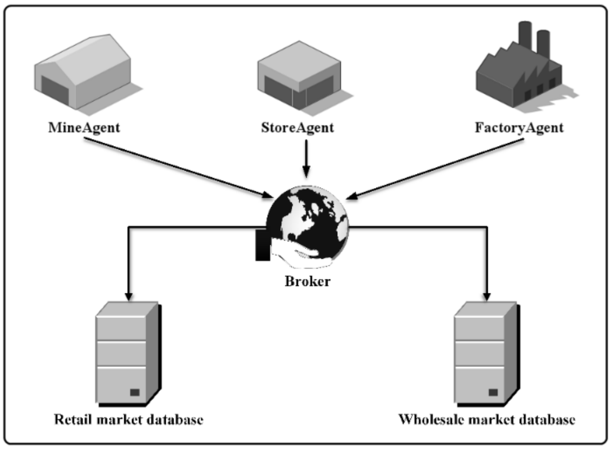

Fig. 1. The principle of indirect communication in the Virtual Economy Project.

The labor market will be implemented by the same principle as product markets. Before the implementation, the several questions need to be analyzed to choose the most appropriate option.

3 Implementation ways of the labor market

To implement the ways how the companies would hire the employees the main attributes of the consumer agents had to be defined:

Table 2. Consumer agent's attributes relating to the labor market.

Attribute	Description
Age	Only CA in productive age (15 – 65) should be employed
Specialization	CA prefers the workplace with its specialization.
City	CA prefers the workplace which is near to its permanent residence

The next important attribute for labor market area could be e.g. **efficiency** which could be calculated from attributes like experiences, education and if the CA works in its specialization field. This attribute is scheduled to be added to the future version of the VEP project.

Table 3. Workplace attributes relating to the labor market.

Attribute	Description
Salary	Salary for the specific workplace
Specialization	CA with the relevant specialization to the workplace will have a better chance to be employed than CA with other specialization.
City	CA prefers the workplace which is near to its permanent residence.

The companies prefer the employees in the relevant specialization – simple behavior of the hiring. Consumers prefer the workplace in its specialization field, near to its permanent residence and on the amount of the salary.

3.1 Datasets of the VEP relates with Labor market

The important part of the project is the verification of the appropriate datasets. The main statistics in the model are provided by the Czech Statistical Office [2].

The age of the consumers is calculated by the average values of the age limits:

Table 4. Age limits in the VEP project

Age limit	Age group name	% Consumers (CZ)
1 – 14	Child	15
15 - 65	Adult	65
66 +	Retired	20

The dispersion of the consumers by age is done at the start of the model by the simple function, where for each of the consumer agent the age is randomly calculated by the percent probability from the Table 4:

At first, the value from the random generator is used to determine to which age group the CA belongs (1 – 15 = Child, 16 – 80 = Adult, 81 – 100 = Retired). Then the age is set at the appropriate interval.

The next datasets based on the real data in VEP are e.g. gender distribution, the population of the specific cities or location of the cities on GIS map.

4 Experiments

For the verification of the right behavior of the age distribution and the relating hiring procedure, the simple experiments were performed.

4.1 Age distribution experiment

The purpose of this experiment was to ensure that the all of the age groups have the similar distribution as in the real. The experiment was performed on the total population of the 4 cities (which parameters were based on the real data) from the

Hradec Kralove region. These cities (Hradec Kralove, Trebechovice pod Orebem, Chlumec nad Cidlinou and Jaromer) have totally 116502 people (consumers). The results of the distribution from the 10 runs of the model are following:

Table 5. Age distribution in the VEP

Run	Childs	Childs ratio	Adults	Adults ratio	Retired	Retired ratio
1	17501	0,15	75675	0,65	23326	0,20
2	17447	0,15	76181	0,65	22874	0,20
3	17416	0,15	75866	0,65	23220	0,20
4	17493	0,15	75746	0,65	23263	0,20
5	17535	0,15	75561	0,65	23406	0,20
6	17504	0,15	75881	0,65	23117	0,20
7	17316	0,15	75746	0,65	23440	0,20
8	17321	0,15	75790	0,65	23391	0,20
9	17525	0,15	75775	0,65	23202	0,20
10	17469	0,15	75729	0,65	23304	0,20

From these results, it is clear that the age distribution function works properly in the VEP model. It was important to verify to get the right count of the consumers which could be used as the employees within the labor market area.

4.2 Hiring management experiment

This simple experiment verifies that the preferences of the companies (described in chapter three) are applied properly. The consumer's decision making will be more complex and will be used in the future research. For the test this companies and consumers were available:

Table 6. Companies in the VEP model within the hiring experiment

Company	Specialization	City
Butchery_1	1	Hradec Kralove
Butchery_2	1	Jaromer
Accounting_1	2	Hradec Kralove
Accounting_2	2	Jaromer

The companies are looking for the employees with the same specialization and the location of the consumer and company is not important for them. Within this strategy the results after applying hiring process in the model run were different.

Table 7. Consumers in the VEP model within the hiring experiment

Consumer	Specialization	City
Consumer_1	1	Hradec Kralove
Consumer _2	1	Jaromer
Consumer _3	2	Chlumec nad Cidlinou

Once the Consumer_1 was hired by Butchery_1, in the next run by Butchery_2 etc. In the main attribute, the results were always the same – specialization of the consumer was equal to the specialization of the company. It was not possible to hire e.g. Consumer_1 with specialization 1 by company Accounting_1 with specialization 2.

5 Conclusion

Presented simulations showed potential for testing more complex labor market behavior patterns in such virtual environments. The experiments were focused to verify if the standard and expected behavior work properly to start to implement complex algorithms. Future proceeding in the simulation will be focused on whole labor market process and its impact on the other areas (producing, transporting, trading…). Together with the involvement of more market participants, this is intended for the future work.

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Business Climate and Production Dynamics Nexus: Empirical Evidence for Bulgarian Manufacturing Sector

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Abstract. The paper presents selected results from an empirical analysis of the interrelation between the industrial dynamics and business climate in industry for the period 2009-2017 in Bulgaria. A vector auto-regression model has been estimated for this purpose using variables for the indexes of production volume and business climate estimated on monthly basis. Data from the short-term business indicators as well as business surveys in industry conducted by the Bulgarian National Statistical Institute have been used. New insights about the hypothesis for positive effects of business climate expectations are suggested concerning the industrial production dynamics during this period. Evidence is provided in respect of the anticipated favorable effect of the business climate, as perceived by the managers in the industrial sector, on the production volume shifts observed at lag one month. Similar short-run effect is found in support of the hypothesis that improved expectations of the industrial managers about the business climate are systematically induced by an expansion of the industrial production.

Keywords: Business Climate, Industrial Growth, Bulgaria.

1 Introduction

Business environment in Bulgaria has been in the focus of the public interest not only in the period of market transition but also after the official EU integration of the country. The specialized literature indicates that market reforms, if combined with macroeconomic stabilization and trade liberalization, are expected to establish an advantageous environment for investment and growth [3]. The importance of the favorable environmental conditions for the facilitation of successful economic reforms is unquestionable. However, the links between institutions and growth are still under comprehensive analysis [3, 5]. A recent study finds that access to infrastructure acts as quite influential component of business environment reflected by the overall economic performance – along with it, the effectiveness of law enforcement, government programs, and market institutions are also key drivers of the entrepreneurial productivity around the world [9].

The turbulent social and economic transformations in Bulgaria during the last 20 years have been induced by major events as the bank system collapse and inflation crisis of 1996-1997, the introduction of Currency Board in 1998, EU accession period (up to 2006) and all structural shifts incurred due to the opening of Bulgarian economy to the EC common market regime and regulations. The global economic crisis of 2008-2009 additionally generated drastic economic downturn and a following period of stagnation and disruptive resurrection. Nevertheless, the competitive potential of Bulgarian economy proved to survive even in the harsh post-crisis years.

Studies of different supra-national organizations provide a variety of assessments of different aspects of the business climate in a multi-country framework. For example, the World Economic Forum /WEF/ announces its Global Competitiveness Index /GCI/ which measures national competitiveness level evaluated by a set of institutions, policies and factors influencing the national productivity level. According to the up-to-date GCI for 2017-2018 Bulgaria is positioned at rank 49 (of 137 countries) as compared to rank 62 in 2012-13 [11]. In particular, the rank on "Macroeconomic environment" pillar is quite high (25), however, on "Infrastructure" the country rank drops to 76; notably, the rank on "Labor market efficiency" (68) is much more favorable than the rank on "Institutions" (98). According to the Executive Opinion Survey 2017 conducted by WEF the five most problematic factors for doing business in Bulgaria are corruption, inefficient government bureaucracy, tax rates, access to financing, and inadequately educated workforce.

Similarly, the World Bank /WB/ "Doing Business" survey positions Bulgaria at rank 39 among 190 economies [13]. Particularly, in respect of the "ease of getting credit" – related to indicators about how well the credit system and bankruptcy legislation enable the access to bank funding – the country ranks better (rank 32, akin to that of the Czech Republic). According to another WB survey Bulgaria receives unfavorable scores on the majority of governance items (e.g. government accountability, corruption and regulatory enforcement) which had a limiting effect on the enhancement of productivity and overall country's progress in the past decade [14]. Similar results are obtained by the Business Environment and Enterprise Performance Survey (BEEPS) implemented by the European Bank for Reconstruction and Development – a face-to-face survey with enterprise managers that examines the quality of the business environment in 29 transition countries [8]. Bulgaria ranks amongst the countries having highest scores on "Informal sector", second highest score on "Political instability", and among the countries with third highest score on "Corruption".

This paper suggests a selection of results from empirical analysis of the interrelation between industrial dynamics and the shifts in business climate evaluation in Bulgaria for the period 2009-2017. New insights about the expected effects of the business environment are suggested concerning the dynamics of industrial production during the period of interest.

2 Short literature review

Specialized literature provides evidence from various studies that asses the interaction between business climate perceptions and industrial production performance in different countries. A multi-country comparative study explores the options to predict Euro-zone estimated Industrial Production Index (IPI) using data from business surveys conducted in three major EU countries: France, Germany, and Italy [4]. Specifically, results are obtained by forecasting the Italian IPI applying a VAR model using three variables taken in logs: IPI, Business Surveys Production Prospects, and Quantity of Railway Transported Goods evaluated monthly for the period 1985-2002. Bachmann et al. (2013) emphasize on the business-level uncertainty captured by the "mood of decision-makers" evaluated by business survey data from narrowly delineated economic sectors. The authors use data for two major world economies: the monthly IFO Business Climate Survey (for Germany) and the Federal Reserve Bank of Philadelphia's Business Outlook Survey (for the US) for the period 1980-2010. The results from an implemented VAR model show that an impulsive shift in the survey-based measures of uncertainty is significantly correlated with a decline in production and employment in both Germany and the US – yet, the share of output variation explained by changes in the uncertainty proxies is evaluated as modest [2].

Acedański (2013) applies several alternative modeling approaches – autoregressive, leading indicator, factor, and joint models – in order to forecast the IPI in Poland. Three variables are involved as leading indicators in the study: Purchasing Managers' Index (PMI) for Manufacturing, the Survey on General Business Tendency Climate in Manufacturing (executed by the Central Statistical Office), and the IFO Expectations Index (IFO-EI) for Germany. The study finds that models utilizing PMI and IFO-EI as leading indicators deliver best predictions, as far as Germany appears to be the main trading partner of Poland [1]. In their study for Brazil, Simonassi et al. (2013) also utilize an appropriate variable to involve the subjective perception of business outlooks into the modeling of industrial activity dynamics. VAR models are estimated from seasonally adjusted monthly data for 1995-2013 that provide evidence for a high explanatory power of the qualitative/sentiment variable for the business expectations to anticipate trends in industrial production over a 12-months horizon [12].

Recent evidence is provided by Dapkus and Stundziene (2016) in their search for answers to the question "*Are the business survey data suitable for the prediction of economic indicators?*" using German business surveys data. Their study focuses on the nexus between the Industrial Confidence Indicator (ICI) and the production indexes concerning several types of goods as well as industrial sub-sectors for the period 1995-2015. For this purpose, autoregressive distributed lag model are estimated in order to capture the effects of the ICI on production dynamics – the analysis indicates that the variation of indexes of industrial production can be explained by the ICI, however, the confidence indicator appears to be weakly dependent on the current and/or past changes in the industrial production level [6].

3 Information basis of the study

Here the scope of the “industrial sector” includes: Mining and quarrying; Manufacturing; Electricity, gas, steam and air conditioning supply; Water collection, treatment and supply (NACE sections B, C, D and E). Data from two relatively independent data sources within the National Statistical Institute of Bulgaria are utilized in the current study [10]:

- Short-term Business Statistics /SBS/ – which estimates the short-run dynamics indicators of business units production;
- Business Survey in Industry /BSI/ – which estimates indicators reflecting managers or entrepreneurs' opinions about problems perceived, barriers encountered, and expected developments of the businesses they run.

SBS generates monthly data for the Industrial Production Index /IPI/ which measures the monthly relative change in industrial production volume. The monthly measurement of IPI captures:

- The receipts from sales of end products (goods and services);
- The changes in the stock of end products;
- The receipts from resale of goods purchased with such a purpose.

IPI is calculated after deflation of the value of production in order to compensate for price level shifts. This is performed using the “producer price indices” estimated by the regular NSI survey of producer prices.

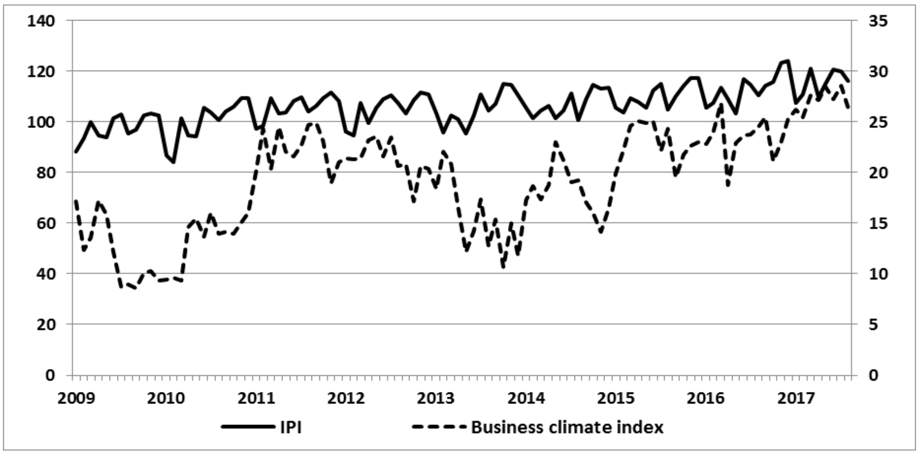

Fig. 1. Dynamics of IPI (2010=100) and Business Climate in Industry index for 2009-2017. Source: [10].

BSI provides monthly information from a sample of representatives of business units (methodological issues of the survey can be found in the Harmonised EU Programme of Business and Consumer Surveys [7]). A total of 4200 interviews for all sectors, about 10% of which from Manufacturing. This survey requires a set of opinions to be recorded regarding the current situation and prospective development of their business. Ordinal scale based on 3 response categories is used to operate a variety of questions related to issues of interest covered by the survey – e.g. “the expected direction of change of production / competitive position on the market / selling prices, etc. in the next 3 months will: (a) Increase, (b) No change, (c) Decrease”. On this basis, the so called “balance of opinions” is calculated monthly for each question /indicator/ as a difference of the relative shares of the positive and negative answers.

Utilizing a set of items, an overall index for the business climate in industry /BCI/ is estimated on monthly basis. The dynamics of the indices of Industrial Production and Business Climate in industry for the period of interest is presented on Fig.1. An obvious upward trend is observed in both series which should be taken into account by the analysis.

4 Interrelation between IPI and BCI: VAR model

The analysis of the interrelation between the two variables is limited to the post-crisis period Jan.2009-Aug.2017 (104 monthly observations) due to the relatively homogeneous dynamics of the indicators, without any shocks or abnormal behavior. A Vector Auto-Regression model is estimated in order to capture the possible impact of the changes in business climate on the actual shifts in industrial production levels, and *vice versa*. The model takes the following general form:

$$\begin{aligned} Y_{1t} &= \beta_{10} + \sum_{i=1}^{p} \beta_{1i} Y_{1t-i} + \sum_{i=1}^{p} \gamma_{1i} Y_{2t-i} + \sum_{j=1}^{11} \delta_{1i} SD[j]_t + \lambda_1 t + \varepsilon_{1t} \\ Y_{2t} &= \beta_{20} + \sum_{i=1}^{p} \beta_{2i} Y_{2t-i} + \sum_{i=1}^{p} \gamma_{2i} Y_{1t-i} + \sum_{j=1}^{11} \delta_{2i} SD[j]_t + \lambda_2 t + \varepsilon_{2t} \end{aligned} \qquad (1)$$

The initial hypotheses here are about:

- Inertia effects in the short-run dynamics of IPI with lag “p”;
- Inertia effects in the formation of business climate perceptions with lag “p”;
- Positive net effects of the improvement of business climate (evaluated by industry managers) on the changes in industrial production, on a short-term basis (1, 2, …, “p” months).

The model includes also seasonal dummy variables SD[j] in order to control for monthly seasonality as well as time trend variable. Parameters have been estimated by ordinary least square method where the standard errors of the parameter estimates are calculated as robust to heteroscedasticity and serial correlation in the residual term (i.e. HAC standard errors). In order to determine the lag order “p” of the VAR model the Schwarz Bayesian information criterion has been utilized – it showed that the optimal lag length for this model is p=1.

Table 1 presents the parameter estimates, standard errors (heteroscedasticity and autocorrelation consistent) as well as the significance levels of the t-tests (information about the estimates of "delta" and "lambda" parameters is excluded). The parameters for 9 out of 11 seasonal dummy variables as well as the trend parameter have been estimated as significant which proved the necessity for their involvement into the model. This way, the partial effects of the lagged variables of IPI and BCI have been cleared from any distorting effects of the seasonality and secular trend in the time series. The regression model shows quite high explanatory power estimated by the adjusted coefficient of determination amounting to 86%.

Table 1. Empirical results about the VAR model for IPI. Source: Author's calculations.

Variable	Coefficient	Std. Error	t-ratio	p-value
const	73.6138	9.45031	7.7896	<0.0001
indprod_1	0.12244	0.10881	1.1253	0.2635
bclimind_1	0.30040	0.08125	3.6971	0.0004
R-squared	0.8785		Adjusted R-squared	0.8594
F(14, 89)	55.8857		P-value(F)	7.3E-38
Dependent variable: indprod (Industrial Production index)				

The lagged dependent variable did not show any significant effect on the level of IPI although it was initially expected that some inertia could be captured by the VAR model. On the contrary, the lagged variable of the business climate showed the expected positive and strongly significant partial effect (at significance level less than 0.01). This provides evidence in favor of the hypothesis that the expectations of managers in the industrial sector for favorable impacts of the business environment factors correlate with actual positive shifts in the industrial production observed one month later.

Table 2. Empirical results about the VAR model for BCI. Source: Author's calculations.

Variable	Coefficient	Std. Error	t-ratio	p-value
const	−22.2801	5.29184	−4.2103	<0.0001
indprod_1	0.2527	0.06399	3.9483	0.0002
bclimind_1	0.6627	0.06395	10.3619	<0.0001
R-squared	0.8244		Adjusted R-squared	0.7968
F(14, 89)	121.01		P-value(F)	1.47E-51
Dependent variable: bclimind (Business Climate in Industry index)				

Table 2 presents the second equation results. The joint F-test for zero restrictions on the parameters for the seasonal dummy variables has been certainly rejected at negligible level of significance, however, the parameter on the time trend variable was not found significant. The explanatory power of the second equation showed a similar level (80% for the adjusted R-square). Here the autoregression component (i.e. the lagged dependent variable bclimind[t-1]) proved to have a significant partial effect on the level of BCI index which provides evidence in favor of the expectation about inertia in the formation of business climate perceptions of industrial firms' managers. Additionally, the lagged variable of IPI revealed the expected positive and strongly significant net effect. This supports the hypothesis that upward shifts in the expectations of industrial managers about the business climate are systematically induced one month after positive shifts in the industrial production, and *vice versa*.

5 Final remarks

The presented empirical results are indicative about the objectively existing interrelations between business climate expectations of the managers in the industrial sector and its growth. This is shown explicitly by econometric evidence utilizing independent data sources for the variables of interest – Industrial Production Index and the index of Business Climate in Industry. Further more comprehensive analysis is necessary in order to evaluate the impacts of different aspects of the business environment that constitute the integrated measure for the Business Climate index. Nevertheless, governance policies should adopt levers that are capable in alleviating the weaknesses and circumventing the main threats to the national competitiveness – measures that are firmly targeted in improvement of the most problematic business environment components. Especially, policies accelerating the innovation processes, reforming the law enforcement, and restraining the bureaucratic barriers could be most effective for the stabilization of business activities.

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Comparative Analysis of Selected Determinants of Innovation in EU Countries

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Abstract. Innovation is the key to the success of businesses and entire economies in today's world. And it should become a strategic target for the development of the EU economies. Undoubtedly, the creation of conditions for the development of innovation becomes the most important issue both from the perspective of an individual economic entity success and of the entire state. This issue is therefore extremely important in the micro and macroeconomic area. Bearing in mind that modern economies are transforming at an incredible rate, and at the same time, permanent sources of development are weakening, innovations, and above all their commercialization, are what the EU countries see as an effective solution to the problem of achieving economic growth. When analyzing selected determinants of innovation, it is impossible to underestimate their role and importance. Consequently, the subject matter is relevant both from theoretical as well as practical point of view.

The aim of the article is to deepen the definition and multifaceted examination of the relevance of selected determinants of innovation in EU countries. The essence of the research problem is therefore to examine the relationship between the level of innovation in EU countries and the following factors: GDP, number of applied patents, innovative products, or research and development expenditure. In the light of the theoretical research, the following were analyzed: the essence and definitions of innovation, the role and significance of innovation in the company.

Keywords: Analysis, Innovation, European Union.

1 Theoretical approach to innovation

1.1 The essence and definitions of innovation

There are many definitions of the subject in the literature, so it is important to find their common ground.

When analyzing the definitions of innovation, it is worthwhile to present the meaning of the word itself, which is derived from Latin. Innovatio or innovare means novelties or newly introduced things.

In the first years of functioning, the term innovation was seen in the macroeconomic context. It was analyzed how technological development affects the development of the economy. Over time, professionals have shifted away from perceiving innovation in macroeconomic terms, and microeconomic analysis has begun, where technological development has been perceived as a process.

The analysis of the problem of defining innovation is as follows: among foreign authors it is necessary to mention: J. Schumpeter [21], F. Machlup [15], P. Kotler [13], R. W. Griffin [7], S. Jobs [5], P. R. Whitfield [24], R. Johnston [12], S. Shane [23], P. Drucker [1], [2], Ch. Freeman [4], E. Helpman [9], M. E. Porter [19]. In contrast, among Polish authors taking up this subject, one can distinguish, among others: Z. Pietrasiński [17], W. Grudzewski and I. Hejduk [8], A. Pomykalski [18], Z. Madej [10], A. Jasiński [11] and M. Goławska [6].

The concept of innovation was introduced by the Austrian economist Joseph Schumpeter at the beginning of the 20th century. His definition is the foundation on which the other terms are based, yet it is extremely versatile and current in the present day. The creator based the innovation on the following pillars [26]:

- introduction of new goods that consumers have not yet known or a new product of some kind;
- introducing a new method of production that has not yet been practically tested in the particular industry;
- opening up a new market, i.e. a market where a given type of industry of the relevant country was not previously introduced, regardless of whether the market existed before or not;
- gaining a new source of raw materials or semi-finished products, regardless of whether the source already existed or had to be created;
- Conducting a new organization of an industry, such as creating a monopoly or breaking it [20].

Schumpeter's theory can be summarized as the introduction of new methods. Typically, they were related to technology, but the use of imitation, i.e. the dissemination, implementation and use of new methods, was significant.

Innovation can also be seen as an economically successful exploitation of new ideas [19].

The multitude of different views for innovations made F. Machlup to look for other solutions. He said that in such a situation, we should be able to cope without using the word “innovation” if we are able to find more definite words [15].

P. Kotler stated that innovation refers to any good, service or idea which is perceived by someone as new. The idea can exist for a long time, but it is an innovation for the person who perceives it as new [13].

R. W. Griffin treated that innovation should be introduced by a company as an effort aimed at developing new products / services or making a whole new use of products / services that already exist in the market [7].

For S. Jobs innovation does not refer only to technology, it also deals with ideas that help solve problems. The founder of Apple thought there was no system that could create innovation. He said that a person who forces themselves to invent something innovative is “ like somebody who’s not cool trying to be cool. It’s painful to watch…” [5]. S. Jobs created seven principles which could accelerate creating process of innovation:

- Do what you love – follow your heart and passion;
- Put a dent in the universe – attract other people who want to create amazing things;
- Make connections – get a wide experience and connect facts;
- Say no to 1 000 things – simplicity is a sign of sophistication;
- Create insanely different experiences – create deep, lasting emotions;
- Master the message – the launch of a product should be a form of art
- Sell dreams, not products – create products that will allow people to fulfill their dreams [5].

P. R. Whitfield has an interesting way of defining innovation as he pointed to the process of complex work that is based on finding solutions to problems. The effect of this is the development of novelty [24].

Researchers also had a different opinion on whether innovation can be considered at the time of introducing a new product, as Schumpeter and his imitation are concerned, or innovation as well as any further improvement of an existing product. The representative of the second mainstream was undoubtedly R. Johnston [12]. Similarly, in the western world, researchers in Poland have been wondering how to define innovation. The first works began in the 1960s. The study was limited to the technical context because of the specificity of the market in a socialist state where the economy was centrally planned.

Z. Pietrasiński, for whom "innovations are deliberately introduced by human beings or by cybernetic systems designed by them, which are substituting previous states of things that are positively assessed in the light of certain criteria and which also create a progress" [17].

Schumpeter's perception of innovation was also shared by W. Grudzewski and I. Hejduk, for whom innovation, every activity, or product, which is new, qualitatively different from existing ones was an innovation.[8].

A. Pomykalski, on the other hand, was leaning toward the Johnston’s model, where innovation is part of improvement of given solution or a product [18].

Z. Madej believed that innovation must not always carry a positive load, affecting the development of the company [10]. Thus, his perception was beyond the framework of the concepts that were presented in the above examples. He created a definition that is somewhat aberration of the old way of thinking.

In addition to the above condensed presentation of the term innovation is Table 1, which contains the most popular researchers in innovation theory and the keywords that are included in their definitions. It can be seen that the basis of most of the analyzed definitions is "novelty" and "product" - (they occurred seven times), it becomes the main determinant of introducing the innovation in the enterprise. It is also worth noting that among the eleven selected researchers of this problem, much less frequent (because 4 times) the word "service" has appeared, and "improvement" only 3 times. Incidentally, such terms as "good", "idea", "imitation", "failure", "progress" and "commodity" were scattered.

Table 1. Keywords of the term innovation by selected authorities of economic sciences.

Creator	Keywords
J. Schumpeter	novelty, product, commodity, imitation
F. Machlup	rejection of the word innovation
Oslo Mannual	novelty, improvement, product, process
P. Kotler	novelty, good, service, idea, product
R. W. Griffin	development, novelty, product, service, use
S. Jobs	idea, lack of innovation system creation
P. R. Whitfield	workflow, problem resolution, novelty
R. Johnston	product improvement
W. Grudzewski, I. Hejduk	novelty, product, service, distinction from existing forms
Z. Madej	novelty, improvement, failure
Z. Pietrasiński	positive changes in products, services; progress

1.2 The role and importance of innovation in the enterprise

At present, the dynamics of changes taking place in developed countries has led to the emergence of postmodern economy, network economy and, in particular, knowledge-based economy. These terms may have different, sometimes distinct, meanings, and each of them can be understood in a variety of ways, leading to a perception of the essence of the present economic systems. The distinguishing feature of the developed countries economy is the increase in the share of the services sector in employment and formation of GDP (so-called servitization of the economy). Moreover, in the described systems, the fundamental factor of economic growth of the country and the enterprises operating therein are: knowledge and innovations. So their role in the aspect of building the economic structure of the country is extremely important. It can also be noted that the formal and informal relations of all members operating in the economic space are important.

The role of innovation in development, not just of enterprises but of the economy as a whole, is indisputable, and many researches can prove that. For authors of Global Competitiveness Report 2016-2017, innovation is a part of the twelve pillars of economic competitiveness [22].

Implementing new products / processes that will be approved by consumers can lead to increased returns on sales, while the use of process innovation can reduce production costs.

In today's aggressively competitive market, companies must work on a high level of innovation [16], which will distinguish them from other economic operators and thus allow them to survive on the market.

The overriding role of innovation is to increase the value of the company [25] that leads to its development. It should be borne in mind that the value of an economic entity should be related to what the company can achieve in the future [14], that is why long-term planning and innovation management must be established.

2 The impact of selected factors on the level of innovation in EU countries

The impact on the level of innovation can be influenced by factors such as: GDP, PCT patent applications, SMEs introducing product or process innovations, or expenditure on research and development. The relationship between these factors is analyzed below. Table 2 shows these aspects on the example of EU Member States in 2015-2016. The highest average number of introducing product or process innovations registered in Belgium, it was 0.789% and in Finland 0.714%, while the lowest in Romania 0.000% and Poland 0.030%. In terms of patent applications, the highest percentage was recorded in Sweden at 1.000 PPS and in Finland at 0.977 PPS. The lowest percentage was recorded in Romania 0.170 PPS and Slovakia 0.244 PPS. Unfortunately, Poland also fell in the group of countries whose index was one of the lowest and amounted to only 0.249 PPS.

Table 2. Selected indicators of product innovation and macro-economic measures for the EU-28 in 2015-2016 [3].

Country	SMEs introducing product or process innovations (percentage of SMEs)	PCT patent applications per billion GDP (in PPS)	R&D expenditure in the business sector (percentage of GDP)	R&D expenditure in the public sector (percentage of GDP)	GDP (in mln euro)
Austria	0.622	0.738	0.846	0.815	348895.05
Belgium	0.789	0.612	0.684	0.597	416741.8
Bulgaria	0.045	0.253	0.231	0.115	46707.55
Croatia	0.275	0.255	0.152	0.289	45403.3
Cyprus	0.453	0.282	0.022	0.171	17932.25
Czech Republic	0.448	0.345	0.416	0.798	172518.8
Denmark	0.530	0.830	0.728	1.000	274633.4
Estonia	0.314	0.380	0.250	0.709	20723
Finland	0.714	0.977	0.797	0.916	212598
France	0.521	0.678	0.562	0.658	2211550
Germany	0.712	0.842	0.759	0.871	3093850
Greece	0.479	0.245	0.108	0.479	175255.65
Hungary	0.049	0.383	0.381	0.227	112226.85
Ireland	0.681	0.522	0.420	0.244	268802.25
Italy	0.564	0.488	0.286	0.457	1666337.65
Latvia	0.045	0.260	0.067	0.339	24639.9

Lithuania	0.307	0.292	0.108	0.653	38047.45
Luxembourg	0.665	0.438	0.258	0.513	52553.35
Malta	0.414	0.350	0.144	0.227	9608.8
Netherlands	0.710	0.806	0.432	0.821	693049
Poland	0.030	0.249	0.170	0.406	428017.45
Portugal	0.669	0.282	0.227	0.569	182494.3
Romania	0.000	0.170	0.063	0.104	164945.9
Slovakia	0.125	0.244	0.118	0.608	80025.2
Slovenia	0.397	0.598	0.686	0.423	39627.35
Spain	0.157	0.415	0.244	0.468	1099260
Sweden	0.669	1.000	0.854	0.955	457107.7
United Kingdom	0.432	0.607	0.426	0.446	2497636.55

When analyzing the level of R & D expenditure in the business sector, it should be noted that the leader in the ranking was Sweden at 0.854% of GDP and Austria at 0.846 of GDP. The lowest recorded countries in this respect were Cyprus with 0.022% of GDP and Romania with 0.063% of GDP. Poland, as in the case of patent applications, came in second to last with 0.170% of GDP.

Considering the GDP level, the highest values were obtained in countries such as Germany (over € 3.09 trillion) and Great Britain and France, whose values were € 2.49 trillion and € 2.21 trillion, respectively. Table 3 presents the results of the correlation coefficient between GDP and individual innovation indicators.

Table 3. Results of the correlation coefficient between GDP and individual innovation rates in the EU-28 countries in 2015-2016.

GDP and R&D expenditure in the public sector (percentage of GDP)	**0.24**
GDP and R&D expenditure in the public business (percentage of GDP)	**0.33**
GDP and PCT patent applications per billion GDP (in PPS)	**0.42**
GDP and SMEs introducing product or process innovations (percentage of SMEs)	**0.27**

Pearson's correlation coefficient for the relationship between the country's GDP and R&D expenditure in the public sector was r = 0.24. Correlation is therefore plus / positive, and the relationship is very weak. In the case of the relationship between GDP and R&D expenditure in the public sector, r = 0.33, which proves that the correlation is plus / positive and the relationship is very weak. As for the correlation between the GDP and PCT patent applications per billion GDP, it was r = 0.42; which means that it is plus / positive, and the relationship moderately strong. In the last case correlation coefficient for the relationship between the GDP and SMEs introducing product or process innovations was r = 0.27. Correlation is plus / positive, and the relationship is very weak. Figure 1 is a supplement to the analysis because the scattering between the examined data is shown.

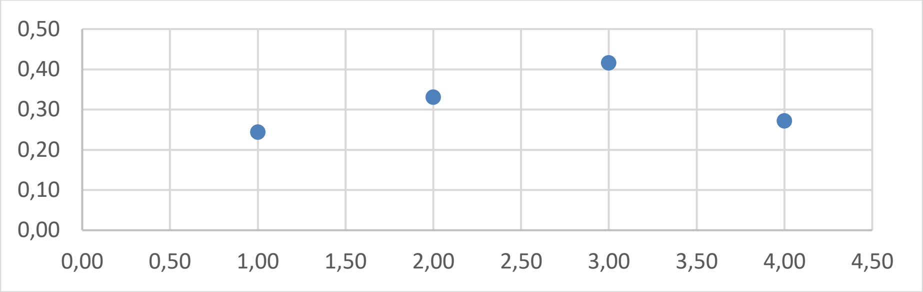

Fig. 1. The relationship between GDP and individual innovation rates in the EU-28 countries in 2015-2016.

In the next stage, further dependencies were investigated, but this time they concerned PCT patent applications. The strength of the relationship between PCT patent applications per billion GDP and R & D expenditure were also examined. It should be noted that, as in previous analysis, all positive correlation coefficients were obtained, so that in each analyzed case a positive correlation was obtained. The coefficient of the first tested relationship (i.e. between PCT patent applications per billion GDP and R & D expenditure in the public sector) was r = 0.73; so the relationship is very strong. The analysis of the relationship between PCT patent applications per billion GDP and R & D expenditure in business sector was characterized by a correlation coefficient of: r = 0.91, and therefore a very strong relationship. The analysis is detailed in Table 4 and Figure 2, which shows the scattering between the surveyed data.

Table 4. Results of the correlation coefficient between PCT patent applications per billion GDP (in PPS) and R & D expenditure in EU-28 countries in 2015-2016

PCT patent applications per billion GDP (in PPS) and R & D expenditure in the public sector (percentage of GDP)	**0.73**
PCT patent applications per billion GDP (in PPS) and R & D expenditure in the business sector (percentage of GDP)	**0.91**

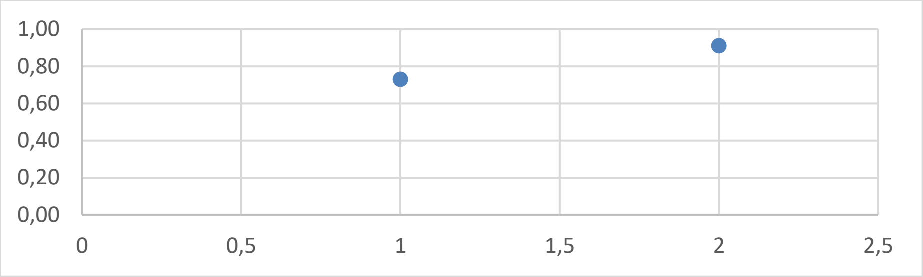

Fig. 2. The relationship between PCT patent applications per billion GDP (in PPS) and R & D expenditure in EU-28 countries in 2015-2016

In the next phase, further dependencies were investigated, but this time they concerned SMEs introducing product or process innovations. The strength of the relationship between SMEs introducing product or process innovations and the two selected R & D indicators were also examined. It should be noted that, as in previous analysis, all positive correlation coefficients were obtained, so that in each analyzed case a positive correlation was obtained. The coefficient of the first tested relationship (i.e. SMEs introducing product or process innovations and R & D expenditure in the public sector) was r = 0.58; so the relationship is strong. The analysis of the relationship between SMEs introducing product or process innovations and R&D expenditure in the business sector was characterized by a correlation coefficient of: r = 0.62, and therefore a strong relationship. The analysis is detailed in Table 5 and Figure 3, which shows the scattering between the surveyed data.

Table 5. Results of the correlation coefficient between SMEs introducing product or process innovations (percentage of SMEs) and R & D expenditure in EU-28 countries in 2015-2016

SMEs introducing product or process innovations (percentage of SMEs) and R & D expenditure in the public sector (percentage of GDP)	**0.58**
SMEs introducing product or process innovations (percentage of SMEs) and R & D expenditure in the business sector (percentage of GDP)	**0.62**

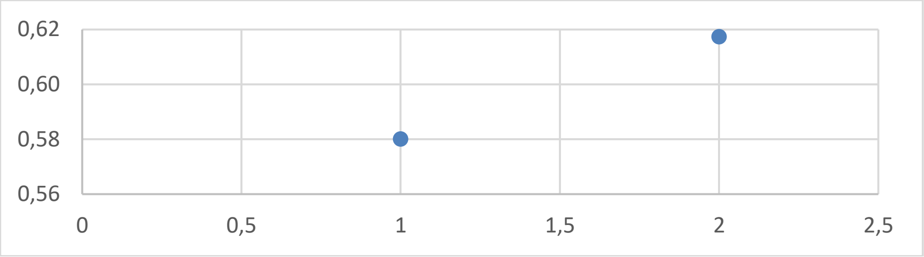

Fig. 3. The relationship between SMEs introducing product or process innovations (percentage of SMEs) and R & D expenditure in EU-28 countries in 2015-2016

The above analysis suggests that in every case, together with increasing GDP or PCT patent applications, there is an increase in all tested innovation ratios. However, it should be borne in mind that in each case the relationships between the individual elements are strong. In many cases, the development of innovation may be linked to the economic situation of a particular country. Therefore, the economic factor may be significant, but its complement should be, for example, the knowledge and experience of human capital. It can be stated that this idea and the involvement of employees together with adequate financial contribution are the appropriate catalyst for the formation of new products / processes.

3 Summary and conclusions

Innovations are present in every aspect of life today. They reflect the dynamic changes taking place in the world. One can get the impression that every successive product or every next thought is related to innovation, and consequently the meaning has to some degree been depreciated. This word is often used by marketing agencies, which in the dynamically developing markets are trying to overtake the competition.

Comparative analysis of selected determinants of innovation in EU countries has been started with three indicators of innovation, namely: R & D expenditure, PCT patent applications and SMEs introducing product or process innovations. The research period was limited to two years (i.e. 2015-2016) and the innovation rates were reported by twenty-eight EU countries. The stated purpose of the discussions was achieved by applying statistical analysis, with particular emphasis on the use of Pearson's correlation coefficient. The study was divided into three phases. The first focused on demonstrating the strength of the relationship between GDP and (separately) the three selected indicators of innovation. On the other hand, the second part of the analysis was to determine the scale of dependence between PCT patent applications and R & D expenditures in the public and business sector. The third stage of the analysis was to present the strength of the relationship between SMEs introducing product or process innovations and R & D expenditures in the public and business sector.

Correlation analysis allowed us to identify the most important innovation determinant of all the surveyed ones. The strongest correlation was with the number of PCT patent applications. For both in the first case, when examining the correlation index between the number of PCT patent applications and R & D expenditure in the public and business sector, were analyzed, correlation coefficients showing a very strong correlation between the tested variables were obtained. There was a positive correlation, so both features grew or diminished in the same direction.

Moderately strong relationship depicted SMEs introducing product or process innovations and R & D expenditure in the public and business sector. On the other hand, the lowest correlation coefficient results were obtained when comparing R & D expenditure in the public sector and GDP and SMEs introducing product or process innovations and GDP. So there was a very weak connection between these features. Therefore, on the basis of the obtained results, it can be stated that the innovative products new for the market are the least important determinants.

The above analysis demonstrates that the country’s GDP is not as strong factor enhancing innovation as it is shown to the general public consciousness. Obviously, as the Gross Domestic Product grows, the index of innovation is growing, but their impact is not as large.

However, it is important for SMEs which are introducing innovative products or processes and patent applications to have financial support from public organizations or government. It will involve more specialists and provide special equipment for research centers and laboratories that will allow engineers to design and implement new ideas and products.

The proposed analysis does not exhaust the totality of the examined matter, but it is an indication of the rightness to continue further and extend the research in this field.

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The Impact of Monetary Policy on CPI and GDP in the Czech Republic and Switzerland for the Period 2000 - 2016

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Abstract. The aim of this paper is to compare the effectiveness of the monetary policy implemented at the time of low interest rates and foreign exchange interventions in the Czech Republic and Switzerland (using the monetary aggregate M3 and its impact on CPI and GDP). The followed relationship between these values is analyzed using the Engle-Granger cointegration test. These tests are conducted on select statistical data from the years 2000 to 2016. The input data are quarterly in nature and have been seasonally adjusted. For determining the cointegration relationship, it is possible to proceed with the Engle-Granger test, which is meant to determine the long-term relationship between the effectiveness of the monetary policy – between the monetary aggregates M3 and GDP and the relationship between M3 and CPI in the Czech Republic and Switzerland. On the basis of these tests, it was found that there is no cointegration relationship between any time series at a level of significance of 0.05; this means that no long-term relationship was found between the M3 and GDP and also for M3 and CPI. Not finding long-term relationships between M3 and CPI, respectively GDP, means that the monetary policy in the Czech Republic and Switzerland was in the period 2000-2016 ineffective.

Keywords: Monetary Policy, Cointegration Analysis, CPI, GDP, M3

1 Introduction

In the past, many central banks have exhausted the standard tool of monetary policy, i.e., interest rates, in their attempt to achieve inflation targets. Therefore, they have been forced to proceed using unconventional monetary policy, realized using quantitative easing, negative interest rates, or foreign exchange interventions. Unconventional monetary policy is based on a quantitative theory of money based on the knowledge that money supply growth affects price levels. This causality is empirically proven over a long period of time. Money supply growth only affects the price level in the long run. In the short term it is possible to find the influence of money supply on the development of the output of the economy. The inflation targeting, as introduced in [23], is based on monetarism and the thesis that monetary policy should focus on maintaining price stability. Inflation targeting in monetary policy implementation does not use monetary aggregates, which is in contrast to the monetary targeting strategy. During the 1970s many central banks chose monetary aggregates as intermediate goals [4]. For this reason, monetary aggregates have become an important instrument in the conduct of monetary policy. The main reason why both the Czech National Bank (CNB) and the Swiss National Bank (SNB) instigated foreign exchange intervention was that inflation that was too low and there was a near zero interest rate. In addition to this, the SNB had another reason, which was the fight against a strengthening domestic currency. Both before as well as during the intervention, the external and internal economic conditions in these individual countries were diametrically opposite.[24] In the Czech Republic, there was consistently low inflation and a decreasing GDP, whereas in Switzerland, GDP was growing and the franc was appreciating. The common impact of the interventions was the growth of foreign-exchange reserves. In Switzerland, the foreign-exchange reserves grew from CHF 50 mil. to CHF 500 mil. between 2009 and 2015. After the subsequent revaluation, the reserves reached as high as CHF 600 mil. – it was precisely this more than tenfold increase that was one of the main impulses for ending intervention. The SNB relinquished its fixed exchange rate suddenly, which led to a jump in the exchange value by nearly 20% and a decrease in export volume and GDP. In the Czech Republic, foreign-exchange reserves roughly tripled after a period of foreign exchange interventions lasting from 2013 to 2017. The koruna strengthened slightly after the announcement ending the fixed rate of 27 koruna to the euro.

The goal of this paper is to conduct a mutual comparison of the effectiveness of monetary policy executed via, among other things, the foreign exchange intervention in the Czech Republic and Switzerland – or, more precisely, by observing the influence of the M3 monetary aggregate's influence on CPI and GDP from 2000 to 2016. The central banks instigated foreign exchange intervention, which had the effect of increasing M3 with the goal of increasing inflation.

2 Review of literature

It is possible to undertake investigation foreign exchange intervention, i.e., the purchase and sale of domestic currency by a central bank, by comparing the bilateral relationships of macroeconomic aggregates. As stated by [16], these occur most frequently in the following relationships:

- the money supply → the exchange rate,
- the M2 & M3 monetary aggregates → GDP, and
- the M2 & M3 monetary aggregates → the inflation level.

The first part of the pair is always the amount of money in circulation in the given economy. This is the variable that is directly influenced by foreign exchange intervention: if the central bank conducts an expansive monetary policy, the monetary aggregate increases as a result, and if they resort to a restrictive monetary policy, the opposite results.

The impact of foreign exchange intervention in Japan from 1991 to 2001 monitored [15]. His conclusion was that the second phase of foreign exchange intervention was 20–50 times more effective than the first; this was primarily because bilateral intervention was conducted both with the yen and with the US dollar. A study by [8] dealing with intervention in Australia from 1984 to 2001 also confirms the relationship between foreign exchange intervention and the spot exchange rate. This study comes to the conclusion that a relationship exists between the intervention that was implemented and the exchange rate's level and volatility. Another conclusion in [7] also came to a conclusion similar to [8], i.e., that intervention influenced the spot exchange rate only weakly. Study [7] investigated the CNB's interventions between 2001 and 2002. Another study [18] dealt with the problem of foreign exchange intervention and the exchange rate. They came to the conclusion that the relationship of the exchange rate to the interventions that were conducted is derived from the ability to signal the central bank's future monetary policy to the public and that; conversely, transparency is thus desirable in this instance.

The macroeconomic impact of the growth of broad monetary aggregates is investigated in [17]. He applied his work to the United States of America (1960–2007), the Eurozone (1991-2007), Japan (1960–2007), Great Britain (1987–2007), and the Czech Republic (1993–2007), for example. In all the countries he analyzed, this meant growth of the broad monetary aggregate increased inflation and increased real GDP – at a ratio of 1:1.

According to [22], there is a correlation between the growth of the M3 money supply, inflation, and the growth of the economic product. They arrived at this conclusion in their study dealing with M2 and M3 monetary aggregates in Switzerland, specifically between 1996 and 1999. The correlation between the amount of money in the M2 supply and the price level and the subsequent confirmation of this relationship in the USA is analyzed in [14]. The foreign exchange intervention by 33 central banks between 1995 and 2011 is investigated in [11]. The authors came to the conclusion that foreign exchange intervention is a very effective monetary policy tool, though in relationship to influencing the exchange rate and not the monetary aggregate.

On the basis of the conclusions of the individual studies listed above, the following relationships have been selected as basic relationships for investigating the effectiveness of monetary policy in the CR and Switzerland:

- the influence of the M3 monetary aggregate on inflation,
- the influence of the M3 monetary aggregate on GDP.

3 Methods and Data

The input data for analysis are quarterly in nature and have been cleaned from seasonal influence. The data for analyzing the relationship of the M3 aggregate and the development of inflation was derived from the Organization for Economic Co-operation and Development (OECD) ([20] and [21]), and the data for analyzing the relationship of the M3 aggregate and GDP were derived from the portal of the Federal Reserve Bank of St. Louis (FRED) ([12]).

The economic research in this paper was conducted during the years 2000–2016. The actual foreign exchange interventions by the CNB and the SNB were implemented over a relatively short period of time. Because of the time lag that has been applied to the time series, it was not possible to conduct analysis for the period of the foreign exchange intervention only. The program Gretl 1.9.4. was used for econometric analysis.

Time series depict a specific progression of observations of selected economic indicators. The development shown by time series tends to be diverse over the short term, whereas the values have a tendency to return to a specific equilibrium over the long term. It is precisely because of this that it is possible to prove a mutual relationship for the two quantities being monitored. If two time series have a tendency to keep a constant distance between them over the long term, they are considered cointegrated. The concept of cointegration was first introduced by Granger in his article [10] concerning the use of time series analysis in econometric models. Cointegrated time series make it possible to analyze the nature of their dependence when observing relationships between economic time series. If the time series are not cointegrated, a common correlation does not exist, and further investigation is pointless, because they are developing independently of one another over the long term [10]. We consider time series to be stationary if the values for their mathematical average and variability are the same for the duration of the whole series. For estimating a regression model, it is necessary for the data to be stationary [10].

Testing time series for optimal lag length is one of the prerequisites for conducting Granger tests. First, testing is done using Akaike's information criterion (AIC), where the best series lag is always considered the lowest AIC value. Individual variables will be tested separately, and the best lag for the series will be applied in the subsequent tests. Akaike's information criterion was introduced in the 1970s by the Japanese statistician Akaike in [1].

$$AIC = n * ln\left(\frac{RSS}{n}\right) + 2k \qquad (1)$$

where RSS is the residual sum of squares;
k is the number of parameters;
n is the number of measurements; and
RSS/n is residual variance.

Next, the test to check for the existence of a unit root follows; here, it is determined whether the time series being investigated are stationary or nonstationary. A stationary series is distinguished by the fact that it has a tendency to return to a specific value or follow a specific recordable trend, whereas this does not exist for a nonstationary one. Formally, it is possible to proceed using the equations listed below [3]:

For the stochastic process { , t= 0, ±1, ±2,… }, we define the following terms:

the mean function:

$$\mu_t = E(X_t) \tag{2}$$

the variance function:

$$\sigma_t = D(X_t) = E(X_t - \mu_t)^2 \tag{3}$$

where Xt is the dependent variable, $E(Xt)$ denotes the mean, and $D(Xt)$ expresses variance.

For econometric analysis, an augmented Dickey-Fuller test (ADF test) is used next. Dickey and Fuller in [6] defined three types of these tests – with a constant, without a constant, and with a constant and a trend. When testing, we assume that the process listed below (Eq. 4), where we test that Ø=0 (the variable contains a unit root), takes the form [3]:

$$\Delta X_t = (\emptyset 1 - 1)X_{t-1} + \sum_{i=1}^{p} \alpha i\, X_{t-1} + e_t \tag{4}$$

Here, Xt again expresses the dependent variable, p is lag, and e_t is the residual component.

The decision concerning the time series' stationarity or nonstationarity will be made by evaluating the p value (the level of significance p is always defined as 0.05 for this paper), which thus establishes with a 95% level of probability whether the null hypothesis has been rejected or not. The null hypothesis has been established as follows:

- H_0: the series being tested are nonstationary (a unit root does not exist).
- H_1: the series being tested are stationary (a unit root does exist).

A third step, cointegration analysis, will follow if the time series achieve the same degree of integration. Here, this is done using the Engle-Granger cointegration test. In line with this, the error terms are further tested using the ADF test – in order to determine the existence of the unit root (for more on this problem, see, e.g., [9],[13] or [2]). The following hypotheses have been established:

- H_0: the series being tested are not cointegrated.
- H_1: the series being tested are cointegrated.

A decision concerning the time series' relationship is derived from the p-value as defined by the Engle-Granger cointegration test. If the null hypothesis is not rejected, ($p > 0.05$), the time series will be marked as noncointegrated – they contain a unit root. In the opposite scenario ($p < 0.05$), the time series will be marked as cointegrated.

Using cointegration testing on the monitored variables, it is possible to verify whether there is a long-term relationship among their trends or whether the regression between these variables is spurious. Therefore, the statistical concept of cointegration corresponds to the theoretical concept of long-term stability.

4 Results and Findings

4.1 Test for optimal time lag using Akaike's criterion

Before the Engle-Granger cointegration test, it is necessary to test the data for optimal time lag. CPI is entered as the dependent variable in this relationship. In Table 1, the AIC's values are lagged using 6 different orders of magnitude; the lowest value is highlighted. According to economic theory, the optimal lag for a time series is specified as being between 12 and 18 months, which agrees with the results that were determined. On the basis of the lowest value found for the information criterion, an optimal lag length of six is specified for the dependent variable of the CPI, which was determined for the AIC. For this time series, this concerned lag when including a constant for CPICZE and for CPISWI a test with trend. An optimal lag length of six is specified for the dependent variable of the HDPCZE (for test with constant and trend) and an optimal lag length of five six is specified for the dependent variable of the HDPCSWI (for test with constant and trend). This lags will be taken into consideration in the subsequent tests.

Table 1. Results of optimum delay in the Czech Republic and Switzerland.

Order of delay	**AIC for CPICZE**			**AIC for CPISWI**		
-	Test with constant	Test with trend	Test with constant and trend	Test with constant	Test with trend	Test with constant and trend
1	2.341131	2.372624	2.370802	1.955633	1.977728	1.876791
2	2.370524	2.404666	2.398340	1.605519	1.608004	1.582178
3	2.402727	2.435104	2.430413	1.546827	1.556384	1.510908
4	2.429199	2.454900	2.459450	1.305234	1.299736	1.299426
5	2.189065	2.255970	2.139762	1.208090	1.211334	1.188178
6	**2.03724****	2.07236*	2.052789*	1.012756*	**1.00029***	1.002161*

Order of delay	**AIC for HDPCZE**			**AIC for HDPSWI**		
-	Test with constant	Test with trend	Test with constant and trend	Test with constant	Test with trend	Test with constant and trend
1	2.663360	2.511841	2.450049	1.981278	1.983109	1.899336
2	2.250905	2.251815	2.191904	1.541850	1.554711	1.415631
3	2.233558	2.230233	2.159807	1.481415	1.498036	1.353858
4	2.258853	2.261478	2.182963	1.513450	1.529115	1.383651
5	2.285927	2.292069	2.201441	1.450532*	1.46893*	**1.322073***
6	2.20142*	2.19988*	**2.127688***	1.559670	1.569410	1.445222

4.2 Verifying the Stationarity of the Time Series

The possibility that the data is nonstationary could lead to spurious regression, which is dangerous primarily because it is possible to obtain statistically significant estimates for the regression function parameters when the least squares method is applied – even though the time series that were analyzed do not relate to each other. It is therefore necessary to test the time series involved using the ADF test. The ADF test results for the unit root are listed in Table 2, including a listing of the *p-parameter* values for all of the quantities that were analyzed.

Table 2. ADF test results for M3.

Variable abbreviation	Value of p-parameter	Evaluation of ADF test results	H_0:
M3CZE	0.9975	Time series non-stationary	Not refused
CPICZE	0.8688	Time series non-stationary	Not refused
M3SWI	0.6623	Time series non-stationary	Not refused
CPISWI	0.9995	Time series non-stationary	Not refused
HDPCZE	0.7095	Time series non-stationary	Not refused
HDPSWI	0.6623	Time series non-stationary	Not refused

For the observed time series, it is clear that all of the time series were marked as nonstationary at a 0.05 level of significance. Since the time series turned out to be nonstationary, i.e., they do not have a unit root, it is necessary for further analysis to resolve this problem using a suitable transformation, so-called stationarizing. One option is to difference the time series. Table 3 lists the values of the ADF test once more for the differenced variables. Modified in this way, the time series for inflation in the CR and inflation in Switzerland are stationary at a 0.05 level of significance, i.e., a unit root does exist for them.

Table 3. ADF test results for M3 - the difference time series.

Variable abbreviation	Value of p-parameter	Evaluation of ADF test results	H_0:
d_M3CZE	0,005362	Time series stationary	Refused
d_CPICZE	0,03606	Time series stationary	Refused
d_M3SWI	0,04666	Time series stationary	Refused
d_CPISWI	0,02742	Time series stationary	Refused

4.3 Cointegration analysis

The test for cointegration is done using the Engle-Granger test. For this test, it is necessary to have the original time series be nonstationary and for them to have the same degree of integration – these conditions were fulfilled for the selected variables

(Table 3). The null and alternative hypotheses for the Engle-Granger cointegration test that was applied are as follows:

- H_0: the time series being tested are not cointegrated.
- H_1: the time series being tested are cointegrated.

Table 4 depicts the relationship of the given pairs of time series, which were accordingly marked as stationary.

Table 4. Results of the Engel - Granger cointegration test and ADF test for M3

Variable abbreviation	Value of p-parameter	Optimum delay	Evaluation of Engel-Grangerova test	H_0:
M3CZE-CPICZE	0.3225	6	No cointegration	Not refused
M3SWI-CPISWI	0.1216	6	No cointegration	Not refused
M3CZE-HDPCZE	0.3225	6	No cointegration	Not refused
M3SWI-HDPSWI	0.1216	5	No cointegration	Not refused
M3CZE-CPICZE	0.3225	6	No cointegration	Not refused

The results of the tests above show that there was no proven correlational relationship between the M3 aggregate and inflation for either the Czech Republic or Switzerland. The first reason to consider explaining why the conclusions that were determined differed from [17] and [14] is the different time periods for which both these analyses were conducted. Next, there were the differences in how the central banks' monetary policies were set up during the periods that were observed. Last, but not least, there was also the presence of the economic crisis, which influenced all of the world's economies. A combination of these factors was the reason the analysis did not confirm the correlation between the investigated values (M3 and CPI or GDP) in the given countries for the years 2000–2016.

4.4 Discussion

On the basis of the tests that were conducted, the results did not confirm a relationship between M3 and CPI and between M3 and GDP in the Czech Republic and Switzerland from 2000 to 2016. The monetary policy effectiveness, which is realized through the targeting of monetary aggregates, was mainly dealt by monetarists. The monetarist's concept of the transmission mechanism explains the price level movements by changing the amount of money. The results confirmed that monetary policy in the Czech Republic and Switzerland is inefficient if monetary policy is realized by foreign exchange intervention when increase money supply. The foreign exchange intervention did not affect the CPI and GDP in selected countries. Both central banks are currently realizing their monetary policies primarily through interest rates and not by targeting monetary aggregates.

5 Conclusion

This paper focuses on analyzing the effectiveness of monetary policy in the Czech Republic and Switzerland as realized using foreign exchange intervention. First, macroeconomic variables suitable for analyzing this effectiveness were established via research in the literature. The M3/CPI and M3/GDP relationships were tested for the given countries. On the basis of research in the literature (e.g., [22]; [14]; and [17]), an assumption of the existence of a positive correlation between both pairs of indicators was also established. On the basis of the tests that were conducted, the results determined that a cointegration relationship does not exist between any of the time series at a 0.05 level of significance. The paper's conclusions correspond to the conclusions of [9]. Not finding a long-term relationship between M3 and CPI or GDP can be caused by a combination of a number of factors. It is important to note that the observed time series capture a shorter period of time compared to other studies. Furthermore, the period 2000 - 2016 was influenced by the global financial crisis, when central banks were forced to cope with specific situations in individual countries. Selected central banks have come to unconventional monetary policy at different times, and for example in the Czech Republic only less than four years have been implemented. Therefore, it would be appropriate to choose a longer time series to assess the effectiveness of the monetary policies of selected central banks. These factors could clearly be the reason why the previously proven positive relationship between the macroeconomic variables that were investigated was not statistically corroborated. However, the results can be considered as inspiring for further time series analyzes as the tests used are still not a common tool for analyzing time series. In further research, it would be possible for us to focus on models that allow for the endogeneity of variables. Such studies do exist, but they primarily process data from the USA (e.g. [5] or [19]). It would certainly be interesting to apply the same models to other countries that have tried to face deflation using the zero-interest rates in the form of unconventional monetary policy. Using these methods, however, requires a greater amount of observation and longer time series. If the model is extended by other variables (e.g. interest rates or money of zero maturity), their importance in relation to for this research, it is necessary to test the model again in the cointegration analysis of the Engle-Granger test. The new variables cause a change in quantification of the influence on CPI and GDP.

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Interests of Organic Food Consumers

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Abstract. Perception of the enterprise from the standpoint of interests (expectations) of consumers (customers) is socially and economically justifiable. It concerns all the enterprises, including, perhaps especially, those that produce organic foods. Over the last years, people have started to more and more often care for their health and for what they eat. Organic food production has raised the standards of quality for conventional methods and has often demonstrated its superiority in both product quality and other benefits of organic food production. Therefore, the aim of the study was to collect information about an understanding of the concept of organic food by consumers and to identify expectations (interests) of consumers. Analysis of the above problems was based on the empirical pilot research performed by the authors and the literature survey. The study outlines a direction a further topic survey could follow such as a consumer ability to identify an organic food, explain the term or state a frequency of buying organic food products.

Keywords: Interests, Consumers, Organic Food

1 Introduction

There is a widespread belief in the related literature that contemporary enterprises have to be aware that they operate in a specific environment, whereas their relations with specific groups of stakeholders have an effect on their reputation, long-term results and market position [8]. As indicated by M. Crozier [2, p. 20], one cannot forget the necessity of social reality, including the legitimacy of listening to the stakeholders, who are the most important to the enterprise. Therefore, it is becoming important to ensure a comprehensive identification of the stakeholders, their role with respect to the enterprise, with a particular focus on recognition of their expectations.

Among the stakeholders connected with the enterprise are internal stakeholders (insiders), such as owners, employed managers and employees, and external stakeholders (outsiders). The outsiders include in particular customers, suppliers, partners, financial institutions, insurance firms, local governments, and potential (for a specific organization) employees [1, p. 14-15]. Under conditions of the constantly increasing competitiveness, the particular focus, as it seems, besides insiders, should be on customers and recognize and meeting their expectations.

Customers expect not only a specific value (e.g. quality, health values), but they also transfer a specific value (e.g. cash, loyalty, trust) in exchange. Relationships of the customers with the enterprise should also be characterized by trust, loyalty, credibility, and friendship, which they can "bestow" on the enterprise in expectation of reciprocity [9].

Creating such persistent ties between enterprises and customers seem to be especially important to producers and food consumers. It is worth noting that for several recent years, the problems of organic foods has been addressed in both business practice and scientific studies. It is also remarkable that organic foods are foods from organic farming and produced by means of organic agriculture methodologies in a clean and uncontaminated environment [4, p. 28].

Organic farming has demonstrated its superiority over the conventional food production methods in both product quality and other benefits of organic food production. It should be emphasized that organic food, which is high-quality food, is only the products with specific symbols and from farms or organic production.

With this definition, the aim of the study was, on the one hand, to obtain information about an understanding of the concept of organic food by customers, and on the other hand, identification of the expectations (interests) of consumers (customers) concerning the organic food products. The attempts to achieve this aim were supported by the presentation of the basic information about the specific nature of organic food and its manufacturing, which represented the aim of the theoretical part of the study.

2 Methodological aspects of examinations and literature overview

2.1 Research methodology

With consideration for the above problems, the study involved:

- an overview of the literature, legal acts, and published reports,
- a diagnostic survey with pilot character, concerning the interest of the students of the last year of master's course in starting the business activity connected with self-employment.

Empirical studies were conducted in the third quarter 2017, whereas they concerned 64 respondents, of whom 60% were women and 40% were men. Therefore, the dominant sex was women, aged 21 to 26 years. The respondent inclusion criterion was their consent for participation in the study. Most respondents lived in the region of the Lower Silesia (Poland).

The study used the survey questionnaire containing the closed-end questions, with several options of answers, and open questions. The survey was of anonymous and confidential character. The analysis concerned the list of 15 interests, preceded by the questions that allowed for assessment of the knowledge of respondents concerning organic foods and their specific nature. The proposed set of interests was developed based on the literature survey and authors' own observations. Furthermore, the respondents had an option of supplementing this list with the interests which were not mentioned.

The respondents were asked to assess each of the proposed interests from their own standpoint while having the choice of the following answers: very important, rather important, neither important nor unimportant, rather unimportant or unimportant at all. The results presented below refer only to the expectations which were assessed as very important.

The study was preceded by the free-form interviews with the respondents who expressed their consent to participate in the interview (36 people). The in-depth interview (IDI) described by S. Kaczmarczyk was used, which is a direct method of the primary survey, where a respondent is an active object of the measurement and a direct communication between people subjected to the measurement and those who make measurements occurs (conversation) [7, p. 252 and further].

The presented results cannot be considered as statistically significant but they should be approached in the categories of initial recognition of the correctness of the adopted research assumptions and the basis for the formulation of further research goals.

2.2 Research Organic food and interests of consumers in light of literature

R. B. Tucker argues that enterprises, in order to survive in the turbulent environment, must respond to changes through continuing implementation of innovative solutions and prediction of new emerging needs and expectations of customers (consumers), especially by offering opportunities for meeting them [13]. From this standpoint, the category of customer satisfaction is becoming important, especially for the economic outcomes and especially the social effects of the enterprise functioning. The satisfaction is hardly measurable phenomenon since it concerns individual needs and expectations of customers which are much varied. Therefore, the problem of strategic importance is to recognize these expectations that are conducive to the achievement of the indicated satisfaction.

With this background, the consumers are more and more oriented towards care for the responsible consumption and the related activities which are conducive not only to the care for the environment, conditions of production of the products offered but also the consequences of their use. The latter concerns especially the responsible consumption of food products.

In this context, it is worth emphasizing the fact that over the last years, people have started to think more about their health and pay more attention to what they eat. Consequently, the number of organic food consumers is constantly rising. Organic farms and shops that sell these products are also developing.

The definition of the Food Code published by the Food and Agriculture Organization/ World Health Organization (FAO/WHO) says that organic foods are those produced by farms that use organic systems harmonized with the environment. Therefore, the foods are produced based on the principles that organic farming organizations use to award special trademarks. In order for a product to be considered as organic, certain prerequisites have to be met, contained in the Basic Standards for Organic Production and Processing according to the International Federation of Organic Agriculture Movements (IFOAM). The first version of these standards was published in 1982. The document contained the principles of production, processing, storage, labeling and placement on the market of foods. In English language publications, this type of food is termed organic food [11, p. 80].

The organic foods are characterized by at least 95% of ingredients produced using organic farming methods or fully organic (organic raw materials) or those with at least 70% of such ingredients, with 30% permissible from processing using the organic processing technologies. Organic foods can be divided into three categories according to the content of organic ingredients [3, p. 9-21;28]:

- Category I: amounts of organic ingredients of over 95%; only these products can be labeled as organic and regarded as organic products,
- Category II: amounts of organic ingredients range from 50 to 95%, with these products termed partially organic,
- Category III: a content of organic ingredients below 50%; these products are not qualified as organic and are termed non-organic.

The current legal pillar concerning organic farming in Poland is the Act as of 5 December 2014 on the amendment of the act on organic farming [10].

The particular focus should be on the principles that concern processing of the organic foods. Producers of such foods are obliged to produce foods using organic agricultural components except for the case of unavailability of the component of "organic" quality in the market. It is recommended that food additives, auxiliary substances, microelements and non-organic components that perform sensory and technological functions should be limited to the minimum level and used only if technology requires using them or the product is designed to be used for specific food purposes. Organic food producers are obliged to carefully process foods using biological, physical and mechanical methods. It is forbidden to use GMOs and ionizing radiation to process foods or raw materials used as food ingredients [12].

Organic products can be recognized by their labels, with words organic, eco or bio, the EU organic logo (Euro Leaf) and the certification authority number. Only this product marking provides the guarantee of its organic origins. Figure 1 presents the graphical symbol of the Euro Leaf.

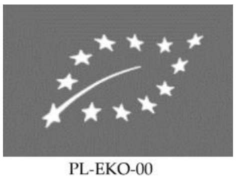

Fig. 1. The EU's organic farming logo [3].

In 2012, Poland was among the leading countries of the European Union in terms of the number of ecological countries and the surface of the agricultural land for organic farming. However, in terms of the percentage of land for organic farming in the total agricultural land, Poland, compared to other EU countries, was below the average. With this background, Poland's immediate neighbouring countries (Czech Republic and Slovakia) were much better [14, p. 160-165].

It is worth showing the example of one of the pioneers of organic food in Czech Republic, the limited liability company "PRO-BIO, obchodní společnost s.r.o.", which was founded in 1992. The company has an ecological certificate (KEZ, ww.kez.cz) and also meets international quality standards (IFS) which solve the problems of security and quality of food products. The main objective of PRO-BIO is processing of cereals and food wholesale (ca. 1,200 products offered). The company also produces seeds. PRO-BIO is one of the biggest companies in the Czech Republic, dealing with production and sales of organic foods [5]. It should also be emphasized that the enterprise cooperates with Polish farmers who produce organic foods.

With this background, the information contained in the report "Organic food in Poland 2017" prepared by IMAS International sp. z o.o. is especially interesting. Among other things, the report says that *„The market is in the growth phase, which is also forecast for the years to come, the industry is picking up, the barriers of product availability are being overcome, and the organic food products are reaching not only shelves of specialized shops but also local shops or supermarkets. Consumers of organic foods are motivated for purchasing them, have substantial knowledge of organic foods and their effects on health. …*"[13].

With this in mind, the following part of the study presents the results of the pilot research concerning the knowledge of the idea of organic food and expectations connected with this type of food products in a group of respondents.

3 Organic food consumer interests: presentation of chosen aspects of empirical studies

Organic products are characterized by a specific character, including individual smell and specific production methods. This ensures that the producers can be more attractive in the market. However, in order to make it possible, the producers should, apart from other variables, such as legal regulations, take into account the interests (expectations) of customers. Especially important is knowledge of customers about the characteristics of organic foods.

The empirical study showed that 85% of 64 respondents were unable to identify the term organic food. It is also interesting that 95% of the same respondents declared that they knew how to identify organic foods in the shops. The respondents properly described the symbols that certify the organic foods.

The study also showed that 18% of the respondents declared buying organic foods at least once a week. Other people in this group did not buy organic foods since they found it expensive and difficult to find.

Using the results of the study, the Tab. 1 presents the interests (expectations) which are found as very important by the respondents who represented consumers of organic foods.

Table 1. Interests of organic food consumers.

Expectations of organic food consumers
producers' respecting the production methods specific for organic foods
producers' using raw materials specific for organic foods
product price corresponding to its value
maintaining of specific access to organic food
competent services provided by producers and/or vendors

With reference to the interests preferred by consumers (see Tab. 1), it is interesting that the consumers ranked the problems of care for raw materials and production methods as very important.

As results from in-depth interviews over the respondents who gave consent for the interview, the people who buy organic foods are guided by health concerns, taste, and tendencies for eating healthy foods. When selecting the shop with organic foods, the important factor is consumers' trust to the supplier (98%). The respondents indicated that they prefer small atmospheric shops or street markets, where they can familiarize with food news and know that organic food is original and not forged. They also often know the concrete organic farm that produces the specific product. The symbols only confirm product quality. The respondents demonstrated that they had experienced inconsistency in these terms. It happened that they had to deal with dishonest producers. Several respondents indicated that these situations had affected their perception of the value of organic foods.

Among the group of expectations considered by consumers as very important, there was the statement concerning "maintaining of specific access to organic food." The in-depth interviews showed that the respondents, who were asked to consider the above cases of the dishonesty of producers or vendors, expressed the views that the access to the organic products should be somehow limited and the opportunities of selling them should be connected with obtaining specific certificates. The need was emphasized for the knowledge of people who sell organic food concerning food characteristics, especially health values. Consumers choose organic foods since they are aware that this type of food is less chemically contaminated. They are afraid of the unfavourable effect of residue substances contained in the conventional foods as a consequence of using pesticides, antibiotics, and hormones.

All the respondents who declared buying organic food found that food appearance is unimportant (this food typically looks unattractive). The health function of the food is what matters to buyers. These people also indicated the necessity of using biodegradable packages.

4 Conclusions

Recognizing the foreground role of the external stakeholders requires the focus on their interests (expectations), which should be connected especially with satisfaction, quality, and product reliability.

This was also reflected in the above-presented pilot research concerning the interests of producers and consumers of organic foods. The particular task of producers is to create the picture of the enterprise for the consumer. Therefore, the consumers are especially interested in respecting formally and informally defined procedures, using specific raw materials, production techniques and names of products.

As already mentioned, the results of the empirical survey presented in this study concerned a pilot study. These results cannot be found significant in statistical terms. Nevertheless, the opinions of both producers and customers seem to be important and interesting. Therefore, it is worth verifying them in a bigger, representative group of respondents. With reference to the examples of the Poland's neighbouring countries indicated in the study (Czech Republic and Slovakia) and their experiences concerning the organic foods, it seems justified to perform such studies not only in Poland but to include the examinations of the respondents and consumers from the Czech Republic and Slovakia. Furthermore, it would be worth examining the producers of organic foods, which, especially in the context of forging foodstuffs, should be important. Bearing this in mind, the problems presented in the study should be further explored and subjected to public discussions.

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Self-employment as a Non-standard Form of Employment in the Czech Republic and in Poland

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Abstract. The Modern companies, faced with high volatility and the associated unpredictability of their operating environment, often approach the challenge by changing the character of their relations with employees. Flexibility of employment as a strategy of response based on non-standard or alternative models of employment has become an established standard in business practice. A good example of this new approach is self-employment or disguised employment. Observation of business practice suggests that companies are more and more interested in maintaining a pool of contingent workers loosely associated with traditional company structures and employed for specific tasks. In this context, the study presents an analytical evaluation of self-employment defined as a formal statement of contractual independence. The aim of this paper is to portray the character and the wealth of approaches in business perception of the self-employment category, particularly in association with business operation practices observed in the Czech Republic and in Poland. In addition, based on the results of a pilot empirical study, the study addresses a partial objective of examining the interest in this type of contractual employment among persons entering the job market.

Keywords: Self-employment, Czech Republic, Poland

1 Introduction

Modern companies, faced with high volatility and the associated unpredictability of their operating environment, are often required to change the nature and the quality of their relations with employees, with marked preference for departure from the traditional model of employer-employee association of interests. The traditional model of employment was based on the paradigm of permanent employment with dominance of stable employment relations and assumed full-time employment, and – at the same time – providing formal confirmation of employment status for workers. This approach is now being replaced by the new category of flexible employment construed on a framework of non-standard and alternative forms of employment.

Professional literature presents several categories of non-standard employment which can be regarded as examples of flexible employment strategy, such as contracted work, seasonal employment, employment based on civil contracts (e.g. fee-for-task), and others. It must be noted that those forms are not mutually exclusive, and individual employment may incorporate features and characteristics of one or many of the above [11, pp. 56-80].

The self-employment phenomenon is a specific form of non-standard employment. It involves delegation of specific tasks and assignments to independent contractors. One of the most notable differentiating features in this context is the sharing or roles played by self-employed individuals – they are employed both in the role of owners (typically representing the SME sector) and of work duty performers.

The adaptive capacities of both workers and employers underlined in the context of promoting flexible forms of employment (including self-employment) are considered to be one of the most important elements of the third pillar of the European Employment Strategy (EES) formally adopted in 1997 in Luxembourg. At the same time, it should be noted that, in 2014, Poland ranked fifth among the European Member States in self-employment (measured as a ratio of self-employed in the total number of employed), with a score of 18.2 %. The Czech Republic ranked fourth, with a similar score of 18.9%) [3, pp. 104-105].

As observed by J. Wiśniewski: “The roots of self-employment should be sought in the promotion of the entrepreneurship ideal, as the increased interest in self-employment is perceived to be a sign of socially accepted attitudes of industriousness and creativity. Human entrepreneurship and investing in one’s own attributes and potential are seen as a radical departure from the traditional attitudes of submission and servility” [18, pp. 36-41].

Taking into account the above observations, this study aims to examine the characteristics of self-employment and the general perception of self-employment as a category of gainful employment, particularly in association with business operation practices observed in the Czech Republic and in Poland. In addition, based on the results of a pilot empirical study, the study addresses a partial objective of examining the interest in this type of contractual employment among persons entering the job market.

The above objectives were addressed by the use of literature studies, analyses of statistical data and results of proprietary pilot studies of self-employment as a viable form of employment considered by students of senior years of master studies. A broader overview of research methodology will be presented in the next section of this paper, followed by presentation of conclusions from literature studies and analyses of results obtained in the course of empirical research (both third-party studies and own research).

2 Research methodology and literature studies

2.1 Methods of research

For the realisation of the study objectives, the following methods were employed:

- Review of professional literature and applicable legal documents,

- Overview of third-party empirical research on the subject at hand,
- Presentation of statistical data derived from formal reports obtained from statistical offices,
- Presentation of results obtained from a pilot proprietary diagnostic poll on the interest in self-employment as a viable form of employment considered by students of senior years of master studies.

The proprietary pilot empirical study was conducted in the years 2016 – 2017 and took the form of a poll survey targeting nearly 70 respondents (as part of a research project conducted by the Department of Labour and Capital at Wroclaw University of Economics, and managed by a co-author of this paper, A. Cierniak-Emerych).

The survey contained both closed-type questions with variants of responses, and open questions. Opinion polls were anonymous and confidential. Analytical evaluations were made with regard to 10 most beneficial and 10 most detrimental properties or qualities of self-employment. The list of benefits and detriments used in the study was construed on the basis of third-party research and own observations. In addition, the respondents were free to supplement the list by other properties and qualities deemed important in the study's context. Respondents were also asked to present their own conclusions on the positive dimensions and the limitations of self-employment. Apart from questions targeting directly the scope of issues under study, respondents were also asked to present their opinions, interests and expectations towards their future gainful employment. Respondents were asked to evaluate each of the elements from the list of attributes from their own perspective and select the appropriate response from the following: very important, fairly important, neither important nor unimportant, rather unimportant, entirely unimportant.

The surveys were also accompanied by open-type interviews with those of the respondents who agreed to participate in this segment of research (16 persons). This stage of research employed the methodology of IDI – *in-depth interview* – as described (among others) by S. Kaczmarczyk; this type of interview is an example of a direct instrument of opinion-poll measurement in which the respondent is an active object of measurement and which is characterised by direct communication between respondents and researchers (i.e. takes the form of a conversation) [12, ff. 252].

The results presented herein concentrate solely on those expectations which were deemed by respondents as 'very important'. The entire range of results will be presented and utilised in later publications. Below are the results of opinion surveys collected in the years 2016 – 2017 among nearly 70 students of Wroclaw University of Economics, Department of Engineering and Economics, who took the subject of 'technological entrepreneurship' as part of their master course studies. The reason for limiting the survey to recipients of this particular subject of studies lies in the fact that skills and knowledge required in the formation of own enterprise are the core of competence addressed by this course.

The results presented below cannot be regarded as statistically significant, and should only be perceived as a preliminary examination of the validity of the adopted research assumptions.

2.2 Self-employment and the flexible model of employment, in the light of professional literature

The existing and fairly rich scope of professional literature on the subject of self-employment provides a wealth of diverse determinants and characteristics deemed of essence for the practical operation of the contemporary model of flexible employment. One of the most popular postulates is the concept of a ‘shamrock organisation’ flexibility of employment, developed by Ch. Handy. According to this concept, company employees may be classified into three fundamental segments – symbolised by three distinct ‘leaves’ of the shamrock structure of organisation [10, pp.75-97]:

- The first leaf is composed of the core staff, i.e. persons that define the core competences of the organisation. This segment is also referred to as the *professional core*. Employees in this category hold knowledge that differentiates the organisation from the others,
- The second leaf represents persons employed on short-term contracts,
- The third leaf represents contingent work force, employed in response to increases in demand.

Similar attempts at structuring the present changes to traditional models of employment can be found in other publications. For instance, J. Atkinson [1] postulates a method of classification into the following ‘layers of employment’: basic employees, core personnel, and peripheral employment. As a result, companies display a tendency to separate their employment structure in two distinct groups – permanent (stable) employment and peripheral (unstable) employment, resulting in a stark distinction between stable and unstable workplace assignments and the formulation of a network of external contractors employed by separate economic entities.

For the purpose of this study, the main emphasis will be placed on the latter group of external contractors and on the associated category of self-employment, typically identified with external provision of per-task duties for the company by persons running their own independent enterprises. One point of note in this context is the lack of a unified definition of self-employment, both at national (the Czech Republic, Poland) and supranational level (the European Union). For example, as pointed by Lasocki B. and Skrzek-Lubańska M., Austrian regulations define self-employment as independent gainful employment; this service can take many forms, such as: micro-entity (and its extreme form of a one-man company), personal partnership (civil-code, general or limited partnership), capital venture, liberal profession contracts or funds. Belgium, in contrast, identifies self-employment with independent enterprise ran for profit, while the law of the Netherlands perceives it mainly through the provision of subcontracting services for other companies [13].

Based on the above deliberations, it may be observed that self-employment – regardless of the adopted legal definition of the term – should be interpreted in the context of the entrepreneurship idea, and specifically in relation to the rapid formation of small and micro enterprises.

It may also be useful to note at this point that self-employment is often perceived as a measure of workforce flexibility, since it may reduce the unemployment rates and – at the same time – serve as a source of additional income for state budgets (taxation). Formation of one-man enterprises may also lead to creation of new jobs, as micro-entities may eventually expand into larger structures. The above outlook on the benefits offered by self-employment can also be observed in the EU documents where this particular category of employment is clearly perceived as a warranty of balance on the labour markets.

It must be remembered, however, that self-employment is not without faults. The most important disadvantages of this form of employment include: poor stability, sharing in the risk of business operation, lack of the broadly defined security of employment, bearing the full cost of individual development, security of work conditions, etc. [7, p.261].

As already noted, both the Czech Republic and Poland are representatives of states with the highest ratio of self-employed individuals [3, p.104.]. For this reason, the following sections of this study will concentrate on the presentation of the phenomenon from the viewpoint of these two EU Member States.

3 Self-employed Persons in the Czech Republic

3.1 Definition of Self-employment

According to Act No. 155/1995 Coll., on Pension Insurance, as amended, the following are considered self-employed [4]:

- they carry out an independent gainful activity, or
- they co-operate in carrying out an independent gainful activity, if the income from this activity and the expenses incurred by it can be divided to this person pursuant to Act No. 586/1992 Coll., on the Income Taxes, as amended,
- they have completed the mandatory school attendance and have reached at least the age of 15.

An independent gainful activity is understood as:

- the business of farming, if the natural person carrying out the farming is registered pursuant to special legislation,
- carrying out a craft on the basis of an authorization to carry out a craft pursuant to special legislation,
- the activity of a partner in a partnership or general partner in a limited partnership carried out on behalf of this company,
- carrying out an artistic or other creative activity on the basis of copyright relations.

Since 1 January 2004 the difference between a major and subsidiary independent gainful activity has been distinguished. An independent gainful activity is always considered major unless the conditions for a subsidiary independent gainful activity are fulfilled.

An independent gainful activity is considered subsidiary if the self-employed person in the calendar year:

- was employed,
- was entitled to the payment of a invalidity pension or an old-age pension has been awarded to him/her,
- was entitled to a parental allowance or maternity cash benefit or sickness benefit due to pregnancy and delivery if there is an entitlement to these benefits on the basis of sickness insurance of employed persons or cared personally for a person under 10 years who is dependent on the care of another person in degree I (light dependency) or for a person who is dependent on the care of another person in degree II (medium dependency) or degree III (heavy dependency) or degree IV (full dependency), if the person who is dependent on the care of another person is a close relative or lives with the self-employed person in a common household,
- served in the Czech military, unless they are professional soldiers, or community service,
- was a dependent child within the meaning of § 20 (3) (a) of Act No. 155/1995 Coll., on Pension Insurance, as amended (study) Results and Discussion[5].

3.2 Statistical Data - Self-employment i.e. Natural Persons

Data on the organizational structure of the national economy are compiled from information kept in the Statistical Business Register. The Statistical Business Register keeps record of businesses, i.e. legal persons, organizational units of the state, unit trusts, and *natural persons with the status of entrepreneur*.

A business with an identified activity is such a business that according to information from administrative sources or statistical surveys reports economic activity. This economic activity is demonstrated at least by one of three conditions. A unit has employees, pays income tax or pays social insurance. It means that the Czech Statistical Office assigns the code of activity to business entities on the basis of information from other registration sites such as the Tax Office and the Czech Social Security Administration.

In the Czech Republic within the business sector there is a visible difference between the number of enterprises that are registered as business entities and the number of enterprises that exert real economic activity. Natural persons include private entrepreneurs who are in business under the Trade Act (A), agricultural entrepreneurs (B) – natural persons, and natural persons carrying out other business activities governed by special regulations (C). Private entrepreneurs in business under the Trade Act are natural persons with a trade licence. Private entrepreneurs in business under other acts include agricultural entrepreneurs – natural persons, members of professional chambers, and other natural persons whose business activities are governed by separate legal regulations.

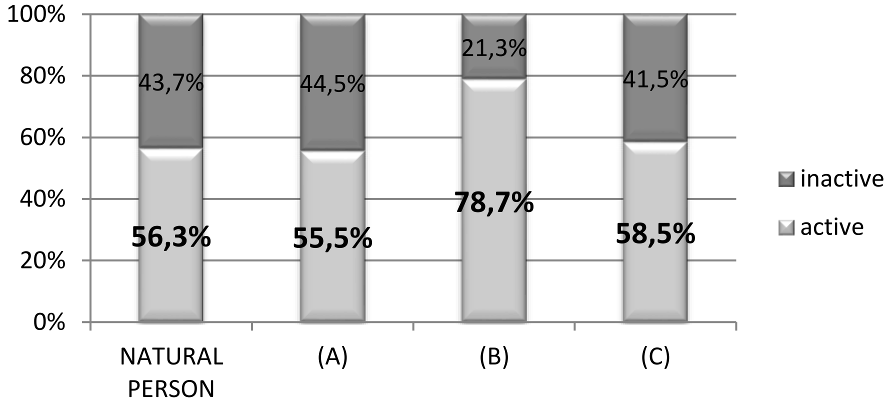

Fig. 1. The Share of Active and Inactive Natural Persons in the Czech Republic 31 12th 2015.

In the Czech Republic within the self-employment sector there is a visible difference between the number of enterprises that are registered as natural persons entities and the number of natural persons that exert real economic activity (see Fig. 1). For their significance, only active natural persons are analyzed.

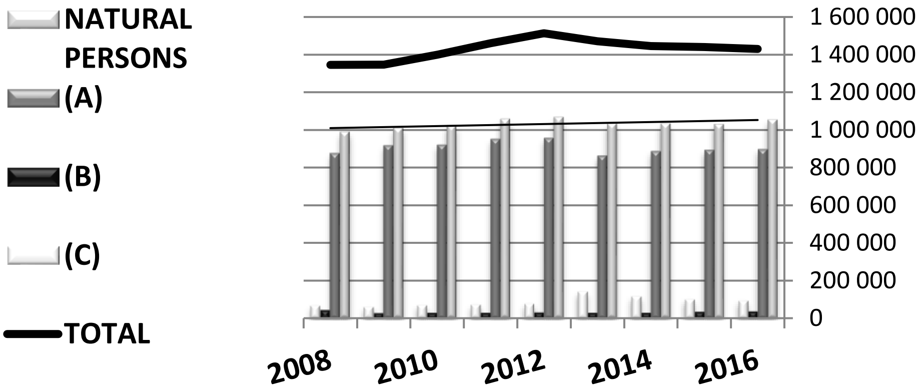

Fig. 2. The Development in the Number of Active Natural Persons in the Period 2008-2016 in the Czech Republic. (A) Private entrepreneurs in business under the Trade Act; (B) Agricultural entrepreneurs – natural persons; (C) Others.

The analysis shows (see Fig. 2) that self-employment represents a high share of the total number of active business units in the Czech Republic (70 - 75 % in the period 2008 - 2016).

Self-employment is represented in the following sectors: wholesale and retail trade; repair of motor vehicles and motorcycles; professional, scientific and technical activities; construction; manufacturing; other service activities; real estate activities; accommodation and food service activities [9].

The private entrepreneurs who are in business under the Trade Act (A) constitute a greatest proportion (59 - 68 % in the period 2008 - 2016 of the total number of active business units). These entrepreneurs take advantages of self-realization, independence, flexibility and a higher income than as an employee earns. They are their own bosses, enjoy more tax deductions but on the other hand they risk all their property, assume high responsibility, overcome bureaucratic obstacles, manage a large number of different roles in entrepreneurship and a lot of different skills and knowledge (be a ´jack-of-all-trades´). The natural persons with the status of entrepreneur in the Czech Republic prefer the speed of registration as a freelancer, simplicity of establishment, interruption and finishing of entrepreneurship.

4 Self-employment in Poland

4.1 The character and the manifestations of self-employment and individual entrepreneurship

In Polish economic practice, self-employment is typically associated with individual entrepreneurship and rendering of independent services for one or many business enterprises [8, p.6]. Article 2 of the Polish Act of July 2, 2004 on freedom of business operation defines individual entrepreneurship as a gainful activity in production, construction, trade, services, exploration, identification and extraction of mineral deposits, and other vocational pursuits rendered in an organised and continuous manner [16].

In addition, the Act provides a definition of an entrepreneur as a natural person, a legal entity or an organisational unit with legal titles endowed on the power of a separate Act, and involved in economic operation under their name. In other words, the Act associates self-employment with entrepreneurial activities of a one-man company. It must be emphasised that professional literature fails to provide a unified approach to the formation of new jobs within the existing self-employment structures (i.e. expansions of one-man companies into larger companies. Some experts state that self-employment should be carried out without additional employment [8], while others believe that self-employed individuals have the freedom to create new jobs [18; 14].

In Poland, perceptions of self-employment are varied. In some cases – as demonstrated in third-party studies – it may (and in fact, often does) lead to pathologies. In particular, employers willing to reduce the cost of employment and driven by the egoistic slogan of ‘for my own good’, may exert pressure upon their employees to resolve their standard contracts and opt for self-employment to serve their regular range of duties [2, pp. 45-46]. There are also positive examples of practical effects of self-employment, with more and more professional and vocational segments perceiving this form of employment as highly desirable. This effect is observable in freelancing professions (lawyers, architects), but can also be found in other vocational segments (e.g. physicians).

As suggested in study results published by the European Commission, at the onset of the second decade of the century, six out of ten Polish citizens up to the age of 25 displayed interest in setting up their own enterprise. At that time, a third of the formally registered companies in Poland were run by persons below the age of 30. In e-business, this ratio went as high as 85% [17].

Based on 2016 data, Polish entrepreneurship involves the operation of ca. 1.84 million formally registered companies, of which 96% – ca. 1.77 m – represent the small and medium sized enterprise segment. The above figures translate into a 73.5% share in GDP, with more than a half (50.2%) generated by the SME segment (30.8% from micro enterprises, 8.8% from small companies, and 10.6% from medium sized companies) [15].

In view of the above, it may be useful to examine the attitudes towards this form of employment among students of senior years of master studies, as the new generation of professionals about to enter the labour market.

4.2 Self-employment as a viable form of future employment for young professionals entering the labour market – a presentation of findings obtained in a pilot study

Based on a predefined list of factors that stimulate or deter decisions on self-employment, and on respondents' suggestions in this respect as well as their voiced preferences in future vocational career, the authors found that the dominant group of respondents were those who – while conscious of the positive effects of self-employment – expressed their reservations towards this form of employment.

More than a half of nearly 70 respondents, when asked to provide their own suggestions of the positive and negative aspects of self-employment, emphasised the following:

- Potential for self-fulfilment,
- Preserving autonomy of decisions made with respect to future professional development,
- Improved gain (increases in both financial and non-financial returns for service rendered to third parties),
- Potential for pursuing own business objectives and ideas,
- Relative freedom in the choice of time, place, and method of task realisation.

Beneficial properties of self-employment, such as self-fulfilment, professional development, and pursuance of own business ideas, were particularly strongly emphasised by those respondents that qualified for the in-depth interview stage of the study. Persons in that group stressed the view that, based on their own observations and – in part – professional experience (despite being students, some of them had already had the opportunity to practice in their field), rendering of services for a specific employer on a contractual basis would potentially have the effect of limiting or even blocking off their creativity and innovation, and would surely have a strong impact on their perceived ‘independence’ or ‘self-reliance’.

The above opinions may rise reasonable doubt, particularly when contrasted with the abundance of arguments offered by professional literature in favour of the view that creativity and innovation are the most preferred qualities of a modern employee. Perhaps one of the reasons for such a negative pool of opinions voiced by our respondents lies in the fact that some of them had already had some ‘bad experience’ in this respect.

In fact, the reality of Polish business practice shows propensity for employers to perceive persons entering the labour market as a ‘cheap workforce’. To make things worse, young professionals are often perceived as wielders of purely theoretical knowledge, and thought to be, on average, devoid of any competence to utilise their knowledge in practice. It must be noted at this point that the above opinion is – or may be – quite detrimental to those professionals who aspire to share their creativity with the employer, but are denied any opportunity to do so. At the same time – and interestingly enough for research purposes – it was the same group of respondents of all the persons included in the study who (based on their questionnaire responses) were steadfast reluctant to engage in self-employment. They attribute it mostly to the lack of financial resources – and sometimes the courage – to undertake the risk of independent business operation. They also emphasised their intent to gain more experience before they are ready to consider the idea of running their own independent enterprise.

The respondents (57 out of 68 included in the study) were adamant in their view that self-employment was largely stimulated by such personal qualities as success orientation, leadership qualities, optimism, mental resilience, and the skill to cope under stress. However, those attributes were indicated as part of general self-image only by 8 out of all the 68 respondents included in the study. For instance, one female respondent had already had extensive practice in creating and selling for profit a wide assortment of decorative products. Incidentally, the same female respondent was the only one to steadfastly assert her commitment to self-employment after completion of her studies.

The remaining respondents, when asked for their expectations towards future vocational career, attributed greatest weighs to such qualities as the adequacy of wages to workload and the sense of employment security. Of the properties deemed detrimental for their will to engage in self-employment, respondents indicated such responses as: risk avoidance, the lack of mental resilience, and the perceived difficulties in making adequate decisions, particularly those related to business. Such attitudes may be quite astonishing among persons who – without exception – are students of senior years in management and engineering of production, specialising in ‘Management in Production and Services’, where the attribution of knowledge and skills required for the formation and management of own enterprise is considered among the main educational objectives. Entrepreneurial knowledge and skills should not come as anything new for this group of students. On the contrary – they should already be fairly well established, particularly when students are actively incentivised to participate in various extracurricular activities to that effect, e.g. those within the framework of academic incubators of entrepreneurship.

5 Conclusions

Professional literature provides ample representation of the view that self-employment offers more opportunities for creative approach for the most skilled individuals. At the same time, practical realisation of these opportunities is closely related to structural, legislative, economic and social determinants that serve to ascertain the perception of self-employment as a viable approach in the distribution of human creative potential for innovation [18]. It must also be remembered that properties deemed of great value for one person may just as well be perceived by others as obstacles that greatly reduce their ability to cope with decision-making challenges and risks of economic operation.

To sum up the results of the pilot empirical studies, it may be observed that the knowledge and the skills required in self-employment are already fairly well-established among our respondents as master course students who are about to enter the labour market. However, not all of them – as evidenced in the results – were ready to commit to this type of employment in the near future despite being quite aware of the positive dimensions of running one’s own business.

In this sense, the responses obtained in the pilot study failed to corroborate the modern trend in professional literature that associates propensity for self-employment with young age. Perhaps the pilot quality of the study is one of the reasons for such a discrepancy; another reservation may be raised as to the composition of the respondent sample. Hence, the problem under study will require further insight and evaluations, both economic and those in the social dimension. The authors believe that one of the most promising directions for further research is the consideration of cultural determinants of self-employment propensity. This is the chance the authors would like to pursue, based on close cooperation and simultaneous studies by partners in Poland and the Czech Republic.

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Production of Tomatoes in Mexico and its Competitiveness in the U.S. market

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Abstract. The most dynamic Mexican agrarian export value chains are vegetables (tomatoes, peppers and other fresh vegetables) and fruits (avocado, strawberries, blackberries, blueberries), usually produced under system of contract farming and protected agriculture. The article focuses on quantitative analysis of competitiveness of tomato (*Solanum lycopersicum***)** in international trade. Tomatoes are the most important product of Mexican agricultural exports to the United States, with a value of 2.11 billion USD and a volume of 1.75 million tons in 2016. The quantitative analysis is conducted using indicators that present the greatest explanatory power and consistency: Revealed Comparative Advantage and Constant Market Participation.

Keywords: Agrarian Export Value-chains, Revealed Comparative Advantage, Constant Market Participation, Tomatoes, Mexico

1 Theoretical framework

According to Agricultural and Fisheries Information Service (SIAP), the total planted area for tomatoes in Mexico shows a decreasing trend in the last ten years, in this period it declined at an average annual rate of 2%. In 2007, 66,600 hectares were planted and in 2016, it was only about 51,900 hectares [11]. However, it is important to consider that the downward trend in the area planted stems from the decrease of the open field tomato production. Cultivation under protected agricultural conditions (such as greenhouses, shade-houses and tunnels) had been increasing substantially in the last years, going from 1,078 hectares in 2006 to 15,006 hectares in 2016, which means an average annual increase of 30 % [4]. During one decade, the volume of tomato obtained under protected farming conditions has increased, from 6.5% in 2006 to 60.7% in 2016. In 2012, for the first time, the volume of tomatoes obtained in greenhouses, shade-houses and tunnels (56.6%) exceeded that obtained in open field cultivation (43.4%) [4].

The production of tomato in Mexico presents a high geographic concentration: Sinaloa contributed 27.6% of the national tomato production, followed by Michoacán, Baja California, Zacatecas and Jalisco with 7.0%, 6.8%, 5.7% and 4.7% respectively

[11]. The high geographic concentration leads to a greater vulnerability of the production to natural phenomena. The risk reduction response is the introduction of protected agriculture. Producers in Sinaloa and Baja California are widely considered more technologically advanced than other producing states. Central states like Querétaro and the State of Mexico have a higher percentage of greenhouse technology due to colder climatic conditions. [14].

In Mexico, yield levels in tomato production vary depending on the wide range of technologies used by producers, such as open field cultivation, use of shade-houses, basic greenhouses or highly-skilled greenhouses with automated systems and hydroponics, as well as the use of inputs for nutrition and phytosanitary control. Under irrigation conditions, average yields at national level increased from 29.7 tons per hectare in 2000 to 70.8 tons per hectare in 2016 [11]. In the protected agriculture, the yields multiply to those obtained in the open field cultivation: in Sinaloa, State of Mexico, Querétaro and Zacatecas, the highest yields in tomato production are generally obtained, exceeding 200 tons per hectare during the last years. The yields obtained in other areas of the country (Tabasco, Yucatan, Guerrero) are between 15 and 20 tons per hectare [11], which is attributed to a less intensive use of inputs (deficient pest and disease control programs, insufficient plant nutrition).

The world imports of tomatoes are stable with an average amount of 8,773 million of US dollars in 2012-2016; being United States, Germany, France and United Kingdom the main importers of tomato in the world. The most important world exporter is Mexico with 25 percent of share of value in 2016, followed by Netherlands (19%) and Spain (13%), while Mexico's export grew by 15% between 2015-16. In 2016 the 87% of tomatoes imported to USA (in terms of value) come from Mexico, only 14% from Canada and 4% from Dominican Republic. From the Mexican perspective, this dependence of the US market is even more striking: the 99.7% of the exported tomatoes is heading right there [6].

Per capita fresh tomato consumption in the US has a growing trend due to demographic phenomena such as the aging of the population (there is an increase in consumption in people over 70 years of age) and the increase of the Hispanic population (the ethnic group with the highest per capita consumption index). Other factors which promote the growth of fresh vegetables consumption are socio-economic: higher incomes and higher levels of education. There is no linear relationship between the increase of income and increase of consumption of tomatoes (high income elasticity) rather it is a change in eating habits (towards a healthier diet) in people with a higher economic and social status. The current consumption of fresh tomatoes per capita in US is 21.3 kg with an average annual increase of 1.7% in period 2008-16 [15].

Due to seasonality in production, prices vary distinctly throughout the year: between December and April, the price of tomato in the United States reports the highest levels; it is because the lowest domestic tomato production occurs in this period, when Florida production is low and California is not producing. This gap represents an important market opportunity for Mexico. There is a well-defined pattern in the fluctuation of the volume of imports (see Fig 1). In Mexico tomatoes can be produced during the whole year (under system of protected agriculture) and at lower production costs (due to lower labor cost and favorable climatic conditions). Tomato production in the United States is mainly (89%) destined to the food industry [4], and the harvest is basically mechanized. In contrast, most of the Mexican tomato exported to USA is for direct consumption, and the harvest is manual [8]. The share of Mexican imports in fresh tomato US consumption was on average 48.1% in 2012-16 and increase annually by 4.2% in this period [4].

Another opportunity presents changing climatic conditions: the droughts in California are forecast to have a major impact on agricultural production in the coming years. An estimated 175,000 hectares of the state of California will stop producing due to lack of precipitation. California is the main producer state: contributes 45 % of US fresh tomato production. Florida, the second producer state, participated with 31 % of the national volume of fresh tomato [16].

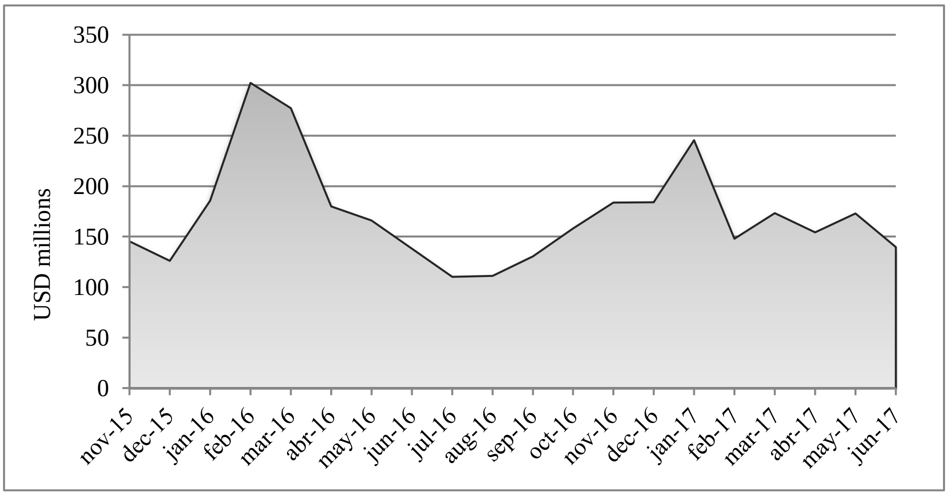


Fig. 1. Fluctuation of tomato imports from Mexico to United States of America [6]

2 Methodology

The competitiveness of international trade has two basic aspects: the relative costs position and the ability to penetrate markets [17]. Competitive advantage is based on relatively (compared to others) low production cost; under this logic countries exploit the production factors with an abundant offer. Nevertheless the ability to export depends equally on transportation costs, marketing costs, quality and degree of product differentiation and the season; as well as on macroeconomic factors like exchange rate and commercial government policies (of both, exporting and importing country). An increase in exports and/or the increase in market share incorporate all the mentioned complex aspects, so we can state that it express greater competitiveness of a product in the international market.

The competitiveness of a country's exports in the international market is usually measured indirectly, for example by Revealed Comparative Advantage (RCA) index.

We will use the formula developed by Vollrath [18], because this formula has been designed for agricultural products and uses statistics dates of trade [1].

$$RCA_{ai} = (EX_{ai} / EX_{ni}) / (EX_{ar} / EX_{nr}) \qquad (1)$$

Where:

RCA_{ai} - Revealed Comparative Advantages of the product *a* from the county *i* to the target market.

EX_{ai} - Value of exports of the commodity *a* from the country *i* to the target market.

EX_{ni} - Value of the total exports from the country *i* to the target market, except the exports of the commodity *a* from the country *i* to the target market.

EX_{ar} - Value of the total world exports of commodity *a*, except the exports of commodity *a* from country *i* to the world.

EX_{nr} - Value of the total world exports, except the world exports of commodity *a* and except the total exports of the country *i*.

RCA is calculated for Mexico, Canada, Dominican Republic, Guatemala and Netherlands (the top five tomato importers to the US market), the commodity is tomato (Tomatoes, fresh or chilled, ITC code 070200), the unit is thousands of USD and the target market is USA. The calculation was performed for the period 2006-2016.

The CMS analysis is an arithmetic breakdown of the growth of a country's market share over a period of time into a structural component, reflecting the impact of specialization by product and geographical area (the structure effect, SE), and other factors reflecting changes in individual market shares (the market share or competitiveness effect, CE). The total effect (TE) also contains a residual term, so-called the interaction effect (IE), which results from the fact that the product and geographical structures are not independent and thus the sum of the product and geographical effects does not match the combined structure effect [9]. The questions the method is intended to answer include whether a country's exports have grown in line with its main competitors (that is, a scale effect) and whether a country's comparative performance reflects a strong presence in highgrowth regions or products (regional and product effects, respectively) or competitive gains in individual markets [2].

The traditional model was first applied to the study of international trade by Tyszynski in 1951 [13] but Richardson in 1971 [10] reviewed the method and pointed out the theoretical and empirical limitations of the model. Several authors have presented improved versions; e. g. Jepma in 1986 [7]. Ahmadi-Esfahani [3] adapted the method to apply it to the case of an agricultural product within a specific market. The contribution of [1] was the synthesis of the method and application on the Mexican agrarian market.

$$TE = SE + CE + IE \tag{2}$$

$$SE = S_0 * \Delta Q \tag{3}$$

$$CE = \Delta S * Q_0 \tag{4}$$

$$IE = \Delta S * \Delta Q \tag{5}$$

Where:

S - Share (percentage) of a country in total volume of exports from the group of competing countries exporting to the target market.

Q - Volume of exports from the group of competing countries exporting to the target market.

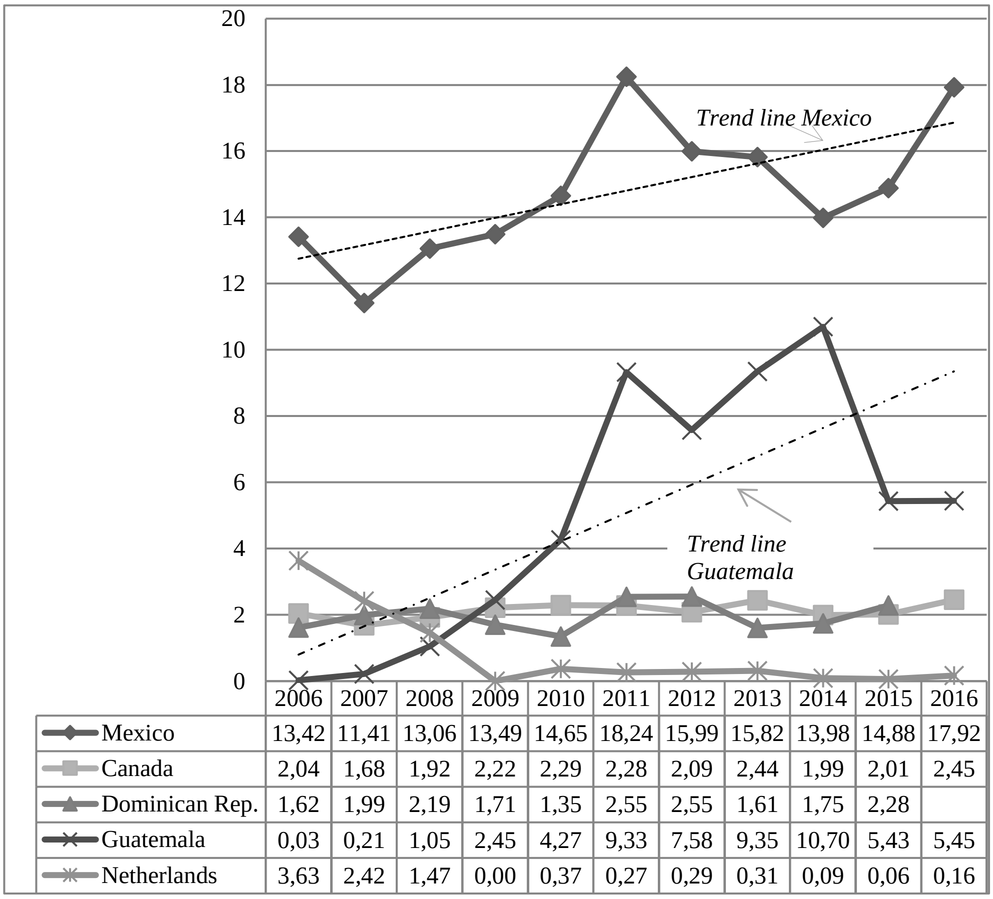
Δ - Change of the variable over time.

0 - Start of the period.

In the analyzed case, the group of competing countries consists of Mexico, Canada, Dominican Republic, Guatemala and Netherlands. The reviewed period is the last decade, so the starting year is 2007. Tons of tomatoes are calculated. Data used for the analysis are of International Trade Center (ITC) and its statistical instrument Trade Map. The supplementary source is statistics of INEGI (Mexican National Institute of Geography and Statistics).

3 Results

RCA index compares the national export structure with the world market structure, considering the international market as the space where the pattern of specialization and the comparative advantages are reflected. The higher value of RCA index expresses higher comparative advantage and higher degree of specialization of the country in this product (if the index is less than 1 or negative, the country has a comparative disadvantage). As shown in the Fig. 2 Mexican tomato sector is the most competitive and with a positive trend. Mexico is followed by Guatemala, which has also positive trend, although its RCA index has declined over the past two years. Canada and Dominican Republic have lower competitiveness and are not improving it significantly over the years considered. Netherlands is losing specialization in tomato sector and is giving up its market share in favor of other countries.



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
◆ Mexico	13,42	11,41	13,06	13,49	14,65	18,24	15,99	15,82	13,98	14,88	17,92
■ Canada	2,04	1,68	1,92	2,22	2,29	2,28	2,09	2,44	1,99	2,01	2,45
▲ Dominican Rep.	1,62	1,99	2,19	1,71	1,35	2,55	2,55	1,61	1,75	2,28	
× Guatemala	0,03	0,21	1,05	2,45	4,27	9,33	7,58	9,35	10,70	5,43	5,45
✳ Netherlands	3,63	2,42	1,47	0,00	0,37	0,27	0,29	0,31	0,09	0,06	0,16

Fig. 2. Revealed Comparative Advantages index, 2006-16. [6]

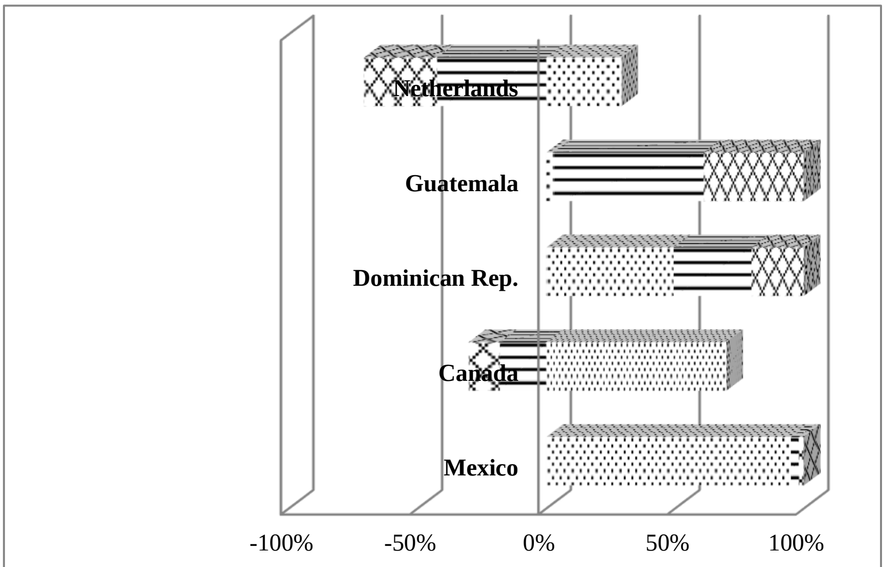
Note: No data available for Dominican Republic in 2016.

The base for the CMS analysis is the difference between a country's export growth and the competing countries group export growth. When a country's export growth is higher/lower than the group export growth, that country is gaining/losing market share. The Total Effect has been positive for all the analyzed countries, except Netherlands: Mexico 670,220 tons, Canada 42,677 tons, Dominican Republic 3,597 tons, Guatemala 5,415 tons and Netherlands -4,936 tons.

The Structural effect is positive for all the group of competing countries (see Fig. 3). SE represents the expected change in exports, keeping constant the participation of the countries in the US market. This result indicates that the growth in demand for tomatoes in USA has a positive effect in the growth of exports of the five suppliers, Mexico takes the greatest advantage: 95% of the Total effect represents the Structural effect. Whereas tomatoes are bulky goods, Mexico has a clear advantage due to its geographical proximity.

Competitiveness effect represents the country change in exports during the decade, keeping constant the volume of US demand. CE is positive for Mexico, Dominican Republic and Guatemala (gain of competitiveness) and negative for Canada and Netherlands (loss of competitiveness). Relatively the largest share has Guatemala (58% of Total effect), in the case of Mexico it is only 3 percent. We can conclude that Guatemala is gaining competitiveness significantly, while Mexico only maintains its position.

The Interaction effect combines the influence of variation in the target market demand with changes in the share in exports. As well as the CE, it is positive for Mexico, Dominican Republic and Guatemala and negative for Canada and Netherlands.



	Mexico	Canada	Dominican Rep.	Guatemala	Netherlands
⁙ Structural Effect	636 648	74 912	1 777	169	3 467
= Competitiveness Effect	20 097	-19 297	1 090	3 140	-5 030
× Interaction Effect	13 475	-12 939	731	2 106	-3 373

Fig. 3. Constant Market Share index, 2007-16 (tons) [6]

4 Conclusion

The US market has a favorable trend that allows to expect an increase in exports of tomatoes, especially if no phytosanitary problems occur. Meteorological phenomena are other risk factor with important impact on the production and price of tomato, nevertheless this impact is reduced by transformation of production technology. The implementation of protected agriculture systems can be considered like a positive trend not only for protect against pests, diseases and adverse climatic conditions but also for water savings: in tomatoes the saving is up to 77% (in the open field production 89 liters per kilogram of tomato are used and in hydroponics it´s only 20 l/kg).

The comparative advantage is based on specialization, which increases the general productivity of an open economy. Notwithstanding, empirical data show that as the underdeveloped countries get richer, production becomes less concentrated and more diversified. The sectoral specialization takes place only in high-income economies (per capita income of Ireland and higher). First, the emerging economies have to acquire skills in a wide range of activities and then specialize. Market prices can not reveal the profitability of non-traditional activities (that do not yet exist), which is the reason why investment in these activities is high risk. Successful examples show that diversification requires state assistance or government intervention (investment in infrastructure and research, preferential credits or guarantees for export).

Mexico has achieved a great differentiation of products, both in production technology (greenhouse, hydroponic, organic etc.) and in the varieties. Current tomato production is mainly based on hybrids that produce higher yields and have greater resistance to pests and other stress factors than native varieties (Saladette, Roma, Cherry). However, as mention Ladewig et al. [8], some consumers prefer tomatoes of non-hybrid varieties, which have different colors, shapes and flavors. In USA they are called Heirloom (criollo, local, traditional or native varieties). In terms of maturation, most commercial tomatoes come from hybrid genotypes that have been developed to be harvested before ripening in the plant to facilitate their transport and distribution. In contrast, the native varieties of tomatoes are harvested in a more mature state or even in complete maturation. Once ripe, the fruits are sold directly in marketplaces and consumers can distinguish a difference in taste (various varieties of Heirloom, for example Goose Creek, Hawaiian Currant, Stupice, Citlale and Ojo de Venado). Another important reason for preference of traditional varieties is the visual appearance: Green Zebra (yellowish green with dark green stripes), Black Krim (dark red to purple), Dixie Golden Giant (yellow to orange), Chino Criollo (shaped like paprika) or Yellow Pear (yellow with a small pear shape).

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Geocaching in the Czech Republic and India with a Focus on Selected Aspects – Comparative Study

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Abstract. The article deals with a multidisciplinary phenomenon called geocaching. Various aspects of geocaching form the core of this paper. The aim of the paper is to map current situation in geocaching and location of caches in the Czech Republic and India, to be precise in the city of Hradec Králové, Prague and New Delhi. The first sub-goal is to compare occurrence of various kinds of caches in two cities and give a real illustrative example of geocaching activity. The other sub-goal is to compare both countries according to the Networked Readiness Index (NRI). The findings are accompanied by tables and figures. In spite of the fact that India is so many times larger than the Czech Republic the occurrence of caches is small. In Hradec Králové with less than 100,000 people there are more caches than in the whole India. India still hasn´t found the potential of geocaching for the promotion of sustainable tourism and development of the economics.

Keywords: Czech Republic, Geocaching, India, Network Readiness Index.

1 Introduction

Geocaching is a global phenomenon. This multidisciplinary issue encompasses many areas that mingle and influence one another. Geocaching as a hobby or leisure activity is unambiguously a game or sport characterized by a hunt for treasure; that is the first what comes into mind when people hear this word. But Geocaching is currently often presented as a tool with a powerful potential to promote Tourism and Cultural Heritage. Another perspective, which Geocaching is being approached to, is the economic perspective. There is general support of Information and communication technologies and computer literacy in the state policies so that these countries could succeed in the digital world. This location-based treasure hunt game, which is based on network cooperation and digital competences where players use Global Position System (GPS), corresponds to state policies. The economic, social, heritage and education aspects of geocaching forms the core of this paper.

2 Methodology and goal of the paper

The paper deals with geocaching in two distant worlds, in two different economies, in two different cultures. The aim of the paper is to map the current situation in geocaching in the Czech Republic and India, to be precise in the city of Hradec Králové, Prague and New Delhi. One sub-goal is to compare occurrence of various kinds of caches in two cities and give a real illustrative example of geocaching activity. The other sub-goal is to compare both countries according to the Networked Readiness Index (NRI). NRI which was developed and introduced by the World Economic Forum to measure how countries use information and communication technologies and how they increase their competitiveness.

The article is based on primary and secondary sources. The secondary sources provide information about network readiness index, professional literature and information collected from professional press, web sites, discussions and previous participation at professional seminars and conferences related to the chosen subject. Then it was necessary to select, classify and update accessible relevant information from the numerous published materials that provide the basic knowledge about the selected topic.

3 Literature review

The Czech Republic is a geocaching superpower. India is just entering the world of Geocaching. India is currently a quickly developing country especially in technologies. In 2017, the Indian economy was the world's sixth largest by nominal GDP. [11]

Both countries can boast with marvelous Cultural and Natural Heritage with a great amount of unique UNESCO sites. The Czech Republic covers only an area of 78,866 square kilometers and has about 10.6 million inhabitants but can offer Twelve Czech wonders of the world and astonishing Intangible cultural heritage, e.g. Falconry, Kings´ ride or Puppetry, see more [23]. As for India, it is the seventh largest country covering the area of 3,287,263 square kilometers with population over 1.2 billion people. There are 28 cultural sites, seven natural sites and in 2016 one mixed site - Khangchendzonga National Park was added to the UNESCO World Heritage list, see more [21].

Literature review brings selected studies dealing with Geocaching and its relevant aspects in three domineering areas: tourism, education and economy. Key terms aren´t explained separately; they are mostly presented within a frame of the literature review. The outburst of Geocaching is connected with the historical moment when private citizens were in May 2000 given access to more accurate signals, allowing more precise locations to be found. [5]

The beginnings of Geocaching is as adventurous as the game itself. Just one day after the Department of Defence of the United States enabled its citizens to use Global Positioning System (GPS) satellites without any limitations; the first container with a logbook were placed in Oregon and GPS coordinates of the first cache were posted to an online satellite newsgroup. [1]

When two key terms “Geocaching and Economy” were placed into the search engine in two technical scientific literature databases Scopus and Web of Science only one article was found. In both databases it was the same article dealing with hybrid economies of collaborative networks. [17] The authors discuss hybrid economies within the context of market – based exchange and sharing. They apply and develop performativity theory in this newly established consumer-producer collaborative consumption and production engagement. [17]

The role of the ´Performativity´ is currently analysed topic in Economics, see [13]. Healy [4] in his paper ´Performativity of Networks´ explains the issue of methods, which are these days applied in the Economy and Finance, and points to the autonomy of the field and the very different origins of the methods used.

The first article on this topic was already published in Scopus in 2002. In case just one key word - ´Geocaching´ is given into the search engine, e.g. in the Scopus database, 138 academic articles are generated (to 10.12.2017). In Web of Knowledge there are 63 articles, on Science Direct 86, Springer Link 320 and Google Scholar with 7390 articles is from selected databases the biggest one.

The following table 1 illustrates the published materials in chronological order in selected databases. Geocaching expression was searched in Scopus in the following areas, title, abstract and keywords, in WoS it was searched in a topic area, in Science Direct in keywords section, in Springer Link in results and in Scholar Google is the free search field box.

Table 1. Geocaching and databases [3, 18, 18, 20, 25]

Database	Scopus	WoS	Science Direct	Springer Link	Scholar Google
2002	1	0	0	0	23
2003	2	0	0	0	31
2004	0	0	2	10	72
2005	2	1	1	0	94
2006	2	1	0	7	120
2007	4	0	0	8	188
2008	7	2	0	9	244
2009	6	1	8	11	356
2010	10	8	5	26	445
2011	7	3	6	21	645
2012	14	6	8	28	736
2013	17	7	8	27	846
2014	14	4	8	38	787
2015	13	9	11	39	811
2016	21	14	10	36	779
2017	17	7	17	47	603
2018	1	0	2	13	15
Total	138	63	86	320	7390

The following area where Geocaching plays worthy role is the development of regions. Geocaching is a proven tool which is being used in the promotion of the Cultural heritage and its potential is still waiting to be fully revealed.

One of the first papers highlighting the potential of Geocaching in promotion of tourism and cultural heritage goes back to the 2009. [1] "Geocaching can provide Cultural Heritage organizations, which often have limited budgets and lack technical staff, with a method to:

- increase revenue and
- and provide value added services with minimal investment or technical training." [1]

Craigh [1] discusses the unique characteristics of technology driven game where virtual world of virtual community mingles with a physical place in search of real world cache. Not only positives are connected with the Geocaching game. As this global game is spreading, also pitfalls start to occur. One of the latest topics in Geocaching is the environmental issue. Hödl and Pröbstl-Haider [6] discuss the potential threat to the protected areas which are affected by the kind, number and difficulty of caches which are scattered in the Austrian national parks.

Nature conservation theme together with positives and negatives of Geocaching are discussed in the first paper on Geocaching in the Czech Republic which was published in 2010 under a proud title Czechia – the geocaching power [16].

Last topic in the literature review on Geocaching deals with implications of geocaching for social interactions of people and for education. Finish author Ihamäki explores this game in detail especially in the field of Education and Tourism. [7-9]

People, technology and outdoor life get connected in this game, moreover the boundaries between game and non-game get broken. [7]

Ihamäki, P. [9] in her thesis User Experience of Geocaching and Its Application to Tourism and Education refers to the Australian author Webb [24] as to the first researcher who wrote about geocaching game about Recreational Geocaching Sport presenting it beside other characteristics as and innovating teaching approach for introduction to GPS.

4 Findings

The first part of findings relates to the occurrence and comparison of various kinds of caches in New Delhi and Hradec Kralove.

4.1 Geocaching in the Czech Republic and in the India

Globally, based on the Geocaching.com webpage, geocaching has been played about 200 countries and there are more than 12 million registered geocachers worldwide [2]. Amount of caches is a distinctive indicator of Geocaching popularity in individual countries. In December 2017 there were there were 56, 073 active caches in the Czech Republic but in the whole India there were only 261 caches which is even fewer caches than in the Czech city of Hradec Kralove where the conference Hradec Economic Days is held. The first cache in the Czech Republic was hidden already one year after the start of the game in June 2001. Within last two years, about 20,000 new caches have been placed in the Czech Republic. [12] The first cache in India was placed in January 2008 and six more caches were located within the same year. [2] The table 2 shows comparison of caches occurrence in Hradec Kralove, Prague and New Delhi.

Table 2. Geocaching in Hradec Králové and in New Delhi [2]

	Hradec Králové - 16 km radius	Hradec Králové - 5 km radius	Prague – 16 km radius	New Delhi – 16 km radius
Traditional	351	134	1153	12
Multi-cache	119	39	457	1
Mystery	252	120	1203	0
EarthCache	1	0	75	2
Letterbox Hybrid	6	4	46	0
Event	4	2	40	0
Webcam	0	0	59	0
Wherigo	3	2	1	0
Virtual	0	0	8	0
	736	301	3068	15

The occurrence of caches is visualised also by means of maps. Fig. 1 and fig. 2 show the occurrence and kinds of caches in Hradec Kralove and New Delhi.

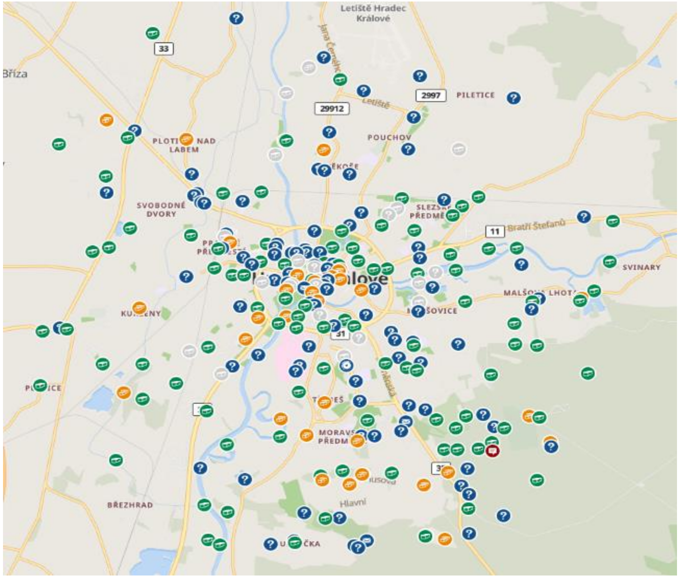

Fig. 1. Geocaches in Hradec Králové, radius 5 km [2]

Various kinds of caches typical for the game are listed and compared in the table 2 and figures 1 and 2. New Delhi is nearly four times larger, that is why two size categories were applied when describing amount of caches in Hradec Kralove: the large and smaller radius. Traditional caches dominate in both cities but with enormous difference in occurrence. These traditional caches are in Hradec Králové followed by Mystery and Multi-caches also in high numbers. As for New Delhi there is only one occurrence of Multi-cache and two EarthCaches. Prague has been a significant tourist destination. The Czech Republic is favorite tourist and cultural destination boasting with number of historical sights and caches which are visited and found. Geocaching is popular with Czech people and a lot of people are engaged into this trendy "sport". As for India structured surveys were distributed to the sample of people at University. In spite of the fact that those are the people that are competent in technologies they are not familiar with geocaching. Because of the fact that they do not know this tech game, they do not create new caches and do not administrate and search for them. On the other side the Czech people are very active in all roles of this topic.

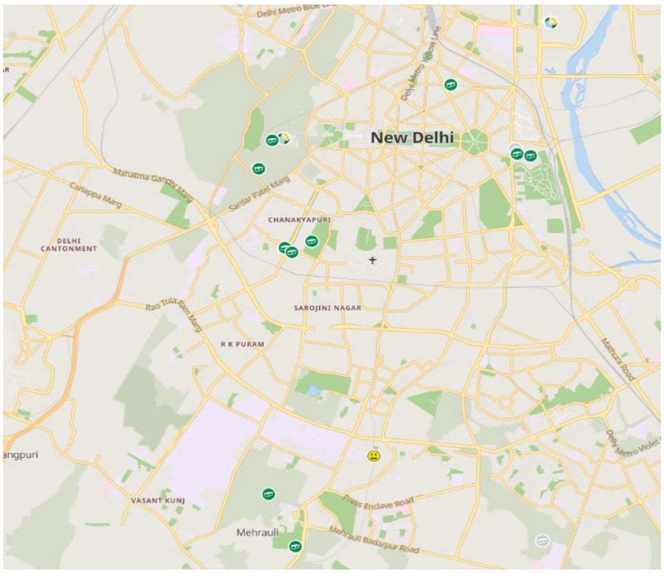

Fig. 2. Geocaches in New Delhi, radius 16 km [2]

Another vital reason of minimal spread of caches in India might be literacy of citizens and utilization of technologies including internet accessibility. That is why we have focused on findings relevant data containing current actual situation in network readiness index in both countries. Next part discusses selected aspects dealing with literacy and technological issues utilized in geocaching support.

4.2 Network readiness index in the Czech Republic and in the India

The other part of findings relates to the comparison of the CR and India based on the Network Readiness Index (NRI). “NRI measures the capacity of countries to use ICTs for increased competitiveness and well-being. It is now emerged as a key indicator of how countries are doing in the digital world. The significance of NRI is that several basic infrastructure facilities, policy frameworks etc., are to be built to achieve the benefit of digital revolution. The NRI measures the level of preparedness of countries on this.“ [10]

Altogether, there were 139 countries involved into the assessment. Network Readiness Index is a composite indicator that is rather complex; it consists of four main categories, ten pillars and 51 individual indicators. The names of pillars follow: 1st pillar: Political and regulatory environment, 2nd pillar: Business and innovation environment, 3rd pillar: Infrastructure and digital content, 4th pillar: Affordability, 5th pillar: Skills, 6th pillar: Individual usage 7th pillar: Business usage 8th pillar: Government usage 9th pillar: Economic impacts and 10th pillar: Social impacts. Individual indicators are assessed on the scale 1-7 (best).

Out of individual indicators, the following ones are found important for Geocaching: Mobile network coverage % pop., International Internet bandwidth kb/s/user, Secure Internet servers /million pop., Mobile cellular tariffs PPP $/minute, Fixed broadband Internet tariffs PPP $/month, Internet and telephony sectors competition index, Adult literacy rate %, Mobile-cellular telephone subscriptions /100 pop., Internet users % pop., Households with a personal computer %, Households with Internet access %, Fixed-broadband Internet subscriptions /100 pop., Mobile-broadband subscriptions /100 pop., Use of virtual social network, Impact of ICTs on new services and products, Impact of ICTs on access to basic services and Internet access in schools.

The table 3 shows results from two compared countries on the basis of the Network Readiness Index.

Table 3. Network readiness index in the Czech Republic and in India [14, 15]

	Czech Republic	India
Environment subindex	40	99
Political and regulatory environment (9 indicators)	35	78
Business and innovation environment (9 indicators)	47	110
Readiness subindex	22	88
Infrastructure (4 indicators)	23	114
Affordability (3 indicators)	46	8
Skills (4 indicators)	39	101
Usage subindex	37	103
Individual usage (7 indicators)	29	120
Business usage (6 indicators)	31	75
Government usage (3 indicators)	101	59
Impact subindex	43	73
Economic impacts (4 indicators)	32	80

Social impacts (4 indicators)	67	69

The Czech Republic reaches better results in most of indicators except for:

- mobile cellular tariffs,
- fixed broadband internet tariffs
- and internet and telephony sectors competition index.

5 Conclusion and implications for the discussion

The goal and sub-goals were reached as they were described in the chapter Findings. The important findings relate to The Network Readiness Index; India is better compared to the Czech Republic with only two indicators of affordability and government use, which was the worst indicator for the Czech Republic. The rating of affordability is not very surprising. Includes, in particular, PPP $ / minute Mobile Cellular Tariffs, PPP $ / month Fixed Broadband Internet Tariffs and Internet and Telephony Sector Competition Index. While in India these services are at a lower price level, this is not the case in the Czech Republic. In terms of government usage, it evaluates the importance of ICTs to the government's vision of the future, the Government Online Service Index and Government's success in ICT promotion. For all three ratings, it is rated according to the subjective opinion from 1 to 7 (7 best). Here, perceptions and assessments of different nationalities can occur. While India seeks to highlight government usage in the Czech Republic it is not that case.

When it comes to economic benefits arising from Geocaching, is necessary to mention that tourism revenue is brought to the cultural sites via the adventure of the exploration of local or historical attractions and via development of businesses. On the official Geocaching website there is a section with a turnkey marketing program called 'A GeoTour' sophistically combining Geocaching and Tourism. 'A GeoTour' is a customized package pointing travel-ready players to their destination. Destination becomes a target for their game, enjoyed by locals and visitors alike. With measurable data, it is possible to monitor the return on the investment. “It's more than just techy fun; it's a measurable investment in your destination. This is how your destination enters the arena of mobile experiential gaming”. [22] Amount of caches is a distinctive indicator of Geocaching popularity in individual countries. Geocaching is a promising tool which is being used in the promotion of the Cultural heritage. This paper strives to contribute to the exploration of Geocaching potential.

Following analyzed area might be measuring of visits and founds of caches. At first sight it can be seen that caches in the Czech Republic are more frequently visited and newly founded and carefully administrated. [2] Another interesting and fruitful perspective might be gained from the economic benefit for the destination in the connection with sustainability tourism.

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Internet of Things

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Abstract. This paper is devoted to the actual topic the internet of Things. Internet of Things is really frequent topics. The vision of future is a smart world which is interconnecting smart devices enabling qualitatively new services. In this concept, Industry of Things (IoT) plays crucial role. We are dealing with analysis of the most important which are used by companies for providing data from sensors to heir users. At the beginning of the paper we are comparing Internet of Things. The Internet of Things, which contains two parallel streams called Industrial Internet of Things and Industry 4.0 is an evolution of Internet. The Internet of Things in general will be consuming a lot of technical resources nevertheless will be producing a lot of usable information. . Information generated by way of IoT can be used for example in predictive maintenance, improving production cycles, adding addition value to processes based on Just in Time method etc.

Keywords: Internet of Things, Industry 4.0, Standards, Technologies.

1 Introduction

Internet of Things is really frequent topics. For example amount of links related to Internet of Things is 248 million, Industry 4.0 is 209 million, Industrial Internet of Things 157 millions and when we compare it with amount of links related to Google (11 billions) or Yahoo (2.2 billions) we see, that this new topic has significant number of search.

The vision of future is a smart world which is interconnecting smart devices enabling qualitatively new services. In this concept, Industry of Things (IoT) plays crucial role [16]. Most global companies (56%) are viewing IoT as a strategic activity [9] where the motivation for implementation is an increase in productivity (24%), decreasing time to market (22.5%) and improving process automation (21.7%). The Vodafone IoT Barometer 2016 survey identified that 63% of businesses will have launched IoT projects in the next year and 76% of businesses say that IoT will be “critical” to their future success [15, 2].

Importance of the IoT is confirmed by IDC which expects, that in 2020 IoT in Central and Eastern Europe will be presented by 1.4 billion of connected things (globally 37 billions) and the market opportunity of IoT will be 24 billion dollars. [9, 15]

The second view of importance of the Internet of Things for companies is displayed in next figure.

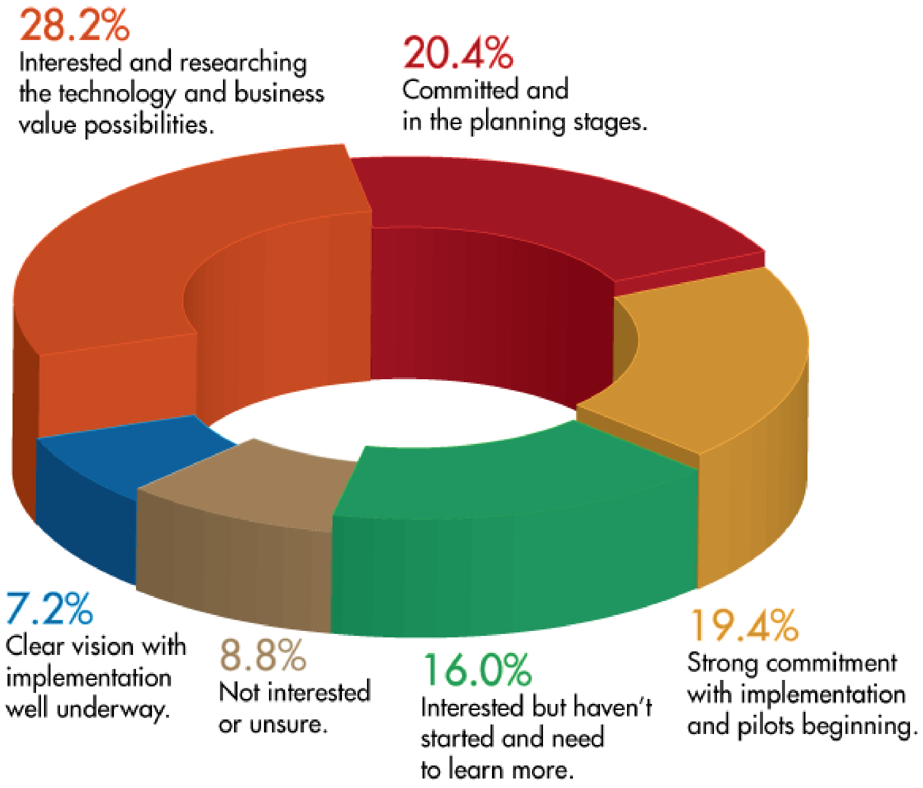

Fig. 1. Importance of Internet of Things and related terms for companies, Source: [2]

Other emerging technologies are overlapping with IoT. Big Data technology could be used to handle massive amounts of data that IoT sensors can produce. Machine learning and advanced analytics are needed to process and analyze IoT data in real time. Voice based human-machine interface is the way how users will interact with devices connected and integrated in IoT world.

2 Problem Formulation

Scientist are using words like Internet of Things, Industrial Internet of Things and Industry 4.0 but they are not differentiating among these terms. The aims of this paper is to explain differences between these terms and provides basic information about available technologies, which can be used for harnessing data from sensors etc.

3 Internet of Things vs Industry 4.0 vs Industrial Internet of Things

All of those terms are closely related nevertheless there are significant differences especially between Industry 4.0 and Internet of Things and Internet of Things and Industrial Internet of Things which will be explained in next part. Lest start with time differences among these terms which is displayed in next picture.

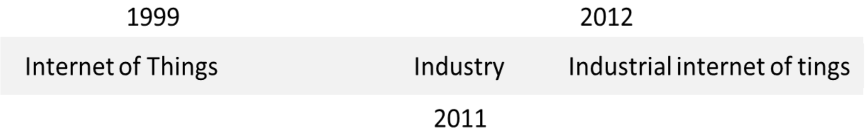

Fig. 2. Evolution of an Internet of Things Source [7]

3.1 Internet of Things

IoT can be described as an evolution of Internet in a way that integrates not only mobile devices but also other objects like sensors attached to cars, home appliances, different devices into one interconnected mesh [13]. Smart things integrated in IoT context are able to perform three basic tasks [12]:

- Communication, the ability to wirelessly communicate among themselves, and form ad hoc networks of interconnected objects.
- Identification with a digital name: relationships among things can be specified in the digital domain whenever physical interconnection cannot be established.
- Interaction with the local environment through sensing and actuation capabilities whenever present.

IoT applications were categorized by [4] into four application domains: personal and home, enterprise, utilities and mobile. These domains provide general classification of possible applications of IoT but real business environment usually crosses these domains. Possible applications of IoT in context of industries were identified by [20]. Ability for companies to implement IoT concept and leverage new possibilities can be key to competitive advantage in the future.

Enabling technologies for IoT concept are currently under development or are emerging [10]. Standardization is a little bit lacking in the field of providing much needed standards for interoperability on different layers in IoT architecture [19]. Dynamic environment of evolving enabling technologies creates risks and uncertainty for organization that are willing to adopt IoT technology. Security of IoT environment should also be noted as one system aspect that must be solved robustly in distributed and omnipresent system. [8]

Although we thing that IoT is a new term, this term is old. The first usage of this terms is registered in 1999 and was used by Kevin Ashton during presentation at Procter & Gamble. [1]

3.2 Industry 4.0

Industry 4.0 is a name for the current trend of automation and data exchange in manufacturing technologies.

Industry 4.0 is a German government initiative, which identifies the fourth industrial revolution which is happening right now. [6] The Industry 4.0 promotes the computerization of manufacturing The 4.0 is based on the name of previous industrial revolution which happened in the mid-twentieth century and linked to information technology.

According to McKinsey [14, 11], Industry 4.0 is *"the next phase in the digitization of the manufacturing sector, driven by four disruptions: the astonishing rise in data volumes, computational power and connectivity, especially new low-power wide-area networks; the emergence of analytics and business-intelligence capabilities; new forms of human-machine interaction such as touch interfaces and augmented-reality systems; and improvements in transferring digital instructions to the physical world, such as advanced robotics and 3-D printing."*

Industry 4.0 creates what is called a "smart factory". Within the modular structured smart factories, cyber-physical systems monitor physical processes, create a virtual copy of the physical world and make decentralized decisions.

The evolution of industry is illustrated in the next picture.

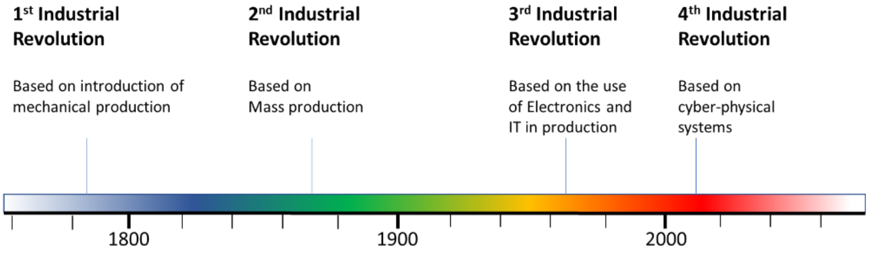
1st Industrial Revolution
Based on introduction of mechanical production
2nd Industrial Revolution
Based on Mass production
3rd Industrial Revolution
Based on the use of Electronics and IT in production
4th Industrial Revolution
Based on cyber-physical systems
1800
1900
2000

Fig. 3. Evolution of an Industry Source [18, p. 4], [authors]

The Industry 4.0 is based on 4 principles:

- Interoperability
- Information transparency
- Technical assistance
- Decentralized decisions

3.3 Industrial Internet of Things

According to the [18], the Industrial Internet of Things (IIoT) promises: "to revolutionize manufacturing by enabling the acquisition and accessibility of far greater amounts of data, at far greater speeds."

In general, Industrial Internet of Things newly contains modern areas like machine learning and big data technology and harnessing of the data from sensors. We are including into Industrial Internet of Things services, machines, communication etc. which were used during last years and the new one are enriching it into IIoT.

The target of all of those activities is to achieve so called Smart machines which are better than humans, produce less error than humans, provides real-time and precise information about processing and all activities and producing process.

As [18] says, the IIoT has great potential for quality control, sustainable and green practices, supply chain traceability and overall supply chain efficiency.

The biggest problem with Industrial Internet of Things is a standardization which influence interaction among devices and machines. Standardization is missing and almost each company has its own communication protocol/standard and for companies is really difficult to easily create smart production processes. This situation results in foundation of the nonprofit Industrial Internet Consortium in 2014. Which focuses on standardization that promote open interoperability and the development of common architectures as well as catalyze and co-ordinate priorities and enabling technologies in industry, academia and governments around the Industrial Internet. [3] The Industrial Internet Consortium was formed with support off GE, AT&T, Cisco, Intel and IBM. The Industrial Internet consortium has over 200 members from private companies and some academic institutions in 12 different countries including India, China and Germany.[20] This distinction of origin and participation, albeit formal, carries with it a profound distinction of vision and approach According to the General Electrics, the benefits of the IioT will be [3]:

- 46% Percentage of global economy that can benefit from the Industrial Internet
- 100% Industrial Internet potential impact on energy production
- 44% Industrial Internet potential impact on global energy consumption

3.4 Internet of Things vs Industry 4.0 vs Industrial Internet of Things

Internet of Things. Industrial Internet of Things. Industry 4.0. Based on the text above we already see that these terms are not interchangeable. Each term has a different preconditions, stakeholders, goals and results.

The Internet of things is a network of intelligent devices and objects that harness and share huge amounts of data. The IoT increase automation in homes, schools, stores, and in many industries.

The IIoT is part of concept called as the Internet of Things (IoT). The application of the IoT to the manufacturing industry is called the IIoT (or Industrial Internet or Industry 4.0). The IIoT is part of the Internet of Things. The IIoT is revolutionizing manufacturing by enabling the acquisition and accessibility of far greater amounts of data, at far greater speeds, and far more efficiently than before.

One perspective is to think of the Industrial Internet as connecting machines and devices in industries and helps with predictive maintenance or help to reduce risky situation. The second perspective of the Internet of Things includes consumer-level devices such as heart monitoring fitness bands or smart home appliances.

At the end we can say that Industrial Internet of Things and Industry 4.0 are similar activities which are using Internet of Things as it bases.

All of these terms are closely connected with Cloud Computing, which means, that an application (from IoT, IIoT, Industry 4.0) is running on computer located remotely.

4 Conclusions

The Internet of Things, which contains two parallel streams called Industrial Internet of Things and Industry 4.0 is an evolution of Internet. The Internet of Things in general will be consuming a lot of technical resources nevertheless will be producing a lot of usable information. This information can be used for example in predictive maintenance, improving production cycles, adding addition value to processes based on Just in Time method etc. [15]

Usually users and scientist are using term Internet of Things without any distinction.

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Outsourcing and Changes of Business Models of Polish Enterprises – Research Results

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Abstract. The main goal of the paper is to identify and measure the strength of relations between changes made in different elements of business models of Polish companies using outsourcing. In particular, the presented findings should answer the question regarding the importance of Value Proposition (being, according to most of the business model concepts, its central element), as well as show the influence of using outsourcing on changes made within the business model. The paper presents the results of research among 281 Polish companies, and the main research method was a questionnaire survey. The research presented here confirms the systemic nature of the business model. Statistically important dependencies were observed between the changes made in specific elements of the business model, both quantitative and qualitative. The use of outsourcing by the companies forming the research sample was reflected in modifications of their business models. The research results seem to prove the empirical importance of Alexander Osterwalder`s business model framework. Firstly, all the nine elements of Osterwalder`s business model framework are interrelated; secondly, the Value Proposition appears to be indeed the central element of a business model. From managerial perspective, the results show the importance of business model approach in strategic management, especially when planning and managing strategic changes within a company.

Keywords: Business Model, Outsourcing, Strategic Management, Management Change, System Approach.

1 Introduction

Business models are becoming increasingly important, both in theoretical and practical management fields. This fact is evident in the rising number of publications on the subject (growing steadily for at least a decade, and including results of research into the matter of business models), but also in the increasing presence of business models in strategic management practice (thus proving the use of business models as a management tool). The many profits of using business models, which result from their specific traits, prove their usefulness [2, 3, 4, 8, 9, 10, 15]. While the concept of a business model is yet to be defined in a single, "true" way that would be accepted by the majority [14], the key traits that make it interesting in both theory and practice of strategic management can nevertheless be listed. Of these traits, two are especially important in the light of the research results presented in this paper.

The first is a consequence of the systemic nature of a business model. Regardless of the ideas on its character (e.g. its elements and their number), a business model assumes a correlation between its elements. And, like in any organization, a change in one area of the model requires adjustment of other area(s). This raises questions as to the nature and strength of the interrelations between the various elements of a business model.

The second important trait, one that distinguishes a business model from organization models (like the 7S model, for instance), is the fact of taking into account the organization environment. The business model sees beyond the organization itself and to the environment in which it operates, underlining the importance of various elements of that environment (usually partners and clients) in identifying and implementing strategies. This aspect of the business model becomes especially important if a company outsources any of its functions, and therefore has to keep relations with outside entities (outsourcing partners), and to adjust other elements of its business model. Therefore, another important research question is the influence of outsourcing on the shape of the business model of companies which use it.

Both of the aforementioned traits (as well as the research questions) have been taken into consideration in the research carried out by the author. Therefore, the main goal of the paper is to identify and measure the strength of relations between changes made in different elements of business models of Polish companies using outsourcing. In particular, the presented findings should answer the question regarding the importance of Value Proposition (being the central element of business model), as well as show the influence of using outsourcing on changes made within the business model. The starting point of the research presented in this paper is the business model as described by Alexander Osterwalder [11]. The paper presents the results of research among 281 Polish companies, and the main research method was a questionnaire survey.

2 Methodology of the research and characterization of research sample

The research tool used during the research described in the paper was a survey questionnaire. Four channels of communication were used in order to initiate contact with the respondents: traditional mail, electronic mail, direct contact and via telephone. The research sample included 281 cases, and the data regarding the model of contact with the respondents (including the size of the investigated enterprises determined, according to criteria stipulated in the Act from 2nd July 2004 on Freedom of Economic Activity, Journal of Laws 2004 No. 173, item 1807) as shown in the table 1:

Table 1. The model of contact with the respondents divided by the enterprise size.

	Size of enterprise			
Model of contact	**Small**	**Medium**	**Big**	**Sum (%)**
Electronic mail	3	2	2	**7 (2.5%)**
Traditional model	7	2	1	**10 (3.6%)**
Direct contact	18	4	5	**27 (9.6%)**
Telephone	75	101	61	**237 (84.3%)**
Sum (%)	**103 (36.6%)**	**109 (38.8%)**	**69 (24.6%)**	**281 (100%)**

The research sample was purposive. Alongside the criterion of using outsourcing two additional criteria were used (arising from the specifics of the project, by which the research was financed):

- the source of capital: the research included Polish enterprises ,
- the size of employment: only enterprises employing at least ten employees [5].

The characterization of the research sample in the cross-section of selected quality features (organizational and legal frame, scope of diversification, and business area) is displayed in table 2:

Table 2. The characterization of the research sample in the cross-section of selected quality features.

Organizational and legal frame of business activity	**Size of enterprise**			**Sum (%)**
	Small	**Medium**	**Big**	
State owned enterprise	1	2	7	10 (3.6%)
Joint stock company	3	5	19	27 (9.6%)
Civil law partnership	21	50	13	84 (29.9%)
General partnership	12	9	4	25 (8.9%)
Limited partnership	0	0	1	1 (0.3%)
Limited liability company	22	20	24	66 (23.5%)
Business run by a natural person	44	23	1	68 (24.2%)
Sum	**103**	**109**	**69**	**281**
Area of business				
Activity only on domestic market	66	72	30	168 (59.8%)
Activity mostly on foreign markets	2	3	5	10 (3.6%)
Activity mostly on domestic market	35	34	34	103 (36.6%)
Degree of diversification				
Enterprise operating in one	53	52	21	126 (44.8%)

sector (branch)				
Enterprise operating in several related sectors (branches)	45	53	31	129 (45.9%)
Enterprise operating in several unrelated sectors (branches)	4	3	7	14 (5%)
Enterprise operating in a dozen or so sectors (branches)	1	1	10	12 (4.3%)

Almost one third of the research sample were comprised of civil law partnerships, around one fourth – limited liability companies and businesses run by a natural person. Roughly every tenth subject being a part of the sample was organized in the form of a joint stock company; in total, share-holding companies equaled to one third of cases. Most of the subjects comprising the research sample (nearly 60%) operated the business only on a domestic market while more than one third was active mainly on the domestic market. The degree of diversification of investigated subjects should be evaluated as low: more than 90% of enterprises operated its business either in one branch or at most few related branches [5].

3 Factors of business model variability

As it was mentioned in the introduction, the factors of variability of a business model were determined based on the definition and construction of business model created by A. Osterwalder [11]. In this conceptualization, the business model is comprised of nine elements presented and described briefly in table 3:

Table 3. The characterization of the research sample in the cross-section of selected quality features.

Main areas of the model	Elements constituting the business model	Description of the elements
Product	Value proposition	Gives general overview on the benefits offered to customers
Customer	Customer segmentation (target group)	Describes the segment(s) of customers to whom a company wants to offer its values
	Distribution channels	Describes the channels of distributing offers, communication and contact points with customers
	Communication with customers (relations with customers)	Explains the way in which a company builds and maintains relations with customers
Infrastruc-ture management	Key activities (configuration of activities)	Describes the system of activity which a company undertakes in order to deliver the values
	Key competences (resources)	Identifies key skills essential to

		use a certain business model
	Partners network	Presents the network of cooperation links essential to create and deliver values to the market
Financial aspects	Structure of costs	Determines the financial consequences of running the business model based on a specific model
	Streams of income	Determines the sources of income tanks to which a company earns money

Based on the earlier author`s research and Alexander Osterwalder`s business model framework described in detail in: [6, 7], seventeen quantitative and nineteen qualitative factors of business model alterations were identified. These factors are presented in table 4:

Table 4. Factors of quantitative and qualitative alterations of a business model.

Business model ingredient (area)	**Quantitative changes factors [variable code]**	**Qualitative changes factors [variable code]**
Client segments	• Amount of client segments/groups serviced [QA$_1$]	• Changes aiming to reach larger groups of clients within currently serviced segment(s) [QL$_1$] • Changes in the method of identifying the key client [QL$_2$] • Actions aiming to reduce the least profitable clients [QL$_3$]
Value proposition	• Amount of products/services offered [QA$_2$] • Amount of after-sale services offered [QA$_3$] • Activity fields (markets, branches) [QA$_4$] • Products/services prices [QA$_5$]	• Perfecting existing products/services [QL$_4$] • Perfecting the after-sale services [QL$_5$] • Perfecting client problem solving methods [QL$_6$]
Channels	• Amount of sales/distribution channels [QA$_6$] • Amount of after-sale services channels [QA$_7$]	• Perfecting the method of product/service supply (distribution channels) [QL$_7$] • Perfecting the means and channels of after-sale services [QL$_8$]

Client relations	• Client communication channels [QA$_8$]	• Perfecting customer service [QL$_9$] • Optimisation – perfecting marketing tools [QL$_{10}$] • Changes in building and maintaining client relations [QL$_{11}$]
Key activities	• Amount of key activities performed as part of value creation process [QA$_9$] • Processes/functions performed by the company [QA$_{10}$]	• Implementing new actions vital for value creations processes [QL$_{12}$] • Perfecting the methods of implementing processes/functions [QL$_{13}$]
Key resources	• Amount of human resources [QA$_{11}$] • Amount of physical resources [QA$_{12}$] • Amount of financial resources [QA$_{13}$]	• Obtaining new employees with new skills [QL$_{14}$] • Obtaining new employees with rare skills [QL$_{15}$] • Obtaining new technology [QL$_{16}$]
Key partners	• Amount of key partners [QA$_{14}$]	• Changes in the evaluation criteria of the key partner [QL$_{17}$] • Changes in the type of resources obtained from the key partner [QL$_{18}$]
Income streams	• Amount of income sources [QA$_{15}$] • Amount of payment methods (forms) for products/services [QA$_{16}$]	• none
Cost structure	• Amount of cost items [QA$_{17}$]	• Actions aiming at cost optimisation [QL$_{19}$]

In the case of the variables determining the changes of quantitative factors, the respondents' (CEOs, Board members) task was to specify the degree (scope) of the changes of such factors. An 11-point Likert scale (including the zero score) was adopted, with the variables assuming values from -5 ("considerable decrease in, limitation of the quantity of, reduction of a given component"), to 0 (meaning "no changes of a component"), to +5 ("considerable increase in a component"). In the case of the variables determining the changes of qualitative factors, the respondents' task was to specify the nature of the changes of such factors. A 6-point ordinal Likert scale was adopted, with the variables assuming values from 0 to 5 (0 meant "changes with no significant impact on the form of the business model and company's activities", 5 – "fundamental changes that are revolutionary for the company").

4 Results of research

The correlation levels between all identified variables are calculated using R. Spearman's coefficient (Spearmans`s rhos, rank correlation). All the correlations presented in the article were important for the entirety of the research sample, with their importance reaching at least 95% ($p<0.05$). The analysis was carried out both for the variables constituting quantitative and qualitative factors, as well as between those two groups of variables.

Correlation coefficients were positive and medium to high [1] for most quantitative change factors. Correlations between the following variables are especially interesting:

- QA13 and QA15 (R=0,72)
- QA14 and QA8 (R=0,66)
- QA14 and QA3 (R=0,60)
- QA9 and QA13 (R=0,62), QA15 (R=0,64), QA16 (R=0,72)
- QA5 and QA7 (R=0,62)

These results seem to confirm the relevance of business model logic as presented by A. Osterwalder. Interestingly, using outsourcing has had a visible influence on the business model (changes in the key partners area are strongly correlated with other elements of the business model). Correlations were especially strong in the left part of the model (called "infrastructure" by A. Osterwalder), which may mean that the companies forming the sample concentrated on cost effectiveness; the use of outsourcing seems to be an important factor in that. In the case of quantitative changes, the size of a company influences the correlation level between the variables, and said level is higher for big companies than for small firms.

Similarly to the quantitative changes factor, the correlation coefficients for qualitative changes factors were positive and mostly medium to high, with the medium correlation level being higher. The correlations between the following variables are especially interesting:

- QL_{17} and QL_{2} (R=0,70), QL_{8} (R=0,74)
- QL_{18} and QL_{2} (R=0,61), QL_{8} (R=0,70)
- QL_{11} and QL_{13} (R=0,67)
- QL_{8} and QL_{2} (R=0,70), QL_{5} (R=0,68)

In the case of qualitative changes factors, there are relations between the left and right side of the business model, and these relations are stronger than in the case of quantitative factors. The most interesting are the changes in the key partners area, and in the client segments (QL_{17}, QL_{18} and QL_{2}) and channels (QL_{8}). This may be due to outsourcing (the importance of cooperation and inter-organizational networks). There is also a relatively high correlation between the QL_{8}, QL_{10} and QL_{11} variables (change factors for channels and client relations). This may be due to the companies being strongly client-oriented. Similarly to the quantitative changes, the size of an enterprise influenced the dependencies between the variables, which were higher for large firms.

This seems to prove a more conscious approach to strategic management change in larger enterprises.

The analysis of empirical research results attempted to establish the correlation between the quantitative change factors (described through the QA variables) and the quantitative changes in each of the nine business model elements as described by Osterwalder (see Table 3). Thus, the variables within the specific areas of the model were aggregated. Table 5 shows the rank correlation coefficients (Spearman's rhos) for the QA variables (quantitative changes factors), and the aggregates of variables responsible for qualitative changes in business models of the examined companies:

Table 5. Correlations between the scope of quantitative and qualitative changes (divided into specific elements of the business model).

	Spearman`s rhos (marked are the rhos≥0,5)							
Variable Code	Customer Segments	Value Proposition	Distribution Channels	Client Relations	Key Activities	Key Resources	Key Partners	Cost Structure
QA$_1$	0.42	0.45	0.27	0.30	0.35	0.30	0.33	0.33
QA$_2$	0.38	0.48	0.37	0.37	0.37	0.46	0.44	0.40
QA$_3$	0.48	0.59	0.48	0.44	0.42	0.48	0.47	0.30
QA$_4$	0.39	0.51	0.40	0.40	0.46	0.52	0.44	0.44
QA$_5$	0.47	0.45	0.47	0.48	0.40	0.51	0.50	0.36
QA$_6$	0.46	0.59	0.49	0.48	0.46	0.51	0.42	0.33
QA$_7$	0.50	0.57	0.61	0.62	0.58	0.58	0.57	0.44
QA$_8$	0.41	0.56	0.45	0.50	0.47	0.38	0.38	0.41
QA$_9$	0.43	0.50	0.43	0.38	0.46	0.45	0.52	0.35
QA$_{10}$	0.57	0.60	0.47	0.51	0.58	0.42	0.50	0.44
QA$_{11}$	0.42	0.45	0.34	0.32	0.31	0.43	0.40	0.36
QA$_{12}$	0.43	0.49	0.44	0.39	0.41	0.49	0.49	0.43
QA$_{13}$	0.37	0.47	0.42	0.37	0.38	0.55	0.51	0.41
QA$_{14}$	0.52	0.59	0.43	0.42	0.47	0.48	0.49	0.45
QA$_{15}$	0.38	0.53	0.36	0.37	0.36	0.46	0.48	0.40
QA$_{16}$	0.50	0.49	0.47	0.48	0.40	0.50	0.53	0.38
QA$_{17}$	0.26	0.32	0.28	0.24	0.32	0.34	0.35	0.23

The analysis of the above data leads to the following three main conclusions:

- The qualitative and quantitative changes made within the elements of the business model were correlated; the level of correlation for most of the variables was medium to high.

- The correlation between QA_x variables and the variables reflecting changes made in the Value Proposition (VP) was the highest, compared to other eight elements. This was relevant for all the researched companies, regardless of their size. The relations between VP and quantitative changes made within: Distribution Channels (QA_6, QA_7), Customer Relations (QA_8), Key Activities (QA_9, QA_{10}) and Key Partners (QA_{14}) are the strongest. This seems to prove the importance of Value Proposition for the shape of business model of an enterprise.
- Qualitative Changes made both in Key Partners and Key Resources areas of the business model were strongly correlated with its other elements. Again, the form of cooperation with company`s business partners influences the shape of business model due to the fact of using outsourcing by the researched companies. The importance of Key Resources seems to result from the impact of resources to processes of creating value within the company.

5 Summary

The research presented here confirms the systemic nature of the business model. Statistically important dependencies were observed between the changes in specific elements of the business model, both quantitative and qualitative. The use of outsourcing by the companies forming the research sample was reflected in modifications of their business models. This is confirmed by the strong dependencies between the infrastructure elements of the business model (according to A. Osterwalder's approach), between the key partners areas, and between the changes in infrastructure and the client segments.

The research results also seem to prove the empirical importance of Alexander Osterwalder`s business model framework. Firstly, all the nine elements of this particular business model framework are interrelated; secondly, the Value Proposition appears to be indeed the central element of a business model. From managerial perspective, the results show the importance of business model approach in strategic management, especially when planning and managing strategic changes within a company. Managers should also take into consideration the impact of outsourcing on their business models, for using it strongly influences the shape of the business model.

The results presented here can form a basis for further exploring of the subject. Examples of future research problems include: evaluating the effectiveness of the changes in business models, mergers and takeovers (e.g. fusing business models) or problems concerning the dependencies between business models and organization life cycles (with special attention paid to startup`s business models). The process of business model creation, especially at its very beginning, seems also to be unexplored. In this context, apart from using quantitative approach, the qualitative research methods should be used (e.g. IDI, case study etc.). Finally, the constant changes happening in the environment of modern companies require constant monitoring of changes happening within different business model areas. This brings up the issue of using certain methods of measuring both the level and direction of business models changes, which would provide objective, rather than subjective, information for the managers. Research into aforementioned fields will add to the total sum of knowledge on management, and help to perfect the business model as a tool of strategic management.

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A Study on the Cultivation and Development of the Sixth Industry in Jingzhou

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Abstract: Jingzhou is a big agricultural city with abundant agricultural resources. In recent years, the development of agriculture there has entered a new stage and is heading to mass production, diversification and precision. However, the rural economy is facing some challenges, such as feminization and aging of labor force, and the insufficiency of development vitality. The sixth industry is a new way to solve the above problems. As to the development of the sixth industry in Jingzhou, the article introduces the present situation, analyzes the related problems, and then puts forward some feasible suggestions. To begin with, the government and the relevant departments should come up with the development outline and support policies for the sixth industry. What's more, they should focus on strengthening the cultivation of new type of agricultural business entities and innovating more paths to develop modern agriculture. Last but not least, the relevant industrial supporting platforms should be constructed in order to help out the development of the sixth industry.

Keywords: Jingzhou, Agriculture, The Sixth Industry, Industrial Convergence

1 Introduction

The concept of the sixth industry was first proposed by the Japanese scholar Imamura Naraomi in 1990s for solving dilemma faced by Japanese agriculture. In his opinion, the sixth industry is the projects and activities that creating job opportunities especially for elder people and women to increase agricultural income by combining secondary industry and tertiary industry with primary industry [8]. He advocated farmers to engage in a variety of operations, that is, they not only grew crops (primary industry), but also engaged in the processing of agricultural products Industry (secondary industry) and sales of agricultural products (tertiary industry), so that they could obtain more added value. Since 1+2+3 or 1×2×3 are both equal to 6, it is called the sixth industry [3].

Professor Zhang Laiwu, Chinese former vice minister of Ministry of Science and Technology, and some Chinese scholars further developed the theoretical system. They thought of the sixth industry as the highest form of the industrial structure, and its core is to develop primary, secondary and tertiary industry and integrate internet and cultural and creative industry. The real goal is to realize the increase of agricultural added value and farmers' income [10].

Jingzhou is a big agricultural city and known as "land of fish and rice, China granary". In recent years, the rural areas there, however, are facing the challenge of massive labor transfer as well as feminization and aging of labor force. Agriculture is becoming sideline and urban-rural income gap is expanding which reflect the dilemma that rural economy is suffering from the insufficiency of development vitality [6]. In the *No.1 Central Document* and on the *Central Rural Work Conference* in China in 2017, such modern industrial organization modes as industry chain and value chain are introduced into agriculture to promote the integration of the primary, secondary and tertiary industry. As a new light spot and form of current agricultural development, the sixth industry is the development of modern agriculture as an excellent remedy for this situation [4] in Jingzhou.

2 The Present Situation of the Sixth Industry in Jingzhou

2.1 Obvious Advantages but Slow Growth in Agricultural Production

As shown in Table 1, from the view of the proportion of agriculture in the primary industry of Jingzhou from 2013 to 2016, agricultural production has obvious advantages and accounts for more than 35% of primary industry each year; as for cumulative growth rate, the agricultural growth rate is the slowest; the added value of agriculture from 2013 to 2016 is 15.78 billion yuan, and the cumulative growth rate is 29.50%, which is lower than that of forestry and fisheries. At the same time, it can be seen from Table 2 that the average annual growth rate of agricultural output value is the lowest of 1.59%, which is much lower than 6.21% of the average annual growth rate in primary industry output value from 2013 to 2016.

Table 1. The Output Value of Primary Industry in Jingzhou in 2013-2016 (unit: 100 million yuan, %).

Item	2013	2014	2015	2016	Cumulative Growth Rate
Output value of Primary industry	578.34	616.16	631.45	692.78	29.50
Output value of agriculture	253.1	262.74	257.99	260.14	7.84
Output value of forestry	6.48	7.02	7.77	8.38	44.23
Output value of animal husbandry	138.58	142.4	134.58	153.02	16.79
Output value of fishery	173.2	196.18	209.4	237.95	57.99
Proportion of agriculture in primary industry	43.76	42.64	40.86	37.55	
Proportion of agriculture in forestry	1.12	1.14	1.23	1.21	
Proportion of agriculture in animal husbandry	23.96	23.11	21.31	22.09	

Proportion of agriculture in fishery	29.95	31.84	33.16	34.35

Notes: the above data are derived from Jingzhou Statistical Yearbook from 2013-2016 and Statistical Yearbook from 2013-2017 of Hubei Province.

Table 2. The Growth Rate of Primary Industry of Jingzhou in 2013-2016 (unit: %).

Item	2013	2014	2015	2016	Average
Agriculture	4.92	2.4	-1.81	0.83	1.59
Forestry	11.53	1.5	10.68	0.79	6.13
Animal husbandry	5.77	4	-5.49	13.70	4.50
Fishery	14.5	7.8	6.74	13.63	10.67
Primary industry	8.11	4.5	2.5	9.71	6.21

Notes: the above data are derived from Jingzhou Statistical Yearbook from 2013-2016 and Statistical Yearbook from 2013-2017 of Hubei Province.

2.2 Steady but Slow Growth of Agricultural Product Processing Industry

In recent years, seven industrial systems for agricultural product processing in Jingzhou have been set up, which involve in high-quality grain, cotton, oil, fruits and vegetables, livestock and poultry, aquatic products and paper products. The number of enterprises above designed size reached 542 in 2016, whose output value was 134.61 billion yuan and rose by 9.13% year-on-year. As shown in Table 3, the proportion of agricultural product processing industry in the secondary industry had been more than 25% in 2012-2015, and it even accounted for almost 30% in 2014. Meanwhile, from 2012 to 2014, the production value of agricultural product processing industry increased from 43.97 billion yuan to 64.3 billion yuan, and the cumulative growth rate was 46.25%, while the output value and growth in 2015 were slightly dropped down, specifically, the output value is 62.01 billion yuan with a drop of 3.51% year-on-year.

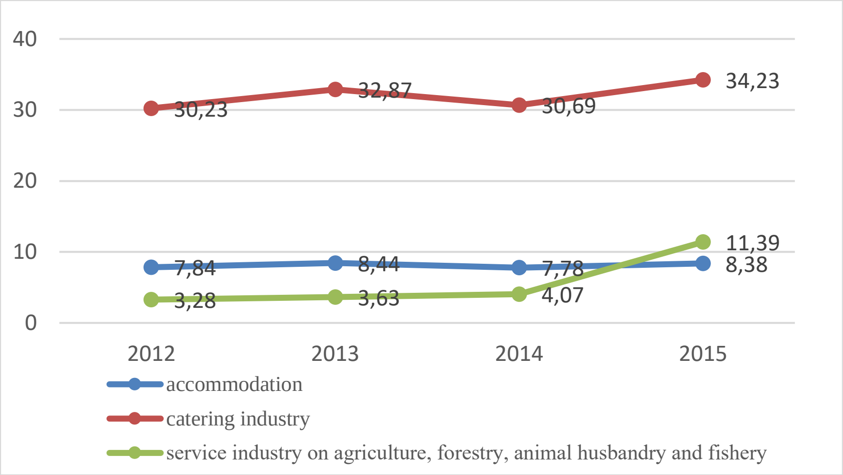
Table 3. The Growth Rate of the Second Industry of Jingzhou in 2013-2015 (unit:100 million, %）.

Item	2012	2013	2014	2015
Output of the second industry	1519.88	1896.66	2183.5	2362.94
Agricultural product processing industry	439.69	541.57	643.04	620.45
Proportion of agricultural Product processing industry in the second industry	28.93	28.55	29.45	26.26
Growth rate of agricultural Product processing industry	17.25	23.17	18.74	-3.51

Notes: the above data are derived from Jingzhou Statistical Yearbook from 2013-2016. The related data of 2016 have not been issued publicly.

2.3 Relatively Backward but Promising in Rural Service Industry

As can be seen from the Figure 1, there is an obvious increasing trend in the added value of services on agriculture, forestry, animal husbandry and fishery from 2012 to 2015. Specifically, it has increased cumulatively by 811 million yuan or by 247.26%; while the added value of accommodation and catering industry are in a light of amplitude fluctuation state, and their cumulative growth were respectively 54 million yuan and 400 million yuan, that is to say, the cumulative growth rate were 6.89% and 13.23% respectively; in addition, from 2013 to 2015, the average annual growth rate on accommodation, catering industry and agriculture, forestry and the added value of service industry on agriculture, forestry, animal husbandry and fishery were 2.51%, 4.54%, and 67.55%.



Notes: the above data are derived from Jingzhou Statistical Yearbook from 2013-2016. The related data of 2016 have not been issued publicly.

Fig. 1. The Added Value of Accommodation, Catering Industry and Services on Agriculture, Forestry, Animal Husbandry and Fishery in Jingzhou in 2013-2016（unit:100 million yuan）.

3 The Main Problems Faced by Jingzhou in Cultivating and Developing the Sixth Industry

3.1 Lack of Adequate Knowledge about the Sixth Industry

To learn about how much the citizens, know about the sixth industry, we make investigation through questionnaires and face-to-face interviews in Jingzhou. According to the survey, about 80% of the villagers, 50% of the village cadres and 30% of the township cadres have never heard of the concept of the sixth industry, and only 20% of people think that the industry may be associated with industrial convergence. In response to the willingness to develop the sixth industry, villagers' enthusiasm is not high, many agricultural cadres do not know how to start, and some of them take the sixth industry as "targeted poverty alleviation in China", which is developed essentially depending on financial support. Therefore, the public have some error perception of the sixth industry, and it is a long way to go for cultivating and developing the sixth industry.

3.2 Talent Shortage in the Sixth Industry

As the rural migrant workers increase year by year, rural area faces a serious lack of labor force. In recent years, although some migrant workers return home, the growth rate of labor and talented person still cannot keep pace with the sixth industry's rapid development, in addition, there is a much more serious shortage in some kinds of agricultural professional and technical personnel. The existing structure of scientific and technological personnel is aging and thus lacking in passion and innovation, which becomes an obstacle to the further development of the sixth industry.

3.3 Insufficient Construction Funds and Obstructed Financing Channels

To develop the sixth industry, it needs a long cycle and relatively huge construction funds which is difficult to raise simply by a single investment subject. As a result, the new operators tend to face the plight of capital shortage, especially in seasonal funds [7]. There is usually a relatively high, complex program, limited loan amount in commercial loan, which lead to the obstructed financing channel. In addition, in the process of cooperation and development, due to lack of trust in partners, investors resist to invest much capital to the operators. Without the sufficient funds, it is difficult for the operators to carry out advanced agricultural technology, collect rich information and increase the scale of the industry, which severely restrict the development of the sixth industry in Jingzhou.

3.4 Lagged Brand Building

Brand building is of great significance to enhance the added value of agricultural products. Nowadays, the characteristic agriculture product superiority in Jingzhou has not been transformed as the scale superiority and benefit superiority, the main reason of which lies in the lagged brand building. Firstly, brand cultivation and protection systems have not been established. Brand development is lack of unified, systematic planning, organization and guidance. Secondly, brand influence is urgently needed to expand. Most of the brand influence only stay in the local area, which lead to the lower social trust degree. The agricultural brand status in Jingzhou is not commensurate with the status of the big agricultural city. Thirdly, the concept of regional public brand needs to be popularized. The construction of regional public brand has not been planned as a whole, the brand resources have not been well integrated, and the public brand system has not yet been established.

4 Policy Recommendation on Cultivating and Developing the Sixth Industry in Jingzhou

As early as 20 years ago, Japan and Korea began the exploration and practice in the sixth industry, and have accumulated more abundant experience. In recent years, many provinces and cities in China also actively take part in the practice of sixth industry, so far, such places have gained some successful experience as the Jinshan District of Shanghai, Yangling Agricultural High-tech Industry Demonstration Zone of Shanxi Province, Fuyang of Zhejiang Province, Nantong of Jiangsu Province and Guangdong Province, etc. Learning from successful practical experience at home and abroad, it is undoubtedly important to cultivate and develop the sixth industry in Jingzhou.

4.1 Overall Planning on the Development Outline and Support Policies for the Sixth Industry

The development of the sixth industry is inseparable from the support of the policy, so the primary task is to do a comprehensive planning, which is also the successful experience of Japan, South Korea and Jinshan District of Shanghai, etc. In reference to their experience, the government of Jingzhou can put forward the strategic measures and work out the formulation on *Jingzhou Development Outline for the Sixth Industry*, and then guide the counties to develop the corresponding action plan, so as to form consensus and resultant force of developing the sixth industry in the whole city. This outline should be drawn up considering the industrial base, location characteristics, resource advantages and cultural endowments of Jingzhou [2]. More importantly, it should clearly set the development goals and overall task, and focus on the ecological industrial integration, so that we will develop the sixth industry with scale, Standardization, quality, commercialization and specialization. Meanwhile, the government should also adopt the following policies to support the development of the six industry:

Preferential Policy to the Base Construction of the Sixth Industry on Rural Construction Land. Priority should be given to those who need non-agricultural construction land to set up enterprises of agricultural products processing, and declaration and use of land in the abandoned schools, four kind of wasteland shall be inclined to the sixth industry.

Funding Support Policy. Financial institutions should study and formulate the credit policy to support for the development of the sixth industry. For the sixth industrial business entities with large-scale, strong leading role, high credit ratings, the banks should implement preferential policies such as loan priority, interest rate concessions, easing and simplifying procedures. The local agricultural sectors, finance offices, banking regulatory bureau should study specific policies to support financial institutions for the sixth industry to carry out mortgage loan business towards orders for agriculture, agricultural production facilities, agricultural machine, land contract and management rights, forest ownership, right to use water and beach. Guarantee institutions should study and formulate access conditions, put the eligible sixth industrial entities into the scope of loan guarantee services, and give priority to guarantee services [1]. In addition, policies should also be formulated to attract social capital to participate in the development of the sixth industry.

Setting Up Financial Subsidy Projects for the Sixth Industry. Following the experience of Japan and Korea, the government and the relevant departments should put into more fund to carry out fiscal subsidies for the sixth industry, establish specialized accreditation agencies, standardize certification process, which can be considered as the basis that provide precise assistance and the sixth industry business owners obtain financial subsidies [9]. As a result, it can improve the implementation effect of government subsidy policy.

4.2 Strengthening the Cultivation of New Type of Agricultural Business Entities

The shortage of talent resources is the bottleneck problem of the current development of the sixth industry in Jingzhou, so it is necessary to cultivate new type of agricultural business entities to improve staff quality, including cultivating leading specialized households, family farm as the backbone, making professional cooperatives and leading enterprises as the link.

Speeding Up the Cultivation of New Type of Professional Farmers. The authorities should try every means to broaden training channels and forms to carry out vocational education training, expand the scale of sunshine projects and rural practical personnel training, conduct a wide range of training on large grain farming, large breeding families, family farm operators, leaders of cooperatives and so on. Furthermore, the government and the relevant departments should study and formulate the identification standard of professional farmers as the basis of cultivation and support.

Vigorously Developing Specialized Households and Family Farms. The government and the relevant departments should explore identification standards towards specialized households and family farms of different production areas. The new added agricultural subsidies will be tilted to those identified specialized households and family farms, and the contracted land transfer should also be encouraged and supported for them.

Accelerating the Development of Farmer's Cooperatives. The government and the relevant departments should encourage farmers to set up diversified and multi-type cooperatives, such as professional cooperation and joint-stock cooperation. At the same time, they should establish the evaluation mechanism of model cooperatives to publish a list of model cooperatives at different levels, and take them as the key supportive subjects.

Strengthening the Leading Enterprises of Agricultural Industrialization. The government and the relevant departments actively promote the leading enterprises to cooperate with farmers and cooperatives, and take the road of win-win development between agricultural enterprises and farmers and cooperatives.

4.3 Innovating more Paths to Develop Modern Agriculture

Jingzhou should focus on the development of modern agriculture, aim at developing brand agriculture, leisure agriculture, ecological agriculture and building the sixth industry as the goal, take "Internet+", "cultural creativity+" as the means. Through adjusting the industrial structure of agriculture and innovating the way of agricultural development, we can improve the level of agricultural modernization and increase farmers' income.

Carrying Out Agricultural Brand Strategy Deeply. Firstly, "*Jing Chu taste*" regional agricultural products can be chosen as the core public brand to excavate and protect special agricultural products, so as to form the leading and dominant industrial structure of "high quality rice, green vegetables, famous fruits and special breeding", "one village with one industry" and "one village with one product". It is essential for the operators to improve the agricultural quality, brand and taste. Secondly, the operators should further strengthen the brand integration, gradually improve standardized cultivation techniques of brand agricultural products, and formulate the operation procedures, technical standards and product packaging standards of representative agricultural brands. Thirdly, the external image of the products and brands should be carefully dealt with, which can enhance the intrinsic value of product brands.

Developing Leisure Agriculture, Ecological Agriculture and Promoting the Integration of Rural Tourism in the Whole Region. Firstly, combined with the sixth industry, the government should actively promote the integration of agriculture, forestry and tourism, culture, health and other industries, and strive to build pastoral complex, so as to form the new highlight and new format on agricultural industry development of "eco-oriented, industry-based and cultural landscape". Secondly, combined with the characteristics of Jingzhou, the government should vigorously build the *Chu Culture* leisure tourism industry belt, the red leisure tourism industry belt, the pastoral scenery leisure tourism industry belt, the green development leisure tourism industry zone, the eco-tourism leisure tourism industry and other agricultural tourism agglomeration area construction. Thirdly, combined with agricultural and special resources, organize a series of agricultural festivals, such as grape festival, peach blossom festival, strawberry festival, peach festival, crayfish festival and so on. Through deeply seeking organic integration of traditional culture and modern elements, the operators can guide the development of farming and fishing culture, promote the integration of agriculture and cultural creativity, science and technology development, design services, ecological construction, landscape tourism, and build leisure agriculture park combined with agriculture sightseeing, farming experience, education exhibition and cultural heritage.

4.4 Strengthening the Construction of Industrial Support Platform to Help out the Development of Sixth Industry

The development of the sixth industry cannot do without the support of platform construction. The support system helps the integrated operation and management of the entire process including production, processing, distribution, export, experience, tourism, sales and consumer [5]. Therefore, Jingzhou should strengthen the construction of platform to promote the development of the sixth industry.

Strengthening the Construction of Research Platform and Think Tank. The government should give full play to the intellectual advantages of Yangtze University and the agricultural scientific research institutes, and encourage scientific research personnel to go to the forefront of the industry, agricultural products processing enterprises to carry out product research and technical guidance. At the same time, the government should carry out the think tank construction plan, and construct high-level think tank for scientific and technological innovation and enterprise business.

Building Diversified Industrial Development Platforms. The network operators can be introduced to build product sales platform. The authorities can lay down some favorable policies to attract social forces to build the sixth industry incubation platform, scientific and technological achievements transformation platform, brand planning and creative platform, etc.

Building Innovation and Entrepreneurship Platform. In order to provide talents support for industrial development, the government should actively guide and encourage young intellectuals, university students, returning migrant workers to join the development of the sixth industry in Jingzhou.

5 Conclusion

The sixth industry is a bright spot and a new pattern of the current agricultural development. It is of great practical significance to cultivate and develop the sixth industry for Jingzhou to change the mode of agricultural development and promote the modernization of agriculture. Developing the sixth industry can effectively stimulate the vitality of agriculture, promote the development of local industries and new industries, and enhance the driving force of rural economic development. From the perspective of reciprocity benefit and industry complementarities, the sixth industry is an important starting point to accelerate the modernization of agriculture. From the perspective of the continuous increase of basic requirements for quality of life, the sixth industry is an effective way to expand the multi-function of agriculture. From the realistic challenge of coping with the hard constraints of resource environment, the sixth industry is the objective requirement of sustainable development of agriculture.

From the gradual change of farmers' income, the sixth industry is the inevitable choice to build a moderately prosperous society in all respects. Learning from the successful practical experience at home and abroad, based on the actual situation in Jingzhou, the government and the relevant departments should overall plan on the development outline and support policies for the sixth industry. What’s more, they should focus on strengthening the cultivation of the new type of agricultural business entities and innovating more paths to develop modern agriculture. Last but not least, the relevant industrial supporting platforms should be constructed in order to help out the development of the sixth industry.

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Dynamic Analytic Network Process

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Abstract. The AHP (Analytic Hierarchy Process) method is modified with respect to network structures and dynamics of the analyzed systems. The ANP (Analytic Network Process) method is appropriate for setting priorities in network systems where there are different types of dependencies between evaluation criteria and system elements. However, with time-varying environments in network systems, time-dependent priorities play an increasingly important role. Long-term priorities can be based on time-dependent comparisons of criteria and system elements. For short-term prediction, exponential smoothing of compositional data can be used. The paper proposes a hybrid procedure DNAP (Dynamic Analytic Network Process) that combines and enriches advantages and benefits of both approaches by analysis of network systems.

Keywords: Analytic Network Process, Time Dependent Priorities, Compositional Data, Hybrid Procedure.

1 Introduction

Many of today’s economic systems are characterized by a network structure and operate in a dynamic environment [2]. Analytic methods seek to respect this development and adapt to these characteristics.

The Analytic Hierarchy Process (AHP) is a very popular method for setting priorities in hierarchical systems [4]. Network systems contain both positive and negative feedbacks. A variety of feedback processes create complex system behavior. For the whole network seems to be very appropriate Analytic Network Process (ANP) approach [5]. The ANP makes possible to deal systematically with all kinds of dependence and feedback in the system. The paper presents a dynamic approach. Dynamic ANP as an extension of ANP can deal with time dependent priorities in network systems. Dynamic models use concepts of state variables, flows, and feedback processes. The models try to reflect changes in real or simulated time and take into account that the network model components are constantly evolving.

Explaining the dynamic nature of systems is a subject of interest in research [2, 3, 6]. Section 3 of the paper is devoted to modeling time-dependent pairwise comparisons. This approach is suitable for long-term predictions. Another approach is based on prediction by exponential alignment of compositional data (Section 4). Composite data is the same for analyzing relative data, such as priorities. Exponential alignment of compositional data is appropriate for short-term forecast changes of priority. The paper proposes a hybrid procedure that combines and enriches each other's procedures (Section 5). Section 6 provides conclusions.

2 Analytic Network Process

The Analytic Hierarchy Process (AHP) is the method for setting priorities [4]. A priority scale based on reference is the AHP way to standardize non-unique scales in order to combine multiple performance measures. The AHP derives ratio scale priorities by making paired comparisons of elements on a common hierarchy level by using a 1 to 9 scale of absolute numbers. The absolute number from the scale is an approximation to the ratio w_j / w_k and then is possible to derive values of w_j and w_k. The AHP method uses the general model for synthesis of the performance measures in the hierarchical structure.

The Analytic Network Process (ANP) is the method [5] that makes it possible to deal systematically with all kinds of dependence and feedback in the performance system. The structure of the ANP model is described by clusters of elements connected by their dependence on one another. A cluster groups elements that share a set of attributes. At least one element in each of these clusters is connected to some element in another cluster. These connections indicate the flow of influence between the elements. Computations of the weights use three types of matrices.

Supermatrix

For the evaluation of all linkages, a pair-wise comparison method is used as for the AHP method. Pair-wise comparisons are inputs for calculating global priorities in the network system. The so-called supermatrix is a matrix that compares all the elements of the system to each other. Weights, calculated on the basis of pair-wise comparisons of the system elements, are the contents of individual supermatrix columns. Supermatrix is composed of sub-matrices comparing elements of one cluster with elements of another cluster W_{ij}. These matrices, if they are non-zero (they capture the effect of the elements of one cluster on elements of another cluster), are column stochastic, i.e. the sum of the elements in the column is equal to one. The sum of the elements in the supermatrix column is equal to the number of clusters being compared.

Weighted supermatrix

By pair-wise comparisons of each cluster gradually towards all clusters, we get the vectors of cluster weights. By multiplying the individual matrices W_{ij} of the supermatrix by the corresponding weights v_{ij}, we get from the supermatrix the so-called weighted supermatrix, capturing the importance of the clusters. Weighted supermatrix is already column stochastic and its elements express the assessment of the direct influence between the elements.

Limited supermatrix

If we create powers of the weighted supermatrix, these powers will express other indirect influences, given by links over other elements. After a certain number of iterations, the powers of weighted supermatrix are stabilized to the so-called limited matrix. The matrix columns are identical and represent the global priority of the elements.

We used the ANP software Super Decisions developed by Creative Decisions Foundation (CDF) for some experiments for testing the possibilities of the expression and evaluation of the network models (see Fig.1).

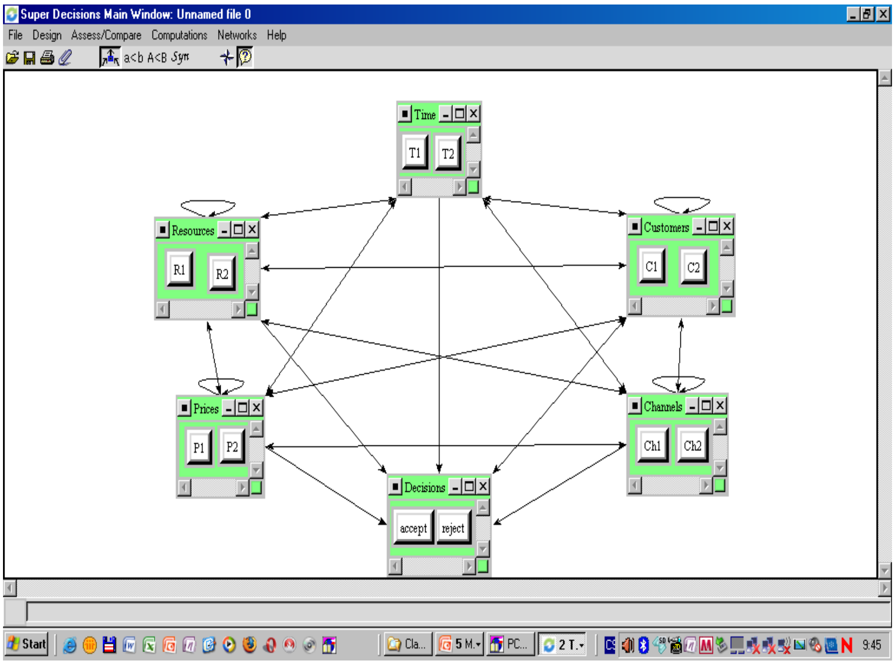

Fig. 1. Super Decisions

3 Time dependent priorities

Dynamic extensions of ANP method can work with time-dependent priorities in a networked system. There are two approaches for time-dependent pairwise comparisons:

- structural, by including scenarios,
- functional by explicitly involving time in the judgment process.

Functional dynamics is provided by pairwise comparison functions, where evaluations are time dependent. It is a generalization of ANP from points to functions.

For the functional dynamics, there are analytic or numerical solutions. The basic idea with the numerical approach is to obtain the time dependent priorities by simulation [6].

Judgment matrix in dynamic form:

$$A(t) = \begin{bmatrix} a_{11}(t) & a_{12}(t) \dots & a_{1k}(t) \\ a_{21}(t) & a_{22}(t) \dots & a_{2k}(t) \\ \vdots & \vdots & \vdots \\ a_{k1}(t) & a_{k2}(t) \dots & a_{kk}(t) \end{bmatrix} \tag{1}$$

By changes of time periods we get new weighs of elements. The ANP software Super Decisions can be used for computations of time dependent weights in discrete time periods.

Time dependent priorities capture long run trends but forecasting using pairwise comparison functions brings a problem with keeping the consistency of paired comparisons.

Example

We use the method for an illustration of positive feedback. The time dependent comparison of two products is expressed by S-curve:

$$a_{12}(t) = \frac{9}{1 + 7 \cdot 0{,}01^{t}} \tag{2}$$

The paired comparison matrix:

$$\begin{bmatrix} 1 & a_{12}(t) \\ 1/a_{12}(t) & 1 \end{bmatrix} \tag{3}$$

The numerical data are shown in Table 1 and plotted in Fig. 2.

Table 1. Dynamic comparisons.

t	$a_{12}(t)$	$w_1(t)$	$w_2(t)$
0	1,13	0,53	0,47
0.1	1,66	0,62	0,38
0.2	2,38	0,7	0,3
0.3	3,26	0,77	0,23
0.4	4,27	0,81	0,19
0.5	5,29	0,84	0,16
0.6	6,24	0,86	0,14
0.7	7,04	0,87	0,13
0.8	7,65	0,88	0,12

0.9	8,10	0,89	0,11
1	8,41	0,9	0,1

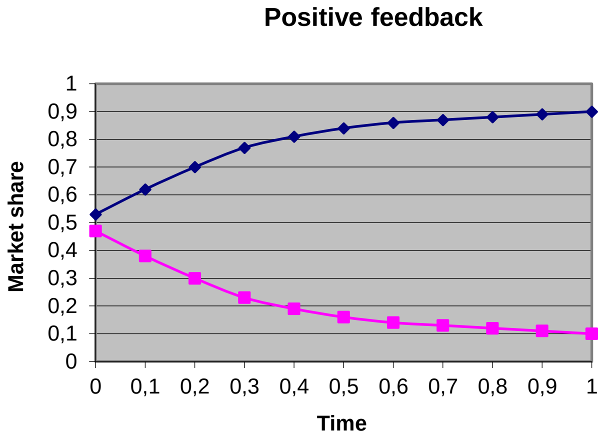

Fig. 2. Positive feedback – example.

4 Compositional data analysis

The compositional data are everywhere, where we need to work with data containing only relative information, which is useful for working with weights. A procedure based on exponential smoothing was designed, which is suitable for short-term predictions [3].

The following operations are defined on the simplex space:

$$S^k = \left\{\boldsymbol{x} = (x_1, x_2, \dots, x_k), x_i > 0, i = 1,2,\dots,k, \textstyle\sum_{i=1}^{k} x_i = 1\right\} \qquad (4)$$

Closure operator $\boldsymbol{C}(\mathbf{x})$: For any vector $\mathbf{x} = (\boldsymbol{x_1}, \boldsymbol{x_2}, \dots, \boldsymbol{x_k}) \in \boldsymbol{R}_+^k$

$$\boldsymbol{C}(\boldsymbol{x}) = \left(\frac{x_1}{\sum_{i=1}^k x_i}, \frac{x_2}{\sum_{i=1}^k x_i}, \dots, \frac{x_k}{\sum_{i=1}^k x_i}\right) \qquad (5)$$

Perturbation: For any two vectors from simplex space **x**, **y** $\in S^k$

$$\boldsymbol{x} \oplus \boldsymbol{y} = \boldsymbol{C}(\boldsymbol{x_1 y_1}, \boldsymbol{x_2 y_2}, \dots, \boldsymbol{x_k y_k}) \qquad (6)$$

Closer operator is used for Hadamard product of vectors **x** and **y**.

Power transformation: For any vector from simplex space **x** $\in S^k$ and $\alpha \in R_+$

$$\boldsymbol{\alpha} \otimes \boldsymbol{x} = \boldsymbol{C}(\boldsymbol{x}_1^{\boldsymbol{\alpha}}, \boldsymbol{x}_2^{\boldsymbol{\alpha}}, \dots, \boldsymbol{x}_{\boldsymbol{k}}^{\boldsymbol{\alpha}}) \tag{7}$$

Difference:

$$\boldsymbol{x} \ominus \boldsymbol{y} = \boldsymbol{x} \oplus (-\mathbf{1} \otimes \boldsymbol{y}) \tag{8}$$

Exponential smoothing with compositional data can be used for predicting weights

$$\boldsymbol{w}_t = (w_{t1}, w_{t2}, \dots, w_{tk}), w_{ti} > 0, i = 1,2, \dots, k, \textstyle\sum_{i=1}^{k} w_{ti} = 1 \tag{9}$$

in a short time.

Simple exponential smoothing
Vector of observations at time *t*

$$\boldsymbol{x}_t = (x_{t1}, x_{t2}, \dots, x_{tk}), x_{ti} > 0, i = 1,2, \dots, k, \textstyle\sum_{i=1}^{k} x_{ti} = 1 \tag{10}$$

elements of simplex space.

Vector of predictions at time *t*

$$\boldsymbol{y}_t = (y_{t1}, y_{t2}, \dots, y_{tk}), y_{ti} > 0, i = 1,2, \dots, k, \textstyle\sum_{i=1}^{k} y_{ti} = 1 \tag{11}$$

elements of simplex space.

The formula for simple exponential smoothing of compositional data:

$$\boldsymbol{y}_t = \alpha \otimes \boldsymbol{x}_{t-1} \oplus (1-\alpha) \otimes \boldsymbol{y}_{t-1} \tag{12}$$

Double exponential smoothing
We introduce for trend modeling a vector of trend values $\mathbf{u}_t$, a vector of slopes $\mathbf{v}_t$, a smoothing constant $0 \leq \alpha \leq 1$, a trend constant $0 \leq \beta \leq 1$.

Formulas for double exponential smoothing of compositional data:

$$\boldsymbol{u}_t = \alpha \otimes \boldsymbol{x}_t \oplus (1-\alpha) \otimes (\boldsymbol{u}_{t-1} \oplus \boldsymbol{v}_{t-1}) \tag{13}$$

$$\boldsymbol{v}_t = \beta \otimes (\boldsymbol{u}_t \ominus \boldsymbol{u}_{t-1}) \oplus (1-\beta) \otimes \boldsymbol{v}_{t-1} \tag{14}$$

$$\boldsymbol{y}_t = \boldsymbol{u}_{t-1} \oplus \boldsymbol{v}_{t-1} \tag{15}$$

5 Hybrid procedure

For a dynamic version of the ANP method, we propose a hybrid procedure that combines the advantages of long-term prediction of pair-wise comparisons and short-term predictions by exponential smoothing of compositional data. This procedure also enriches each of these processes by obtaining more accurate data. Both procedures were presented in the previous sections and here we limit ourselves to a brief summary of the hybrid procedure steps:

- **Step 1:** Formulation of pair-wise comparison functions.
- **Step 2:** Testing and improving consistency of comparisons.
- **Step 3:** Collection of historical data by ANP priorities over time.
- **Step 4:** Using of compositional exponential smoothing.
- **Step 5:** Selection of the best coefficient α, β with lowest value of error.
- **Step 6:** Forecasting of priorities for next time periods.
- **Step 7:** Re-formulation of comparison functions based on short-run model, go to step 2.

6 Conclusions

The proposed hybrid procedure is an attempt to eliminate the shortcomings of both procedures and enrich their advantages and benefits. Searching for a tool for evaluating dynamic network models is an important research area. There are some possibilities to modify and to generalize the approach. Using such a tool in practice would have numerous applications.

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The Influence of Fur Farming on the Local Economy in Poland

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Abstract. Modern farms are seen as a source of social and economic benefits in the development of the local economy. When discussing the problem of fur breeding it should be emphasized that fur fur has both usefulness and commercial value. In the past their main advantage was protection from cold and unfavorable weather conditions. Over time, they became a currency, emphasized the signs of power, and pointed to a social position and a sign of elegance. The consequence of the exchange of markets for the economy is also interesting. It can be predicted that as a result of the presumed ban on agriculture in Poland, the difference will be fulfilled by countries such as Denmark, Germany, Russia and China. Ten years after Poland's accession to the European Union, enthusiasts are faced with serious difficulties if they continue to invest in fur production, as initial drafts of animal protection legislation are expected to phase out in the coming years.

Keywords: Modern Farms, Fur Farming, Local Economy.

1 Introduction

The origins of the fur farming industry in Poland go back to the 1990s. The good quality of production allowed developing a high position on the fur market, which is often perceived as one of the most modern special sectors of agriculture. Modern farms are perceived as a source of social and economic benefits in development of the local economy. It has been raised more and more controversy regarding the issues of possible benefits connected with the maintenance of this industry recently. Discussing the problem of fur farming it should be emphasized that fur skins have both utility and trade values. In the past their main function was a protection against cold and adverse weather conditions. With time they became a currency; they emphasized the signs of power as well as indicated the social position and were the sign of elegance. Fur skins are also often combined with other fabrics as well as they are used as coats or jackets finishes. In the past the fur skins were obtained from a wild and half-wild farming but in the 20th century there were attempts to domesticate these animals and the specialized farms were built, which started to produce the fur skins on a mass scale. The quality of these skins differs significantly from the skins of animals living in the wild as the only aim of the farming is to obtain skins. In the production process there is a constant breeding perfecting of the quality of fur coating, colouring, animals temper, body weight and a size of skins [6]. It should be also emphasized that breeding animals compared with living in the wild are usually better fed which results in bigger body weight, beautiful fur skins, less damages and highly variable colouring [1, 2, 5, 9]. The aim of this article is to present the impact of fur farming on the local economy in Poland. The locations and number of fur farms in Poland are shown as well as the current production of fur skins in the chosen European countries and the annual fur skins production in the years 2006-2016. The final stage of the research was to define the impact of fur farms on the local environment.

2 The aim and research methodology

The main aim of the study was to provide an illustrative presentation of a current state and financial results achieved in fur farming in Poland, which became the matter of interest of many breeders, scientists and politicians in 2017. Showing this state enabled to indicate directions and extent of fur farming impact on the local economy in Poland. In the operational and analytical part of the article, to present received data, the chosen time series methods were used as well as the graphic and table presentation concerning location and number of carnivorous farms and fur animals in Poland, production of fur skins in the selected European countries and annual production of mink skins.

3 The current state and the research results

In 2016 there were 1130 fur farms in Poland, of which a significant proportion (especially the farming of carnivorous fur animals) is located in the North-Western Poland. The majority of farms are located in Greater Poland voivodeship and Pomeranian voivodeship (fig. 1).

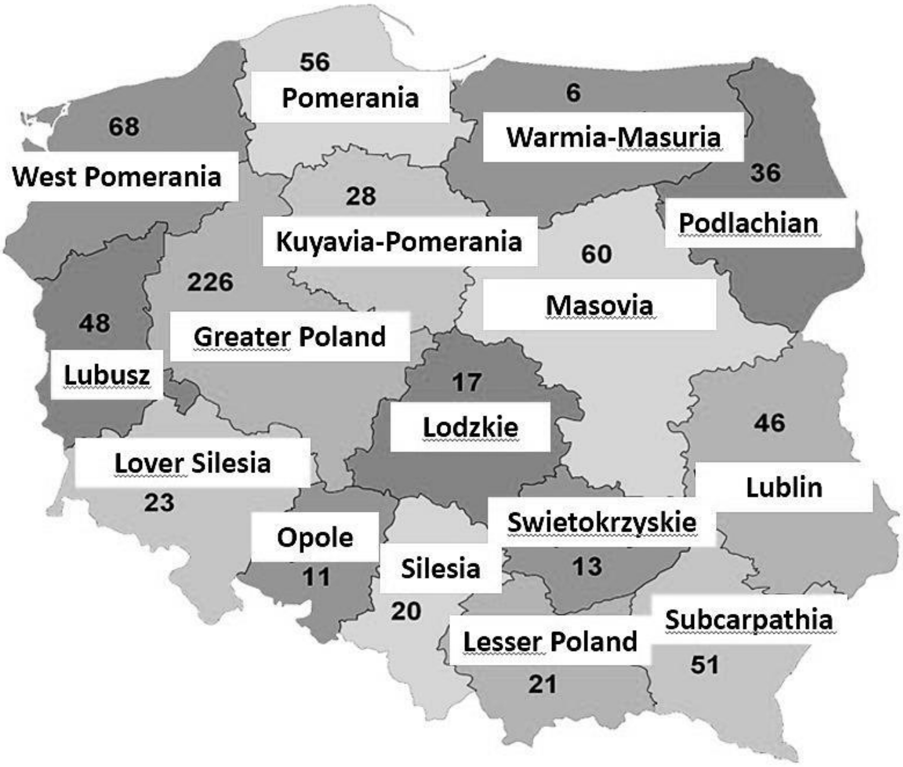

Fig. 1. The location and number of carnivorous fur farms in Poland.

In terms of fur skins production Poland belongs, following Denmark, to the hegemons on the European market (table 1).

Table 1. The production of skins in chosen European countries in 2016 (in units), source: [3].

	Denmark	Poland	Finland	Netherlands
Minks	17 100 000	8 500 000	1 940 000	4 000 000
Foxes	2 500	50 000	2 300 000	0
Raccoon dogs	0	10 000	150 000	0
Chinchillas	45 000	80 000	0	0
In total	17 147 500	8 640 000	4 390 000	4 000 000

The annual upwards trend in the number of mink skins production in the years 2006-2016 is noticeable (fig. 2). In 2016 8,5 million mink skins were produced, representing 13% of the world production.

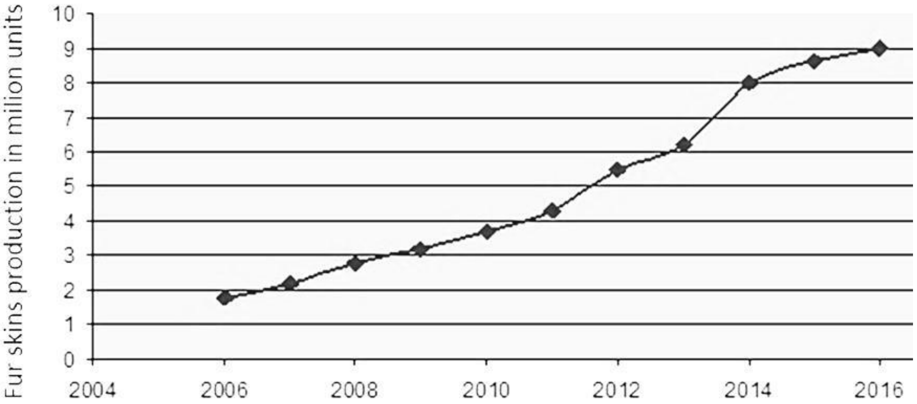

Fig. 2. The annual mink skins production in the years 2006-2016, source: [4].

The production of fur skins in the individual European countries in 2016 appears quite interesting (tab. 2), where the leaders in the industry are Denmark and Poland. Further positions with far smaller level of production are occupied by Finland, the Netherlands, Lithuania, Greece and Sweden. It is worth emphasising that at present in some European countries there is a total ban on fur farming (Great Britain, Austria, Slovenia, Croatia) and in the others a public debate is conducting on introducing such a ban. As a consequence, a tendency to develop fur farming in Eastern Europe (including Poland) may change and move into production in China and Russia. In the light of the appearing reports on the state of farms in these countries there are concerns if they will be properly controlled and if the rules regarding the animal welfare will be observed [7].

Table 2. The production of fur skins in the individual European countries in 2016, source: [3].

Country	Number of farms	Fur skins production				
		Minks	Foxes	Raccoon dogs	Chinchillas	In total
Belgium	19	160 000	0	0	0	160 000
Bosnia and Herzegowina	50	0	0	0	9 000	9 000
Bulgaria	3	100 000	0	0	0	100 000
Czech Republic	10	20 000	500	0	0	20 500
Denmark	1 533	17 100 000	2 500	0	45 000	17 147 500
Estonia	40	46 000	15 000	0	6 000	67 000
Finland	914	1 940 000	2 300 000	150 000	0	4 390 000
France	13	140 000	0	0	0	140 000
Greece	98	1 400 000	0	0	0	1 400 000

Spain	54	750 000	0	0	0	750 000
Netherlands	185	4 000 000	0	0	0	4 000 000
Ireland	3	150 000	0	0	0	150 000
Iceland	30	174 000	0	0	0	174 000
Lithuania	131	1 500 000	1 500	0	6 000	1 507 500
Latvia	8	500 000	5 000	0	3 000	508 000
Germany	13	130 000	0	0	2 000	132 000
Norway	340	700 000	110 000	0	0	810 000
Poland	1 144	8 500 000	50 000	10 000	80 000	8 640 000
Romania	153	245 000	0	0	13 000	258 000
Serbia	52	0	0	0	15 000	15 000
Slovakia	1	4 500	0	0	0	4 500
Sweden	80	1 000 000	0	0	0	1 000 000
Hungary	200	0	0	0	14 000	14 000
Italy	30	160 000	0	0	0	160 000
Total	5 104	38 719 500	2 484 500	160 000	193 000	41 557 000

4 Fur farming and the local community

A very important question is what impact the maintenance of the fur farming industry has on the local economy. A really significant element providing an answer to this question is a thorough study of the potential benefits and costs of the analysed industry (table 3).

Table 3. The impact of fur farms on the local area.

Farm		
Production of skins as a valuable export product	Activation of rural areas by creating workplaces	Benefits connected with UPPZ utilization

It is an obvious fact that the farms employ a certain amount of people. In Polish farms 10000 people is employed. The report on the impact of fur farming on the local economy in Poland prepared by the Polish Industry of Fur Animals Farmers presents that a farm keeping 10 000 of females is a potential source of employment at the level on average 15 employees (plus 10 additional during the season). A farm keeping of over 25 000 females employs 50 permanent employees and 45 seasonal employees. Making such the number of people redundant is a risk of increasing unemployment especially in the areas with a high rate of structural unemployment. The only solution in such a situation is to retrain these people but in case of less educated people that could be difficult. It is also stated that 40 000 people are employed in the companies cooperating with the farms. It refers to the enterprises with a mainly mass production which will not contribute to major turmoil in these goods production.

An important argument is the environment protection as fur farming contributes to utilization of slaughterhouse waste. The annual utilization is between 400 000 to 600 000 tons waste. There is a question of what to do with the waste in case of close-down of the industry. Unfortunately the Polish industry is still not developed enough in this matter so there is only possible to utilize abroad, which consequently is connected with moving costs to the foreign companies. Another important argument is the location of fur farms. They are mainly located on soils of low agricultural usefulness.

Important postulates refer to the economic issues. The basic question is regarding the economic benefits from the farms. The estimation of the potential income is difficult. The special issue refers to the boroughs. Furthermore, there is no clear answer what impact the farmers have on the development of a borough. Are they a significant element in their functioning? Do they influence on the investment development in each area? The fur farming significantly injects public finances. It is obviously indisputable that this industry supports the budget by returning an income tax, local tax, tax on goods and social security contributions. It is important to mention the figures from PwC report. The total input of the farmers in Polish economy was estimated for 1,3 billion złotych in 2013 of which the added value generated by the farmers was 570 million złotych. Te report also stated that the income generated by the farms were in total 587 million złotych (of which 274 million złotych of the farmers and their employees). However, what is a benefit fraction in proportion to liabilities?

It is vital to reconsider the issues regarding law and legislative solutions in the countries that do not have significant moral, law and economic problems like Denmark. However, should not the total ban (the Czech Republic) or phasing out the farming in the other countries (the Netherlands) raise a serious question mark on the factors responsible for that?

In the report ‘The impact of fur farming on the local economy in Poland’ it is shown that a demand for fur skins is strongly related to the climatic conditions – cold winters guarantee high prices. Another important factor is fashion. At present it is estimated that furs are presented at 2/3 the most prestigious shows in Milan, Paris, New York and London. On luxury goods like furs the vital influence has also incomes and views of retail customers. In the world where customers more and more consciously purchase various goods, the fur industry takes actions to meet demands. The answer for that is pursuing to the transparency of the industry and implementation of the scientific programme WelFur aiming to assess animal welfare. If a farm passes the controls within this programme, will receive a certificate proving farming in accordance with the animal welfare principles. Welfur is initiated by the European Trade Organisation and supported by Kopenhagen Fur, Saga Furs and NAFA. Since 2020 auction houses will sell only mink and fox skins from farms possessing WelFur certificates.

Fig. 3 presents the average price and annual production of mink skins in the years 1983-2014. In the season 2016/2017 the average price of mink skins in auction houses was 35 EUR. In case of polar foxes the average price was 78 EUR and silver foxes 64 EUR. For chinchillas the average price was 45 EUR. The average prices for fur skins coming from Poland are similar to the average European prices, which proves their good quality [8].

The Report of Government Inspectorate from 2015 causes a lot of concerns as it shows that almost 90% of farming do not respect the environment protection demands, half of the farming is run in illegal premises and one in three farms operates against veterinary regulations.

A great reason for concern is the clear signals of controversial farming methods in Wielkopolska region. It is obvious that it poses a seroius problem but was there considered to take actions aiming at decreasing or the complete liquidation of these signals? Polish farms are regulated by one of the most restrictive legislation and they are subject to supervision of the Veterinary Inspection, Environmental Protection Inspectorate or Building Control Inspectorate. The Code of Good Practices was also introduced. There are a lot of proposals of improvements regarding development of the industry: the change of farming methods, the change of meterage of living space of animal and more frequent controls of farmers. The question is how the farmers respond to that. Are they willing to cooperate in order to liquidate the negative aspects regarding the farming? There are vital signals from the farmers that they want to obtain the standardization of work conditions. The important action is also to be determining postulates aiming at liquidation of quasi-farming. Liquidation of farms raises a question if their total liquidation does not cause an emergence of illegal farming.

A considerable controversy refers to worries among the inhabitants of the fur farm areas. These regions are less attractive, there is a negative effect on the environment and groundwater or worsening of the inhabitants' quality of functioning mainly due to unpleasant stench. The talks with the members of the local governments provide some interesting findings. They are unanimous that fur farms are not a burden to the local communities and if they appear they often turn out unreasonable. A lack of negative effect on a development of rural tourism and agrotourism was also stated.

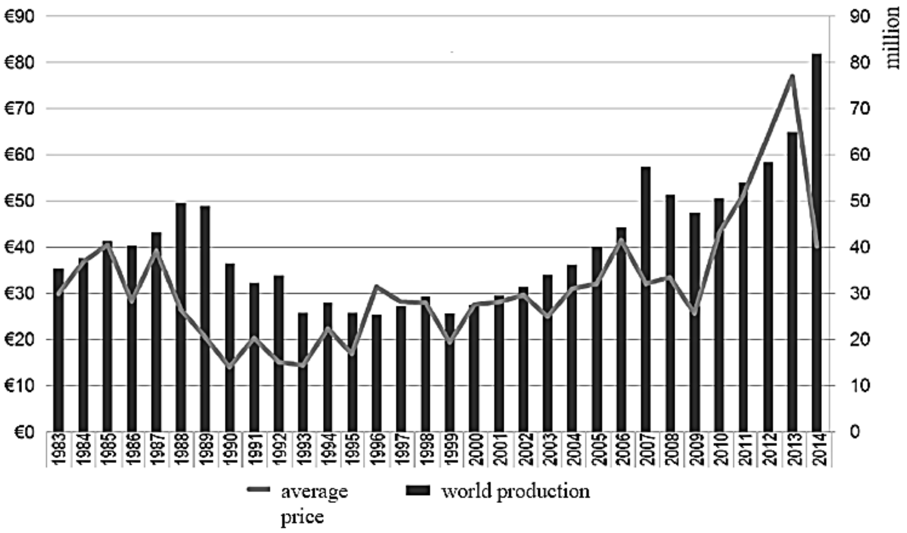

Fig. 3. The average price and annual production of mink skins in the years 1983-2014, source [8].

An interesting issue is also the consequence of markets replacement for the economy. It can be predicted that as a result of a presumptive ban of farming in Poland, the gap will be filled by such countries like Denmark, Germany, Russia and China.

It is worth referring to the survey conducted to recognize the fur farming industry. However, due to a small number of respondents (4,4% farms in Poland) it is difficult to assess the veracity of the answers to the whole trial. It also applies to the farms located in the Western Pomeranian Voivodeship.

Importantly, a half of the surveyed farm owners is pessimistic about the development of the industry and 2/3 of surveyed declared the withholding of investment as a consequence of legislative work on the industry liquidation. Taking these data into consideration, is the fur farming in Poland necessary? What is a reason for farming if the significant number of respondents is going to withhold their investment and the research findings show that 90% of farms are the main source of income.

5 Conclusion

A decade after the accession of Poland to the European Union the entrepreneurs are facing a serious dilemma if it is still worth investing in fur farming since the preliminary drafts of the proposed laws on animal protection presume the phasing out of this industry in the upcoming few years. The source query of literature as well as journalistic studies, source data and interviews with the farmers resulted in the following findings:

- Poland is the leading fur skins producer and in 2016 was the second in Europe producing 8,64 million of fur skins, had the second position in the number of produced mink skins – 8,5 million and the first in the number of produced chinchilla skins – 80,000. What is more, 50,000 of fox skins and 10,000 of raccon dog skins were produced.
- The number of functioning fur farms in 2016 was 1144 (including 400 chinchilla farms) with annual income 400-600 million Euro and export value of over 1,3 billion zloty.
- The industry generates the income of public finances assessed on the level of over half million zloty, is a sponsor of local initiatives and enterprises, contributes to a technical industry in a borough, initiates and develops cooperation with a lot of cooperating industries.
- The owners and employees of the fur farms pay taxes to the state budget and the budgets of the local governments as well as insurance and pension contributions and due to functioning of fur farms in boroughs a lot of work places were established resulting in a low unemployment level.

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The Quality of Income Planning for County Budgets vs. Multi-annual Financial Forecast

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Abstract. Planning pertains to any functioning unit of both the public and the private sector. Such planning forces the search for newer and newer forecasting techniques and optimal presentation of data. Public finance sector institutions actively use the instruments and tools specific to private sector entities. For that purpose, in all local self-government units Multiannual Financial Forecast is developed. Using it, the authorities of local self-government units should design the content of future budgets, anticipate their result, specify the exact level of certain expenditure categories and consequently the spending limits for projects.

The objective of this article is to assess the quality of county budget income planning in the context of MAFF functioning. The author is of the opinion that any realistic estimate of potential income determines the possibilities for a more effective implementation of public tasks. The quality of income planning is a starting point for the long-term planning in a given self-government unit. The study has shown that in the period of the MAFF operation, the accuracy of forecasts in the respective rural counties improved.

Keywords: Quality of Planning, Public Income, Local Self-government, Multi-annual Financial Forecast.

1 Introduction

Financial planning is perceived as a process that determines the means of achieving financial objectives. [5] This process includes many elements, including primarily forecasting, programming and plan development. [6] Schick A. indicates that planning should enable financing of local self-government unit (LSGU) activities in terms of on-going processes having their financial consequences in the future so as to ensure the stability of the financial economy as well as the effectiveness and efficiency of the current and development-related decisions taken. [15] For that purpose, in all LSGU annual plans and long-term plans are developed. Fiscal rules, which underpin the development of decisions to disburse public financial resources and verify their legitimacy on the basis of the applicable laws and regulations, are closely linked to the annual plan. The budget, in view of the need to adopt it and then implement it according to specific procedures and legal standards has very limited possibilities as a development instrument. Among these limitations, e.g. the planning period can be indicated. It must relate to a period of one budgetary year. The process of budget development adoption and implementation comply with the applicable rules of law. All this contributes to very little flexibility of such budget. The budget is a good tool for implementation of current activities, whereas it seems to be too “short” for investment financing. At this point, it is necessary to link the budget with long-term financial or investment plans. In this way, the budget operates not only as a plan of current tasks, but also as an instrument to implement strategic tasks. [1] Also, the large variability of economic processes and financial markets present in recent years has shown insufficient efficiency of using the budget as a tool of financial planning. [2] Planning and plans are the classic and basic institutions, without which the modern state cannot function so that its activities were considered measurable and predictable. Since 2011 the multi-annual financial forecast (MAFF) and a long-term financial plan have been the strategic documents functioning together with the budget. The former is addressed to the local self-government and the latter to the state sector. These documents are of a similar internal structure and should serve to assess the long-term potential of public finance. MAFF combines many planning processes taking place in the unit: planning, spatial development, financial planning, strategic planning of unit development and investment planning. In practice, MAFF is a combination of planning documents already operating in local self-governments, including e.g.: a long-term investment plan, spending limits on programs and projects implemented from the EU funds, non-repayable aid of the EFTA countries and the forecasts of debt amount. The task of the forecast is to raise the level of transparency and openness of local self-government activities and to assess the financial standing and credit rating. [12] The substantive scope of MAFF was specified by the act on public finance. [13] Article 226 of this act specifies the elements that should be indicated in MAFF in each year covered by the forecast. These components are linked in a specific way to the so-called long-term forecast for budgets (income and expenditure) which forms the first of the annexes to the resolution on MAFF. The analysis of the legal provisions of law on public finance provides the basis to find that the status of MAFF is equivalent to the one held by a budget resolution. In view of the above, in the literature certain doubts arise: Does the budget reflect the provisions of MAFF or is the long-term plan subject to the adopted local self-government budget? [16]

MAFF is to be an instrument for better planning and implementation of income and expenditure, which should result in a significant reduction of expenditure and consequently of debt incurred by LSGU. Using MAFF, the authorities of LSGU should design the content of future budgets, anticipate their result, specify the exact level of certain expenditure categories and consequently the spending limits for projects. The adopted planning values in terms of income, expenses, revenue and expenditure have a strong relationship with the sphere of public task implementation.

The only question is whether a given LSGU attempts to capture this relationship during its works on MAFF. This situation could lead to a clear dilemma which, in practice, is seen in the application of the provisions on MAFF - whether it is an important instrument used when making strategic decisions? Does it boil down to the role of a spreadsheet, drawn up because of the formal requirements and the need to obtain the opinion of financial management supervisory authorities? In Polish literature, these issues have been raised many times and there are divided opinions about it. After the first year of MAFF application, there was an opinion that it is not an ideal planning and management document. The legal provisions regarding MAFF were evaluated as imprecise. Many doubts were raised by: the realism of data, compliance of MAFF with the budget resolution, the powers of LSGU in terms of various changes in the course of the financial year and issues related to the list of projects. Most authors and practitioners agree however that the introduction of a document of a similar nature is necessary. MAFF drawn up diligently, fairly realistic and made with the use of macroeconomic indicators, can become a document that facilitates budget income and expenditure planning and enables the assessment of the financial standing in LSGU. The most important, however, is the manner of perceiving MAFF by the authorities of LSGU in practical terms and not as a statutory requirement.

2 Methods

As part of this article, the author focused on issues related to the effectiveness of income planning for LSGU. The author is of the opinion that any realistic estimate of potential income determines the possibilities for a more effective implementation of public tasks. The quality of income planning is a starting point for the long-term planning in a given self-government unit. The objective of this article is to assess the quality of county budget income planning in the context of MAFF functioning. The author poses a hypothesis that the requirement of using the multi-annual financial forecast did not improve the quality of planning the rural county budget income.

Data connected with the size of planned income, its components and the actual income were analyzed. The comparison of the expected basic macroeconomic indicators with their actual values was considered the starting point of the analysis. These indicators are the basis for estimating the budget-related income that is essential for counties.

The study covered the period between 2007 and 2016, i.e. the years in which the budgetary planning was carried out without MAFF and the years in which MAFF was actually applied. The results of the investigation are based on two periods of investigation. The first one pertains to the years in which MAFF did not function (2007-2011). The second period of the study covers the years of the actual functioning of the forecast – i.e. 2012-2016. The object of research are all rural counties of Lower Silesian province (26 rural counties).

The selected results of empirical research over the quality of budgetary planning presented in this paper were limited to the area of income. The statistical data relating to the plan and income achieved by LSGU have been obtained from the Regional Chamber of Auditors for Lower Silesia province - the quarterly statements of budget implementation of LSGU for 2007-2016 (plan as at the end of the first quarter and implementation as at the end of the fourth quarter).

The data on the projected values of macroeconomic indicators come from the document "Assumptions for the draft state budget 2007-2016 adopted by the Council of Ministers". To show the actual value of indicators the database of the Central Statistical Office was used.

The data on projected budget income came from the annual budget acts for individual years, while information on the obtained income was taken from reports on the implementation of the state budget for individual years.

The considerations and analyses presented in the article refer to the previous research results on MAFF operation published by the author and are the starting point for the next deliberations relating to MAFF effectiveness with regard to the assessment of the accuracy of income and expenditure forecasts for LSGU.

The cross-analysis of variables enables the assessment of mean errors for the investigated variables for the objects in question. To determine the error for the entire group that the author is investigating, mean percentage error for forecasts (MPE) has been applied. To achieve the perfect matching of plans and implementation, this value should be equal to zero or should be very low - when the value of ME indicator is positive, forecasts are underestimated, and when it is negative, forecasts are overestimated.

$$MPE = \frac{1}{n}\sum_{t=1}^{n}\left(\frac{(y_t - y_{tp})}{y_t}\right) * 100 \qquad (1)$$

where: Y_t - actual value of variable in time "t" (implementation)
Y_{tp} - projected value of variable in time "t" (plan).

Most textbooks recommend the use of the mean absolute percentage error (MAPE). [4, 7, 9, 10] MAPE informs us of the mean value of forecast errors for a given period, expressed in percentage. It indicates the percentage of error that such forecast is subject to [11].

$$MAPE = \frac{1}{n}\sum_{t=1}^{n}\frac{|y_t - y_{tp}|}{y_t} \qquad (2)$$

On the basis of MAPE indicator, the forecasting accuracy indicator (TFA) may be introduced.

3 Results

As part of the basic budget-related income sources of county self-government units there are fundamental limitations to their forecasting. At this point, a relatively limited role of the local self-governments in forecasting the budget income based on participation in personal income tax (hereinafter: PIT), targeted subsidy or general subsidy should be emphasized. Annual amounts of the subsidy and funds from participation in PIT for individual counties are determined by the ministry of finance. The value of income planned due to participation in PIT results e.g. from the participation rate of PIT due for a given county. The proceeds depend also on the value of the macro-economic indicators assumed in the draft state budget for a given financial year. In addition, information on the proceeds from the source that is so vital for any county, is not obligatory, but generated only for the purposes of providing information and estimation. This results from the fact that tax income is planned in the state budget on the basis of estimates and forecasts. The implementation of income may therefore be increased or decreased.

The basis for obtaining an individual part of the general subsidy is the necessity to meet the conditions set out in the relevant algorithm. The law on LSGU income specifies in detail what data are the basis of the algorithm. Consequently, the level of a particular part (or amounts) of subsidy is determined on the basis of a mathematical model (on the basis of ex-post data) and is demandable. Therefore, the accuracy of income forecasts from this source is very high.

Significant variation of forecast accuracy and at the same time of the planning quality occurs in the case of income from participation in income tax, other own income and subsidies. In the first case, these differences may arise primarily from discrepancies between the forecasts of macroeconomic indicators taken into account by the central sector and the values of these indicators characteristic for individual counties. Significant underestimation or overestimation when predicting the size of macroeconomic values may affect the quality of budgetary planning.

The basis of the structure and forecast of the income and expenditure for the LSGU budget is constituted by internal regulations in addition to the existing legislation, including the resolution of county councils (municipalities, provincial parliament) concerning the adoption of the multi-annual financial forecast for a given unit and he assumptions of the draft state budget for a given year adopted by the Council of Ministers, where basic macroeconomic indicators are determined. [13, 14]

The subject of the comparison of basic macroeconomic indicators was GDP indicator, price growth index and the unemployment rate. The analysis covered the effective planning of total income for the state budget taking into account the proceeds due to PIT and CIT. The author has decided to examine the forecast accuracy indicator for the subsidies awarded to the counties from the state budget due to implementation of the government administration tasks and other tasks delegated to LSGU. Forecast accuracy determines the quality of planning individual components of the budget-related income. The results of the studies are presented in the table below.

Table 1. MAPE of macroeconomic indicators and state budget, %. Source: Own elaboration.

	GDP	Price growth index	Un-empl. rate	State budget income	CIT	PIT	Subsidies	PIT & CIT
2007	34.3	24.0	25.9	3.1	10.1	10.6	7.0	10.4
2008	35.7	45.2	4.2	11.2	0.0	6.5	9.7	3.8
2009	78.6	17.1	33.1	10.5	0.6	4.0	8.0	2.6
2010	66.7	61.5	3.2	0.5	20.8	1.4	7.1	8.8
2011	30.0	46.5	20.8	1.6	0.2	0.3	6.9	0.1
2012	150.0	24.3	25.4	2.1	5.9	1.1	27.9	3.0
2013	107.1	200.0	7.5	7.2	4.7	0.9	8.7	2.3
2014	24.2	240.0	20.0	2.0	0.1	1.6	3.1	1.0
2015	0.0	-355.6	25.8	2.8	0.8	0.0	2.1	0.3
2016	40.7	-383.3	18.1	0.3	1.2	2.8	10.7	2.2

The results of the analysis show systematic and random errors made in the process of planning the state budget. The most serious errors were made when planning the GDP and inflation rate. For these indicators, it is difficult to talk about errors, the presented forecasts were simply completely inaccurate. This can be seen especially well in 2012-2013 (as regards GDP) and in 2013-2016 (as for inflation). In 2015 only the GDP forecast was 100% accurate (see table 1).

Numerous variations in the accuracy of macroeconomic indicator forecasts show that during the last few years, budget planning required extreme caution. The turbulence on the financial markets has resulted e.g. in violent disturbances in the public finance. In such a situation, the process in planning fiscal aggregates is extremely difficult and complex.

Table 2. MAPE of counties income forecast and forecast accuracy (TFA), %. Source: Own elaboration.

	Total income		Own income		Participation in Pit & Cit		Subsidies	
	MAPE	TFA	MAPE	TFA	MAPE	TFA	MAPE	TFA
2007	9.1	90.9	15.4	84.6	8.9	91.1	14.4	85.6
2008	12.6	87.4	18.3	81.7	10.4	89.6	26.7	73.3
2009	6.7	93.3	23.9	76.1	10.3	89.7	22.0	78.0
2010	11.5	88.5	26.8	73.2	3.0	97.0	21.6	78.4
2011	11.8	88.2	8.7	91.3	5.0	95.0	26.8	73.2
2012	6.0	94.0	10.7	89.3	4.6	95.4	15.7	84.3
2013	5.0	95.0	11.5	88.5	4.8	95.2	12.4	87.6
2014	5.1	94.9	10.3	89.7	0.9	99.1	13.0	87.0
2015	5.1	94.9	12.1	87.9	2.3	97.7	9.0	91.0
2016	6.1	93.9	7.8	92.2	4.0	96.0	15.9	84.1

The financing system of county-level LSGU is based on the subsidies, subsidies from the state budget and own income. The accuracy of income forecasts for respective counties of Lower Silesian province is varied. In all investigated counties, both the phenomenon of income overestimation and underestimation was present. The essential differences between implementation and plans occurred mainly in total income, including: subsidies, own income and income from participation in income tax. The investigation enabled its author to observe the improved quality of income planning in rural counties of Lower Silesian province. A difference between the indicators (MAPE and TFA) is noticeable in the period 2007-2011 and 2012-2016 (see table 2).

Table 3. Forecast estimation indicator (MPE) in relation to implementation of counties income. Source: Own elaboration.

	Total income	Own income	Participation in Pit & Cit	Subsidies	General subsidies
2007	4.7	2.2	8.9	12.8	2.6
2008	5.8	-1.1	10.4	21.2	3.4
2009	-1.6	-20.9	-9.4	14.6	1.5
2010	1.2	-22.1	-1.1	15.5	2.8
2011	7.0	-1.4	3.9	14.5	1.8
2012	1.9	-3.4	-2.7	3.7	0.3
2013	0.4	-6.5	-3.3	4.5	1.5
2014	2.4	-1.3	-0.4	7.1	0.7
2015	-1.7	-4.6	0.3	-2.9	0.5
2016	1.6	2.5	0.2	1.7	1.3

As indicated above, the significant differences in the accuracy of rural county forecasts occurred in their total income. This was mainly due to changes in own income and the size of income received due to subsidies. Diversification in the sources of income may have a positive impact on the growth of effectiveness in planning their total budget income. This is reflected by the situation that occurred in 2009 or 2010, when the lower than planned own income was accompanied by the use of the subsidies that were higher than expected. Finally, the effectiveness of total income forecasts for LSGU increased as compared to previous years.

MAPE indicator for counties of Lower Silesian province in 2007 was 9%, in 2008 it reached the maximum value of 12.6%. This means that in 2008 the implementation of income differed from the forecasts by 12.6%. From 2012 significant improvement of this indicator (approx. 5-6%) is visible. In the last year of the investigation its value increased to 6.1%, but still it is substantially lower than in 2007-2011. In other words, forecast accuracy in the years 2012-2016 has been improved and on average it was 94.6% (2007-2011 – 89.6% on average). This means that during the functioning of MAFF, forecasts differed from the actual values by 5.4% on average. On the basis of Fig.1. the improvement of data distribution for the investigated feature can be observed. The values of estimation indicator in individual years are varied, but a small decreasing trend for the investigated indicator is noticeable. A decrease in the number of counties with underestimation or overestimation of total income exceeding 10% can be found.

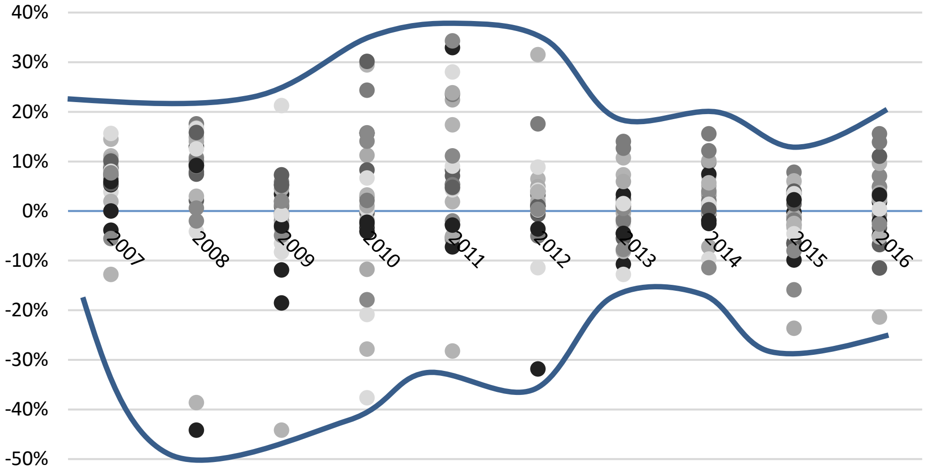

Fig. 1. The values of estimation indicator of total income in individual counties of Lower Silesian province, 2007-2016.

Significant deviations of the forecast from the income actually implemented occurred in terms of targeted subsidies. Taking into account the arbitrary nature of granting the subsidies from the state budget, in principle, this seems to be understandable. The targeted subsidy is used for the purpose of implementing the tasks carried out by county services, inspections and guards. Counties may obtain targeted subsidies for financing their own current and financial tasks (e.g. in the area of social assistance). Among the subsidy-related income, the following grants should also be mentioned: subsidies to implement the tasks performed by way of contracts and agreements between LSGU and external subsidies and funds to finance the expenditure and execution of financial tasks with the participation of EU funds. The highest share among the so-called subsidy income is covered by targeted subsidies for commissioned tasks and financing own tasks. When examining the share of these subsidies in the total budgets in LSGU, the highest one appears to occur in rural counties. [8]

The information on the final amounts of subsidies from the state budget is provided to local self-governments after the adoption and announcement of the budget act for a given year. Taking into account the lasting nature of the tasks commissioned to counties by central administration, it appears that the level of income derived from this source should be reasonably stable in subsequent years. Nothing could be further from the truth. Research indicates that the accuracy of income forecasts for the subsidy-related income of rural counties is very diverse. In 2007, the value of mean forecast error was 14.4%, in subsequent years it increased only to reach 26% in 2011. Since 2012 onwards the quality of subsidy income forecasts for rural counties of Lower Silesia province has improved. In 2012 the value of MAPE was at the level of 15.7%, in 2015 it declined to 8.9%. In the last year of the investigation it rose again to 15.9%.

As regards the income coming from subsidies, a trend to underestimate forecasts is noticeable (see table 3). To a large extent this is due to the numerous changes in the state budget during its implementation. The main factors affecting the final amounts of the subsidies include e.g.: resignation or repayment of unused funds, savings or allocation of reserves. Any additional funds in the budget give room for the possibility of increasing the amount of granted subsidies. This trend is particularly noticeable in 2007-2011 and in 2014 - 2016. After 2011 the level of underestimation of income coming from subsidies decreased considerably. This trend was accompanied by the increase in the number of counties with overestimation of subsidy-related income forecasts. These changes resulted from a substantial decrease in total subsidies in relation to the previous year for all counties (in 2012 by 17.8%, and in 2015 by 7.6 %.).

Optimistic assumptions about the planned income were made in terms of the county’s own income. This phenomenon is particularly visible in 2007-2010. The changes in PIT had a major impact on the quality of own income forecasts in 2008-2010. These changes pertained to e.g. the “unfreezing” of tax thresholds or replacing a three-point PIT scale with a new one having two reduced rates. As for the quality of income planning based on CIT, the impact of the economic crisis on the increased instability of this source of income is of particular importance. Since 2011, MAPE indicator has improved and has not exceeded 5% for the entire period of investigation. Generally, the income from participation in income taxes, especially in CIT, is considered to be most unstable. Although, as for rural (and municipal) counties, such income is considered more stable (in relation to others) and more important in terms of profitability (than in the case of municipalities). [3]

4 Conclusion

The analysis of data from 2007-2016 indicates a discrepancy between the level of errors for expected macroeconomic indicators and the quality of planned income of the state budget. The studies have shown the lower quality of state budget income planning in the first period of investigation (with qualitatively better planning of macroeconomic indicators). In the second period of investigation, despite the huge errors in planning the indicators, the quality of income is planning improved. It should be noted that since 2011 in the "state budget" a multi-annual financial plan has been applied. The exception are the years in which fundamental changes were introduced in personal income tax. Despite this discrepancy, a trend to transfer errors in macroeconomic indicator forecasts to state budget income forecasts is noticeable. Another explanation of this discrepancy is the time delay regarding the effects of better/worse economic conditions for the budget income.

The quality of state budget income forecasts affected the quality of planning the counties' income. In 2007-2011 the quality of planning the counties' income was characterized by a substantially larger error than in 2012-2016. As regards the subsidies and general subsidies for the analyzed counties throughout the entire period of investigation, the planned values were underestimated. It can be concluded that there was the so-called pessimistic forecasting. Since 2012, a significant improvement has been noticed in relation to the quality of planning, especially with regard to the subsidy-related income. Optimistic forecasting, i.e. overestimation, is occurred when planning own income (see table 3).

The study has shown that in the period of the MAFF operation, the accuracy of forecasts in the respective rural counties of Lower Silesian province improved. This is reflected in the mean forecast error indicator that had significantly better results in 2012-2016 than in 2007-2011. The estimated values of income were still erroneous, but on the basis of estimation indicator a considerable improvement of its parameters can be noticed. Local self-government units, when preparing MAFF, plan their income, and consequently the public expenditure, more carefully. Perhaps this should be attributable only to a desire to meet such statutory requirements as the limitation of the amount of debt repayment so as not to be contested by the Regional Chamber of Auditors. Yet, it seems to be an unquestionable thing that the level of planning quality (and thus the forecast accuracy) in the period of the MAFF operation improved significantly. This can be seen with regard to planning the total income, primarily including own income, participation in central taxes and income from subsidies.

The improvement of the investigated parameters is indirectly affected also by other elements: improvement of planning quality for macro-economic indicators, changes in the law, the economic situation in the country or the introduction of innovative management methods (e.g. task-oriented budget). In a given period of time, in addition to introducing MAFF, self-government units were not obliged to implement other forms/methods of budget planning. The theory saying that the redundancy of legal regulations present for many years and their ambiguity or different types of problems associated with the practicability of planning suddenly forced the authorities of rural counties in Lower Silesian province to increase the detailedness regarding verification of the planned budget income is also questionable. On this basis, it can be concluded that the performance of the multi-annual financial forecast affected the quality of income planning for rural counties of the Lower Silesian province in a positive manner. Thus, the hypothesis made by the author was rejected. However, the author does not risk a generalization of a positive impact of MAFF on the quality of planning in all LSGU. A more extensive investigation covering essentially all sub-sectors of local self-government units is necessary.

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The Blue Ocean Strategy in the Context of Management and Development of the Number of Jobs

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Abstract. Currently, the main goal of a company is to be more successful than competition and to gain a higher profit. One of the options for companies is the use of the Blue Ocean Strategy, i.e. to create your own market space. The aim of this contribution is to highlight the Blue Ocean Strategy in the context of management and development of the number of jobs.

In the second part of the contribution we will focus on the relationship and the impact of the Blue Ocean Strategy on managerial functions. We will deal more closely with the planning and human resources functions that are affected by the strategy. For the planning function we will point out mainly to a plan, a component of marketing. In human resources we will draw attention to creative thinking when creating new markets. In the following part we will break down the confidence of the economic assortment indicators and the development of the number of jobs within the Slovak Republic

In the contribution through secondary statistics and regression analysis and Pearson correlation, I will evaluate the impact of the business environment, i.e., External and internal conditions to develop the number of vacancies. I contribute to the changes that have occurred in the managerial positions and their impact on the business environment on the trend of production automation and global job cuts.

Keywords: Blue Ocean Strategy, Number of Jobs, Management.

1 The Blue Ocean Strategy in the context of business management

The Blue Ocean Strategy was defined by W.Chan Kim and Renée Mauborgne, who characterised the differences between the blue and the red ocean. [12] The existing industries and certain boundaries of competitors are specific for the red ocean. In presence, the competition in a market space is oversaturated. The Blue Ocean Strategy is defined by creating new, i.e. non-existing industries; new market space and many opportunities for a business growth are created in the blue ocean.

Table 1. The differences between the Blue and the Red Ocean [9]

Red Ocean	**Blue Ocean**
Competition in existing market space	Creation of new market space
Competitive environment – beating the competition	Irrelevance of competition
Exploiting existing demand	Creating and capturing new demand
Compliance: value / cost	Non-compliance: value / cost
Align the whole system: employers' activities, strategic choice of differentiation or low cost.	Align the whole system: the consistency of employers' activities in pursuit of differentiation or low cost.

The term strategy has its origin in the military. In the 20th century complicated external influences and dynamic changes occurred, penetrating into the company and relating to the term strategy. W.Chan Kim and Renée Mauborgne defined the Blue Ocean Strategy, analysed their research in 30 various industries based on 150 strategic goals in the period from 1880 to 2000. [12]

According to [7] the test a new generation of strategic management theories to discover the most appropriate qualitative factors Multiple regression analysis has shown that the set of all researched independent and moderating variables is strongly correlated with a startup success and can predict e-business successful performance in more than 80% of the cases. [1] proposes that blue oceans can be created via radical innovation, disruptive innovation, frugal innovation, and purely differentiation strategy and focused differentiation strategy rather than only value innovation. We, thus extend the boundaries of sources of blue oceans.

Research into [5; 17; 3] new dimensions of performance and value have been introduced. The lesson learned from this survey is that certain strategies based on the fulfillment of established or overlooked customer needs provide greater market appraisal.

[13] It presents paths to a formulating strategy focused on innovation and approaches to value. It also introduces the main barriers to an enterprise's innovative activities and their types.

Businesses apply strategies in their life cycle at the time of stagnation or bankruptcy. Following the global economic crisis the companies are making greater use of the Blue Ocean Strategy. The use of the strategy influences managerial functions to a large extent. Basic managerial functions include planning, organising, human resources, management and control.

Planning is a basic managerial function; it determines the future goals of the company and its paths. Proposals, solutions, systems of plans are the result of the planning activity. Planning is a formal approach to setting up the company's goals.

Planning is one of the managerial functions characterised by its importance. None of the theoreticians in the management field in defining managerial functions missed the planning function. In the sense of Waterman R. H. the best companies consider the planning process more important than the plans themselves for generating new information, problems, critical parts etc. [18] Unless sufficient space is created for strategic planning, new thoughts and ideas in the planning process can be reduced.

Planning is the most important managerial function, for each decade of a period the function has different effective methods used in strategic management. The Blue Ocean Strategy is one of the methods of higher significance after the year 2008, i.e. the period of the commencement of the economic crisis.

Based on the content-subject component of a plan of a company the plans can be broken down by the following functional areas:[4]

- marketing;
- production and material needs;
- investment projects;
- human resources;
- financial plans.

According to [22] We build on contingency theory to examine how growing turbulence may have impacted three aspects of strategic planner jobs: temporal range, processes, and organizational location. Overall, the study suggests that choosing the right ownership form can have important strategic consequences. This authors [8] examines the extent to which ownership form (i.e., public or private ownership) and ownership structure (including diffused ownership and block holding) affect firm performance. The results of an analysis of 30,525 European Union (EU) firms indicate that form of ownership is an important explanatory factor in the difference in performance among firms.

The second managerial function we will deal with is human resources. Human resources are currently an important source of a company, it is necessary to manage them and create an effective environment for them to be creative.

Human resources management is strategic and holistic approach to management with the most valuable assets of a company, people, who individually and collectively contribute to achieving the organisational goals [2].

The pivotal role of human capital in this relationship :[11] knowledge-based HRM practices impact structural and relational capital partially through human capital, and human capital affects innovation performance by enhancing structural and relational capital. Based on the field of personnel measures and staff-welfare measures the authors [21] identified two polarized ideal types of personnel strategies: a requirements-centered strategy, which is strongly future-oriented and subordinates all other concerns to the implementation of the transformation vision and a caring strategy, which focuses more on the here and now and emphasizes also the fulfillment of staff needs. On the other hands [10] the relationship between board effectiveness and innovation varied by the type of innovation.

For the Blue Ocean Strategy human resources are very fundamental, after 2010 a new paradigm has occurred. A firm is a live organism and is built on people and knowledge. Management occurs based on opportunities, a market of thoughts and ideas and managers of innovations and knowledge prevail.

The Blue Ocean Strategy is built on creating new market space and value innovation, which is influenced by a value for a customer and by costs. The planning and human resources functions are affected by the Blue Ocean Strategy mainly for marketing, the content-subject component of a plan and creation of an effective environment for human resources to have creative ideas.

2 Development of the number of jobs within the Slovak Republic

The development of the number of jobs in the Slovak Republic has been decreasing since the global economic crisis; another factor is the introduction of industry 4.0. At present, some countries are trying to introduce a certain permanent income for their citizens in their projects. Work will have a status of volunteer, i.e. The individual decides whether to work. Salary or wages for work will be for permanent income as extra money. The countries have decided to implement the project because of two trends, namely job cuts (industry 4.0) and a growing number of social spending for countries. The following chart shows the development of the number of vacancies within the Slovak Republic.

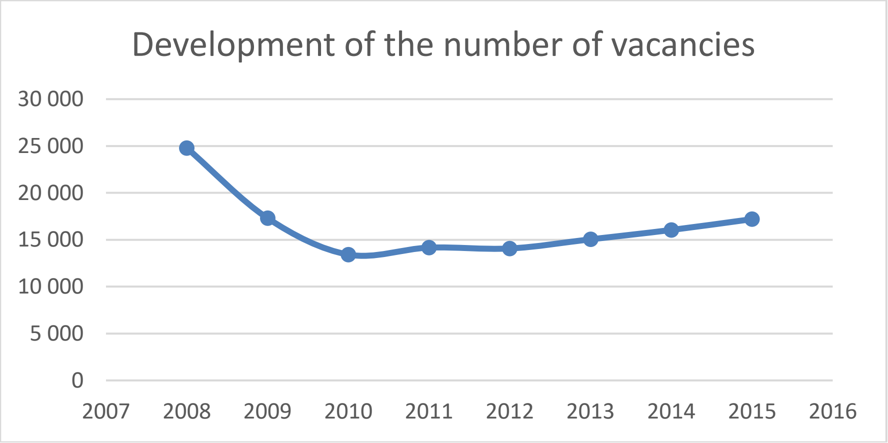

Fig. 1. Development of the number of vacancies [19]

Since 2008, the number of vacancies declined. Graph shows mild stagnation starting from 2010 and from 2012 with a slight increase.

On the other hand, as the number of jobs decreases, it is also important to assess the development of the number of businesses in terms of trust. The following graph, which shows the development of trust of the economic assortment indicators, i.e. industry, construction, retail, consumers, has been processed through macroeconomic statistics.

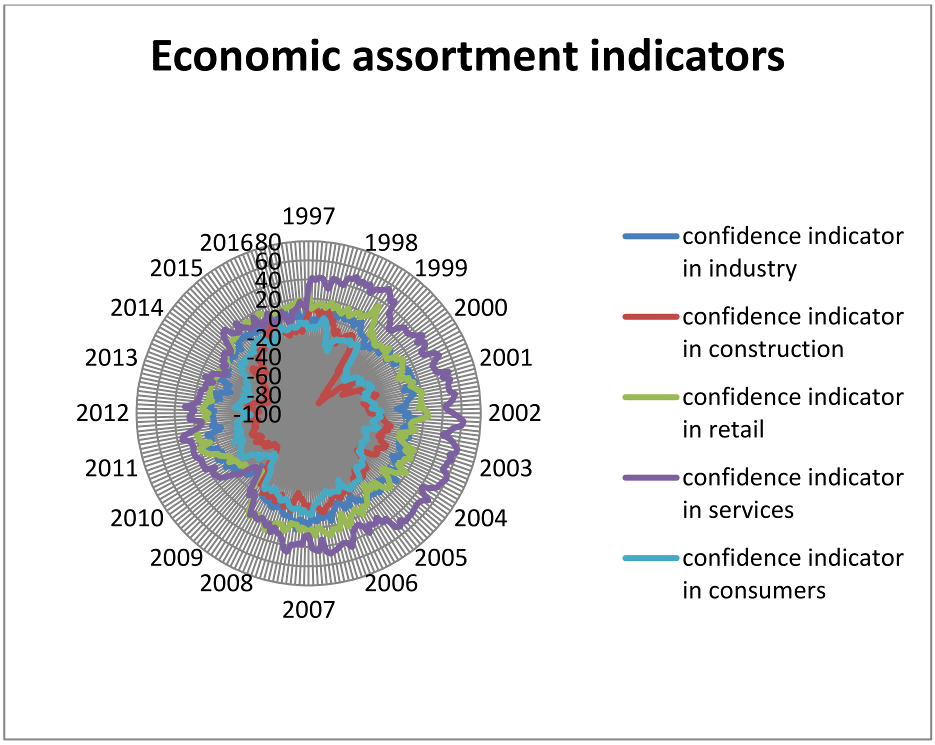

Fig. 2. Economic assortment indicators [19]

The (Fig.2) shows the development period of the economic assortment from 1997 to 2016 in monthly intervals. From 2008 the development of trust in all assortments has decreased, around 2009 and 2010 there was a significant decline, in 2011 and 2012 there was a growing trend and subsequently, the expression of trust has stagnated or fallen. The development in 2016 in the given assortments is almost the same. The global economic crisis caused a drop in employees, an increase in the disappearances of firms, but it also expressed itself in terms of trust in the given economic segments. It is interesting to watch the changes in terms of the graph due to the differences. The development since 1997 has had more distinct differences between the economic assortments; the global economic crisis caused a decline. After its outbreak and implementation of new solutions the expression of trust in the economic assortments was different, but after 2013 the trust has started to express identical in terms of values in the given assortments, or there has been a slight difference. Based on the given development of the graph it is important to note that evaluation and identification of changes caused by the global economic crisis is effective to be investigated after some time.

3 Discussion

Businesses are also effectively investigated from the point of view of management. Through regression statistics, I will compare the external and internal conditions that the Business Alliance of Slovakia [6] has identified in the inter-quarter development as important for the impact of the business environment.

In terms of external conditions, it has determined: state economic policy, bureaucracy, level of corruption in offices, price stability, access to financial resources, financial discipline of business partners and others. In the internal conditions, she defined: fulfilment of vision and business intentions, productivity, performance, human resources management, liquidity, employment, environmental relations, information openness and others.

Table 2. Regression statistics of external and internal conditions in the business environment

RESULT								
Regression statistics								
R2	0.910899635							
Value of reliability R	**0.829738146**							
Setting reliability R	0.80136117							
Mean value error	8.204953733							
Observation	8							
ANOVA								
	df	SS	MS	F	Significance of F			
Regression	1	1968.462843	1968.463	29.2398371	0.001652324			
Residues	6	403.9275945	67.32127					
Total	7	2372.390438						
	Coefficients	Mean value error	t Stat	Value P	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Limit	399.4881644	59.91539028	6.667538	0.00055075	252.8804862	546.0958427	252.880486	546.095843
The file X 1	-1.232097872	0.227854565	-5.40739	0.00165232	-1.789637905	-0.67455784	-1.7896379	-0.67455784

On the basis of regression statistics of internal and external data on the impact of the business environment, the confidence value is 82.976%. The model is statistically appropriate based on significance F whose value is less than $\alpha = 0.05$ i.e. the statistical units represent the scale value $n = 8$.

The regression analysis is shown in the following graph, which expresses the statistical dependence between external and internal conditions.

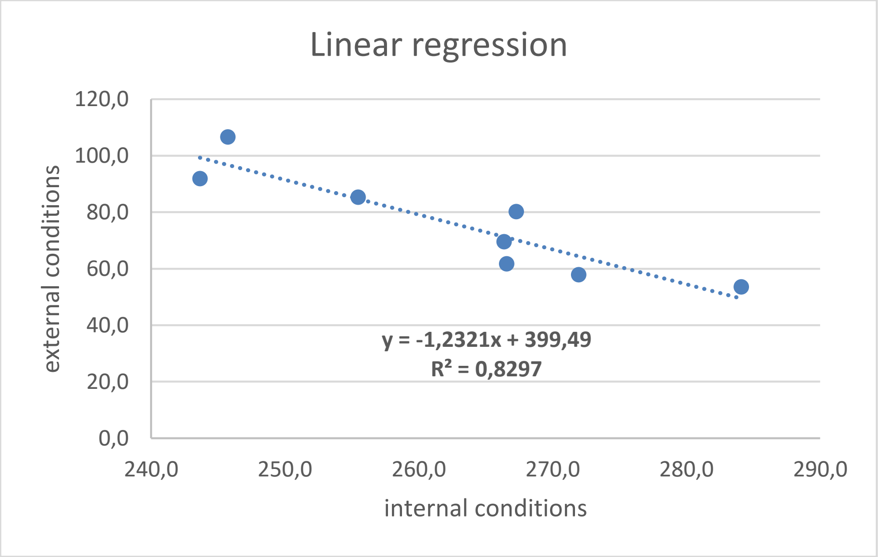

Fig. 3. Regression analysis - external and internal conditions [6]

The graph shows the relationship of regression analysis:

$$y_i = f\ (x_i) + \epsilon_i \tag{1}$$

Legend: y_i, x_i - character values,

ϵ_i- residual component,

f- regression function.

The regression analysis of the dependence of the inner and outer conditions has a linear negative shape.

Through Pearson's correlation I will examine the linear relationship between job vacancies and external conditions affecting the development of the business environment.

Table 3. Calculation of Pearson Correlation-vacancies and external conditions

Double-breasted pair t-test at the mean value

	vacancies	**external conditions**
Mean value	16507.625	75.8824042
dispersion	13303321.13	338.9129197
Observation	8	8
Pears. correlation	0.548748518	
Hyp. Difference of mean value	0	
difference	7	
t Stat	12.77759854	
P(T<=t) (1)	2.08379E-06	
t crit (1)	1.894578604	
P(T<=t) (2)	4.16758E-06	
t crit (2)	2.364624251	

Source: [6; 19]

Pearson Correlation Calculation:

$$r = \frac{\sum x_{i y_i} - \frac{\sum x_i \sum y_i}{n}}{\sqrt{(\sum x_i^2 - \frac{(\sum x_{i)^2}}{n})}\sqrt{(\sum y_i^2 - \frac{(\sum y_{i)^2}}{n})}} \qquad (2)$$

The evaluation of Pearson correlation is as follows:
0 <| r | ≤0.3 - weak dependence,
0.3 <| r | ≤0.8 - mild to moderate dependence,
0.8 <| r | ≤1 - strong dependence.
The Pearson correlation value is 0.548748518, representing a mean dependency.

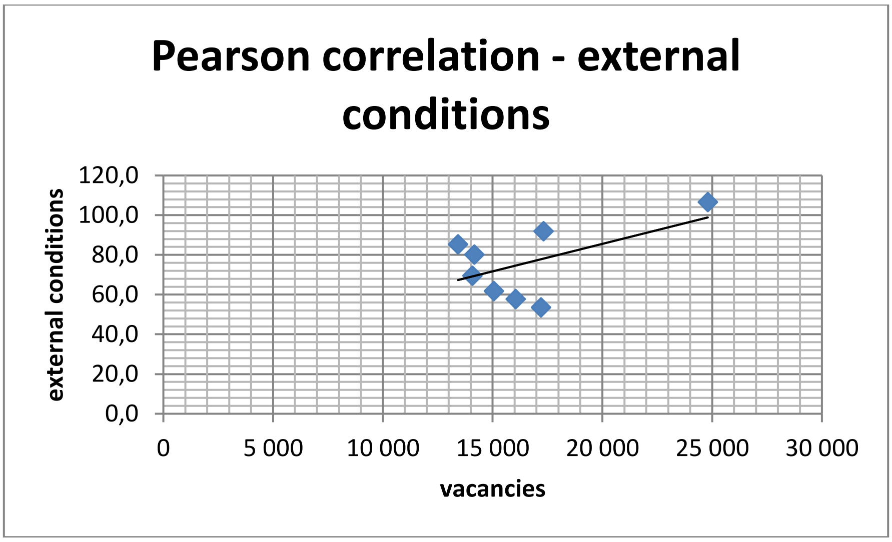

Fig. 4. Pearson correlation - external conditions

The graph shows a Pearson correlation that has a positive linear dependence.
On the other hand, we will examine the dependence between the number of workplaces and the internal conditions that affect the business environment.

Table 4. Calculation of Pearson correlation-vacancies and internal conditions

Double-breasted pair t-test at the mean value

	vacancies	**internal conditions**
Mean value	16507.625	262.6461482
dispersion	13303321.13	185.2417038
Observation	8	8
Pears. correlation	-0.427610287	
Hyp. Difference of mean value	0	
difference	7	
t Stat	12.57735196	
P(T<=t) (1)	2.31788E-06	
t crit (1)	1.894578604	
P(T<=t) (2)	4.63576E-06	
t crit (2)	2.364624251	

The Pearson correlation value is -0.427610287, which represents the mean dependence.

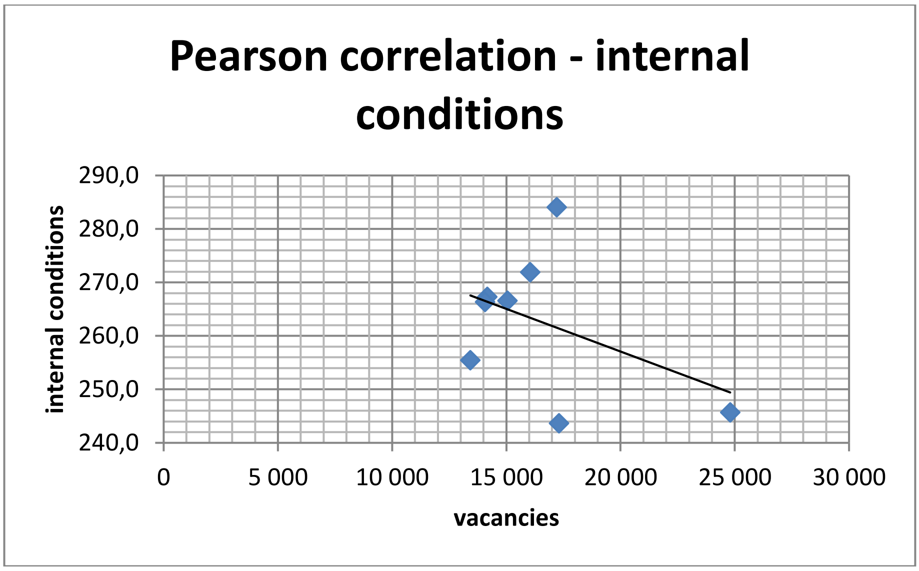

Fig.5. Pearson correlation - internal conditions

The development of the Pearson correlation for internal conditions has a negative linear evolution. On the other hand, there is a higher range of values than the Pearson correlation of external conditions.

4 Summary

At the moment with the onset of automated production, the number of jobs in a global character will have a decreasing trend. In my contribution I drew attention to the use of the Blue Ocean strategy in the context of business management. Subsequently, through statistical methods, namely regression analysis and Pearson correlation, I have evaluated from external statistical data the external and internal conditions that affect the working environment and the number of jobs in the Slovak Republic.

At present, businesses should focus on:

- business environment assessment,
  - external conditions that have a greater impact on the number of vacancies,
  - internal conditions that are characterized by lower efficiency,
- changes that occur in management methods and techniques in the context of enterprise development,
  - the number of vacancies (industry 4.0),
  - the Blue Ocean Strategy within Managerial planning and Human Resources

Business confidence indicators have also been taken into account in the economic assortment. In the number of vacancies for external conditions, the comparison was evaluated as the mean dependence of positive linear development. From this result, I conclude that external conditions are to a large extent significant for the impact of the business environment whose development from the global economic crisis is inefficient. Although the external factor has a considerable impact on business management and its changes, which occur with turbulent times and extremes, The crises that have been and will be under development. In my contribution, I concentrated on the blue ocean strategy from a management point of view, namely the impact on planning and human resources.

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Mechanism of Human Resource Management Practice Influencing Corporate Green Innovation Behavior – an Empirical Research Based on Manufacturing Enterprises

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Abstract. With the intensification of global warming and ecological deterioration and other environmental problems, green innovation has become an important issue of manufacturing enterprises´ management. Human resources management practice is an important support and protection to carry out green innovation activities for enterprises. This paper uses a variety of methods such as questionnaire survey, multivariate regression model to do empirical research on the mechanism of human resource management influencing corporate green innovation behavior. The results show: human resource management practices significant positively impact corporate green innovation behavior, based on mediating effect of organizational commitment of employees. In the research on five dimensions of human resource management, three hypothesized relationships verified, namely training, compensation and employee involvement. While hypothesized relationships of recruitment and performance has not been empirically supported. According to the results of the survey, we put forward some suggestions to promote the implementation of corporate green innovation behavior.

Keywords: Human Resource Management, Green Innovation Behavior, Multiple Regression.

1 Introduction

With the rapid growth of the global economy, the depletion of natural resources, the deterioration of the environment, the global green movement is on the rise since the 1990s.Manufacturing industry, as a pillar industry of the national economy in China's rapid economic development, has played a pivotal role. But the development model of rapid expansion has led to the rapid growth of resource consumption and pollutant emissions rising [13]. In order to deal with the problems of manufacturing industry, the enterprises must transform their operation system and take some green innovation. Green innovation refers to innovative activities that bring together new or improved ideas, products, processes, technologies and systems in economic activities to avoid or reduce the adverse impact on the environment, so that economic, environmental and social benefits are harmonized [4].

As the first resource, human resources are an important factor in the supply of innovation. The essence of innovation driven is the driving of talent. And green innovation-oriented human resource management practice is an important support and protection to promote enterprises carry out green innovation activities and enhance the green innovation performance. Therefore, it is helpful to promote the development of green innovation activities of manufacturing enterprises in China and promote the improvement of green innovation performance by exploring the green innovation-driven human resources management practice mechanism of manufacturing enterprises and developing reasonable human resource management plan and counter measures. At present, the research on green innovation behavior of manufacturing enterprises is still a frontier issue both at home and abroad. It mainly focuses on the research of green innovation performance in manufacturing industry. Such as the study on green innovation performance and differences of Chinese manufacturing enterprises [15], or the research on the impact of forward - looking environmental strategy on enterprise green innovation performance [5]. Many researchers the green innovation behavior from the perspective of green supply chain management [14, 11]. There is little literature about the green innovation performance of manufacturing enterprises from the perspective of human resource management practice. Therefore, this paper uses a variety of methods such as questionnaire survey, multivariate regression model to do empirical research on the mechanism of human resource management influencing corporate green innovation behavior. It is of great theoretical and practical significance to discuss the implementation strategy of green human resource management and to create green atmosphere, protect the environment, enhance the green innovation performance and promote the sustainable development of enterprises.

2 Literature overview and Theoretical Hypothesis

2.1 The Impact of HRM Practice on Green Innovative Behavior

The human resource management of this research refers to human resource management practice recruitment, training, performance management, compensation administration, employee involvement [2]. Modern human capital theory holds that human capital is also corporate capital just same as material capital. People are the core capital of enterprises. The use and management of people can promote the success of corporate strategy. Enterprises in the recruitment process must pay attention to the candidate's green awareness, green ability and consciously obey the green rules of the enterprise. In the training of human resources management, the company should conduct the targeted training for employees, increase the content of green production and operations. Training methods with green innovation will guide the green thinking and behavior of employees. In the compensation administration, enterprises can increase salaries for employees’ special green behavior. It may be non-monetary nature of the reward, which can inspire employees to practice green production behavior. In the performance evaluation, enterprises should focus on the green innovation behavior of individual employees. It will also stimulate the green behavior of employees. Creating and maintaining a pro-friendly working environment can encourage employees to create the greatest green innovation for their business. It is helpful to improve the green innovation that encourage employees to participate more strategic decision-making, and provide employees more participation. Therefore, this study suggest that it is not a single human resources management or a few modules, but the overall human resources management play an important role for the green innovation of enterprises. We therefore hypothesize as follows:

Hypothesis1: Human resource management practice has a significant positive impact on green innovation behavior

2.2 The Influence of HRM Practice on Organizational Identity

Human resources management is the link between the organization and the staff. Organization provide staffs job training, increase the job skills, get paid, promotion and achieve career goals through human resource management. So good human resources management can improve the organizational identity of the staff. Employees and organizations have a common green value of the pursuit by the management of employees, and ultimately get a deep sense of organizational identity. Thus, we posit the following:

Hypothesis2: Human resource management practice has a significant positive impact on organizational identity.

Hypothesis2a: Recruitment has a significant positive impact on organizational identity.

Hypothesis2b: Training has a significant positive impact on organizational identity.

Hypothesis2c: Payment has a significant positive impact on organizational identity.

Hypothesis2d: Employee participation has a significant positive impact on organizational identity.

2.3 The Influence of Organizational Identity on Green Innovative Behavior

American scholar Westbrook argues that individual’s change in behavior is a process in which there are three stages: "knowledge", "emotion", "behavior" [10]. Cognition is the first variable of emotion, that is, the individual will nurse some feeling which is associated with external things and stimuli, and then individuals will do something about it. The stronger the organizational identity of the employees in the enterprise, the easier it is to recognize the values of the organization, the easier it is to be consistent with the organization in terms of speech and action, and to promote the maximization of organizational functions. When employees are committed to the green values, policies, institutions and practices of the business, employees will consciously engage in the work. Employees will take the initiative in the work of environmental awareness, environmental protection and environmental participation in the combination, thereby enhancing the enterprise's green innovation.

Consequently, we hypothesize as follows: Hypothesis3: Organizational identity has a significant impact on green innovation behavior.

2.4 Mediation role of organizational identification

The results of the study on the role of human resources management, mainly concentrated in the field of environmental protection. In the study of corporate green behavior as an explanatory variable, the representative research is about the impact mechanism of green cognition and green emotion on green behavior in retail enterprises. The authors of this study are He Aizhong and Du Jing [3]. They use the structural equation model and other methods to verify their conclusions. This study validated that green cognition and green sentiment of retail enterprises have a significant positive impact on green behavior, and retail enterprises' green emotions play a part of mediating role in the positive effect of green cognition on green behavior. Employees are the object of human resource management practice and the impact of green cognition. Green behavior that was caused by green emotion is an employee role outside the behavior. But just as organization identity, green behavior is also recognized from the employees’ heart. So, employees will work hard so that enterprises can achieve green innovation. Thus, we propose the following hypothesis:

Hypothesis 4: Human resource management practice through the organization of positive sense of the positive impact of green business innovation.

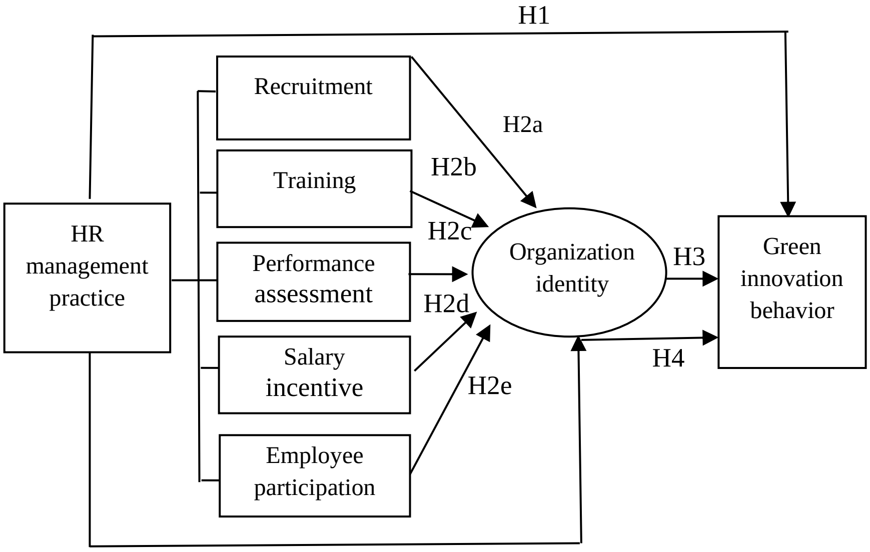

Fig. 1. The conceptual framework and research hypotheses

3 Methods and results

3.1 Data collection and samples

Data for this study were collected through a survey on the practice of human resources management and staff organizational identity. The research object of this study is manufacturing enterprises which had at least 10 years of operation period and had employees below 100 people. Because we use the matching questionnaire to collect the data, respondents were employees and senior managers. The questionnaire was revised on the original maturity scale.

We handed out 45 questionnaires to manufacturing enterprises. In order to avoid homology, the questionnaire survey was conducted by multivariate regression model. A total of 225 employees and 45 senior managers participated. After deleting unmatched data across the two surveys, our final sample include 157 A questionnaires and 42 B questionnaires. We used the Spss19.0 to test the reliability. The result shows that the overall Cronbach's ɑ coefficient of the scale is 0.82(>critical value0.7).This means the questionnaire has a better reliability. In terms of validity test, the scale adopted in this study is based on a large number of research results summed up and modified, and thus have a better content validity.

3.2 Measures

All the measures of this research are based on the established scales. Questionnaire items were measured on a 5-point Likert scale in which “1” represents “strongly disagree” and “5” represents “strongly agree”. For human resource management, we divided it five dimensions. We used different three items to measure the recruitment, training, salary, performance and employee participation. These items were according to the work of Yang Guang [12]. Based on the research of Judge and Douglas, seven items were adopted to measure the green innovation behavior. From the primary scale validated by Ashforth and Mael [1], we tested the organizational identity using four items. In this study, we set the control variables when we select the research objects, including the nature of the ownership of the enterprise, the number of enterprises, and the operation period of the enterprise.

3.3 Reliability and validity of the model

In the exploratory factor analysis, the total variance explanations were 84.35%, 68.53% and 79.27% respectively, which were required to explain the requirements of human resource management practice, organizational identity and corporate green innovation. In this study, we validate the factor analysis of human resource management practice, organizational identity and green innovation. According to the criterion, the model is better. In the confirmatory analysis of organization identity, $\chi 2$ P is 0.879, which is higher than 0.05, which indicates that the model has high fitting degree, RMSEA is less than 0.05, RMR is less than 0.08, GFI, NFI and CFI are all larger than 0.9, so the model has a high degree of fit. In the confirmatory analysis of green innovation behavior, $\chi 2$ P value is 0.572, more than 0.05, RMSEA is 0.049, less than 0.05, RMR is less than 0.06, GFI, NFI, CFI and so on are larger than 0.9, so the whole model has high fitting degree.

3.4 Results of Regression

We used the multivariate regression to verify hypotheses. Table 1 showed the multivariate regression analysis results step by step. From the Model 1 and Model 2, we can see the model of green innovation behavior R^2 from 0.049 up to 0.747. HRMP overall explanatory force β value is 0.799($p<0.01$). This can explain the vast majority of corporate green innovation behavior. So, the hypothesis 1 is supported. The results of Model3 showed that only training, salary and performance is significantly(β=0.378,0,327 and 0.364,$p<0.01$), which means that hypothesis 2b, hypothesis 2c and hypothesis 2e were supported. The results of Model 4 and Model 5 showed that the organizational identity had significantly positive effect on the green innovation behavior(β=0.729， $p<0.01$).Therefore, hypothesis 3 was supported.

Table 1. Results of Multivariate Regression Analysis.

Variables	Organizational Identity			Green Innovation Behavior	
	Model 1	Model 2	Model 3	Model 4	Model 5
Control Variables					
The nature of the enterprise ownership	-.037	-.039	-.039	.094	.119
The operation period of the enterprise	-.067	-.064	-.064	-.019	.029
The number of enterprises	.143	-.010	-.010	.049	-.037
Explanatory variables					
HRMP Overall	.799**				
Training		.378**			
Salary		.327**			
Performance		.118			
Recruitment		.127			
Employee participation		.364**			
Mediation Variable					
Organizational Identity	-	-	-		.729**
R^2	.049	.747	.667	.217	.646
F	.945	36.795**	14.793**	.925	17.589**

**p<0.01

Then, we also use a hierarchical regression analysis method to test the mediating effect of organizational identity proposed in hypothesis 4. The specific regression results are shown in Table 2. From the change of R^2, when we add the mediation variables "organizational identity", the regression model became more effective. The introduction of organizational identity makes the overall interpretation of green innovation behavior R^2 rose from 0.747 to 0.836($p<0.01$). This means the hypothesis 4 was supported. It is worth noting that in the model 2, when we added the human resource management practice, we found that the green innovation behavior became less significant. So, we verified the hypothesis 1 again.

Table 2. Mediation Regression Model of Organizational Identity.

Variables	Green Innovation Behavior		
	Model 1	Model 2	Model 3
Control Variables			
The nature of the enterprise ownership	.069	.089	.094
The operation period of the enterprise	-.021	-.017	-.018
The number of enterprises	.047	-.079	-.091

Explanatory variables			
HRMP Overall		.799**	.703**
Mediation Variable			
Organizational Identity			.284**
R^2	.049	.747	.836
F	.945	36.795**	39.853**

**p<0.01

4 Discussion

Our results have important implications for manufacturing enterprises. Enterprises need to combine their own practical implementation of the green innovation to enhance the human resources management strategy. In the era of low-carbon economy, enterprises should convey the green, environmental protection, low-carbon, energy-saving concept to employees. Enterprises can achieve the entire enterprise green strategy driven by the green concept of all employees. Next, our finding is that green training and green salaries of enterprises have a significant impact on green innovation, so focusing on greening in training and compensation can improve green innovation. Enterprises should strengthen green environmental training and build a compensation system that includes incentives for green innovation. In the training content, enterprises need to train their employees in environmental policy, environmental performance, environmental management and environmental knowledge. In terms of compensation, enterprises should give green compensation and recognition to the employee who have a green behavior. Furthermore, our results suggest that improving the participation of employees and their organizational identity can help improve the green innovation behavior. The object of green human resource management is employees. So, it is helpful that improving the organizational identity of employees and increasing the chance of employees' participation to promote the improvement of green innovation. Another implication is that enterprises should not ignore the recruitment and performance which did not been verified in the regression analysis. Because recruitment is one of a channel for employees to enter the enterprise, green recruitment can identify and access to environmentally friendly employees, thereby enhancing the green business innovation. The combination between performance and salary can also improve the green innovation behavior of enterprises.

As in most research, our studies have limitations. First, enterprise green innovation is a more complex research variable, we cannot measure all items. Second, In the selection of samples, because of limited to the ability to investigate, we maybe miss an important representative of the enterprise, the study sample selection is not a full-scale. We call for future research to study the establishment of green innovation index system and the selection of intermediary variables. Future research seeking to study whether human resources management can improve the green innovation and how to improve the green innovation behavior by some mechanism.

5 Conclusion

This paper uses a variety of methods such as questionnaire survey, multivariate regression model to do empirical research on the mechanism of human resource management influencing corporate green innovation behavior. Our results show that the background information of the enterprise as the control variables is not related to the organizational identity of the employees and the green innovation behavior. Furthermore, our research also aims to significant positive correlation between human resource management practice and organizational identity. But only training, salary and employee participation have a significant positive impact on the employee's identity. Others assumptions did not been validated. Thus, our research enriches the results of the impact mechanism of human resource management on the green innovation of enterprises. We contribute to the research on human resource management as outcome variables and the shortage of empirical research.

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The Difficulties of Launching and Operating CCUS Projects – Evidence from China

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Abstract. Serious environmental problems have resulted in an intense search for technologies to reduce emissions of green gasses in order to stabilize the climate change. CCUS was first proposed by Massachusetts Institute of Technology in 1989 as a way of climate change mitigation [9]. Since then, research on CCUS technologies have been rapidly developing and the International Energy Agency (IEA) has pointed CCUS technology one of the key technologies if we are to limit the temperature increase to 2℃ by 2050 [1]. However, this technology have been initiated and developed in a complex environment; with micro, macro and meso level barriers entangled, resulting making it difficult to full implementation of CCUS. We are focusing on the difficulties faced by the implementation of CCUS projects in China, since understanding more the difficulties will lead to a more optimal policy portfolio in the future for developing such projects.

Keywords: CO2, CCUS Technology, CCUS Pilot Project, Difficulties.

1 Introduction

As the world's largest CO2 emitter, China is facing serious tasks of decarburizing its economic growth. Meanwhile, the emission of non-CO2 greenhouse gases should not be neglected, which is crucial to the realization of the temperature control objective [4]. Since the 11th Five-year Plan (2006-2010) began, the Chinese government has made unprecedented efforts to transform economic the growth model to make it more sustainable, and has moved to a low-carbon growth path. Until the Chinese 13th Five-year Plan (2016-2020), the Chinese government announced that it would reduce carbon intensity by 18% from 2015 levels, and increase non-fossil fuel share of the primary energy mix to 18% by 2020. China also announced that it will try to effectively control carbon emissions from key industries such as power, steel, building materials and chemical industry, and promote low-carbon development in industries, energy, construction of architecture, transportation and other key areas. China will also support and optimize the development regions to first of all achieve the peak of carbon emissions; further implementing various low-carbon pilot projects to build nearly zero carbon emission areas, pilot projects, including projects controlling non-carbon dioxide greenhouse gas emissions. In terms of achievement, by 2014, first of all China's carbon intensity decreased by 33.8% from the 2005 level; secondly, the share of non-fossil fuels in primary energy consumption reached 11.2%; and finally, installed renewable power generation capacity reached about 425 Gigawatt (GW). However, to meet the further targets set by the government in the 13th Five-year Plan (2016-2020), a total energy consumption cap is set at 5 billion tons of standard coal equivalent, requiring any new coal-fired power plants being "ultra-low emissions" and replacing coal in non-power sectors either with electricity or natural gas.

CCUS technologies can become crucial in climate change in the world, especially in big emission countries such as China, USA and India. The Fifth Assessment Report of the International Panel on Climate Change concluded that the costs of decarburization and long-term achievement of limiting global warming to two degrees centigrade without the deployment of CCUS will increase decarburization costs by more than 138%. So far, fossil fuels in China have contributed 85% of the basic energy supply, of which coal contributes 70% of the basic energy supply, and electricity, heat and industrial sectors are dominated by coal. CO2 emissions from electricity generation and heating are account for 50% of China's CO2 emissions, while other industries account for 30% of the rest. The IEA have forecasted that power plants of 430GW capacities need to install CCUS devices by 2040, where 60% of them are coal-fired power plants; moreover, 75% of coal-fired power plants all over the world that need to install CCUS devices are in China. Even as non-fossil fuels and low-carbon energy are deployed rapidly and on a large scale, coal will continue to be a major source of energy for future economic growth in China. Carbon emissions from the using of fossil fuels are unlikely to be effectively constrained by other existing mitigation technologies, so CCUS is the technology closest to becoming commercially viable that has the potential of cutting CO2 emissions by 90% or more frrom large-scale fossil-fuel industries and power plants.

2 The Profile of CCUS in China

2.1 The Basic Information about the CCUS Pilot Project in China

China has carried out CCUS related research and development and pilot built a number of CCUS projects. In capture technology, China has tested a variety of carbon capture technologies and is able to design and build a 1 million-ton CCUS device. There has been several smaller post-combustion CCUS installations with a capacity ranging from 3,000 tons to 120,000 ton.

By 2016, China is operating a total of 13 CCUS pilot projects, funded almost entirely by state-owned enterprises. The last of the pilot projects listed in Table 1 below were launched in 2013, clearly, indicating that the deployment of CCUS pilot projects has come to a complete halt. The detailed information is in the following Table 1.

Table 1. CCUS Pilot Projects in China

	Name of Project	Starting Date	Status in 2016 (tons per year)
1	Research and pilot of CO2 EOR in CNPC Jilin Oilfield	2007	280,000
2	Pilot research in Sinopec Shandong Shengli Oilfield	2010	40,000
3	CCS pilot project in salty water layer of China Shenhua CTL	2011	100,000
4	CO2 EOR project of Sinopec in Zhongyuan Oilfield	2008	100,000
5	CO2 enhanced coal bed gas mining project of CUCBM	2010	1,000
6	China Power Investment Shuang Huai power plant CCS pilot project in Chongqing	2010	10,000
7	Clean coal power systems research facilities in Lianyungang	2011	30,000
8	HUST research and pilot of 35MWt of oxygen-enriched combustion technology	2011	100,000
9	State Grid thermal power plant in Tianjin Beitang	2012	20,000
10	China Huaneng Group Gaobeidian	2008	3,000
11	China Huaneng Group power plant in Shidongkou	2009	120,000
12	China Huaneng Group IGCC in Tianjin	The capture is finished, the storage is delayed	100,000
13	Yanchang Group CCUS pilot project	2013	50,000

2.2 The R&D Investments of CCUS Technologies

In China the government is the driving force behind CCUS, when it comes to reseach and development of CCUS; the government scientific research institutes and universities are the major contributors to participate in this field. Comparatively speaking, there are more funds for basic research, provided by the Ministry of Science and Technology, the Chinese Fund Committee, and through the financial aid of nearly 40 projects from the National Basic Research Plan, the National High Technology Development Plan, the National Science and Technology Support Plan, and so on. The funding is mainly for basic research, but also to certain degree covers technology development, and pilot projects, covering carbon capture, storage, transportation and utilization, as well as the whole process operation. However, it is clear that China domestic CCUS-related projects mainly focus on basic research, and that the CCUS pilot project funding and subsidies are insufficient for such projects to be commercially viable, since capital and running costs are too high.

3 The Difficulties of CCUS Pilot Projects

The main difficulties in the implementation of the CCUS pilot project are as follows: high technology cost, lack of commercial viability, potential environmental risk, insufficient fund support, lack of policy and regulations, and so on.

3.1 Costs and Benefits

For such project is necessary high initial investment. Firstly, the cost of research for large CCUS pilot project is much bigger than for other infrastructure projects. This is due to the complexity of the project and the need for lot of expensive geological research related to finding a secure, long-term leak-free storage location. Secondly, the preparation of feasibility studies is also longer. Finally, a large amount of initial investments to purchase fixed equipment, the upfront investment of project is too high. Given that the lack of finance and capital support and with the high uncertainty of control and the low oil price market environment, the risk of investment for the commercial viability is higher, so the developers are unwilling to carry out the cost feasibility evaluation, even the Prophase project cost and the design research.

Second problem are higher operation costs. High cost, especially the high cost of capture, hinders the development of CCUS project. For example, the use of CCUS technology in power plants consumes more than 25% of energy than ordinary power plants, so investing in CCUS technology is an undoubted high-risk investment for business investors [8]. In addition comes environmental monitoring transportation of CO2 to the location of storage and so on.

3.2 Lack of Demand for the Captured CO2

The basic problem for CCUS is the lack of demand for the CO2 captured. Up to now it has only been when storage of CO2 has been connected to using CO2 as a way to get more oil out of an existing oil field, enhanced oil recovery (EOR) that CCS has been commercially viable. The “classic” example is the Sleipner field in the North Sea. Sleipner started in 1996 and is still operating. In the case of Sleipner the commercial viability was also dependent on a CO2 tax of approximately 50 USD implemented in 1991 by the Norwegian government. In Europe the first wave of pilot projects from 2007 to 2010 could calculate a price of CO2 emissions of 20-30 Euro per ton from the EU emission trading system (ETS). But as the CO2 price started to fall to 10-15 Euro (2009-2011) and the fell to 5-6 Euro per ton and stabilized at that low level *none* of the projects planned by two EU CCS programs were realized as of April 2013.This coincides in time with the halt in the Chinese pilot projects, but there need not be any direct or indirect causation between the EU and Chinese policy. But these project were not EOR projects. With the dramatic fall of the price of oil from August 2014 to January 2015 and no recovery in sight, even EOR projects are not profitable without some subsidies. When it comes to projects using the CO2 captured – not just storing it – so far no commercial viable large products have been found that have a potential demand on the enormous scale needed, so scientific discoveries leading to “disruptive” technologies are needed. Something like cheap, artificial photosynthesis.

3.3 Difficulties to Assess the Economic Benefits of CCUS Pilot Projects

The main contribution of the CCUS project is to ensure a good living environment for human beings by directly slowing climate change or stabilizing climate. The value, the economic cost of global warming climate change is difficult to measure. This problem is highlighted in the exchange of views between such well-known economists as Martin Weitzman and William Nordhaus about Weitzman’s so-called “Dismal Theorem”. The “Dismal Theorem” states that in a situation where there is radical uncertainty, i.e. we do not know the probability of very catastrophic consequences of global warming. This can be modelled as models with “fat tails”. Which in a Cost-Benefit framework points directly to setting a “precautionary price” on CO2. How to set that price, the level, and rate of increase etc. is beyond the scope of this article to discuss, but it is clear that without CO2 getting a price substantially higher than the current price than the EU ETS CCUS will not “take off”. Without such an “internalization” into the costs the inputs the enterprise uses, the enterprise will lack the economic incentive of installing CCUS and as a consequence incentives to support R&D on CCUS, support pilot project installation etc. For example: in recent years along with the global warming and the increase of human social and economic activities, the permafrost in the middle and east of Qinghai Plateau, which is in the transition zone of permafrost to flake succession, is significantly degraded [7]. The popularization and use of CCUS can mitigate climate change and even stabilize climate change, thus protecting the permafrost and ecological environment can produce economic benefits, but the economic benefits are difficult to measure. Just to take one example of very many.

3.4 Policies, laws and regulations of CCUS are not in place

Since 2006, both Chinese central government and local governments have issued a series of policies and regulations to promote the development of CCUS pilot projects, which include also The Special Action on Climate Change in China. In December 2016, China National Development and Reform Commission and the State Bureau of Energy jointly issued The Thirteenth-Five Plan of Coal Industry Development. The document contains a series of policies and regulations showing the determination of the Chinese government to develop and promote CCUS technologies. However, China currently lacks relevant laws and regulations for site selection, construction, operation, environmental risk assessment, and monitoring after the closure of the storage site. Even in more developed United States, when it comes to CCUS, there is still a lack of a complete set of laws and regulations that can be used to clarify jurisdiction of CCUS [1]. For example, to determine the jurisdiction of storage of CO2, it is important to clarify the nature of the storage firstly. Should it be defined as an industrial product, or as a pollutant; if it is defined as an industrial product, the injection project is managed by the existing law of oil and gas; if it is a pollutant, the right of management of CO2 belongs to the scope of environmental regulation. In addition, because of the late development of China's 7 pilot markets for carbon trading, the trading system is far from perfect to put it mildly. There are still large prices fluctuations, high risk, which restrict the proper function of a market price. There is also insufficient liquidity, limited transaction volume in some regions, and so on. Given the current carbon price, companies lack enough incentives to upgrade their emissions-reduction technologies [6]. The key to the establishment of the CCUS legislation and supervision system in China is solving the problem of nature of land and underground rights of CO2 guaranteeing health safety and environment, transferring and protecting intellectual property rights, a well-functioning project approval system and the economic and political incentive system, and so on [3].

3.5 Low Level of Openness and Public Awareness of Project Information

In China, the data of many CCUS project are not accessible for neither the general public nor universities. Scientists cannot conduct the detailed economic and political research needed for learning from the experiences so far and that is an obstacle to the wider up-take of CCUS technology.

At present, CCUS being an emerging technology in the early development stage, the general public knows only the greenhouse effect and its long-term hazards, but there is little knowledge of the deployment of CCUS technology. The lack of knowledge about CCUS in the public will create barriers to the promotion and application of CCUS technologies [2].

3.6 Problems with the Immature Core Technology

In the capture, due to the low technology maturity of capturing before combustion, capturing after combustion and oxygen-enriched burning, it is difficult to determine which technology should be used in large scale operation of CCUS in the future; it is also difficult to determine applicable range, energy consumption, and cost of these technologies, while they have usually different features. Transportation mainly relies on either road transport mainly, railway; pipeline, or ship transportation technology, which also need to be developed [10]. Regarding storage, there is no comprehensive geological survey, no clear storage potential assessment and site selection criteria. There is also a lack of site survey technology and safety monitoring technology. The construction and operation of CCUS involves technology transfer and application, economic benefits, environmental impact, emission reduction benefits and other aspects, and China needs to establish a series of CCUS technology implementation and monitoring standards to ensure the project implementation and technical feasibility in storage, safety and effectiveness [5].

3.7 Inadequate Financial Support

For early pilot projects, additional financial support is needed to build a CCUS pilot project with commercial viability. The support could also take the form of a price (tax) on carbon using the tax-revenues to support CCUS. In China, the CCUS project investment can be summed up in two parts. First one is key project which is supported by the national Government's Scientific Research Fund, where second one is the investment of State-owned enterprises as the mainstay of the project. If the economic contribution of the CCUS pilot project levels is not accepted by government or by enterprise in the long-run, the sustained and reasonable amount of financial investment will not be guaranteed. Before 2020, the IEA expects 100 CCUS projects to be developed with an additional cost of $54 billion, where China and India may develop 21 projects with an additional cost of $7.6 billion. Due to the imperfect incentive policy and uncertain business prospects, the current CCUS pilot project funds in China mainly originate from the plan of national science and technology, the self-financing of the central enterprises, complemented by the financing from the international cooperation projects. So far, the venture capital has been unwilling to invest in CCUS and the CDM financing has also practically stopped completely. All these factors sum up to making the investment difficult consequently to meet the require uptake of CCUS needed for meeting the emission reductions necessary to stay below 2 degrees of global warming of development of CCUS [10].

3.8 Significant Potential Negative Environmental Influence

The large-scale application of CCUS technology has a potential negative influence on environment, personal health, and safety. The capture process demands an increase of energy consumption and the consequent increase of NO_x, SO_x, and other pollutant emissions. The potential impact of transportation like pipelines on natural scenery. The problem with storage is mainly resulted from the leakage of CO2, which can lead to human poisoning, to ocean acidification, to soil pollution, to groundwater pollution, and it can even induced earthquakes [7]. Both geological and marine storage of CO2 have a risk of leakage, and it definitely needs to be taken into consideration. If the percentage of CO2 is over 8%, it can quickly endanger human health and life. In 2006, the IPCC developed The Framework of CO2 Geological Storage Risk Assessment and Management to guide and resolve the problem of CO2 leakage. The results show that the safe CO2 storage period can be up to millions of years, as long as the suitable storage sites are properly selected, designed, and managed [8]. Even if the probability of CO2 leakage is very low, the leak prevention should be done in every part of the storage process. Monitoring is an effective tool for preventing the chance of risks, but China has not established a complete and effective environmental monitoring system yet. The questions how effectively monitor CCUS projects and how long it takes to recover from the leakage will be serious challenge for the Chinese Government and big government enterprises.

4 Conclusions

To sum up, the CCUS projects, although IEA and other international organizations have emphasized its positive role in decreasing carbon emission and helping protecting environment, have to face serious problems. The comparison study between CCUS and other non-fossil energy technology must be done to locate a more effective and more efficient portfolio of energy consumption.

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Agribusiness as a Factor of Regional Development in Eastern Poland

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Abstract. Changes in the development of individual regions in Poland are a result of many factors. Among them significant is the initiative of the inhabitants to undertake business, its development or expansion. The aim of the study was to characterize and evaluate a selected branch of agribusiness in the eastern region of Poland. In order to achieve this aim, the results of our own surveys were carried out among 115 entrepreneurs associated in various types of associations operating in the rural areas of the eastern region. The motivations to start the agritourist activity of the respondents, the conditions of conducting such activity and the support or lack thereof in the entrepreneur's environment were assessed. According to the analysis, the desire to start and continue agritourism activity is largely driven by a favorable environment both in the social and natural sphere. Agritourism is perceived as a positive factor in the advertising and enrichment of a given region, so it should be supported not only by the neighboring agritourism owner but also by the regional authorities. It should be assumed that as a result of relatively more financial and educational assistance for farmers, there will be an increased interest in starting development initiatives for agribusiness activities among the inhabitants of the region.

Keywords: Regional Development, Agribusiness, Region.

1 Introduction

Membership in the European Union and the associated with this inflow of funds to agriculture enabled farms to undertake their own development activities, and the regional authorities were given the opportunity to change the face of Polish villages and towns, for example through technical and social development [13]. When traveling in Poland, it can be seen that many rural areas have become more attractive in terms of living or doing business, but to reduce the disparity of living conditions between rural and urban areas, it is necessary to create new jobs and earn extra income outside agriculture, especially if the farm area is small with no prospects for increasing the area of agricultural land. According to Woś [20], agritourism can be an additional and alternative form of activity for them, particularly important for small farms with unfavorable agrarian structure and low financial condition. Especially because of the statistics present the use of domestic tourism are beneficial to the accommodation. A similar situation exists in other EU countries. Žlábková [22] indicates that in the Czech Republic there is a great potential for the development of tourism in rural areas as a non-productive function of agriculture.

According to the data of the Central Statistical Office in Poland in the first three months of 2017, compared to the first quarter of 2016, the number of tourists using the accommodation base was increased by 8.5% and the number of overnight stays by 6.0%. At the same time, the number of foreign tourists increased by 4.0% and the number of rooms rented by them was 2.3% [21].

2 Regional development – literature overview

The allocation of development within the boundaries of the region obliges to indicate a specific area. In terms of etymology (Latin regio) it would be an area associated with a province or a district, but today the term is identified with a part of the country (state), characterized by characteristic features [6]. On this basis one of the regions in Poland was classified as PL3 by NUTS division, the Eastern Region, consisting of Lubelskie, Podkarpackie, Świętokrzyskie and Podlaskie voivodships. Sadowski in his publication pointed out that the Polish eastern borderlands have for years been marked with a stigma of weakness, peripheral or backwardness, and the various forms of pressure that have been taking place for many years have caused both individual attitudes and public life and even scientific publications. , there is a generalized belief that there is indeed such a objectivized phenomenon as Eastern Poland, distinguished by many distinctive features in relation to Western Poland and that these features are mostly negative [17]. For this reason, the Eastern Region was selected for research in order to identify residents' interest in undertaking development initiatives.

Głuszczuk [6] states that regional development in economic terms is determined by economic growth and is reflected in the transformation of factors and economic resources (internal and external to the region) into increased production of goods and services. In the social sense, it involves changes in interpersonal relations and social structure, which translates into a modification of the way and a higher quality of life of the inhabitants. Technical and technological components include all progressive changes in the degree of modernity and quality of manufactured goods and services, their assortment as well as the material structure of the manufacturing apparatus (fuller, more rational use of resources and resources of the region). According to the Szlachta, regional development is a systematic improvement of the competitiveness of economic entities and the standard of living of the inhabitants as well as the economic potential of the regions contributing to the socio-economic development of the country [18]. On the other hand, socio-economic development, according to Chojnicki and Czyż, is a set of targeted changes that occur in different spheres of social, economic, political, institutional, cultural, biological, ecological and protection of environment [4]. Balinska adds that regional and local development is strongly connected with the competitiveness, entrepreneurship and innovation of both the territorial units themselves and the entities located therein [2]. In regional literature, regional development is perceived as a process of improving conditions in poorly-developed or transitional regions [3]. It should be highlighted that according to some authors, local development is the same as regional development, and the only difference is the size of the territorial unit involved in the development study [12].

One of the possible forms of development of the region is starting agritourism by its inhabitants. Kachniewska investigated that the development of tourism allows to stop migration from the village and positively influences the condition and quality of the manpower [10]. Farm tourism is a tourist activity conducted on farms, and as Firlej adds, it is one of the most important spheres of tourist activity in rural areas, which expanded broadly in Poland in the early 1990s, using farmland as a base for accommodation [5]. Wiatrak defines agritourism as organizing the tourists' stay by the agricultural family in their own farm. The agritourism offer is a stay in the farm (accommodation), which can be combined (depending on the conditions) with full board or the possibility of buying fresh produce from the farm for self-catering [19]. Roman adds that agritourism is a viable alternative to creating new jobs, sources of income and raising overall levels and lifestyles [16]. Gołębiewska notes that the importance of rural tourism has been growing in recent years. This is due to the fact that in rural Europe, rural tourism has until recently been responsible for 10% of the demand for holiday services, and on average 3 to 5% of farms provide such services. The increase in tourist employment in rural areas of the EU is higher than in urban centers and mainly concerns recreational services [8]. The development of agritourism in Poland in recent years has become significant from the point of view of economic practice as well as the development of scientific tools for its analysis [7]. According to Marcinkiewicz, almost every second person, even once in his life, became a tourist and changed his place of residence to rest, get closer to his country or experience new places. In addition, the author points out that tourism often contributes to urbanization of the countryside, causing cultural and economic changes and stimulating the development of the construction industry. Rural areas themselves are subject to a complex process of change [14], thus contributing to the development of rural areas. Balińska and Zawadka show that agritourism in Poland has been developing continuously since the beginning of the 1990s and as an economic, social, cultural and spatial phenomenon, it integrates in its essence the factors stimulating local development [1]. The research conducted by Karbowiak shows that the owners surveyed by the agritourist business on the basis of the suggestion of the guests introduced changes in their services, which they claimed were noticed and contributed to the consolidation of relations with customers, because they showed a willingness to develop their services [11]. In recent years, agritourism has become one of the most popular forms of recreation - says Jęczmyk and Bogusz [9]. Balińska adds that it is precisely thanks to the development of tourism that promotion of products manufactured in the reception area, the region and even the country is also taking place. This results in improved image and better positioning of both the area itself and the individual products in the minds of potential consumers. This phenomenon is not only a marketing dimension but also an economic one, as it leads to an intensification of demand for these products. This may include food (such as wine, cheese, honey, and spices), ornaments and decorations, as well as durable goods (including high technology) [2].

In 2017, the "Regional Review of Poland 2016 Part II" was published in Warsaw, which presented the developmental situation of the Polish Nuts 2 distribution units. It contained data on the four voivodships constituting the discussed Eastern Region. According to the report of the Ministry of Development characteristic for the Lubelskie voivodeship is suburbanization. As a result, the number of inhabitants of rural areas and smaller towns located near the largest urban centers has steadily increased. As a result, the value of the urbanization index decreases. City dwellers in 2015 accounted for 46.18% of the total population of the voivodship. The number of inhabitants of rural areas is growing. The employment rate in the voivodship is rising, while the level of registered unemployment is slightly decreasing [15]. The excerpt of the cited report can be interpreted as an interest in living in rural areas, which is a positive condition for starting an agribusiness activity in this area.

Podlaskie voivodeship is perceived by the prism of naturalness - among the 16 voivodships in Poland, the region is characterized by the largest number of protected areas in the form of national parks and the NATURA 2000 network. This situation has a positive impact on the quality of life in the region and can be used to build competitive advantage in the green Industry [15]. In this case of the Eastern Region, a ministerial report indicates that the area has competitive natural values to develop its agribusiness services - including agri-tourism.

Podkarpackie is one of the voivodships in Poland, where the level of European funds per capita was the highest. The province occupies the 3rd position in the country [15]. The presented activity on the grounds of obtaining European funds may be indicative of the willingness of the inhabitants and entrepreneurs of the voivodeship.

In the Świętokrzyskie region, 54 cultural facilities were built / modernized, 31 health infrastructure projects completed, 66 projects completed in the field of tourism were completed, and 213.98 new jobs were created in the field of tourism [15]. The data show a positive attitude towards tourism, including agritourism.

On the basis of fragments of the ministerial report on the development of the NUTS2 regions in Poland, it was noted that four voivodships constituting the Eastern Region, although commonly called "delayed" in relation to other regions of Poland, show great interest in development and have appropriate conditions, Our own research indicates that the respondents' high awareness of agri-tourism and other agribusiness activities has been confirmed.

3 Methodology

The purpose of this study was to describe and evaluate the agritourism activity among the inhabitants of the Eastern Region in Poland. The study was conducted in the first quarter of 2017. The choice of territorial scope of research has been decided by the fact that this region is widely considered to be the least developed in Poland. The research questionnaire was used in a traditional way to distribute 40 types of associations, clubs and organizations of people living in rural areas of the Eastern Region. Each letter contained from 5 to 10 questionnaires, depending on the size of the organization. A total of 115 duly completed questionnaires received statistical analysis after a 2-month follow-up period. The survey questionnaire was addressed both to respondents with and without agritourism. Non-agritourism respondents were asked to respond to questions assessing this activity from the respondents' point of view as potential recipients of such services. Materials derived from analyzes prepared by the Regional Territorial Observatories issued by the Ministry of Development were also used. The collected materials were prepared in graphical form, tabular, descriptive statistics were also used.

4 Results

4.1 Survey of respondents with agritourism activities

Farmers responded to the question about the length of their service activities (see Fig. 1). Among the respondents were people engaged in running agritourism very briefly, but mainly they were agritourism business owners of several or many years.

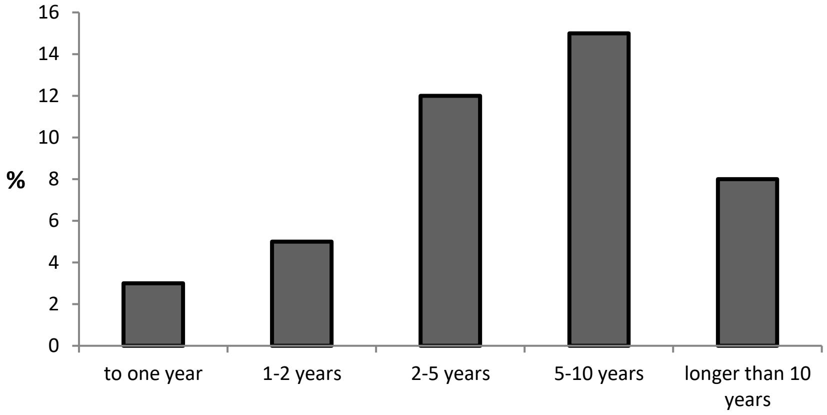

Fig. 1. The length of agritourism activity [in years]

New farms operating less than a year were only 3%. Almost 15% of owners have been engaged in this activity for 5 to 10 years. This indicates that most of the respondents had experience in running an agritourism business, which may indicate a greater perception in this regard. The increase in the number of agrotourism farms was not large. This indicates a slow increase in the activity of rural residents (including the development of agritourism) and also indicates the slow development of rural areas in Poland.

Farmers were asked to select the three most important characteristics describing a good agritourism owner (see Fig. 2). Besides to courtesy, the necessary qualities for running the business are independence and entrepreneurship.

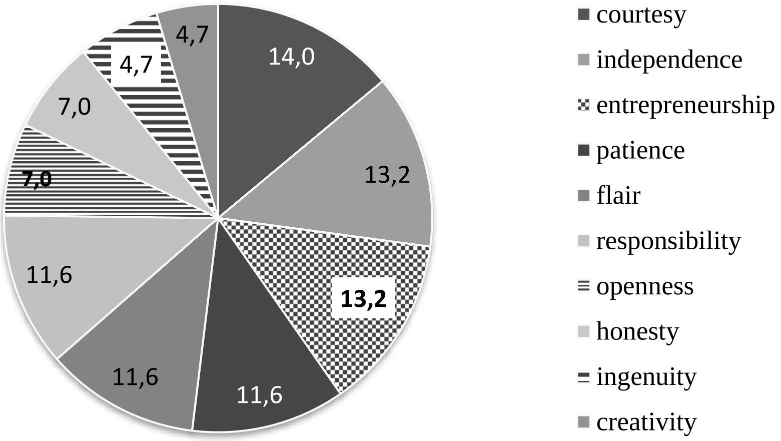

Fig. 2. Characteristics that a person associated with agritourism should have [in %]

The correlation between the number of years of agritourism activity and customer service quality, service standards improvement, service provider surroundings, preparation of offers and offering discounts was calculated. The coefficients of correlation determined are significant at p <0.05, with N = 43. For the above variables, the following results were obtained: 0.198486, 0.000785, 0.073787, 0.000517, and 0.083471. It was noted that the only significant correlation occurred for the variable - high customer service at 0.119486, which was a low positive correlation, and meant that as the number of years of agritourism increased, customer service quality increased. The other variables did not show any association with the examined trait.

Respondents who were asked to choose the three best qualities were considered to be resourceful, entrepreneurial and supportive family and friends (see Fig. 3).

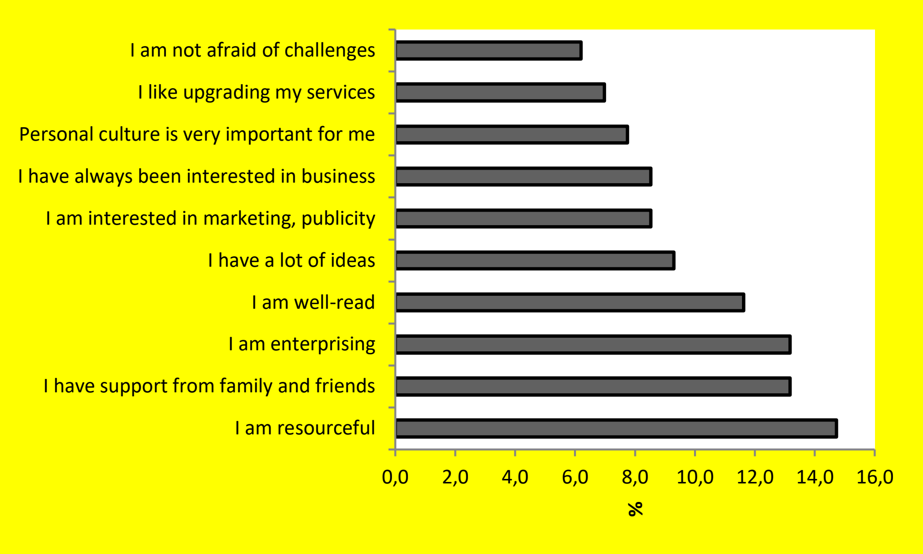

Fig. 3. Characteristics of the owner of the agritourism [in %]

Less than 60% of survey respondents conducted their services seasonally, while slightly over 40% had a yearly offer (see Fig. 4).

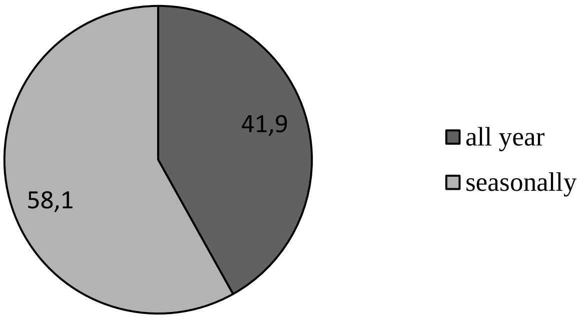

Fig. 4. Preparation of the agritourism offer [in %]

Respondents also answered the question of who or what prompted them to start the agritourism business. Most responded that they had motivation from family. Some of them may have been modeled on relatives who have already conducted such activities, and some have observed such activities in their area and it has motivated them to make an effort. A small proportion of the respondents were encouraged to participate in meetings or trainings organized by the municipality / district (see Fig.

5). At the same time, almost 90% of them showed willingness to participate in a meeting organized to promote the start of agritourism and other agribusiness.

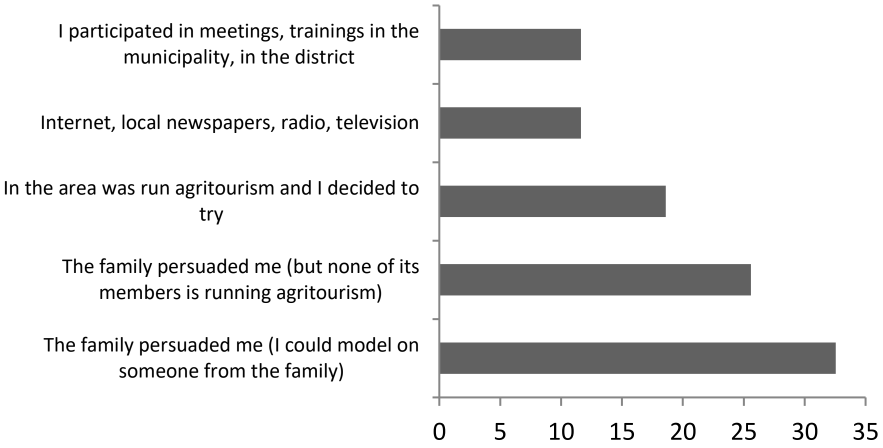

Fig. 5. The source of idea to start agritourism business [in %]

4.2 Rating among non-agritourist activities

The non-agritourism respondents, who were also asked for feedback on the suitability of agritourism for regional development. They were asked about the aspects that they consider necessary for conducting such activities. Among the answers given were predominantly those that indicated the predisposition of young people and the need for funds to start such activities (more than 50% of respondents) (see Fig. 6)

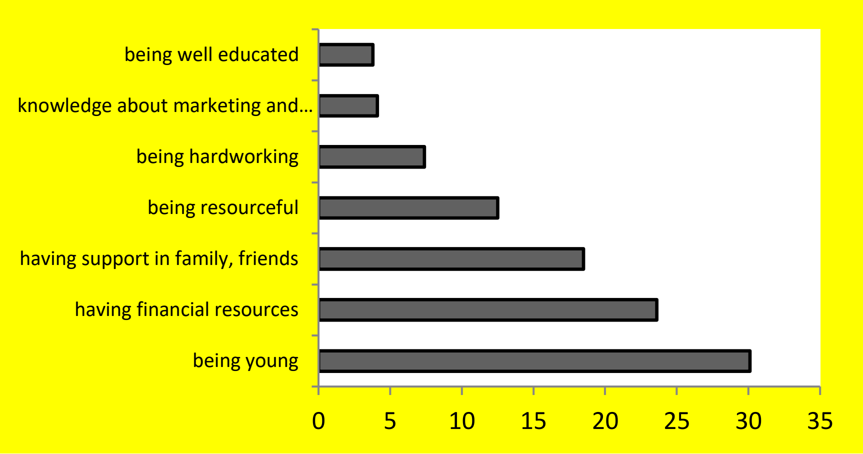

Fig. 6. The necessary aspects for running a business [in %]

Among respondents without agritourism, 16.7% of respondents said that they were thinking about it, while 83.3% were not willing. In turn, only 13.9% of respondents perceived the provision of agritourism services as difficult in terms of service from the documentation of activities (launching activities). For over 86% this would not be a problem. Respondents were asked to indicate the intensity of agro-tourism occurring in their area of residence, and more than 40% indicated that they know of one (at least one) farm and 50% have information about many of these. Less than 10% responded that there are no agritourism farms in their area. Previously, the people who confirmed that they were thinking about running agritourism were also in the group of respondents who declared knowledge of at least one activity in the area of residence. The relationship between these variables, the willingness to work and the knowledge of farms in the area, was 0.56, that is, according to the Guillford classification it is in the range of $0.5 <| r | \leq 0{,}70{,}5 <| r | \leq 0{,}7$, so it is a high positive correlation.

The non-agritourist East Region residents were asked to indicate what agritourism business is for the municipality (see Fig. 7).

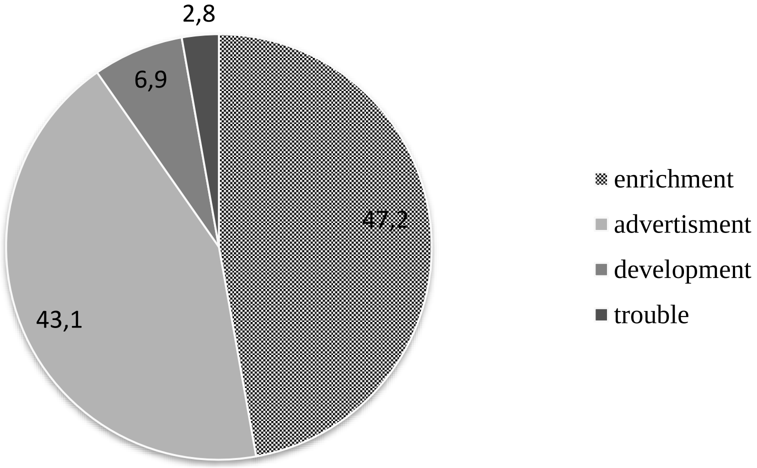

Fig. 7. The importance of agritourism for the commune [in %]

More than 90% of respondents said that the agritourism in the area of the commune is its advertising and thanks to it the community is enriched. Less than 7% chose a broader response and indicated that this could contribute to the development of the municipality, with the responses being interrelated. Commercialization of the community will be connected with greater opportunities for its development, and direct enrichment also indicates development. Less than 3% gave a negative answer and found it to be a problem for the residents, mainly due to disturbances that may be related to strangers in the municipality.

The respondents, who were asked about the financial aspect, found that agritourism can help generate high incomes and contribute to development, although it also requires continuous investment (43%). However, evaluating it for their own benefit, 57% saw no chance of a serious paycheck. This indicates that respondents in the assessment of their own activities were more pessimistic than the general problem (47.2%). At the same time, more than half of the respondents stated that they had conditions for running agrotourism services, and 100% of respondents admitted that appropriate natural conditions (high natural areas) were required to conduct such activities.

5 Conclusion

According to analyzes of respondents' answers and the ministerial report, the willingness to start agritourism or other agribusiness activities, and the possibility of its continuation, is largely dictated by a favorable environment both in the social and natural spheres. Agritourism is perceived as a positive factor in the advertising and enrichment of a given region, so it should be supported not only by the neighboring agro-tourism owner but also by the regional authorities. It should be assumed that as a result of relatively more financial and educational assistance for farmers, there will be an increased interest in initiating development initiatives for agribusiness activities among the inhabitants of the region. Residents of the Eastern Region have shown willingness to meet, start training, or improve their business, as far as their location is concerned. Agritourism is a development activity for the region and its inhabitants. It creates jobs, lowers unemployment, promotes the region, and with the right level of service and consumer interest can be the basis for attracting investment.

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Regional Diversification of the Productivity of the Biomass Sector in Poland in the Context of the Development of the Bio-economy

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Abstract. The aim of the article is to present the significance of the biomass production sector in Poland on the regional basis. The study characterises the importance of agriculture, forestry, and fishing in the economy of Polish regions and evaluates the level of regional variety of labour productivity in the sector of primary production in bio-economy. Data concerning the A section of the Polish Classification of Activities was the basis for the analysis.The analysis carried out indicated that bio-economy is an important sector in the national economy. The significance of this area is proven by the share in the employment and production potential. Comparisons with regions distinguish developed, industrialised, urbanized provinces, in which the share of fixed assets, investments, and added value of bio-economy is of minor importance in the economy of a region.

Keywords: Bio-economy, Labour Productivity, Bio-based Sectors.

1 Introduction

In 2012, the European Commission adopted a strategy for the sustainable use of renewable resources in the European economy entitled: “Innovating for sustainable growth: a bio-economy for Europe”[6]. In this strategy, by taking into consideration demographic processes, which take place in Europe and in the world, and problems with limited access to natural resources, the attention has been drawn to the necessity of the development of production of renewable resources in the European Union, which guarantees not only food security, but also materials, energy, and other products demanded by modern societies.

The term “bio-economy” defines a collection of sectors within the frames of national economy which conduct production and processing of renewable resources. In "The Knowledge Based Bio-Economy (KBBE) in Europe: Achievements and Challenges” report, the term “bio-economy” is defined in the following manner: “The bio-economy is the sustainable production and conversion of biomass, for a range of food, health, fibre and industrial products and energy. Renewable biomass encompasses any biological material is to be used as raw material” [4]. Thus, on the sectoral basis, bio-economy includes many areas of economic activity, which are involved in production and distribution of articles including components of a biological origin [5]. The most important segments of bio-economy include primary sectors of the economy such as: agriculture, forestry, fishing, which produce biomass on the basis of natural resources (soil, air, water), which is the basic resource for other areas of bio-economy such as: food production, chemical industry, pharmaceutical, cosmetic, and textile industry, but also energy production [13].

The bio-economy development strategy assumes the increase of the consumption of raw materials of biologic origin (biomass) in economy, which will have not only traditional application in food production, but also, more and more often, in the production of modern, innovative chemical, pharmaceutical products, as wells as energy and fuels of great added value [9].

The increase of the production of biomass and its effective application should contribute to the improvement of food security, conservation of natural resources, the achievement of independence from non-renewable resources and to act against climate changes [7]. Bio-economy development forces, therefore, to search for technologies, which allow to increase the production of biomass in agriculture, forestry, and fishing without prejudice to purposes related to continuous development and functioning of local ecosystems [14].

In Poland, sectors, which produce biomass (agriculture, forestry, and fishing) constitute an important element of bio-economy [8]. It is appropriate to emphasise, however, that the development of those sectors indicates significant differences in regional cross-section [10]. Source literature is full of studies, which refer to determination of regional differences in the development of agriculture. Having that said, there are not many analyses, which made an attempt to evaluate regional variety of the development of the whole sector of primary production in bio-economy involving agriculture, forestry, and fishery.

The basic purpose of the study is to evaluate regional variety of the biomass production sector in Poland involving agriculture, forestry, and fishery. The undertaken research focuses especially on the presentation of diversification of production potential of this sector amongst particular regions in Poland. Also the evaluation in differences in productivity levels of the biomass sector on the regional basis in Poland has been made.

2 Methodology of research

The aim of the article is to present the significance of the biomass production sector in Poland on the regional basis. The study characterises the importance of agriculture, forestry, and fishing in the economy of Polish regions and evaluates the level of regional variety of labour productivity in the sector of primary production in bio-economy. Data concerning the A section of the Polish Classification of Activities was the basis for the analysis. Section A- agriculture, forestry and fishing involves activities related to:

- exploitation of natural plant and animal resources, cultivation of cereals and other cultivated plants, animal raising and husbandry,
- wood cutting and forest resources harvesting,
- acquiring of animals and animal products from farms or their natural environment.

Temporal extent of research included the year of 2016. In certain cases, due to the lack of data for previous period, sources concerning 2015 or 2014 were used. Basic source materials are data and bases of The Polish Central Statistical Office and primary sources.

3 Significance of the biomass production sector in the bio-economy supply chain

Basic sectors of bio-economy, according to the definition adopted at the beginning of the study, consist of the following: agriculture, forestry, fishing, food industry, but also some parts of chemical, pharmaceutical, and energy industry basing on renewable raw resources. Table 1 presents the division of bio-economy into four groups of sectors and their relations with the NACE classification of economic activity applicable in the European Community.

Table 1. Specification of biobased sectors, according to NACE [13]

Biomass related sectors	NACE sectors
Primary sector activities: natural resource-based activities that directly exploit the bio-resources to be used as input for the bio-economy	Agriculture, forestry, fishing
Secondary sector activities: conventional users (direct users) of raw agricultural products	Food, beverages, tobacco, textile, wearing apparel, leather products, (products of) wood and cork (excl. furniture); articles of straw and plaiting material, paper and paper, furniture, construction of buildings, civil engineering (e.g. wood use for bridges)
Tertiary sector activities: new users of renewable raw materials	Manufacture of coke and refined petroleum (e.g. biofuel blends); manufacture of chemicals and chemical (e.g. bio-based ethylene); manufacture of basic pharmaceutical products and preparations from bio-based resources; manufacture of bio-based rubber and plastics; electricity, gas, steam and air conditioning supply from biomass (e.g. wood chips) and its derivatives (e.g. biogas)
Ecosystem or non-market services: conventional users of green resources, such as sea, parks and forest	Forestry, water supplying services, non-market services of recreational and cultural activities

In this classification, conventional sectors of bio-economy (sector of primary production, and secondary processing of raw materials of agricultural, fishing, and forestry) are distinguished, which are connected with sectors not related directly with the production of biomass - sectors of third tier processing. Basic resources of biomass are provided by sectors of primary production that, by using natural resources (soils, water, air), produce biomass, which is a resource basis for the activity of the rest of the sectors of bio-economy.

The term “biomass” has many definitions in source literature. Mostly, it is used in the energetic context. Biomass, on the energetic basis, is the primary source of energy which is composed of all substances of plant or animal origin, which are subjected to biodegradation and which use for energetic purposes is not restricted by provisions of the law [12]. Biomass is used, most of all, for the production of heat and biofuels. On this basis, biomass is defined by certain legal acts, both those national and adopted by the European Union. The Directive 2009/28/EC of the European Parliament and of the Council indicates that biomass means the biodegradable fraction of products, waste and residues from biological origin from agriculture (including vegetal and animal substances), forestry and related industries including fisheries and aquaculture, as well as the biodegradable fraction of industrial and municipal waste [3].

Bio-economy concept, however, is not limited only to energetic use of biomass. Bio-economy means a rational production and use of renewable resources for food, feed, industrial, and energetic purposes. On such a basis, the term “biomass” includes all raw materials and production having a biological and renewable character. In official EU documents, a biomass pyramid which determines the framework for this broadened definition of biomass is defined [11] (figure 1).

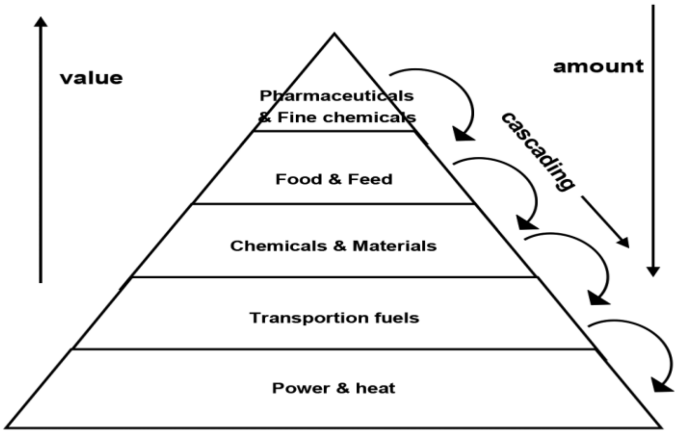

Fig. 1. The biomass pyramid [11]

Agricultural production plays a basic role in the biomass supply chain. Agricultural biomass, in the form of various agricultural products and resources, is used both for food, industrial, as well as energetic purposes. Agriculture receives plant and animal products by means of cereal cultivation and plants cultivation, as well as through animal raising and husbandry. Forest management constitutes an important source of biomass. It is a branch of national economy which manages the use of forest (mainly the production of wood) and activity related to the maintenance of the stability of forest stand. Additional elements of forest management are: ground cover products harvesting, spruces, medicinal plants and the realisation of non-production functions of forests, related to the protection of air, water, and soil. The third segment of the production of biomass is fishing (fishery management). It means the complex of planned and coordinated actions aimed at rational aquatic organisms management. This term involves: fishing in sea waters and the management in inland waters, (inland fishing): catching fish, crustaceans, and molluscs, as well as other aquatic organisms.

The resource of various forms of biomass produced or acquired within those three sectors of primary production is subjected to processing into final products in further links of supply chain of bio-economy. Main links, which lead production, distribution, and marketing of bio-economic products, are: food industry, feed industry, the pulp and paper-making industry, as well as sectors participating in bioenergy production. Physical, chemical, as well as biotechnological operations are applied in production processes realised in those sectors. The development of bio-economy assumes the transformation of raw materials (biomass) into more complex and value products by using various processes particularly basing on achievements of biotechnology [8].

Despite agricultural, forest production, and fishing, also waste management is an important source of biomass. Increase of the use of wastes in economic processes and their transformation into products of higher added value is the basis of the idea of the circular economy. The concept of the circular economy involves a closes cycle of the life of a product which, on a linear basis, includes the following sequence of processes: production - use- waste disposal. The effect of this approach is also reduction of a number of quantities of wastes being stored and increase of the scale of recycling [1]. This area of biomass production will not be analysed further in this study.

4 Diversification of the bio-economy potential in Poland on a regional basis

According to the NUTS 2 classification, there are 16 provinces in Poland. There are significant differences amongst particular provinces in terms of the level of the development of bio-economy, including also those sectors which involve the production of biomass.

Resources of the Earth are the basis for the production of biomass. In 2014, overall area of lands in Poland was 31,268.0 thousand ha (table 2), more than a half of which were agricultural lands, which covered the area of 18,717.0 thousand ha (59.6%). In Poland, also forest lands, as well as wooded lands cover significant area of the country - 9,369.5 thousand ha, i.e. approximately 30% of overall area. In 2014, underwater lands covered approximately 648.5 thousand ha, which was more than 2%

of overall area. The rest of the country is used as urbanized terrains. Wastelands and other lands were, in 2014, nearly 3% of overall area of the country.

Resources of agricultural, forest, and underwater lands indicate significant diversity in particular provinces. Acreage of agricultural lands is concentrated in Masovia province (more than 2.4 mil ha) and in Wielkopolska Province, Lublin Province, Warmian-Masuria Province. In each of those provinces, acreage of agricultural lands is larger than 1.3 mil ha. Having said that, the smallest resources of agricultural lands are in Lubuskie Province and Opole Province, correspondingly 565 and 601 thousand ha.

Table 2. Geodetic area of the country by direction of use in 2016. [2]

Specification/ Province	**Total**		**Agricultural land**	**Forests**	**Lands under waters**	**Urban area (% of total)**	**Wasteland**	**Other area**
	in thous. ha	**in percent**						
Poland	31268.0	100.0	59.9	30.0	2.1	5.2	1.5	1.4
Dolnośląskie	1994.7	6.4	59.6	30.6	0.9	6.9	0.7	1.3
Kujawy - Pomerania	1797.1	5.7	65.2	23.8	2.7	4.8	2.3	1.1
Lublin	2512.2	8.0	70.1	23.2	0.8	3.8	0.9	1.3
Lubuskie	1398.8	4.5	40.4	50.8	1.8	4.5	1.2	1.2
Łódź	1821.9	5.8	70.6	21.5	0.6	5.5	0.8	1.0
Małopolska	1518.3	4.9	60.9	29.0	1.4	6.1	0.8	1.9
Masovia	3555.8	11.4	67.6	23.2	1.2	5.6	1.0	1.5
Opole	941.2	3.0	63.9	27.5	1.4	6.1	0.4	0.8
Subcarpathia	1784.6	5.7	52.6	38.3	1.2	4.6	0.6	2.8
Podlasie	2018.7	6.5	60.2	31.2	1.4	3.7	2.7	0.9
Pomerania	1831.0	5.9	50.3	37.2	4.1	5.2	2.3	0.9
Silesia	1233.3	3.9	51.1	32.6	1.5	12.4	1.2	1.2
Świętokrzyskie	1171.1	3.7	64.1	28.6	0.7	4.6	0.7	1.3
Warmian-Masuria	2417.3	7.7	54.2	31.8	5.7	3.7	3.1	1.4
Wielkopolska	2982.7	9.5	64.7	26.4	1.5	5.2	1.2	1.1
West Pomerania	2289.2	7.3	48.9	36.5	5.2	4.4	3.3	1.7

When it comes to forest lands, the largest resources have the following provinces: West Pomerania, Mazovia, Wielkopolska, Warmian-Masuria, and Lubuskie of area, which exceeds, in each case, the area of 700 thousand ha. On the opposite side, there are provinces as: Opole, Świętokrzyskie, Łódź, in which the area of agricultural lands is the smallest and is not larger than 400 thousand ha. The largest share of forests is in the Lubuskie Province, Podkarpackie Province, Pomerania Province, and West Pomerania Province. Significantly lesser forestation rate than national average is in the provinces as: Kujawy-Pomerania, Lublin, Łódź, and Masovia.

Four provinces dominate in terms of the significance of underwater lands in the structure of the area of the provinces, namely: West Pomerania, Warmian-Mazuria, Pomerania, and Kujawy-Pomerania. In those provinces, the share of water reservoirs is significantly larger than the national average which is approximately 2%.

Labour resources decide about the potential and possibilities of economy. In 2016, the number of persons employed in the national economy was nearly 16.2 mil people. According to the data included in table 3, the service sector is a dominant sector in terms of share in employment.

Table 3. Employed persons by kind of activity* in 2016. [2]

Specification/ Province	Total in thous.	Agriculture, forestry and fishing in % of total	Industry and construction	Services
Poland	16197	10.5	31.3	57,8
Dolnośląskie	1237	4.0	36.5	59,3
Kujawy -Pomerania	852	1.4	31.7	54,6
Lublin	866	21.4	24.1	54,3
Lubuskie	427	6.8	34.0	59,0
Łódź	1103	12.6	31.1	56,0
Małopolska	1407	10.9	31.8	56,2
Masovia	2457	10.8	22.9	65,7
Opole	396	10.4	37.1	52,5
Subcarpathia	831	12.9	32.1	548
Podlasie	481	23.1	24.7	52.0
Pomerania	986	6.3	32.7	60.8
Silesia	1868	2.6	38.7	58.4
Świętokrzyskie	513	19,1	30,0	50,9
Warmian-Masuria	547	13,5	30,3	55,0
Wielkopolska	1 553	11,7	35,5	52,6
West Pomerania	673	7,1	29,3	63,4

* On the LFS (Labour Force Survey) basis; activities of non-specified type are not included in the structure by kind of activity.

The employment in this sector in the analysed year was almost 58%. Share of agriculture, forestry and fishing sector is decreasing systematically. Despite a visible decrease of the share of the employed in the bio-economy sector, there are still significantly more people employed in this sector than in other countries of the EU. According to data of 2016, the share of people employed in agriculture and other spheres of the production of biomass has increased slightly above 10%. Employment in the bio-economy sectors is quite clearly regionally varied. The smallest share of the employed in the bio-economy sector in comparison with the overall employment rate in the whole economy of a region exists in the Silesia Province (2.6) and in the areas, in which state agricultural farms were dominating before the transformation of the political system, that is, in Pomerania, West Pomerania, Lower Silesia, and Lubuskie provinces (share from 4 to 7.1%). The largest share, which is larger than 20% exists in the provinces of the eastern part of Poland, including, among others, Podlasie Province- 23%, and Lublin Province - 21.4%. Those terrains characterise with relatively low urbanisation level and the domination of family farming based on individual farms.

According to absolute values, the largest number of people employed in bio-economy was in the Mazovia Province - more than 265 thousand people, Lublin Province - 185 thousand, and Wielkopolska Province - 181 thousand. Large numbers of people employed in bio-economy occurs also in Lesser Poland Province (154 thousand), and Łódź Province (139 thousand). Having that said, the smallest number of people are employed in the bio-economy in Lubuskie Province (29 thousand), Opole Province (41 thousand), and West Pomerania Province (48 thousand).Fixed assets resources constitute another factor deciding about production potential of bio-economy. This is one of the factors, which has an influence on production results and productivity of labour. Share of fixed assets in the sectors which compose bio-economy in the value of fixed assets in total, in Poland, were 4.4% in 2016. This share is large in typically agricultural provinces. With the average value of 4.4% for Poland, the share of more than 10% characterises Podlaskie Province, Warmian-Masuria Province (8.7%), and Lublin Province (8.2%). The smallest share of fixed assets in agriculture in the gross value of fixed assets in total characterises Silesian Province (1.5%), thus the region of developed industry and highly developed urbanisation.

The largest values of fixed assets if absolute values is gathered in the sector of bio-economy of the Wielkopolska Province - PLN 21 bn, Mazovia Province - PLN 20.1 bn, and Lublin Province - PLN 12 bn. On the other hand, the smallest values are in Lubuskie, Opole, Świętokrzyskie, and Silesia provinces (below PLN 6 bn).

The table 4 also presents investment expenditure borne in bio-economy against the backdrop of economy generally. The level of investment expenditures in Polish economy in total has exceed PLN 271 bn and expenditures, and expenditures on bio-economy were approximately PLN 6 bn, which was approximately 2.9%. According to the table, the bio-economy is distinguished by not large share in the total amount of investment expenditures on the whole economy. The largest share of bio-economy in total investment expenditures borne in the whole economy of provinces was characteristic for Podlasie Province - 6.4%, Warmian-Masuria Province - 5.1%, Lublin Province - 4.2%. On the other hand, the smallest share was occurring in industrialised and urbanized provinces such as: Silesia, Mazovia, and Małopolska (approx. 1%). In the rest of the regions, this share fluctuates around national average. There are also distinct differences between provinces concerning investment expenditures borne on the absolute basis.

The largest expenditure investments in the bio-economy sector were borne in Wielkopolska Province (PLN 897 mil), Mazovia Province (PLN 821 mil), and Podlasie Province (PLN 166 mil). According to the data presented in the table 4, the share of the whole sector of bio-economy in investment expenditures in the whole national economy in the scale of the country is 2.2%, whereas the share in fixed assets is 4.4%. It means that the renewal of fixed assets in bio-economy is two times slower than in the whole economy.

Table 4. Fixed assets and investment outlays by actual location of investments in 2015 (current prices) [2]

Specification/ Province	Fixed assets			Investment outlays		
	Total		Agriculture, forestry and fishing	Total		Agriculture, forestry and fishing
	mln zł	%	in % of total	mln zł	%	in % of total
Poland	3471800.9	100.0	4.4	271839.3	100.0	2.2
Dolnośląskie	276655.1	8.0	3.2	22660.5	8.3	1.8
Kujawy -Pomerania	155317.3	4.5	6.2	13971.1	5.1	2.4
Lublin	151490.8	4.4	8.2	10366.3	3.8	4.2
Lubuskie	97568.0	2.8	3.9	5874.3	2.2	3.4
Łódź	216320.5	6.2	5.1	17437.7	6.4	2.2
Małopolska	258678.7	7.5	2.9	21158.3	7.8	1.2
Masovia	715544.9	20.6	2.8	58041.4	21.4	1.4
Opole	81693.6	2.4	6.8	8052.6	3.0	2.8
Subcarpathia	152880.4	4.4	4.7	11001.5	4.0	2.1
Podlasie	91087.0	2.6	10.7	6848.3	2.5	6.4
Pomerania	196479.8	5.7	3.4	16772.3	6.2	2.0
Silesia	417408.3	12.0	1.5	29502.9	10.9	0.7
Świętokrzyskie	89249.3	2.6	6.4	5826.0	2.1	2.9
Warmian-Masuria	102145.2	2.9	8.7	8057.1	3.0	5.1
Wielkopolska	319161.2	9.2	6.6	25329.0	9.3	3.5
West Pomerania	150120.7	4.3	5.0	10940.0	4.0	3.1

5 Added value of the bio-economy sector and the productivity of labour

The table 5 presents the amount of a gross added value produced in the bio-economy sector. Analysis of the data included in the table 5 allows to determine the significance of bio-economy in the national economy considering regional differences. In 2014, the highest share of bio-economy, approximately 7.4%, in the gross added value generated in the province was achieved in Podlasie Province (PLN 2.5 bn in absolute values). On the other hand, the smallest share in the generation of gross added value of the region was noted in case of agriculture in Silesia Province (0.7%), Lower Silesia Province (1.4%), and Małopolska Province (1.4%). In Mazovia Province, despite low share of agriculture in the structure of the gross added value in total, the added value in absolute terms has exceed PLN 8.9 bn. Apart from Mazowsze, high added value in agriculture has been created also in the agriculture of Wielkopolska - PLN 6 bn and Łódź - PLN 3.5 bn.

Table 5. Gross value added in 2014 (current prices) [2]

Specification/ Province	Total		Agriculture, forestry and fishing		Agriculture forestry and fishing	Industry and construction in % of total	Services
	mln zl	%	mln zl	%			
Poland	1524940	100.0	43419.0	100.0	2.8	34.3	62.8
Dolnośląskie	129050	8.5	1777.0	4.1	1.4	41.9	56.7
Kujawy - Pomerania	67434	4.4	3006.0	6.9	4.5	36.5	59.1
Lublin	59477	3.9	3147.0	7.2	5.3	28.5	66.2
Lubuskie	34061	2.2	1294.0	3.0	3.8	40.8	55.4
Łódź	93091	6.1	3588.0	8.3	3.9	37.1	59.0
Małopolska	118826	7.8	1675.0	3.9	1.4	32.5	66.1
Masovia	338437	22.2	8935.0	20.6	2.6	25.4	72.0
Opole	32267	2.1	1049.0	2.4	3.3	40.1	56.7
Subcarpathia	59719	3.9	986.0	2.3	1.7	38.0	60.3
Podlasie	34233	2.2	2530.0	5.8	7.4	29.5	63.1
Pomerania	86749	5.7	2093.0	4.8	2.4	34.1	63.5
Silesia	189378	12.4	1395.0	3.2	0.7	42.5	56.7
Świętokrzyskie	36611	2.4	1506.0	3.5	4.1	35.3	60.6
Warmian-Masuria	40960	2.7	2519.0	5.8	6.1	33.9	60.0
Wielkopolska	147596	9.7	6011.0	13.8	4.1	36.7	59.2
West Pomerania	57052	3.7	1908.0	4.4	3.3	31.1	65.6

Important element of the evaluation of the regional disparity of the bio-economy sector in Poland is the analysis of diversity of the productivity of labour. Productivity of labour is understood as relation between production results and labour resources used. Average level of the productivity of labour measured by gross value added per one person employed in bio-economy in Poland in 2014 was slightly more than PLN 20 thousand (table). In the regional cross-section, the highest productivity of labour in agriculture was achieved by West Pomerania Province and Lubuskie Province (200% of national average in agriculture, which is approximately PLN 39.4 thousand in nominal terms, and the lowest productivity of labour was achieved in Podkarpackie Province (25% and PLN 4.9). Productivity of the bio-economy sector in West Pomerania Province was more than 8 times higher than the productivity of bio-economy in Podkarpackie Province. High level of the productivity of labour in bio-economy characterised provinces localised in western and north-eastern Poland. However, the lowest level was in the provinces of southern and eastern Poland.

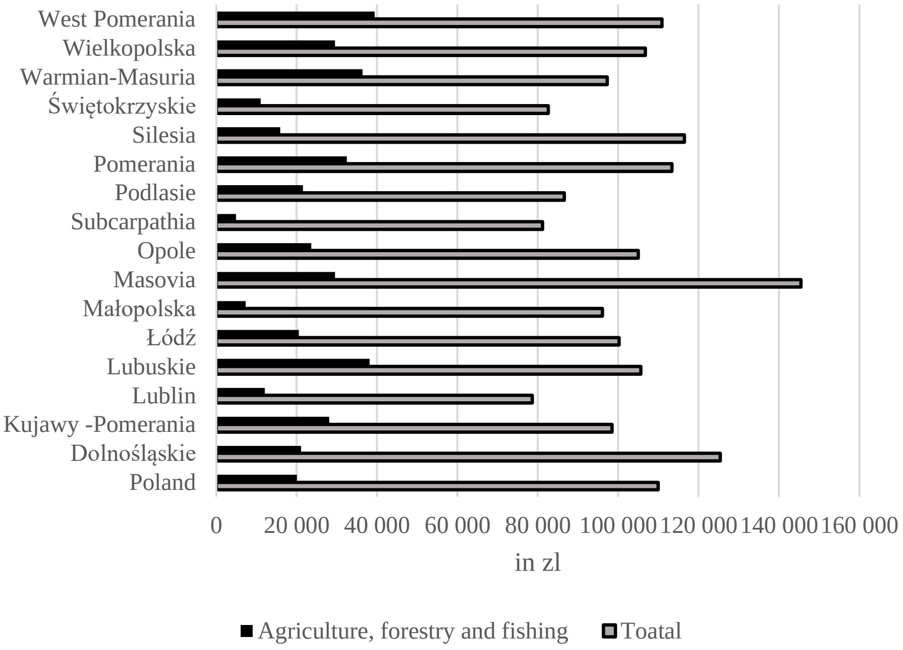

Fig. 2. Gross value added per employed person in 2014. [2]

6 Summary

The analysis carried out indicated that bio-economy is an important sector in the national economy. The significance of this area is proven by the share in the employment and production potential.

Comparisons with regions distinguish developed, industrialised, urbanized provinces, in which the share of fixed assets, investments, and added value of bio-economy is of minor importance in the economy of a region. These are mainly regions of southern and middle Poland: Małopolskie Province, Silesia Province, and Mazovia Province. Silesia and Mazovia provinces belong to the most developed regions in Poland, which has an influence on minor importance of the sectors of bio-economy in the structure of the economy of those regions.

Also Wielkopolska Province, which, despite an important significance of agriculture is a well-developed region, belongs to the group of provinces of high level of the development of bio-economy. One of the largest production potentials of agricultural and food sector is concentrated in this region.

The second group of regions constitute provinces located along the eastern border of the EU, namely: Podkarpackie, Podlasie, and Lublin provinces, as well as Świętokrzyskie Province, where bio-economy decides about the situation of regional economy in a great measure.

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The Impact of the European Refugee Crisis on the Popularity of Greece, Italy and Spain as Tourist Destinations

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Abstract. In 2015 more than a million of migrants from the Middle East and Africa have appeared on the shores of Greece, Italy and Spain, after successfully taking the Mediterranean routes to the dream continent. The unpreparedness of the EU as well as high numbers of the newcomers caused among others the fear of refugees in the Czech Republic. The aim of this study is to find out if there is a negative dependency between the numbers of incoming migrants to the countries of southern Europe and the long-term stays in these countries by the Czech population and to confirm or combat the hypothesis that the increase in the number of refugees arriving at the shores Greece, Italy and Spain has decreased the popularity of these countries as tourist destinations among Czech citizens. The study is based on data of the UNHCR, the Czech Statistical Office and the Institute of Sociology at Academy of Sciences of the Czech Republic.

Keywords: European Refugee Crisis, Tourism, Regional Development.

1 Introduction

Tourism has long been one of the world's leading industries, generating revenue over $ 1 trillion a year worldwide, and ranks among the leading export industries. Tourism does not, however, prosper in places that are perceived as dangerous. The sense of personal safety is one of the basic conditions for the development of a popular tourist destination, region or country. [10] It could have been also the perception of security risks, namely the risks associated with the arrival of refugees to south European shores, which could have influenced the decisions of Czech consumers on spending their holidays in years 2015 and 2016.

The definition of a refugee is defined in the international law as according to the Convention on the Status of Refugees as follows: "*A person who is outside his or her country and has legitimate fears of persecution for racial, religious or national reasons or for reasons of belonging to certain social strata or for having certain political views and is refused to be protected in his homeland; The same applies to a stateless person who is outside the country of his previous residence as a consequence* *of the aforementioned events and who, due to the above mentioned fears, does not want or cannot return*." [6] The amount of refugees globally in 2015 was the highest since World War II. [1] [17] The largest source of refugees was the war in Syria, which resulted in 4.9 million refugees by the end of 2015. Worldwide, Turkey has hosted the largest portion of refugees in 2015, about 2.5 million people. [21]

From Turkey, refugees mostly followed the Eastern-Mediterranean route (putting pressure mostly on Greece and Bulgaria), then followed by the so-called Western-Balkan route through Greece to other European Union countries. The Western Balkan route was used by the majority of refugees, who tried to reach countries of the European Union putting a big pressure on Greece (red and purple lines of the following picture). For example, only during one month (August 2015) 228,967 left Turkey to Europe though the Eastern Mediterranean route (red line of the following picture) and 155,120 people continued their journey through the Western Balkans Route to Central Europe. Little less, but still popular route to Europe was the Central Mediterranean Route (green line of the following picture). Only in August 2015, about 106,341 people used this green line route to reach European Union, specifically Italy. Thousands of migrants have used Western Mediterranean Route (blue line of the following picture). Compared with the other routes, however, the blue route was not so busy. About 7,892 people used the blue line route to reach European Union, specifically Spain in August 2015. This is about 29 times less migrant traffic than in the Eastern Mediterranean route and 13.5 times less traffic than in the Central Mediterranean Route. [18] [21]

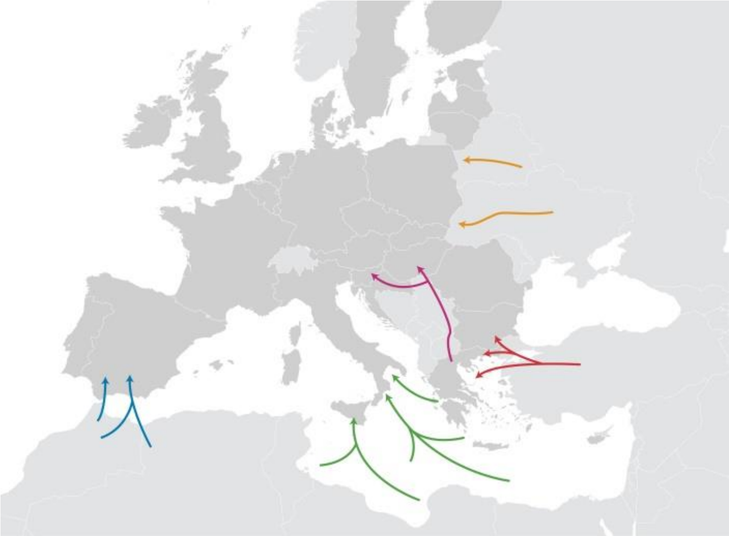

Fig. 1. Map of major migrant routes to the countries of the European Union.

In 2015 the largest wave of refugees heading from the Middle East to the EU borders arrived causing surprise and instability in some European countries, which were unprepared and unable to come to a common ground as to how to deal with this migration wave. Therefore refugees arrived in Europe in an uncontrolled manner, their deployment within the European Union was not centrally managed and there was a considerable heterogeneity among the member states in system of handling with the incomings. The arrival of refugees has in many member states resulted in political conflicts, social tensions, the mobilization of extremist-right parties, possible horror scenarios depicted in the media, arson, attacks on asylum centres and partial closure of Schengen borders. [1] [2] [12]

Finally, in 2016, the European Union has managed to calm down the migration wave through a negotiation about the co-operation with Turkey leading to the reduction of incomings and stabilising the migration wave within its own territory. Incoming migrants were mostly from Syria, but a significant proportion of them were from Iraq and Afghanistan. The following graph illustrates the arrival of migrants from each of the countries of Asia and Africa by sea to Greece, Italy and Spain. Most refugees came in the autumn months – September 2015, October 2015 and November 2015. [19]

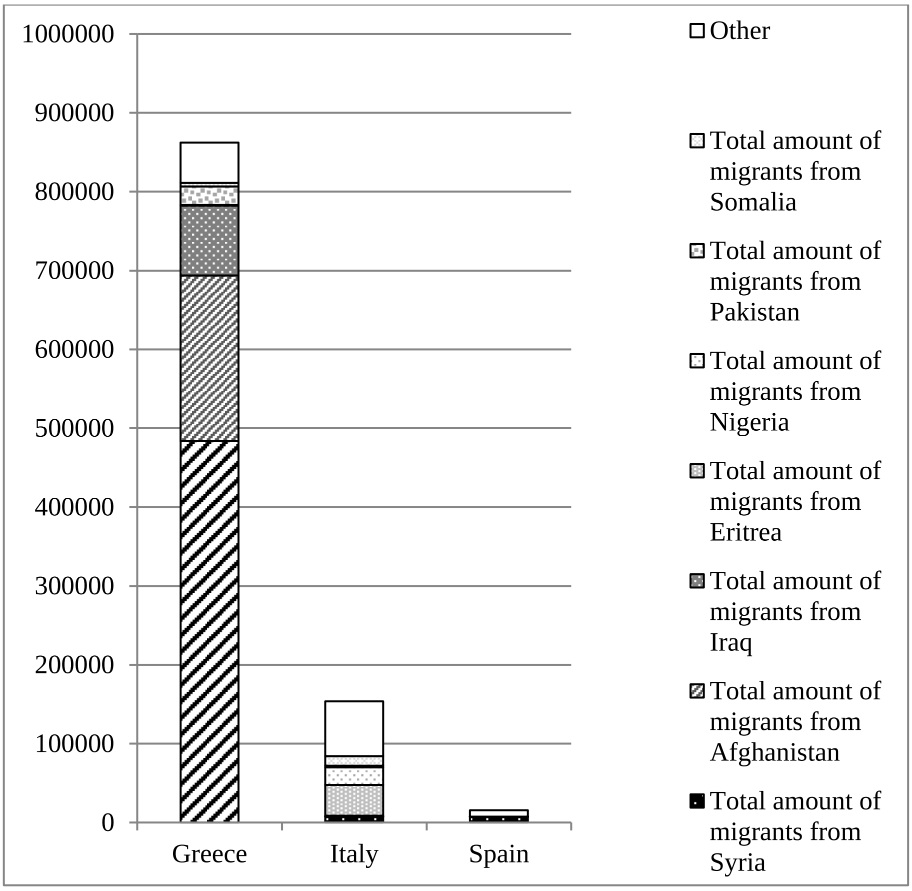

Fig. 2. Admission of migrants by nationality to the individual countries of southern Europe from January to December 2015.

2 Theoretical basis

Modern theories describe a dual process, or two different systems, the individual evaluates the information and then the risk itself, in our case, the fear of refugees or migrants. [3] [7] [13] One of these evaluation systems has a natural evolution in man and resembles an animal instinct - it is fast, automated and therefore not too accessible to conscious perception and control. This system works primarily on the basis of similarities, associations, and includes the whole range of emotions that serve as the first warning system. [14] [16]

The second system processes information and evaluates risk based on algorithms and probability rules, Bayesian updates and formal logic. For this reason, the second system is slower, more demanding, and requires full awareness, including conscious control. The second system is also more abstract. [14] [15] The illustrative distribution of the two information processing systems on which the risk is assessed is plotted in the following table:

Table 1. Explanation of the difference in risk assessment for System 1 and System 2.

System 1	**System 2**
Fast	Slow
Automatic	Controllable
Does not require effort	Requires effort
Based on associations	Based on rules
Emotional	Advisory

Many studies have already documented that perception of risk is influenced by associations and emotions similarly stronger or even stronger than their own reason and a conscious evaluation of probability rules. The two systems mentioned above (System 1 and System 2) are involved in the risk assessment, and the risk is far from being rational. On the other hand, in the case of strong impulses, such as concerns about their own security, there is more frequent emotional processing in the ordinary population than the conscious processing of the likelihood that the risk of repetition of a given terrorist attack will be evaluated. [14] The involvement of emotions in decision making has also been demonstrated by laboratory neurobiology experiments. [5]

Generally, people tend to overestimate the importance of events and information that are suggestive, emotional, recent, recurring often, or most often occurring in memory. As noted in 1974 by a psychologist and later famous Nobel Prize winner for economics, Daniel Kahneman it is common for a subjective perception of the probability of a traffic accident to increase temporarily when we pass a car roof down at the highway – such a situation creates a specific cognitive framework under which people interpret further information. One tends to assess the relative importance of things according to the ease with which they are remembered - and this is largely influenced by the extent of coverage of the matter in the media. Frequently mentioned topics in people's minds remain, while others leave. [7]

The Czech Republic was one of the countries to which the influx of refugees from the countries of the Middle East and Africa has not had a real impact and the number of asylum seekers has not risen significantly. [1] The Czech Republic doesn´t lie on the so called Western Balkan route, preventing the main stream of refugees from the entrance.

Despite the fact, that there was not the influx of refugees in the Czech Republic through the role of the media the migratory wave caused a great social tension, the mobilization of extremist right-wing parties and enormous public concern. The following table presents the most frequently expressed fears of the Czech public in 2010 and 2015 according to the Institute of Sociology.

Table 2. Survey of fears among the Czech public (from a wide range of respondents, the respondents always chose the two worries they feel the most, for the purposes of this article the table was shortened to some concerns).

Concerns of the Czech population	**Expressed as a percentage in 2010**	**Expressed as a percentage in 2015**
Migration, refugees	0%	31%
Illness	20%	12%
Unemployment	31%	9%
Concerns about family, children, partner, friends, about their health	14%	3%
Crime, security	9%	11%
Terrorism	5%	36%
Muslim world	0%	12%

The table above shows that while in 2010 the Czech public did not perceive the problem of migration with great concern almost at all, in 2015, the migration was among the main concerns of almost one third of the respondents of the Sociological Institute. The fears of terrorism (fears of 5% of respondents in 2010 rose to 36% of respondents in 2015) and fears of the Muslim world (in 2010 respondents of the Sociological Institute felt no concern at the Muslim world at all, while in 2015 This was expressed by 12% of respondents). It was terrorism and the Muslim world that were closely related to the fears of the refugees, who mostly came from the Muslim world and were media-blamed for some terrorist attacks. The importance of migration concerns in 2015 should not be underestimated, as they often exceeded concerns about illness, family, children, partners, friends, etc. [8]

The next part of this study will focus on whether and to what extent the impact of Czech citizens' fears of migration and refugees has been reflected in their interests to travel to Greece, Italy and Spain, popular vacation destinations that have also became the gates to Europe for refugees.

3 Methodology

Besides the summary of the current knowledge about the European refugee crisis in 2015 the aim of this article is based on the data about the outbound tourism confirm or combat the hypothesis that because of the commonly spread fear of refugees in the Czech Republic (reported by the Institute of Sociology ASCR) the Czech outbound tourism to Greece, Italy and Spain is negatively correlated with the amount of incoming refugees to these countries. For the purpose of this analysis data of the Czech Statistical Office about outbound tourism of Czech citizens between years 2013 and 2016 and data of UNHCR from the years 2015 and 2016 are used. First of all, we look at the development of amount of incoming migrants to Greece, Italy and Spain and then we look at the development of Czech outbound tourism in Greece, Italy and Spain to see if there is a clear negative dependency between these variables.

4 Results

This part of study analyses results of the European refugee crisis on the popularity of all three researched destinations: Greece, Italy and Spain.

4.1 Refugee crisis and Czech outbound tourism to Greece

The most popular gateway to Europe was Greece for refugees in 2015. Over 800,000 refugees and migrants came via the Aegean Sea from Turkey into Greece, accounting for 80 per cent of the people arriving irregularly in Europe by sea in 2015. [19] This is a huge increase in the number of incoming refugees. For example, between January and September 2014, refugees in Greece have also penetrated, but in significantly smaller numbers - in the 9 months January-September 2014 there were 43,500 incoming refugees to Greece. [20] Between 2014 and 2015, when there was a huge increase in the number of incoming refugees, there was a noticeable decline of Czech tourists in this destination. Between 2014 and 2015, the total number of Czech long-term stays in Greece decreased from 291,000 in 2014 to 253,000 in 2015, or by 13% and the total number of Czech overnight stays decreased from 2,895,000 in 2014 to 2,061,000 in 2015 or by 28%.

In 2016, the situation in Greece has stabilized in the context of the refugee crisis. In January and February 2016, over 123,000 migrants landed in Greece, but in March followed the EU-Tukey deal and the number of migrants arriving in Greece dropped to 26,460, less than half the figure recorded in February. This downward trend continued in April, when only 2,700 migrants arrived in Greece, decreasing by 90% compared to the previous month and this trend has been maintained. Together with the decrease in the number of incoming refugees, the number of long-term stays by the Czech population began to rise slightly again in 2016. The total number of long-term stays of the Czech population increased from 253,000 in 2015 to 265,000 in 2016, or by 4.7% and the total number of overnights in thousands has increased from 2,061,000 in 2015 to 2,285,000 in 2016, or by 10.8%. [4]

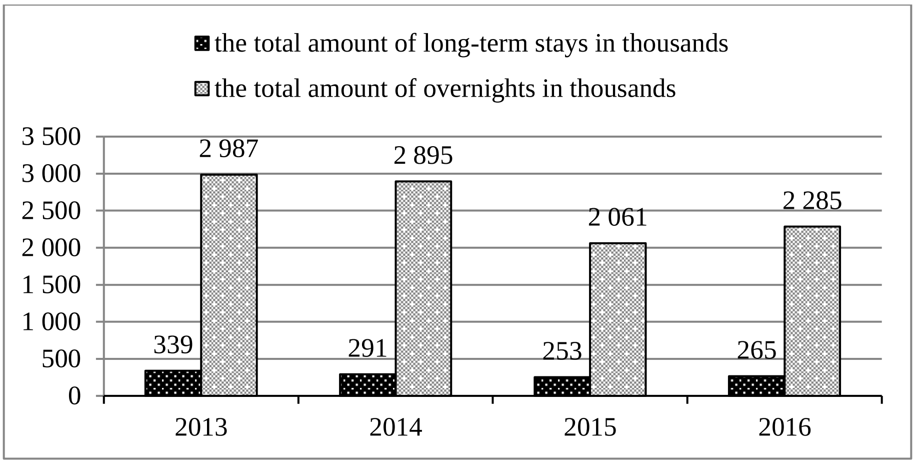

Fig. 3. Development of the Czech outbound tourism to Greece

4.2 Refugee crisis and Czech outbound tourism to Italy

The next most popular route to Europe was the Central Mediterranean route, leading form Africa to Sicily, Sardinia or the other Italian island Lampedusa. Total arrivals of refugees to Italy in 2014 in reached 170,100 and in 2015 reached 153,842 (almost six times less than refugee arrivals to Greece in 2015). [19] [20] It is also important to note that information about Italian refugee crisis in 2014 were no covered much in Czech media and the flow of refugees to Sicily and Lampedusa has not got much attention until 2015. Between 2014 and 2015 the total number of long-term stays of the Czech population has decreased from 553,000 in 2014 to 497,000 in 2015, or by 10.2%, the total number of overnights decreased from 4,192,000 to 3,741,000, or by 10.7%.

In the year 2016 the refugee flow to Italy hasn´t stabilised in the same was at the refugee flow to Greece. The EU-Turkey deal from March 2016 has not prevented the migrant traffic on the central Mediterranean route and had exactly the opposite effect than in the case of Greece. The total amount of incoming migrants to Italy increased in 2016 compared to the year 2015. In 2016 there were 181,436 migrants coming through Central Mediterranean route to Italy (more than to Greece in 2016). [11] It is also important to add, that less than 3% of the migrants coming to Italy in 2016 were refugees. Despite this fact in the year 2016 we can also observe increase of popularity of Italy as a tourist destination among Czech population. Between 2015 and 2016 the total amount of long-term stays in Italy increased from 497,000 in 2015 to 552,000 in 2016, or by 11% and the total number of overnights from 3,741,000 in 2015 to 4,063,000 in 2016, or by 8.6 %. [4]

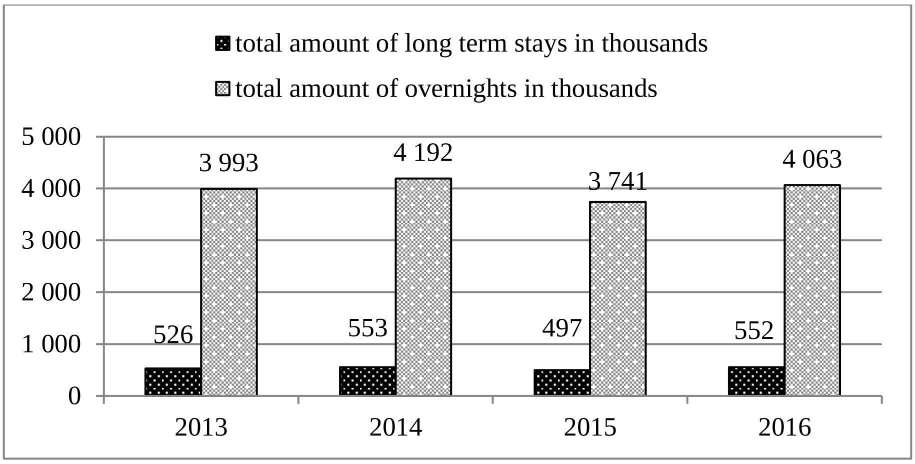

Fig. 4. Development of the Czech outbound tourism to Italy.

4.3 Refugee crisis and Czech outbound tourism to Spain

The least used Mediterranean route to Europe during the refugee crisis was the Western Mediterranean route. In 2015, 4,408 migrants came to Spain by sea. In 2016 sea arrivals to Spain increased rapidly with only 7,490 reported migrants for that year. [9] The total number of incoming migrants by sea is relatively low compared to 153,842 and 181,436 arrivals by sea to Italy in 2015 and 2016 and compared to 856,723 and 173,450 arrivals by sea to Greece in 2015 and 2016. From the perspective of tourism we can observe a huge drop of popularity of Spain in 2015.

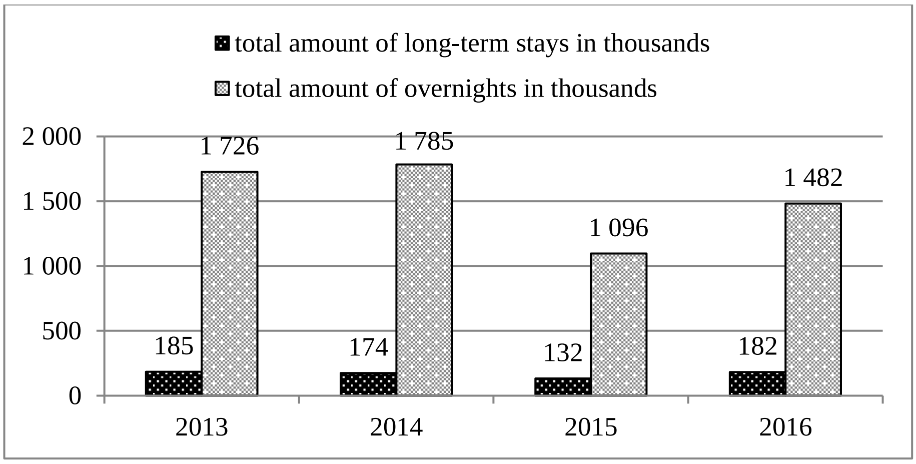

Fig. 5. Development of Czech outbound tourism to Spain.

Between 2014 and 2015 the total amount of long-term stays decreased from 174,000 in 2014 to 132,000 in 2015, or by 24.1% and the total number of overnights decreased from 1,785,000 in 2014 to 1,096,000 in 2015, or by 38.6%.

In 2016, when the amount of migrants coming to Spain by sea increased to 7,490 the popularity of Spain as a tourist destination also increased. The total amount of long-term stays in Spain increased from 132,000 in 2015 to 182,000 in 2016, or by 27.5%. The total number of overnights by Czech population in Spain increased from 1,096,000 in 2015 to 1,482,000 in 2016, or by 26%. [4] [11]

5 Discussion

We have to admit that outbound tourism of the Czech population to Greece, Italy and Spain in 2015 and 2016 was not influenced only by the fear of refugees, but also by many different factors. In 2015 the Czech national currency depreciated making purchases abroad relatively more expensive for tourist with the Czech income. At the same time petrol prices dropped in 2015 encouraging travelling by car and therefore to less distant destinations. Because of these and many other factors it is impossible to describe the changes of the Czech outbound tourism to Greece, Italy and Spain just from the perspective of the refugee crisis. We can only search for a dependency between sea arrivals of migrants and long-term stays (4 nights and more) of Czech tourist at the same period, but we cannot imply a direct causality of these events.

6 Conclusion

This article summarized the dual process decision-making of tourists as well as the basic facts about the refugee crisis in European Union in 2015, when more than one million of migrants from Africa and the Middle East (mainly Syria) arrived in the European Union (mostly in Greece, but also in Italy and Spain) by sea via the Mediterranean routes. This migratory wave has struck the European Union unprepared causing serious concerns among Czech population. According to the Institute of Sociology ASCR one in three inhabitants of the Czech Republic were reporting the fear of refugees and migrants as their greatest concern in 2015. The reported fear of refugees and the Muslim world among the Czech population by far exceeded fears of illness or fear of losing family members, which depicts the wave of hysteria that occurred in connection with the arrival of migrants in the Czech Republic. The main goal of this study was to find out, if there can be found a negative dependency between amount of migrant’s incomings by boats to Greece, Italy and Spain, and Czech outbound tourism to Greece, Italy and Spain, which are normally popular destinations for the citizens of the landlocked Czech Republic.

The analysis of the Czech outbound tourism to Greece, Italy and Spain for the years 2015 and 2016 clearly shows that in 2015, when the refugee crisis has culminated, the number of long-term stays (four nights or more) of the Czech tourists decreased in all researched destinations - Greece Italy and Spain. In March 2016 after signing EU-Turkey treaty the number of migrants taking Eastern Mediterranean route and heading to Greece significantly decreased. Therefore it decreased also the amount of migrants using Western Balkan route with the goal of reaching Central European states. While the number of migrants heading to Greece in 2016 due to the EU-Turkey deal has fallen significantly, in Spain and Italy, the number of migrants arriving to the coast by sea has compared to the year 2015 increased and Italy replaced Greece as a main destination for migrants arriving to Europe by sea in 2016. Despite the increase of incoming migrants to Italy and Spain in 2016 the total amount of long-term stays (four nights and more) and the total number of overnights by Czech tourists in Italy and Spain has increased. Therefore we have to reject the hypothesis about the universal negative dependency between the numbers of incoming migrants and total number of Czech outbound tourism to Greece, Italy and Spain. Despite the fact, we cannot see a universal negative dependency; we can see a clearly negative dependency between the number of Czech long-term stays in 2015 and 2016 and the amount of incoming migrants during years 2015 and 2016 in the case of Greece, where the refugee crisis was the most critical until March 2016.

The possible explanation for the absence of negative dependency between amount of incoming migrants and Czech tourists in Italy and Spain can be a relatively lower scale of the problem in Italy and Spain compared to the situation in Greece. Also, the findings of this paper can be influenced by the fact that rather than by the real numbers of incoming migrants, the decision-making of the Czech population was rather emotional and influenced by feelings and impressions received from the media (by System 1 of dual process decision-making). Since the amount of refugees decreased on the Balkan route (neighbouring with the Czech Republic) in the beginning of 2016 the refugee problems could have stopped to look so urgent globally from the Czech perspective.

The statistics of the outbound tourism to Greece, Italy and Spain could have been also influenced by many other factors, which are not connected with the refugee crisis – for example by weakening of the Czech national currency and by the reduction of petrol prices favouring tourism in central - European countries.

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Analytical and Statistical Research of State and Households Health Care Expenditures in the Czech Republic

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Abstract. The aim of the article is to analyze health care expenditures in the Czech Republic compared to selected countries. Expenditures will be analyzed from the point of view of the state and households. The partial aim of the contribution is a correlation analysis to verify the dependency of household healthcare expenditure and average household income in 2010-2015.
With the rise of modern technology and knowledge, but also with the extension of human life is constantly growing importance of health care. Over the period 2010-2015, total healthcare spending has risen from CZK 340.7 billion in 2010 to CZK 358.0 billion in 2015. Compared with the development of the GDP, total expenditure on health care (including capital) lagged, and their share of GDP fell from 8.6% to 7.9% in the years above. Household expenditures on health care in the year 2015 amounted to CZK 49,358 million, or 13.8% of the total health care expenditures in the Czech Republic. Using Spearman coefficient was shown dependence of health expenditure of households on their income. At the same time, a forecast for healthcare spending was created for 2 years ahead.

Keywords: Health Care, Expenditures, Correlation Analysis, Spearman Coefficient, Households.

1 Introduction

Human health care is undoubtedly one of the most important socially organized activities. Gradually, with the development of knowledge and the application of its results in practical activities on the one hand and the prolongation of human life on the other, the importance of healthcare is growing. From an economic and social point of view, healthcare requires more and more resources that draw on complex redistribution. Finally, with the development of globalization and the related integration tendencies, the need for sharing information on healthcare and the provision of healthcare internationally will increase. [2]

Heuvel's and Malaroiu's [6] research shows, that health care expenditures are not the main determinant of life expectancy at birth, but social protection expenditures are. They show that in countries that spend a high percentage of their GDP on social protection, that have fewer curative beds and low infant mortality, whose citizens report fewer unmet health care needs and drink less alcohol, citizens have a significant longer life expectancy. Braendle and Colombier [1] find that per capita income, the unemployment rate and the share of foreigners are positively related to public health care expenditure growth.

Explanations of growth in health expenditures have restricted attention to the mean. Meijer at all. [7] explain change throughout the distribution of expenditures, providing insight into how expenditure growth and its explanation differ along the distribution. Changes in hospital practice styles make the largest contribution of all determinants to increased spending not only on hospital care but also on pharmaceuticals, suggesting important spill over effects.

Income, ageing population and health care technology exert positive effects on U.S. health expenditure per capita. Unlike prior studies, Murthy and Okunade [8] present new empirical evidence indicating that the U.S. health care is a necessity, with an income elasticity estimate of around 0.92. They find that medical technology advances play a major role in the long run rise of the U.S. health expenditure.

2 Methodology and objectives

The article is based on primary and secondary sources. Secondary sources comprise information about expenditures on health care in the Czech Republic and abroad, professional literature, information collected from professional press, discussions or previous participations in professional seminars and conferences relating to the chosen subject. Primary sources are based on the information gained from Czech statistical office, OECD, Eurostat, WHO etc. Then it was necessary to select, classify and update accessible relevant information from the numerous published materials that would provide the basic knowledge of the selected topic.

Correlation analysis will be performed (correlation matrix will be composed) in the second part. A Spearman correlation coefficient is an important characteristic in evaluating the validity of tests, because it determines how close together two related phenomena are captured. Thus, it allows quantitative determination of how far the two similar order are created. For the calculation, it is necessary to have a table in which you can specify individual correlated pairs, which are compared to the individual components of the correlation, overall index and the basic form of vector analysis. The result is a dimensionless number, which indicates the degree of correlation between individual freedom and the steam created for each pair of correlation. [4], [5]

The goal of the paper is to focus total expenditures on health care in the Czech Republic. The partial goal is to use correlation analysis to verify the dependence of health spending among households and average household income between 2010 and 2016.

3 Expenditures on Health Care in the Czech Republic and selected countries

In accordance with the SHA Methodology Manual, medical expenses are related to healthcare expenditures for our citizens in the Czech Republic. Expenditure on health care can be broken down into current (operating) and capital (investment).

Over the period 2010-2015, total healthcare spending has risen from CZK 340.7 billion in 2010 to CZK 358.0 billion in 2015.

Current expenditure on health care increased from CZK 334.1 billion in 2010 to CZK 352.3 billion in 2015, i.e. by 5.4% (an average of 0.9% per year). The dynamics of population development in the Czech Republic was lower compared to this rate (the increase in the average state of the population was 0.1%), so the average current expenditure on healthcare per capita increased from 31,768 CZK to 33,960 CZK in 2010-2015 (i.e. 6.9%).

Total capital expenditures financed directly from state or local health care budgets declined from CZK 6.6 billion in 2010 to 2015 to CZK 5.7 billion (15.8%).

Compared with the development of the main macroeconomic performance indicator - GDP, total expenditure on health care (including capital) lagged behind, and their share of GDP fell from 8.6% to 7.9% in the years above, see Fig. 1. [2]

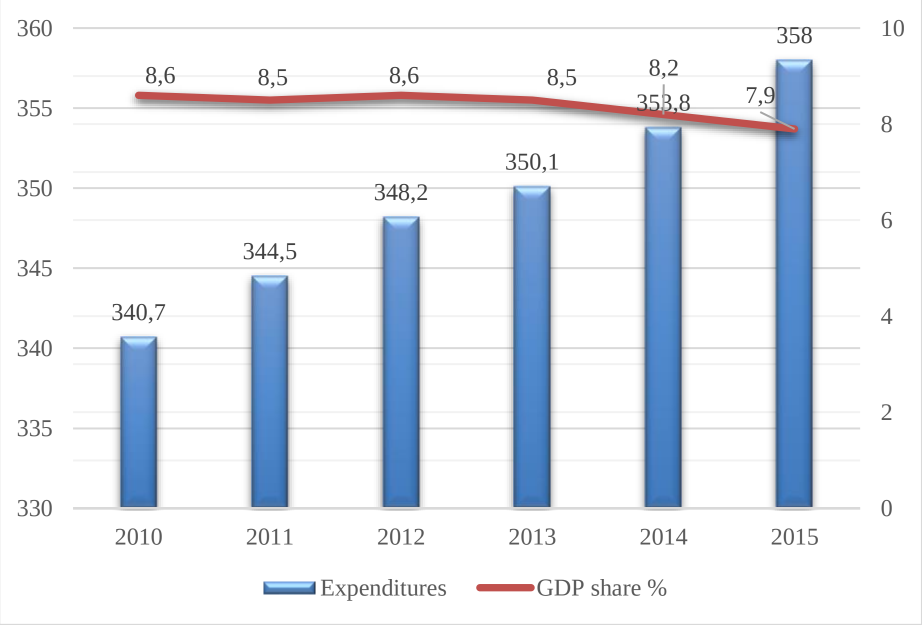

Fig. 1. The development of total health care expenditures in the Czech Republic and its share of GDP, 2010 - 2015 (billion CZK, %) [2].

3.1 Household expenditure on health care

Household expenditure on health care in the year 2015 amounted to CZK 49,358 million, or 13.8% of the total health care expenditures in the Czech Republic. This share ranged between 12.5% between 2010 and 2013 and exceeded 13% in 2013. This amount represents more than 2% of total household expenditure. Since 2010, household spending on healthcare has been above CZK 40 billion, and in the year 2015 it has reached a maximum of CZK 49,358 million. If we were to direct household spending on healthcare per capita, we would have reached 4,600 CZK in 2015 against 4,100 CZK in 2010 (see Fig. 2). [2]

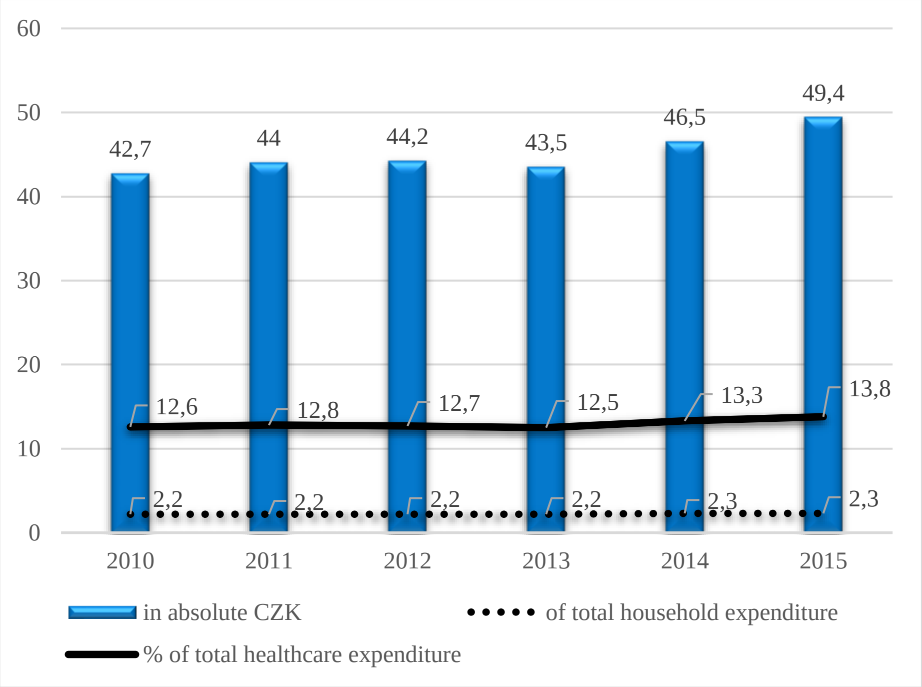

Fig. 2. Direct expenditures of households in the Czech Republic on health care, 2010-2015 (CZK billions; %) [2].

3.2 Health spending in selected country

Health spending measures the final consumption of health care goods and services (i.e. current health expenditure) including personal health care (curative care, rehabilitative care, long-term care, ancillary services and medical goods) and collective services (prevention and public health services as well as health administration), but excluding spending on investments. Health care is financed through a mix of financing arrangements including government spending and compulsory health insurance ("Government/compulsory") as well as voluntary health insurance and private funds such as households' out-of-pocket payments, NGOs and private corporations ("Voluntary"). This indicator is presented as a total and by type of financing ("Government/compulsory", "Voluntary", "Out-of-pocket") and is measured as a share of GDP, as a share of total health spending and in USD per capita (using economy-wide PPPs). [10]

Spending on health in the OECD was about USD 4,000 per person on average (adjusted for purchasing powers). The United States spends almost USD 10,000 per person. Health spending was 9% of GDP on average in the OECD, ranging from 4.3% in Turkey to 17.2% in the United States. In all countries except the United States, government schemes and compulsory health insurance are the main health care financing arrangements. Hospitals account for nearly 40% of health spending. Population ageing has increased the demand for long-term care, with spending increasing more than for any other type of health care. [9]

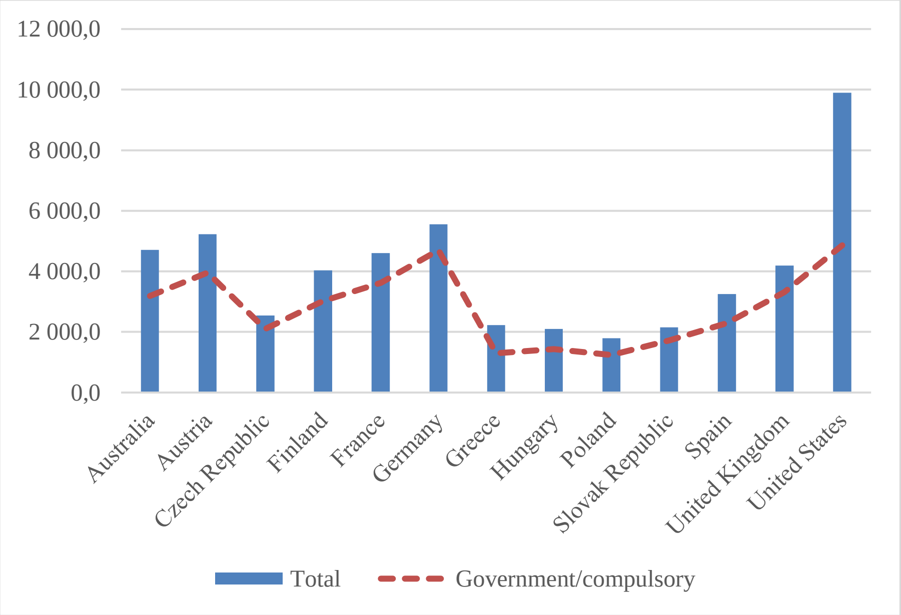

Fig. 3. Health spending in 2016 (US dollars/capita) [10].

According to OECD, the largest amount of funding was spent by United States (17.2% GDP), Switzerland, Luxembourg, Norway and Germany in 2016. The Czech Republic has earmarked total 2,544 US dollars/capita which is 7.3% of GDP and government/compulsory was 2,097 US dollars/capita which is 6% of GDP. Voluntary was only 455 US dollars per capita, which is 1.3 % of GDP. Voluntary is one of the lowest of all the countries compared. The lowest spending on healthcare was reported in Mexico Turkey (total 4.3% GDP), Latvia and Poland. [10]

4 Correlation analysis

Correlation analysis is based on data from the Czech Statistical between 2010 and 2015. The health care expenditures in individual households are available for the years 2010-2015, so it was necessary to create a linear model based on a forecast for the years 2016 and 2017.

Table 1. Expenditures on Health Care in the Czech Republic [1].

Year	Expenditures	Prognosis (Expenditures)
2010	42.7	
2011	44.0	
2012	44.2	
2013	43.5	
2014	46.5	
2015	45.0	45.00000000
2016		45.65044738
2017		46.14247425

According to forecasts, expenditures on health care should grow over the next two years (see to Tab. 1 and Fig. 4).

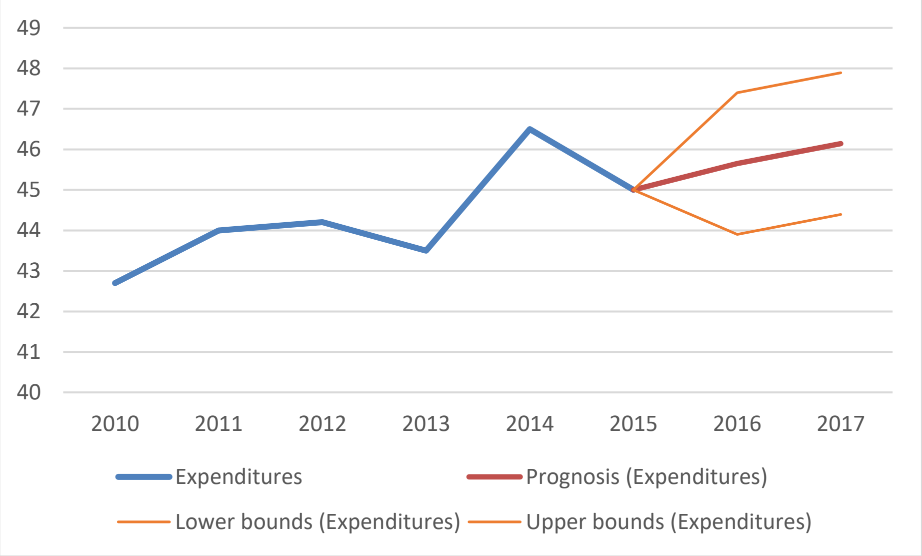

Fig. 4. Expenditures on Health Care in the Czech Republic [2, 3].

Followed by correlation analysis will be verified addiction health expenditure of individual households and average household income between 2010 and 2016.

Spearman coefficient between direct medical expenditures of individual households in the Czech Republic and the average wage, which reflects the average income of the household, came 0.7089, indicating a correlation between these two variables.

As households' average household income grew, households' total healthcare expenditures increased proportionally, and the households' healthcare expenditure was reliant on their income.

5 Conclusion and discussion

Health care expenditures are current in all countries around the world. Governments are trying to optimize the amount of expenditure on health care with regard to economic and social aspects. Health care expenditures in the examined period 2010 - 2015 to grow in the Czech Republic. Over the whole period under review, however, the share of GDP is decreasing. Household expenditure on health care have increased in the last two years.

Using Spearman coefficient was shown dependence of health expenditure of households on their income. At the same time, a forecast for healthcare spending was created for 2 years ahead. According to the forecast, health care expenditures will rise in the coming years. The question in the discussion is which variables are most involved in rising health care expenditures. Another issue is the role of new modern technologies in healthcare and their impact on expenditures.

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Process of Implementation of International Financial Standards (IFRS)

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Abstract. This paper is concerned with the implementation of International Financial Reporting Standards (IFRS) in the Czech Republic. It was written as a reaction to constantly increasing number of businesses implementing IFRS. In order to ascertain the methods selected by such companies for IFRS implementation, I carried out my own research based on semi-structured interviews. The aim of this research was to determine the individual stages of implementation, which would be helpful for business anticipating IFRS implementation. Generalization of the individual interviews revealed that the process of IFRS implementation may be divided into four stages: project preparation, opening stage, trial operation and adaptation operation. The most important thing in the initial stage is to create a project plan. The opening stage contains preparation of the areas affected by the implementation and the changes in the information system; the output of this stage consists in draft statements or a financial statement. In the third stage, trial operation is launched and tested and errors are eliminated; the result is an opening balance sheet. The final stage of adaptation operation includes inspection, evaluation and corrections of possible errors. IAS/IFRS implementation is a multi-stage process, which is time-consuming and demanding in terms of qualified staff and funds.

Keywords: International Financial Standards, IFRS, International Accounting Standards, IAS, IAS/IFRS Implementation.

1 Introduction

International accounting convergence is a highly complex process that began decades ago, emphasized globalization being the main factor that determined setters, professional bodies, investors to become aware of the importance of completing this process, namely the development and implementation of a common set of standards covering all areas of financial reporting. [11]

There are a number of business entities making financial statements in compliance with International Financial Reporting Standards or International Accounting Standards (hereinafter referred to as IAS/IFRS). [10]

Such businesses have experience with the implementation of IFRS principles in order to prepare financial statements in compliance with the said standards. This experience is very valuable because IAS/IFRS deal with the individual areas of accounting only or directly determine the targeted status only.

IFRS 1 First-time Adoption of International Financial Reporting Standards also does not provide specific methods and is based on the transition from GAAP (Generally Accepted Accounting Principles) to IFRS, not on the transition from national accounting regulations. [12]

IFRS 1 aims at: recognizing the assets, liabilities and shareholders equities in conformity with IFRS requirements, ending the recognition of some elements as assets or liabilities if the IFRS do not allow this recognition, reclassifying all the assets, liabilities and components of shareholders equities in conformity with IFRS, revising assets and liabilities evaluations in conformity with IFRS requirements. [6]

In reaction to the said facts, I carried out my own research of businesses proceeding in compliance with IFRS, aimed at the determination of specific methods of IFRS implementation. The given information should be of assistance to businesses anticipating IAS/IFRS implementation.

2 Statement of Problem

Economic globalization is under way in Europe, and in consequence of this, the need of harmonization of accounting is growing. In 2000, the European Commission decided that IAS (IFRS) will serve as the tool for regulation of European accounting. [7]

Since 2003, International Financial Reporting Standards (IFRS) have been gradually substituting International Accounting Standards (referred to as “IAS”). [14] IAS, which have not been substituted by IFRS yet, are still valid; therefore, the accounting standards are hereinafter referred to as “IAS/IFRS”.

The duty to make financial statements in compliance with IAS/IFRS has been imposed on businesses with publicly subscribed shares by Section 19a of Act No. 563/1991 Sb. since 1 January 2005.

Member States of the EU may extend this regulation further to unquoted companies and/or individual financial statements. [4]

IFRS are annually published by the International Accounting Standards Board (IASB) in the form of a book including all the standards and their interpretations. The interpretations, referred to as “SIC” and “IFRIC”, aim to clarify certain provisions of specific standards. The interpretations also react to new circumstances which were not included in the standards at the time of their creation. [5]

However, only standards approved by the Accounting Regulatory Committee, assisted by EFRAG (European Financial Reporting Advisory Group) and published in the Official Journal, are mandatory. [2]

Standards regulated in this way by the law of the European Union are valid in the whole of the European Union without the necessity of their transposition into national law. [8]

Besides IAS/IFRS, there is the Conceptual Framework for Financial Reporting, which is not a standard of its own accord, but forms a necessary base for the preparation and understanding of the individual standards.

The Conceptual Framework outlines the aim, users, basic prerequisites, qualitative characteristics and contents, and the method of recognition and appraisal of the basic elements of a financial statement. The Conceptual Framework does not revoke or substitute any IAS/IFRS.

The purpose of the Conceptual Framework is to assist in the preparation of future IFRS and in the review of existing IAS/IFRS; it should serve as a basis for making national accounting standards; it should help persons making financial statements, auditors and users in their work, i.e., in IFRS application, evaluation of financial statements and interpretation of information contained in financial statements in compliance with IFRS. [9]

Most of the standards are divided into four main parts: definitions of terms referred to in the standard, methods of appraisal, criteria for recognition (stating) of items in financial statements, and publishing requirements. Some standards provide two possibilities of accounting treatment of the same problems. Such possibilities are designated as the “Basic Solution” and the “Permitted Alternative” or by the names of the permitted models. [14]

The experience of passing to IFRS in countries with economies in transition reveals certain problems associated above all with the same approach to the implementation of global reforms of national accounting systems. Current issues of transition to IFRS require attention and solution of internal problems of enterprises, which are defined by current management objectives and they include lack of qualified personnel, lack of collection of information (software) and increase the number of reporting packages (IFRS reporting and national standards). [17]

3 Costs and benefits of I/AS/IFRS

The costs associated with the IAS/IFRS implementation have been determined by the Institute of Chartered Accountants in England and Wales [5] as follows: the establishment of a project team, training of other employees, such as IT staff, internal audit and management, training of staff, external technical advice, tax advice, software and information systems changes, communications with third parties, external audit costs, renegotiating debt covenants and other external data requirements.

Besides the requirements for the IAS/IFRS implementation (costs and time) there are other facts burdening implementing businesses in terms of legislation. Businesses that still keep their accounts according to CAS should be prepared for them.

Based on the experience gained form the first implementation and application of IFRS, the transition economy countries singled out the main shortcomings of the process of applying IAS/IFRS in accounting and financial reporting: lack of standardized requirements for the application of national financial reporting standards and IAS/IFRS, lack of qualified specialists, availability of independent audit and professional organizations of accountants and auditors, availability of regulations concerning the mechanism of IAS/IFRS implementation, small and medium-sized enterprises. [17]

Oremusová [10] defines the general benefits of the international accounting standards as follows: easier access to foreign capital markets, higher credibility of foreign companies on domestic capital markets, global comparability of financial data, increased transparency, greater clarity due to „common accounting language", simpler regulation on capital markets, lower influence of accounting standards by political pressures.

The gradual implementation of IAS/IFRS as accounting basis will increase an entity immediate expenses (for instance, costs for staff training, for the services of authorized evaluators, for software, for the preparation of accounting policies necessary for the application of IFRS, auditing financial statements etc.), but the advantages of presenting financial reporting based on these will be significant not only for the entities themselves, but also for other parties involved, advantages such as: it ensures transparency and comparability of financial reporting, credibility, better rate of information for investors and cheaper access to capital markets. [13]

International Accounting Standards have an important role in developing countries. [16]

4 Description of the Research

During the year 2016, 16 persons concerned with IAS/IFRS implementation in the Czech Republic were addressed in the form of a semi-structured interview.

Between September and December 2015, 24 respondents, who address the issue of the IAS/IFRS in the Czech Republic, were interviewed by means of semi-structured interview. Their function in the IAS/IFRS, the sector of their activity and information on the placement of their company shares on the stock exchange are included in the Table 1. Interviews' records including contacts are available.

Table 1. Research.

Function	**CZ-NACE sector classification**	**Stock Exchange**
Auditor	agriculture, forestry, fisheries	in preparation
Auditor	professional, scientific and technical activities	no
Auditor	professional, scientific and technical activities	no
Auditor	professional, scientific and technical activities	no
Auditor	manufacturing industry	no
Auditor	professional, scientific and technical activities	no
Project manager	finance and insurance	PSE

Project manager	manufacturing industry	PSE
Project manager	finance and insurance	no
Accountant	manufacturing industry	no
Accountant	manufacturing industry	Frankfurt Stock Exchange
Accountant	transport and storage	Luxembourg Stock Exchange
Accountant	water supply	no
Accountant	finance and insurance	no
Accountant	manufacturing industry	no
Accountant	production and distribution of energy	no

The persons were asked about the process of IAS/IFRS implementation. Owing to the individual positions, the individual persons expressed themselves either on the implementation project or on the individual accounting adaptations.

10 persons were concerned with IAS/IFRS implementation as a project and 6 persons expressed themselves directly on accounting adaptations. The persons had to describe phases of IAS/IFRS implementation and ask about a question “How long was the process of implementation?”

The methods of implementation presented in the Results of the Research were created by generalization.

5 Results of the Research

As results from the research performed, the project of IAS/IFRS implementation has four main stages: project preparation, opening stage, trial operation, and adaptation operation, as given in Fig. 1

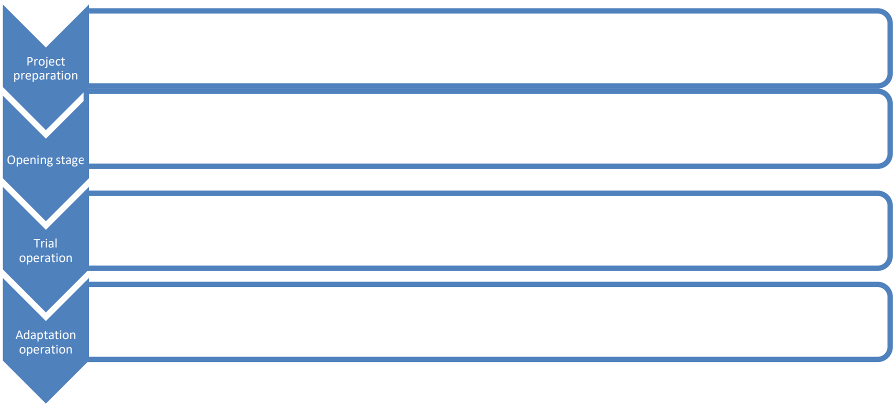

Fig. 1. Stages of IAS/IFRS Implementation.

The first stage of the project, project preparation (Fig. 2), is preceded by the decision to implement IAS/IFRS; the above-mentioned legislative requirement is not the only reason for this. There are more reasons for businesses to implement IAS/IFRS, e.g. the requirements of their business partners. Businesses which have decided to implement IAS/IFRS due to bigger transparency, which is considered by them as a competitive advantage, are not exceptional.

Availability of information is crucial during project preparation. Three of the interviewed respondents got a manual and an application from the parent company in the group. The remaining respondents collected information by training key employees and from external counsellors. The aim was to ascertain the initial and the target statuses, which differed in the differences between CAS and IFRS (GAAP and IFRS in one case). The partial steps consisted in the definition of the areas where accounting transactions must be recorded in a different way. The determination of significance limits was an important aspect.

The preparatory stage resulted in a project plan containing a time schedule of activities and determination of problem-solving teams containing internal employees and external counsellors.

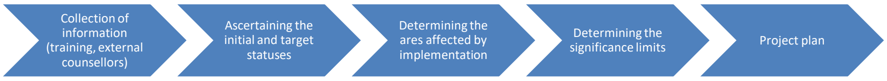
Collection of information (training, external counsellors)
Ascertaining the initial and target statuses
Determining the ares affected by implementation
Determining the significance limits
Project plan

Fig. 2. Stage 1 – Project Preparation.

The second, opening, stage (Fig. 3) contained several partial steps.

At first, the individual accounting elements had to be defined from the perspective of IAS/IFRS and short-term and long-term assets and liabilities had to be classified.

Thus, assets were re-classified, newly appraised and the method of their depreciation changed. Liabilities were re-classified from the perspective of their being long-term or short-term. The research showed that businesses rather classified liabilities as short-term in order not to have to appraise them on the basis of their current value. Certain differences appeared also in the area of revenues and costs. Owing to the different concept, reserves changed and conditional liabilities developed; changes in retained earnings and in deferred tax were noted. It was necessary to substantially re-classify financial leasing and to recognize goodwill.

During the second stage, all the employees affected by the implementation were trained.

The Czech chart of accounts had to be adapted or an IFRS chart of accounts had to be opened; a sufficient number of analytics and transmission cross-walks had to be set up. It was crucial to ascertain the possibilities of the existing information system and to make the necessary adaptations in it. Some respondents said that they had used Excel for making auxiliary files.

Owing to the fact that IAS/IFRS does not present a binding form for the statements, the necessary accounting statements had to be designed.

The result of this stage was a simulation of IAS/IFRS methods for the previous period and making a model annual report.

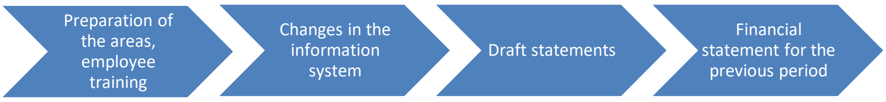
Preparation of the areas, employee training
Changes in the information system
Draft statements
Financial statement for the previous period

Fig. 3. Stage 2 – Opening Stage.

In the 3rd stage of project implementation (Fig. 4), trial operation was launched to test the new methods and to eliminate errors. The result of the trial operation was an opening balance sheet.

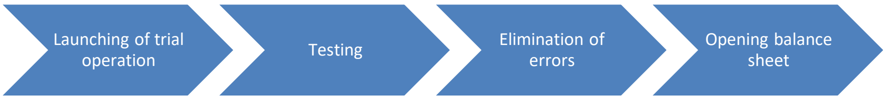

Fig. 4. Stage 3 – Trial Operation.

In the final stage of implementation, adaptation operation was launched (Fig. 5). Having been launched, the adaptation operation was constantly checked and evaluated and possible minor mistakes corrected.

When questioned whether they had been making mistakes in the first years, 9 respondents answered that they had, but 4 of them added that they had been only minor issues, inaccurate estimates and irrelevant mistakes. 3 respondents were not aware of any errors.

The most frequent errors included wrong methods of appraisal or reporting of data in incorrect parts of the statements. Other mistakes mentioned during the interviews included falsely reported profits on the sale of own shares in the P&L statement, mistakes in the use of hedge accounting, consisting in not complying with the conditions, and ignoring the principle of priority of substance over form.

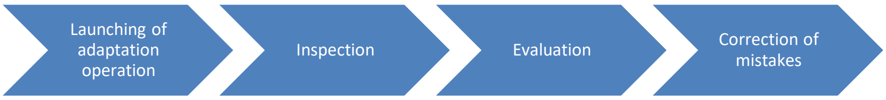

Fig. 5. Stage 4 – Adaptation Operation.

Regarding the duration of the implementation it was researched that the smaller units had taken about 3 months, and in the larger units it had been from 15 to 18 months. There was even an answer that the implementation process took only a few weeks. It was also said that the implementation process had been ongoing since 2013 and was steadily improving. Frequency of the answers is in Table 2.

Table 2. The duration of the IAS/IFRS implementation.

The duration of the IAS/IFRS	**Frequency of answers**
Max. 1 month	1
Max. 6 months	3
Max. 1 year	8
More than 1 year	4

6 Conclusion

IAS/IFRS implementation is a multi-stage process taking months, at the minimum, but even more than a year.

Companies should get ready for the transmission from national accounting rules to IFRS sufficiently in advance [14].

The basis for successful implementation is a project plan including a work schedule.

During the process of IAS/IFRS implementation, it is necessary to create a high-quality team because the process requires cooperation of experts in the field of accounting, legislation and computing.

Besides sufficient time and number of qualified staff, it is necessary to secure financial resources because IAS/IFRS implementation involves a change in the information system of the business.

The process of IAS/IFRS implementation can be managed well only if all the necessary inputs, including a high-quality project plan, are respected.

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Recommendations for Social Media Activities to Positively Influence the Economic Factors

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Abstract. Social Media has become an important part of people life today, all over the world. The number of social media users has grown rapidly during last decade and are projected to keep growing. In this article the statistics concerning social media usage and the global characteristics of this phenomenon were presented. According to researchers, the number of social media users will exceed 3.02 Billion by 2019. Such a huge number of active users, have a strong influence on various economic areas. Social media has changed, the way companies carry out marketing and branding activities, the flow of information or news in the global scenario, international trade, public awareness, transparency of government or public administration, employability or talent acquisition etc. These socio-economic or micro-economic factors inevitably influence the economic factors of each country. In this article, the different aspects of growing number of social media users were analysed. Also, we recommend a set of guidelines for individuals, businesses and government which would positively impact the efficiency of social media usage. These recommendations, brings about a balance between the social, personal and professional aspects of individuals. For businesses and governments, they yield a better connectivity with the citizens / customers. A combination of both these outputs results in positive influence on economic factors.

Keywords: Social Media, Facebook, Macroeconomics, Economic Growth

1 Introduction

The increasing popularity of social media during last decade is one of the most interesting phenomenon of XXI century. Over 2 billion Facebook users and hundreds of millions of users in other social media services [11] have a direct or indirect influence, on various aspects of life [1, 22], and also the Economy. People who spend time on social media engage in relationships, watch advertisements, recommend products / brands, and indulge in lot of other things that affect the economy at both microeconomic and macroeconomic levels [5, 15, 24].

In the literature there were only a few papers which analyzed the impact of social media on economy from macroeconomic perspective [5, 17]. In our paper we want to fill this gap in the literature and make basis for further research in this area.

The main purpose of this article is to recommend important points that should be applied by social media users, i.e individuals, businesses / firms & government, for positively influencing the economic factors. The growth of internet through mobile devices and the vast usage of social networking sites by users around the world have direct or indirect effect on various economic factors. The recommendations for activities stated in this article can positively influence these economic factors, resulting in GDP growth of the country.

The structure of the article is as follows. In the first section, current statistics concerning Internet and social media usage are shown. There-after the mutual relations between social media and economy are analysed. In the section after that, recommendations, for effective usage of social media, are enlisted for individuals, businesses and government. The last section includes short conclusions.

2 The current scenario of Internet & social media

2.1 Internet usage

Internet usage has increased significantly during last decade and mobile internet services were one of the key factors which contribute to this growth [1]. Mobile data traffic increased by 4000 times from 2005 to 2015. If we consider the period between 2000 to 2015, then the increase in mobile data traffic is a staggering 400 million times. This has been possible because of the increased affordability and availability of smart phones as well as the development in mobile communication technology over the last decade. Internet usage on smartphone is estimated as 97% of the total mobile data traffic. According to the usage patterns, a prediction by CISCO puts the monthly global mobile data traffic at 30.6 exabytes and number of mobiles connected per capita at 1.5. Three fourth of the mobile data traffic would be videos by 2020. Further, with the implementation of 4G, the average global mobile speed will surpass 3 Mbps by 2017. At that point the monthly mobile data traffic is estimated at around 9.9 exabytes. These predictions illustrates that there will be an increase of over 300% in the next three years [6].

2.2 Development and Growth of Social Media

In 1979, Tom Truscott and Jim Elis from Duke University created the Usenet, which was a system that enabled the users to have a discussion by posting public messages over the internet. This was one of the first signs of digital social networking. In 1997 an early social networking site named “Open Diary” was founded by Bruce and Susan Abelson. It was around the same time, the word “weblog” was first used. This formed the bases of the word “blog” a year later, as one of the bloggers jokingly divided the word in a phrase “we blog”. With the further evolution of internet speeds and affordability, social networking sites like MySpace and Facebook were founded. “Social Media” became a popular term henceforth [1]. Currently, majority of the time spent on the internet is on social media, which includes blogs, virtual games, social worlds, social networking sites, collaborative projects, building communities etc. [1, 22]. Future evolution of the world wide web is going to be connected with social media, affecting every individual and business directly or indirectly, as the user base of social media expands rapidly [2, 25].

According to a study carried out at the Pew Research Centre in America, over 65% of the American adults were using social media in 2015 as compared to 7% in 2005. Although young adults aging between 18 to 29 years are in majority, the growth of social media users was observed in all the age groups. Based on gender, in 2015, it was found that there was a modest gap of 2% between men & women, with women leading the way. As far as the classification of the users based on socio-economic factors are concerned, it was observed that individuals with higher education level and household income, used social media more. Nevertheless, since past few years it was noted that over 50% of the users from lower income houses or less education had initiated using social media actively. In terms of users by geographic location: rural, suburban and urban; it was observed that the patterns were consistent over the decade of study with the percentage of users standing at 58, 68 & 64 respectively [23].

Analysing the global social media users base, a survey by eMarketer published in July 2017 shows a steady rise in the number of users worldwide. (Fig. 1).

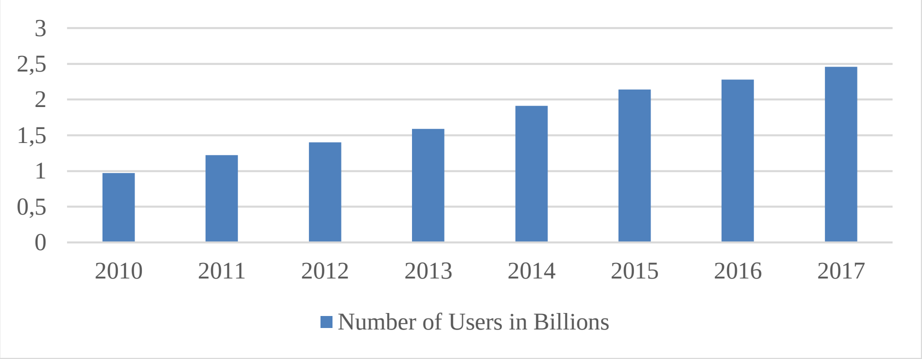

Fig. 1. Year wise number of social media users globally on all platforms [16]

According to Eurostats, considering all the 28 countries in the European union, the frequency of Social Media usage by residents can be divided into everyday users (26.2%), every week users (13.3%), once a month users (2.8%), several times a month users (5.2%), not in the last twelve months (50.5%) and at least once a year (1.9%). These figures are very recent as they were updated on 19th September 2017. Country wise distribution of the users in European Union, on the same basis as above, is presented in the Figure 2. It can be seen that the highest percentage value of every day users exists in Norway (45.5%), followed by Malta (42.6%) & Ireland (41.8) [7].

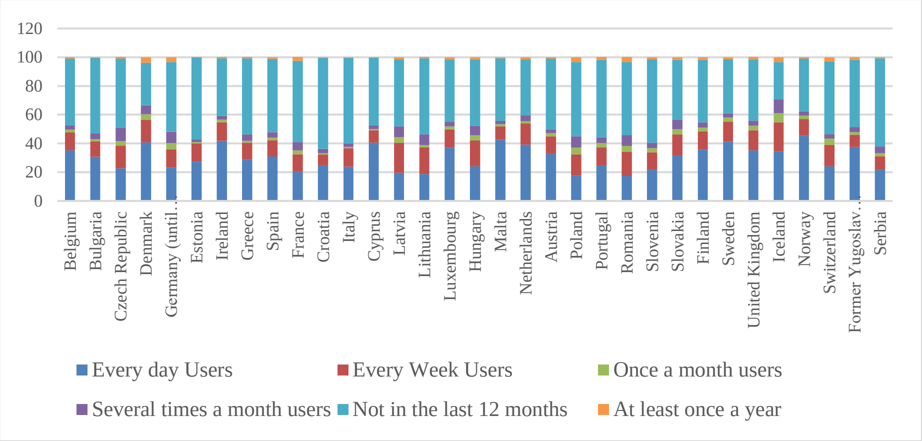

Fig. 2. Demographics of European social media usage on basis of time spent [7]

The projections for usage of social media in the coming years, show a steady rise in the number of users. In 2018, the user base is projected to grow by another 0.16 billion and reach to 2.62 billion social media users. This number would further grow to 2.77 billion, 2.9 billion and 3.02 billion in 2019, 2020 and 2021 respectively [16].

2.3 The spectrum of social media and the current user base

Users are active on more than one social media site, having the variety of different possibilities. Largest social networking website is decisively Facebook. A report by Kepios in September 2017 shows the statistics of the top 20 social networking websites in the world (Fig. 3). As it can be seen there are four social networking website with the number of users over 1 billion and next four with the number of users over 0.5 billion [11].

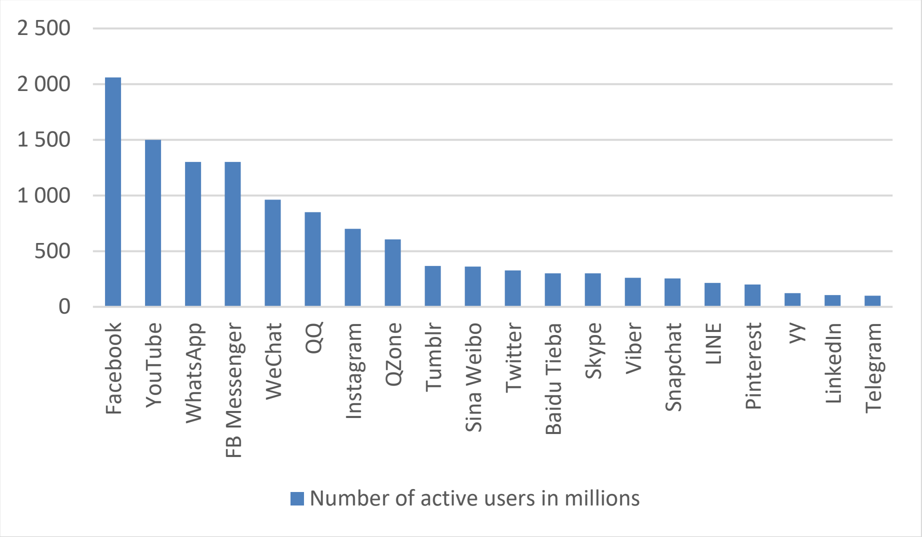

Fig. 3. User base of top 20 social networking websites in 2017 [11]

3 Social media & Economy

The way of disseminating information as well as the way in which individuals or society perceives the information, both can affect the macroeconomic factors. Su-Heng et al. (2013) [5] as well as Jana Nunvářová and Pavel Bachmann (2017) [17] have extensively proved the same in their work on Social Networks & Macroeconomic Stability. In their work they describe three components of the economy which are also used for the calculation of Gross Domestic Product (GDP) by the expenditure approach. Consumption – the expenditures by individuals or households, Investment – the expenditure by the firms / businesses and Government spending, being the three components. Individuals these days prefer to read news on social media and also it has also become their prime source for personal updates. Optimizing the use of social media by individuals, businesses / firms and government in an effective way, would bring about a positive impact on economic growth [5, 17].

Factors of the economy, such as the employability of the citizens, are directly affected by the rising of social media. In this information age, the students need to be equipped with the most accurate knowledge about their fields as well as be connected to the right people globally. Managing one’s career as well as getting proper direction at proper time by professionals is also an area which is aided by professional social networking sites dedicated to the labour market, like LinkedIn. Social media provides a very effective platform supporting the flow of information on the labor market. This allows more effective entry into the labour market for students and a higher mobility on the labour market for employees for both young as well as experienced professionals. Social media may also decrease the cost of recruiting workers for businesses. Vladlena Benson et al. (2013) have highlighted this impact in their work on Social Career Management [3].

Social media also has an impact on the trade, especially e-commerce, because SM marketing allows very accurate targeting of advertising audience at lower cost. This increases the effectiveness of marketing efforts by the businesses [9]. Several companies use Facebook, Instagram and other social networking platforms to their specific group of customers. Also, small niche businesses use social media services (e.g. Facebook, YouTube) to spread wide scale awareness about their products, what was previously difficult to carry out in such scale. These microeconomic activities, influence the aggregated supply and demand.

Effective use of social media by businesses enables building relationships with customers and increases brand awareness [8]. Today's consumers look for product details in the internet and discuss about them using social media before making the actual buying decision. [18]. Sharing the information about products in Internet connected with social influence may cause Bandwagon effect or even speculative bubble.

Sustainable business is a very important part of a stable economy. It contributes to the overall development of economy as well as generate employment, which takes the macroeconomic factors towards stability. Cristian Bogdan Onete, et al. (2013) in their work on social media in sustainable business development, highlighted that social media can be a good supporting tool for development of goods & services that can become sustainable [4]. For businesses it is really important to be connected to the customers and social media gives them a very convenient medium to do so [24]. Seonjeong Lee (2016) published his article about the same research area, but for the hotel industry. In his study he had found that the social media activities of the businesses' that influenced customer's psychological needs and impact on a sense of well-being, proved to be really positive for the brand usage intent of the customers. In the study it was also found that involving the customers in content creation and encouraging or rewarding them for sharing their experiences through social networking sites, attracted customers to engage more with the brand [12].

It is also worth mentioning that excessive & ineffective usage of social media proves to harmful not just socially or psychologically but also physically. The negative effects of social media abuse, such as the possible health problems with the cervical spine (this is due to the excessive use of smartphones and the unnatural position of the bent neck), social alienation, mental problems social media addition etc. All these problems result in the increase of health care expenses.

4 Recommendation for effective use of social media

It is almost impossible to ask social media users, especially the youth, to decrease the time they spend on social media. This is because social media has got integrate in their lifestyles. Hence, increasing the effectivity or positive outcome of this time spent on social media, would be one of the best case scenarios. The recommendations below, for social media users, can improve the efficiency of its use as well as it effectiveness. The suggestions are divided into three groups: for individuals, for businesses/firms and for government.

4.1 For individual users

In this section we propose set of suggestions which can improve the efficiency of social media usage by individuals. First of all individual users need to be really vigilant in differentiating the fake news from the truth. This can be done by verifying the source of information back to its origin. If the time / effort doesn’t permit verification, then further circulation of information or news by the individual should be avoided. Social media news feed algorithms are becoming smarter by the day and show only the most relevant posts made by various users to individuals based on their activities. Following the right path as suggested above would aid the algorithms also to identify the fake news patterns. Moreover, individuals need to build up a strong social media profile, right from the time they enter into college [1, 3, 20, 22].

Individuals need to have a very clear vision of who they are, who they want to be and define their goals in life, before proceeding towards projecting themselves. Once this is decided, individuals need to ensure that the content they are sharing is in line with their defined goals & objectives. This is one of the most important factors which is missing from the social media activities of users today. Asking questions is always good, hence before posting, individuals needs to always ask himself / herself, that the content they are sharing would be beneficial to them or to their friends / family members / colleagues or in general to anyone who views it. If yes, then how? If no, then the content shouldn’t be shared. Our lives are a combination of three roles, Personal, Professional & Social. Therefore, it is very important to have a fine balance between all the three roles through the activities on social media. While interacting with content posted by others, the goals / objects set by an individual should be adhered to. One should interact with only those posts / content which are in line with their objectives. Entertainment or amusing content, shouldn’t cause a deviation from the same. It is very important to train the social media profiles, to show the most relevant information that is useful to the user. This can be achieved by keeping the activities aligned as suggested above. One needs to be really clear and understandable with their comments, their suggestion or any other content they share on social media. A share has the highest impact (always put views on the post shared from others, avoid sharing without your own views in the caption), then comes the comment and then a like or a reaction. A general observation while using social media is the annoying tags that we get on photos totally irrelevant to us. Never tag people, if the post is not relevant for them. Repeated tagging of people in un-relevant content for the purpose of increasing the reach, actually increases the spam score and decreases the reach of the posts gradually. Being punctual, regular, consistent and precise with sharing content goes a long way in creating a better impact on the audience.

4.2 For businesses / firms

Businesses and firms have been taking up social media marketing to great effect for over half a decade now. Since past couple of years, the integration of social media in the customer relationship management has also evolved to a great deal. Today the terms such as re-marketing, influencer marketing, highly precise targeting marketing etc. have become popular among businesses due to the high number of users being active in social media [13, 18, 21].

Now the businesses need to take the use of social media further by using it to influence positive change, for training & development of internal human resources, utilizing the internal resources as influencers, stress more on organic & content rich marketing, building up personal repot with customers etc. A few top end companies have already initiated doing this. But, the majority of the users of social media are in the developing countries. This makes it important for the businesses in those regions as well as businesses targeting those regions to be effective in reaching out there. Some of the companies which are trying to connect with consumers through social media are: Oreo – introducing engaging content, Netflix – making an effort to understanding their audience, Pampers – reaching its specific target market, Dove – creating inspiring content, GoPro – engaging customers in content creation, Royal Dutch Airlines – addressing customer grievances, Always – engaging users for social change etc.

4.3 For Government

Social media has had a lot of impact on the political outcomes in the recent times. Government policy plays a very important role in sustaining the stability of macroeconomic factors in the each country. Maintaining & balancing the cash flow, managing the policies of imports & exports, supporting local businesses etc. all influence the macroeconomic factors. Here the role of social media for the government is vital [10, 13, 15].

Social media trends affect the economic factors such as the stock market [14], consumer behavior in expenditures and many other factors. It is very important for the governments to have social media integrated into public governance. Literacy about social media is still not considered as important subject in the education system at lower levels. Integration of social media knowledge in the high school curriculum is of utmost importance, if a country wants to have socially literate & responsible citizen in the times to come. Currently social media journalism /citizen journalism doesn’t require a license, which has boosted the growth of fake news markets. Proper licensing for such e-portals should be made mandatory and initiator of fake news content should be punished by law. Fighting corruption is one of the major concerns for governments of developing countries. Social media is a very powerful tool for the same [10]. Citizen journalism through social media in a monitored way would prove to be really impactful in the fight against corruption. Government should also monitor the flow of forex out of the country due to the marketing expenditure carried out by the business on search engines as well as social media.

5 Projected outcomes of the above recommendations

The above recommendation would bring out an integration of individuals for a better society, integration of society, businesses & government for a better economy. For individuals the recommendations listed would improve their social & professional presence. This would give them better career opportunities as well social integration. Personal life is an aggregate of the social & professional life, hence it would be positive for all the three aspects of an individual's life. As the users become more alert as well as aware, they would make better social, professional, political and commercial decisions. The business would adapt more organic methods of promoting their business, involving more and more citizen in the same. Currently, the largest social media sites as well as search engines are based in the United States. Hence for rest of the countries, when business spending for marketing on these sites, basically forex flow out of the country into the United States. Increase in more organic marketing would decrease this flow of forex out of the country. For governments, the capability of reaching out to majority of the citizens as well as businesses through social media would decrease the gap between them. Hence a better informed government and a more sustainable government system would evolve. As the three important components of an economy, i.e. individuals, businesses & government, are becoming more effective through these recommended social media activities, therefore the Economy is bound to be influenced positively.

6 Conclusions

Growth of social media is projected to hit new heights in the next four years. Another billion people are projected to become active on social media, apart from over 2 billion people who are already frequent users of it. These large numbers, make the effective use of social media - a necessity. Individuals need to equip themselves, to have the power to differentiate the right from the wrong. They also need to pave their social, personal and professional lives, to get the maximum desired output, which is aided by social media. Moreover, the businesses as well as governments have to use social media effectively in-order to keep the macro-economic factors stable, taking the country towards growth. In the article, due to the limited volume we pointed out only selected aspects of influence of social media on economy, and we gave brief recommendation on how to use it in more effective way. The directions of further research that we intend to undertake include elaborate description of the macroeconomic indicators that social media influence the most.

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Causative Structure of the Public Trust in the Banks

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Abstract. The objective of this paper is to empirically explain how the trust in banks is influenced by the nominal, performative, altruistic and axiological factors in different age-groups of the consumers. The aim of this paper is to answer what factors influence the trust in banks. The structural equation model (SEM) was used in the empirical research to model how trust depends on the type of expectations that a customer has from a bank as well as the essence of the overall trust. The empirical database was comprised by the results of the surveys conducted by the author in the fourth quarter of 2016 on a representative nationwide sample of N=3000 people aged 15 and over. The SEM estimating model yielded positive verification of the model hypothesis, according to which, the trust in banks is built by the normative, performative, altruistic and axiological determinants. The most important thing in building the trust in banks is the banks' proper response to the consumers' normative expectations that they have from the banks. Secondly, the axiological determinants are responsible for the trust in banks.

Keywords: Banks, Trust, Structural Equation Models (SEM).

1 Introduction

The Polish society has limited trust in different public institutions operating in Poland. However, from the list of almost 20 different public organizations, including those from outside the financial sector, banks are trusted by the public more than the judicial authorities, local authorities or the government or parliament [10]. When answering a question which only allowed for three answers, namely: "Yes," "No," or "Do not know, difficult to say," 70% of the consumers aged 15 and over trusted banks that they used, 66% trusted the bank assistant who most frequently served the customer, 54% trusted NBP (National Bank of Poland), and 50% of the society trusted banks in Poland [9].

Trust and lack of trust in banks may be of selective character concentrated only on certain factors that form the trust in banks [10]. Every consumer has his/her own private balance of factors, on the basis of which, he/she builds or loses his/her trust in banks. On the other hand, every bank or every bank's assistant serving the customers has a number of people who trust them and those who do not trust them. Realizing that fact as well as the proportions of the different factors of building/losing trust in banks is also a significant element defining the proper relationship between the banks and the customers [17]. This is all the more important because if the bank betrays its trust, this is a destructive event for the customer [21], which can lead to the emergence and strengthening of the overall lack of trust 3, 10]. It may also entail spreading it to the different players on the banking market or even to the whole system [1]. However, the answer to the question concerning the factors that influence trust or its lack in banks in the different groups of customers is the key problem—to what extent the banks answer the normative, performative, axiological or altruistic expectations, and which of these categories play a key role for each generation that uses the banking services. These issues were, among others, touched upon by A. Giddens [5].

The issue of trust has become a necessary element in forming the relationships between banks and the different groups of stakeholders. However, there is no work conducted in order to adapt the sociological theories of trust to the specific characteristics of the market of the financial services. This paper in part fills this gap. In Poland, apart from the initial paper by the author, nobody has so far applied empirical verification of the theoretical models of trust and the SEM methodology for studying determinants of trust in banks. Such studies due to their complexity of subjects, interdisciplinary character as well as the high costs are not conducted in Poland apart from the ones discussed in this paper as well as in the papers of Idzik [9].

The objective of this paper is to answer the following questions: a) How do the customers define their trust in banks? b) Is the model of trust in banks based on the banks' institutional determinants adequate to the description of this phenomenon at present? c) What factors influence the trust in banks?

This paper touches upon the empirical explanation of the determinants of the customers' trust in banks and establishing the force and direction of the mutual influence in the different age groups of the consumers. Pursuing the development of the theory of trust [22] with the use of the SEM structural models, this paper conducted an empirical verification of the grade model of trust that was modified by the author.

The following elements, first of all, are in favor of applying the SEM models to analyze the determinants of the trust in banks in Poland, namely: (1) the need to verify and update the currently binding theoretical models, (2) the need to study more thoroughly the relationships and feedback between the theoretical constructs and their empirical arguments explaining trust, (3) the need to prove the causative role of the constitutional factors and unconscious factors in building trust, (4) the need to better control the sources of the change in the results which yields more accurate typologies of the people in terms of the certain factors influencing their trust in banks. Literature on these subjects underlines numerous advantages of applying these multidimensional statistical analyses. SEM allows one to verify the hypotheses concerning the occurrence of a specific structure of relationship among the variables [16, 19].

2 Research methods

The analysis of the determinants of the trust in banks requires an approach which takes into consideration both the psychological model of this phenomenon as well as the empirical model. In the first case, on psychological grounds, the so-called grade model of trust was utilized. The Structural Equation Modelling (SEM) was used for the empirical description of the causative relationships taking into account the psychological factors. In terms of the diverse level of trust in banks, the typological groups of consumers were selected using the method of the CHAID classification tree (Chi-squared Automatic Interaction Detector). The empirical research was conducted as part of the "Retail Banking Audit" project financed by TNS Polska. The empirical database was comprised by the results of the surveys conducted by the author in the fourth quarter of 2016 on a representative nationwide sample of N=3000 people aged 15 and over, including N=2328 people who were the individual customers of banks.

2.1 Theoretical Model of Trust

Sztompka [22] defines trust and its lack as "betting on the future and uncertain activities of other people." The use of the word "betting" in this definition indicates that trust is not only a passive hope, but it also implies certain activity—making a decision which carries a certain amount of risk. The most frequent characteristics of trust are honesty (acting in good will, telling the truth, keeping one's promises), kindness (care and acting for the good of the other party), competence (skills necessary in a given situation), and predictability (consistent actions). Trust is also one of the key customer expectations of banks. In the context of trust Sztompka [22] selected three categories of expectations: performative, axiological and care-taking. In this light, the trust in banks is gradationally diversified depending on the type of the expectations from banks. The discussed grade model of trust originates from categorizing the customers' expectations from the providers of different types of services. The concept of Sztompka was additionally expanded by the author of this paper by adding a superior category of expectations, the so-called, normative expectations. Each area of expectations was described by statistical indexes adequate for the banking market in Poland.

When interacting with the bank, the consumers may make more radical or cautious decisions, take higher or lower risk. Trust is grade diversified depending on the type of expectations from the partners of interaction within the banking system [8].

The normative stability is a response to the normative expectations from the banks. This layer of the determinants of the trust refers to the rules upheld in the banking system. If these rules are well articulated, consistent, transparent and legitimate, a feeling of order, predictability, regularity and security emerges. This alone is sufficient for the emergence of an instrumental type of trust in an institution as such. Throughout the ages, such sayings emerged in the social awareness "pewne jak w banku" (literally: "certain as a bank") or "masz to jak w banku" (literally: "sure as a bank"). This statement is the best exemplification of the normative determinants of the trust in banks [9].

The performative expectations concern the instrumental properties of the actions undertaken by the banks. This is the answer to the expectations that the activities of the banks will be regular, proper and predictable. The expectations of the competence, efficiency, effectiveness or productivity are already slightly higher. All these cases, however, involve certain formal properties of the activities undertaken by the banks, excluding the deeper semantic layer of these activities. It can be said that the expectations of this type are connected with the trust in the organizational aspect of the functioning of the banks and the whole banking system.

The axiological expectations concern special humanistic properties of the banks' activities. When placing this kind of trust in a bank, a consumer expects that the bank will act responsibly, justly, fairly, strictly by the book, veraciously, etc. This kind of expectations is connected with the trust in the ethical sphere of the functioning of the bank and its representatives.

The fourth category includes care-taking expectations connected with such activities where the consumers count that the bank will be selflessly taking care of their matters, that it will be altruistic and that it will provide support. Such expectations are the components of trust in the area of the functioning of banks which is mythologized by the social consciousness which implies that the underlying principle of the banks' functioning is a definition that "a bank is an institution of public trust; therefore, its superior objective is public interest."

2.2 Structural Equation Modelling SEM

The SEM models allow one to conduct a multidimensional and multi-variable analysis of the empirical data and offer much higher opportunities than those provided by classic statistics. The assumtions of the SEM structural models were developed by, among others [1, 4, 12, 14, 15, 16, 18, 20].

Structural Equation Modeling (SEM) is a set of procedures of multidimensional statistical analyses which in a classic approach are based on the general linear model. The structural models emerged from the two main techniques: the confirmatory factor analysis [6] and multidimensional regression and path analyses [7]. SEM is a technique of testing and evaluating the causative relationships using the empirical data and qualitative causative assumptions.

The structural models test the linear results of the latent exogenic variables (independent and explanatory) in the scope of the other latent endogenic variables (dependent and explained). Each of the latent variables is measured by an assigned set of measurable empirical variables. The structural models enable one to study at the same time the influence of many sources on the dependent variable [14]. An unquestionable advantage of SEM is the possibility to analyze both direct and indirect relationships. Moreover, the variables included in the models can be measured on different scales [12].

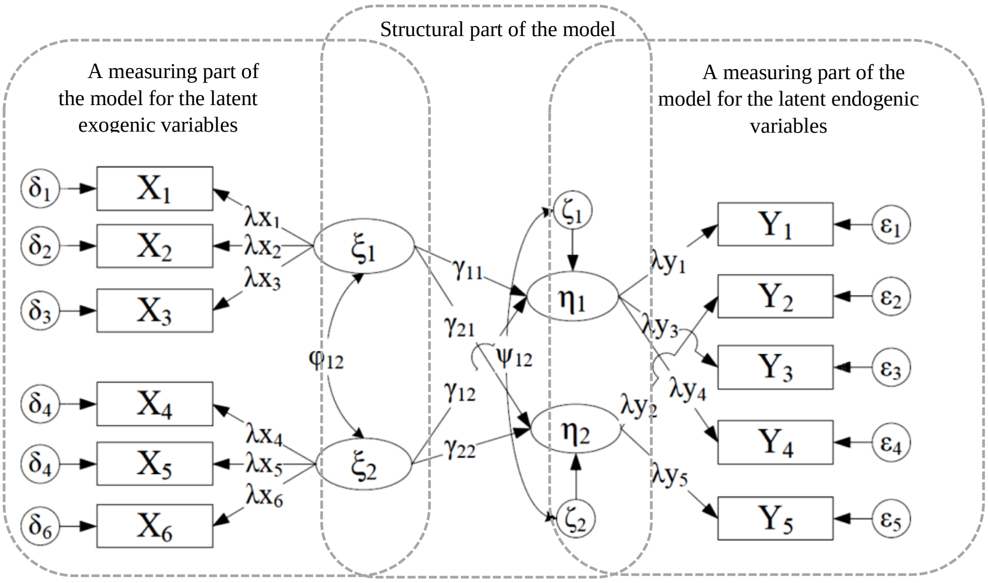
Structural part of the model
A measuring part of the model for the latent exogenic variables
A measuring part of the model for the latent endogenic variables
δ1
δ2
δ3
δ4
δ4
δ6
X1
X2
X3
X4
X5
X6
λx1
λx2
λx3
λx4
λx5
λx6
ξ1
ξ2
φ12
γ11
γ21
γ12
γ22
ψ12
ζ1
ζ2
η1
η2
λy1
λy3
λy4
λy2
λy5
Y1
Y2
Y3
Y4
Y5
ε1
ε2
ε3
ε4
ε5

Fig. 1. Schematic of a hypothetical causative model of the structural equation modelling SEM with the unobserved variables [11].

SEM notation [11]:

- Notations for the latent model:
  - ξ_i – latent exogtenic variables (factors),
  - η_i – latent endogenic variables (factors),
  - ζ_i – in equations, errors connected with the latent endogenic variables,
  - γ_{ij} – a coefficient referring to the influence of ξ_i on η_i (direct effect),
  - φ_{ij} – covariations among the latent exogenic variables ξ_i,
  - ψ_{ij} – covariations among the ζ_i errors connected with the measurement of the η_i variables.
- Notations for the measurement model:
  - Y_i – observed indexes for η_i,
  - X_i – observed indexes for ξ_i,
  - ε_i – an error connected with the measurement of a specific Y_i index,
  - δ_i – an error connected with the measurement of a specific X_i index,
  - λy_i – a coefficient referring to the influence of η_i on Y_i,,
  - λx_i – a coefficient referring to the influence of ξ_i on X_i,.

The model (Fig. 1) is comprised of an internal model describing connections between the latent variables and an external model which studies unobserved endogenic and exogenic variables [2]. The external model represents the results of the factor analysis that allows one to calculate the loading of each factor influencing the latent variable. The internal model presents a path analysis that allows one to determine the cause-effect relationships among the variables. The structural part of this model enables one to test the basic research hypothesis, in other words, a hypothesis about the lack of the formal basis for rejecting the proposed theoretical model if the traditional measure which is the result obtained in the chi_2 test does not exceed the critical distribution value (chi_2; $p>0.05$). In this situation, the result of the H_0 verification serves as a basis to accept or reject the research hypothesis about the acceptability of the causative influence of the psychological reality represented by the latent exogenic variables on the reality represented by the latent endogenic variables.

Prior to verifying the main hypothesis, submodels are being prepared in order to verify the detailed hypotheses, for example, concerning the acceptability of the specific theoretical construct ($\xi_{i,}$ or η_i) which reflects a given cognitive construct. In order to do this, a confirmatory factor analysis is used. For example, if one wants to test the influence of two exogenic variables (ξ_1 and ξ_2) on an endogenic variable (η_1), then $X_{1, 2, 3}$ are the observed indexes for ξ_1, and $X_{4, 5, 6}$ are the observed indexes for ξ_2. These indexes constitute research material arranged in an empirical data matrix (S). Similarly in the case of the endogenic construct of η_1, these are the observed indexes: $Y_{1, 2, 3, 4, 5}$. The matrix is a basis for testing, in other words, proving the acceptability of the theoretical model (Σ) if the value in the chi_2 test is not significant (i.e., $p>0.05$) in the result of the conducted estimation. However, before we test the accessibility of the most important hypothesis about the significant influence of the exogenic variables on the endogenic variable, the partial models (submodels) are being verified [11].

The interpretation of the standardized estimates for the paths is of key cognitive value: if the value of the variable, from where an arrow originates, increases by 1 standard deviation, then the value of the variable, where the arrow is going, will increase by the estimated value of the path coefficient (a standard regression weight) if the sign of this coefficient is positive [15]. The result of the performed estimation of the model yields information about the values of the squared multiple correlation coefficient, which appear with the endogenic variables both latent (η_i), as well as observed Y_i – indexes for η_i and X_i – indexes for ξ_i. Each of these pieces of information is described by the percentage (if the calculated estimated value is multiplied by 100) to which a given variable is explained by the influence of those variables which send arrows towards it. It is worth mentioning that the variables sending arrows are the predicators for the variables which receive arrows. If the causal model does not take into consideration the role of the mediator for the latent endogenic variable (η_1 or η_2), and in such a way controls only the most important direct influences (e.g., γ_{11} represents an influence between ξ_1 and η_1) and gives up the control of the direct influences (β_{21} or β_{12}) between the endogenic variables, then a correlation (ψ_{12}) between the measurement errors (ζ_1 and ζ_2) of the latent endogenic variables should be allowed at the stage of the model specification. It is assumed that the source of the variability η_1 and η_2 may be explained not only by the influence of the exogenic variables (ξ_1 and ξ_2), but also by the other exogenic variables which have not been included in the model [6].

3 Determinants of trust in banks from the perspective of the SEM model

The trust analysis may be started with the statement that trust is not one variable, as it has been assumed so far in banking. The security of the money explains slightly more than 40% of the phenomenon of trusting banks. The definition of trust in banks based on security is incomplete and inadequate for the society's expectations from banks [10, 21]. Additional confirmation of this thesis can be found in the results of the empirical survey. A confirmatory factor analysis was performed for the whole sample. As a result, we arrived at four main groups of the determinants of the trust in banks, that is to say, normative, performative, axiological and altruistic. However, in the course of the further analysis and because of the need to obtain a complete picture of the relationships forming the trust in banks, another confirmatory factor analysis was conducted in order to identify the consistent constructs such as: the price, the availability, the offer, the customer service (within the scope of the performative determinants as well as the relationships with the customers), the communication of the banks, and the ethical conduct (within the scope of the axiological determinants). Eventually in the model there were 11 latent variables (unobserved directly).

Table 1. Selected measures of quality of the measurement models of the latent variables.

Latent variable	Average Variance Extracted	Composite Reliability	R^2	Cronbachs Alpha
Normative determinants	0.831	0.908	0.450	0.797
Performative determinants	0.436	0.902	1.000	0.881
Axiological determinants	0.532	0.953	1.000	0.947
Altruistic determinants	0.764	0.907	0.549	0.846
Price	0.821	0.902	0.655	0.783
Availability	0.810	0.895	0.732	0.765
Ethical conduct	0.717	0.910	0.895	0.869
Communication	0.647	0.916	0.620	0.890
Customer service	0.645	0.879	0.543	0.816
Product offer	0.624	0.868	0.542	0.798
Customer relations	0.633	0.896	0.425	0.855

Each of the nine models measuring the latent variables included in the structural model (Fig. 2) were separately evaluated by using a univariate confirmatory factor analysis. The measures of fitting the measurement models for the data are collected in Table 1. One of the basic measures of the quality of the latent variables is the Average Variance Extracted. This is a part of the variance of the measurable variables that make up a given latent variable reconstructed by this latent variable. Average Variance Extracted in the majority of the cases exceeds 0.5 with an exception of a variable building the category of performative determinants. The Composite Reliability measure shows what part of the variance of the measurable variables is recreated by the latent variable created by them. In each case, its value is over 0.85 which, given the critical value of 0.7, reveals the proper reproduction of the measurable variables on the latent structure of the model. Also in the case of all the factors the value of the Alfa-Cronbach [2] coefficient exceeded 0.75 which testifies to the high reliability of the applied measuring scales.

After specifying, the model was estimated by the method of the highest reliability. The reliability of the received results was tested using procedures of “Bootstrap” resampling, where the analysis is conducted repeatedly on subsets drawn from a base sample, and the results of this analysis are averaged. Thanks to them the evaluation of the standard error of the parameters and the Student’s t-distribution values were obtained. As a result we arrived at the parameters of the model with standard errors and t-distribution, value R2 for each of the variable and several measures of the quality of the model as well as standardized values of the latent variables (Table 1). All the relationships in the model are significant on the level of relationships on the level of $p<0.001$.

In the estimated SEM model of the trust in banks we can discern an internal path structure which describes the cause-effect relationships as well as ten measuring models which characterize the relationships between the latent variables and their observed indexes. On Figure 2, the measurable variables in the measuring models are marked by rectangles. The number of rectangles testifies to the number of the measurable variables building a given latent variable. In the overall perspective, the following elements are of key importance in creating trust, namely, normative determinants (the total effect of 0.538), then axiological determinants (the total effect of 0.503), ethical conduct (the total effect of 0.451), performative determinants (the total effect of 0.224), bank communication (the total effect of 0.201), relations with the customers (the total effect of 0.145), axiological determinants (the total effect of 0.109), customer service at the banks (the total effect of 0.091), product offer (the total effect of 0.087), availability of the banks (the total effect of 0.048) and the prices of the banking services (the total effect of 0.045). The total effect presents a combined influence of the given factors on the trust in banks. This is a sum of the direct influence, but also of the indirect influence through the different categories of evaluation of the banks. For example, the ethical conduct influences the evaluation of the axiological determinants (the path coefficient is 0.254), but also its influence on the evaluation of the axiological determinants is directly executed through the relations with the customers. Similarly, the axiological determinants directly influence the trust (the path coefficient is 0.411), but the total influence of the axiological determinants on the trust is effected also indirectly through the evaluation of the normative determinants. Thus a direct influence of the normative determinants on the trust described with a path coefficient is 0.411, but the total effect is already 0.503.

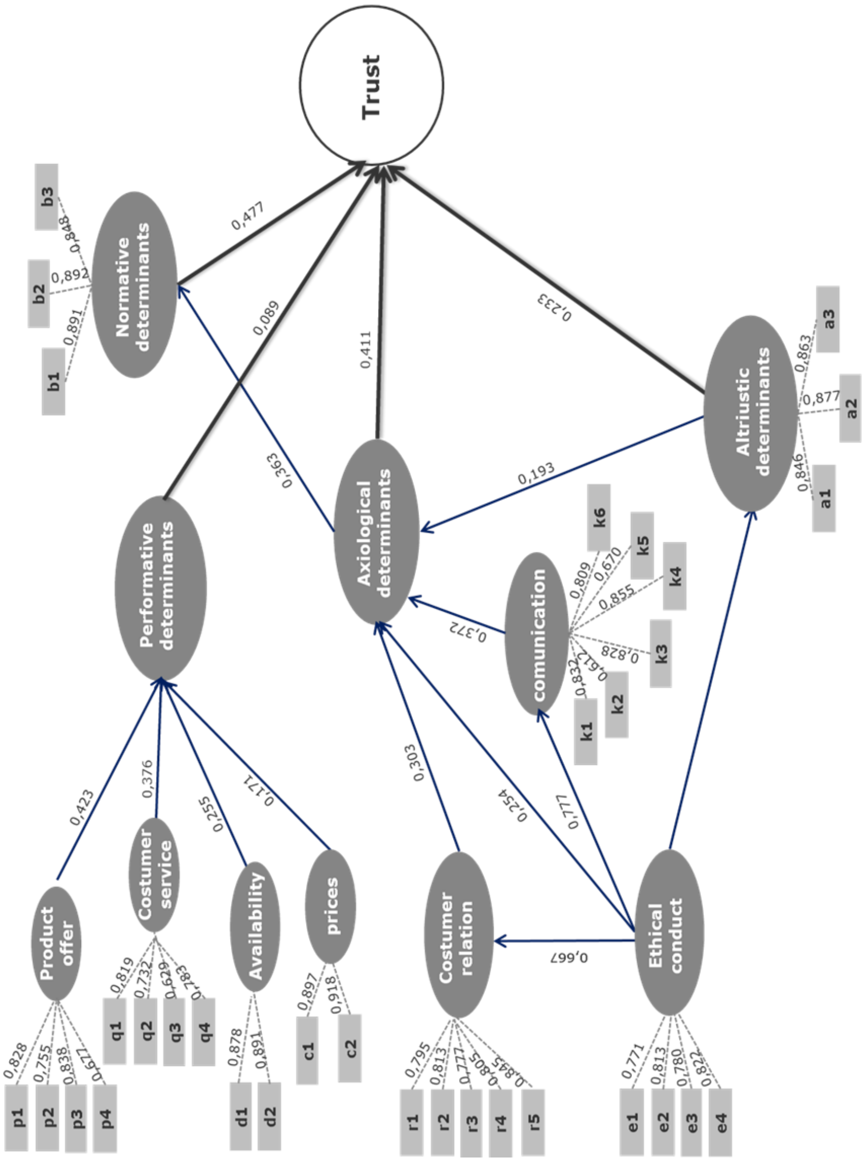

Fig. 2. A diagram of the general SEM structural model of the trust in banks with the standardized values of path coefficients and factor loadings.

4 Summary

The structural equation modelling (SEM) allowed us to conduct a theoretical grade model of trust in banks. The SEM estimating model allowed us to positively verify the model hypothesis, according to which, the trust in banks is built by the normative, performative, altruistic and axiological determinants.

It was proven that the traditional definition of the trust in banks that refers to the security and the functioning of a bank as an institution explains the phenomenon of trusting banks only to a small extent. The analyses should include a broader range of factors—apart from security, also daily experiences of the customers with banks, evaluation of the offer, availability, costs of the services, quality of the services as well as a very important aspect of the ethical evaluation of the banks, their communication, as well as observing the norms which is not simply following a code of good practices.

The most important thing in building the trust in banks is the banks' proper response to the consumers' normative expectations that they have from the banks. Secondly, the axiological determinants are responsible for the trust in banks. These are followed by the performative determinants.

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Financial Sector and its Role and Activities within International Tax Planning

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Abstract. This contribution monitors position of banks in international tax planning. From this perspective, there are two views, by which the banks have to be seen: banks as intermediary and banks as multinational companies with interest in reduction of their tax liabilities. Banks can be assistants for their clients when it comes to the tax avoidance but there are differences between their attitudes to clients with tax avoidance tendencies. Clients of banks mainly accents financial secrecy, in which Switzerland is consider being one of the best. Banks' tax avoidance is different problem and there are also differences between them in this case. Countries, which are magnet in their profit shifting schemes, are Luxembourg or Ireland in EU and some of the Caribbean islands. Clients and banks prefer different countries in their tax planning activities and this is caused by their different needs. On the one hand, clients appreciate secrecy, on the other hand, banks' profit shifting process does not require it at the first place and they can focus on reducing of their tax costs or changing location for investment purposes.

Keywords: Tax Planning, Financial Sector, Tax Havens.

1 Introduction

Nowadays, use of tax havens in business activities is one of the most discussed themes when it comes to multinational companies. Tax avoidance is not a new thing and companies use international tax planning for decades. This area is also important for countries' governments because they try to offer the best condition for multinationals. On the other hand, not all countries tend to attract multinational companies therefore this situation can result in lower tax revenues of state budget. All that means that tax planning is a topic for every country in the world.

From the perspective of the Czech Republic, tax havens are also important because there are many multinational companies, which operate on the Czech market. These companies have possibilities to shift their profits into different subsidiary or to parent company of the group. Furthermore, even small companies can use tax havens in these days because information technologies bring this possibility also to them.

There arise few key questions, when the tax planning is studied. First of all, which countries can be identified as tax havens? Second, how the multinationals use them to lower their tax burden. It is difficult to answer both questions because the answer cannot be stated in general. Tax planning is complex process and its attributes differ from one company to another. Whereas the countries, which want to attract multinational companies from other countries, use different tools, every single company faces decision if the concrete legislation aspects of taxation are profitable for it. It brings to the third question related to the use of tax planning: has a field of the company an impact on selection of countries where the multinational operates and where shifts its profits? One problem related to this question lies in that needs of every company is different and characterized specific field in general can be too much simplifying. On the other hand, there are several specific groups of firms, which tend to have similar behavior in tax avoidance activities. One of them are multinational companies from financial sector, especially banks. This study deals with situation and position of banks in tax avoidance activities.

2 Statement of the problem

Whereas the legislation of different countries accents usually only several aspects of taxation, the multinationals select their subsidiaries locations and location of the parent company according to their specific preferences. It is obvious that some companies from certain field can have similar needs related to tax legislation.

How the field of the company influences tax planning activities can be characterized in several ways. One of them is study from De Simone et al [4]. This paper studies *"the relation between income shifting aggressiveness and corporate investment efficiency."* [4] They use *"a transformation of the Cobb-Douglas production function to model affiliate-year reported profits as a function of capital, labor, productivity, and tax incentives."* [4] Within their model, they use median of the ROA by industry as the measure of the productivity between variables. [4] For the results, locations of investments are influenced by tax planning activities. [4] This study does not result in any information about the particular sector but it is important to see that industry-level variables are important for experts, which study international tax planning.

Delgado et al include information about the field of the company in the set of determinants of effective tax rates [5]. Their study is based on real data of EU companies from company database and they study key attributes, which influence the effective tax burden. The variables for the sectors are dummy variables for each monitored sector. For the results, there are more influential variables than sectors, in which companies operate [5]. According to this study, the *"size, inventory intensity and profitability"* are the main key drivers of effective tax rates [5]. On the other hand, when the company has relatively higher effective tax rate, the debt becomes the most influence variable [5].

Also experts from OECD address tax planning activities of companies with respecting of sectors' factor. Sorbe and Johansson monitor situation of investments and their relation to the tax burden [11]. They study tax planning activities and investment activity on industry level data (from World Input-Output Database) and on firm-level data (from ORBIS database) [11]. Results of their industry level regression show that higher effective tax rates result in lower investment activity [11]. These results do not provide any information about concrete type of sector. On the other hand, further results show that attributes of industry can have effect on investment activity because *"the presence of MNEs with profit-shifting incentives is found to reduce significantly the tax sensitivity of investment."* [11] When there are relatively many multinational corporations with tax avoidance activities in the particular industry, tax burden of companies does not have such an effect on investment activity [11].

Overall, the sector analysis is not very frequent. Experts include this aspect in their studies but their models show that there are more important drivers of tax planning activities. This study shows how the current literature sees the situation of tax planning from the perspective of financial sector, concretely banks. This specific sector is the point of interest of many experts because its significance predetermines it to the importance of knowledge its international tax planning activities. For the banks, it has to be mentioned that it can be viewed from two angles on their role in tax avoidance. First of all, banks and legislation related to their business belong to the most important aspects of business environment when the countries are evaluated from the perspective of their use as a tax haven. Second, the banks themselves are able to use tax haven for reducing their tax liabilities.

3 Role of the banks

Banks are important part of tax avoidance process because the cash flows have to be mediated by someone. Second, the amounts of money have to be deposited somewhere therefore banks are significant helper in international tax planning. Therefore banks and information which they have are at the center of tax authorities' interest.

3.1 Banks as part of international tax planning

Role of the banks is frequently discussed topic in several studies. One of them is from the European Union expert Karel Volckaert [14]. First of all, he shows the significance of tax havens and tax planning in modern days. The importance of banks in tax planning is often seen in hiding of information about owners or about cash flows related to bank accounts. From the perspective of frequently used countries, there is the biggest amount of wealth held in Switzerland [14]. Even more, banks are financial institution which provides financial resources and cash flows between different accounts. Therefore banks can cooperate one tax planning activities with other multinational companies [8].

Often used scheme to avoid paying taxes can be called as *"investing in mutual funds through a tax haven account.*" [14] When the resident in particular country has a foreign account in a different country, where banks shield information, he can avoid paying taxes in a home country in certain situations. Tax authorities from the home country cannot reach the information about his activities and they are not able to taxed them. Another way, how banks are incorporated in tax planning activities, is that they lend money to the parent company. This parent company applies expenses before taxation. Then *"the proceeds of the loan are invested in shares of a subsidiary residing in a low-tax rate jurisdiction."* [14] Then this subsidiary provides a loan to another part of the group, which resides in the country with relatively high tax burden [14].

The role of the banks is also important in offshore centers. There is almost impossible to uncover the beneficial owner of a bank account or investments. Activities to hide the owner identity are very often motivated by tendency towards covering some illegal activities or tax evasions. Volckaert mentions e.g. *"code-name accounts"* as a frequently used banking product related to tax planning [14]. Bank accounts in these countries are also used for hiding assets, which should be taxed according to legislation in different country.

There are also studies, which are focused on quantitative analysis of bank activities in international tax planning. Paper from Gallemore et al belongs to this group of studies [8]. They capture *"bank-client relationships using lending contracts and measuring borrower tax avoidance".* [8] Results of their regression model show that banks play an important role in international tax planning [8]. For the concrete facts, banks have different attitude related to the *"tolerance for substantial tax avoidance by their borrowers."* [8] These findings are important for better knowledge about banks and their activities. There is significant difference between banks and their position as tax avoidance assistant. Some banks tend to provide tax avoidance services and be helpful with tax planning, the others are not so engaged in these activities. Their results also suggest *"that the average tax avoidance of a bank's other borrowers is an economically important determinant of a client firm's own tax avoidance."* [8] Banks are important part of tax planning and there are also activities with goals of sharing information about tax avoidance schemes between their clients.

3.2 Financial Secrecy Index

Financial secrecy can be one of the important of legislation attributes, which can play a role in setting a location of parent or subsidiary or even for persons. Organization called Tax Justice has developed Financial Secrecy Index, which expresses the situation of countries related to their role as secret tax haven.

Several attributes of business environment are included within analyzation of financial secrecy. It is important to mention that the methodology of this calculation consists not only from taxation aspects of legislation but also other areas are included. First area is *"Knowledge of beneficial ownership".* [7] This aspect becomes the most important one when the owners tend to hide their identity. Of course, this hiding can be done from personal reasons but the most probable reason is practicing of tax evasions. There are three types of indicators which addresses banking sector's secrecy and legislation aspects of providing information about ownership of the company [7].

The second area is called *"Corporate Transparency"* [7]. Indicators within this part target public availability of information about the corporation. The next area addressing country's tax legislation itself and it is called *"Efficiency of tax and financial regulation"* [7]. The last indicators include *"International standards and cooperation"* [7].

For this study, the most important are first group of indicators which address situation of the financial sector in the country. This indicator monitors situation about information about customers of banks [12]. This availability of information about accounts held at the banks is meant for the tax authorities. The results of this part of the index demonstrates that there several countries which provides relatively secretive conditions related to banking. The lowest score defined as *"transparency credit"* have Andorra (0.23) and Barbados (0.27) [12]. For example Luxembourg has a score at the level of 0.3. For the comparison, Germany and France have this value about 100 % higher. Also countries like Switzerland or Liechtenstein have the value lower than other countries in Europe and their index is at the similar level as the countries from Caribbean. It can be seen that countries like Luxembourg and Switzerland provides great conditions in terms of banking secrecy.

Overall results of the Financial secrecy index for 2015 show that the country with highest financial secrecy is Switzerland [6]. Selected countries and their results are presented in Table 1.

Table 1. Financial Secrecy Index (FSI) for Selected Countries in 2015 [6]

Rank	Country	FSI	Secrecy Score
1	Switzerland	1,466.1	73
2	Honk Kong	1,259.4	72
3	USA	1,254.7	60
4	Singapore	1,147.1	69
5	Cayman Islands	1,013.1	65
6	Luxembourg	816.9	55
⋮			
73	Slovakia	60.1	50
75	Poland	57.2	36
81	Czech Republic	44.2	35
84	Hungary	37.3	36

Higher ranking have achieved also other tax havens, e.g. Honk Kong, Singapore, Cayman Islands and Luxembourg [6]. There are two other countries, which position is notable: USA and Germany. These two countries often claim that they suffer from the tax avoidance activities but this index ranks them to the best alternatives in terms of financial secrecy. Positions of the countries from Visegrád Group are in the seventh and eight tens.

It has to be mentioned for the best interpretation of this index that the weight represented by *"share in global financial services exports"* has significant effect on the resulting value of FSI [6]. For comparison of legislation, the secrecy score has higher explanatory power. In the case of this score, the Switzerland has one of the highest but there are countries with more than 80 points, e. g. Samoa or Liberia [6]. On the other hand, there is significant difference between Visegrád Group countries in Secrecy Score and countries at the top of the table because Switzerland or Hong Kong provides better conditions in terms of secrecy.

4 Banks' tax planning activities

There are also studies, which try to explain tax avoidance activities applied by banks. One of them is from Aubrey and Dauphine, whose studied tax planning activities of the European banks. Based on data form 2015, they analyzed not only, which tax havens these banks use but also how they use them and the extent of their tax planning activities.

Luxembourg and Ireland are the favorite tax havens for European banks [1]. Studied banks had about 8.4 percent of worldwide profits in these two countries [1]. Apparently, Luxembourg and Ireland are used for tax planning because this proportion does not copy the size of countries. Naturally, the proportion of profits should correspond with market size of the country and scope of activities in such a market. This study shows that banks generally have higher profits in tax havens than they naturally should have in terms of turnover or number of employees [1]. In concrete numbers, there are only 7 % of employees in tax havens but banks reported profits there are about 19 percentage points higher than this value [1]. Mentioned disproportion is also shown by banks' profit per employee, which is significantly higher in countries considered as tax havens [1]. Concretely, one employee working in part of the group on Cayman Islands brings almost 6.3 million of profit [1]. For the understanding of tax planning activities, mentioned findings have crucial importance because data proves that banks profits are shifting to certain countries, which are often considered as tax havens.

Situation of banks in Europe is even more complicated due to the political view on them in different countries. The biggest banks in Europe are multinational companies originally reside in some of the "old" EU countries. This also corresponds with set of banks in mentioned studies, where are companies coming from France, Germany, Italy, Netherlands, Spain, Sweden and the United Kingdom [1]. These banks operate on several countries in Europe and some countries' markets (e.g. these from Visegrád Group) are dominated by these multinational banks. From the perspective of the governments, they are facing threat of lower tax revenues because these multinational companies have not only the possibility of shifting their profits but also their center of interests is set in different country so there are two reasons for shifting their profits to the different country. Therefore there are countries which apply special tax levied on banks, e.g. Hungary [13]. On the other hand, there is also study providing result that the higher tax burden of banks is compensated by increased fees or interests [3]. Therefore the solution of special tax for banks is not sustainable.

Experts from international organizations also notice that the financial sector has specific position related to use of tax havens. European Commission's study from 2017 targets banks' tax avoidance activities. [2] This study is based on Oxfam research (mentioned above) but the experts from European Commission have extended the set of banks included in the study to the level of 36 banks. [2] The study aims to geography of bank's activities with emphasis on use of tax havens. They *"analyze the determinants of banks' commercial presence abroad within a standard gravity framework"* and they *"rely on a Poisson pseudo-maximum likelihood to account for zeros."* [2] The model is based on level of turnover, which bank has in different countries. Firstly, the model is used without taking into account whether the country is considered as tax haven or not. For the results of this model, size of the economy of particular country and number of citizens positively affect the level of turnover [2].

Three other variations of the model consider the fact, how the particular country is seen in terms of taxation. Coefficients expressing if the country is tax haven or not, are positive in all three variations of them [2]. These three models but only deal with the fact if the country belongs to tax havens. They do not consider any specific attribute of the legislation or business environment in general to characterize the level of attractiveness for tax planning activities.

Therefore their study continues with identification of significant specific drivers [2]. For the results of these drivers, they have found *"an unexpected positive sign of the coefficient associated with the effective tax rate suggesting that the larger the tax rate the larger the activity of banks"* [2]. Other results show that banks tend to seek stable countries in terms of governance and business environment. The level of taxation is not the only key factor for the banks for selection of locations including in tax planning activities. Banks from the EU use as tax havens mainly Luxembourg, Isle of Man and Guernsey [2].

There is also s study, which monitors tax planning activities of banks from the Czech Republic [9]. This study is also based on country-by-country reporting data, which leads to better knowledge about tax avoidance. This study covers the five largest banks operate at the Czech market [9]. All of them are part of multinational groups and they operate there through their subsidiaries. From the perspective of only Czech banks, the situation is similar to the other European banks. It makes sense because the biggest banks operating at the Czech market also belong to the biggest in terms of whole Europe. For the countries, which they use within international tax planning, Luxembourg, Ireland and Hong Kong are the most frequently used [9]. A huge amount of profit also ends in countries, where the parent company of the group resides, e.g. Austria and Belgium [9].

Murphy's study is based on the same dataset and is also focused on banks' tax planning activities [10]. His study shows that there is a difference in extent of European banks' profit shifting [10]. Some of them reallocated above 30 % of turnover and there are also few for which this indicator is below 10 % [10]. There is also significant difference between countries when it comes to profit shifting.

According to Murphy's study, banks declared relatively bigger profits in USA, Belgium, Luxembourg or Ireland [10]. On the bottom of the chart are Spain, UK or Switzerland [10].

5 Discussion and conclusion

Overall, the banks are important objects of interest when the international tax planning is studied. Their role as intermediary is known for years and the ways, how the tax avoidance can be done, constantly evolve. In this case, the banks have different position. Reviewed studies show that some of them manage or contribute to tax the tax avoidance practices of their clients. But there are also group of banks which are not active in tax planning. Study from Gallemore shows that there is no significant difference in terms of type of institution or type of clients [8]. It seems that clients practicing the tax avoidance are concentrated in certain banks.

From the perspective of other aspects of banking sector, the financial secrecy is an important thing. It has to be mentioned that this unwind form the legislative and the banking system of particular country. It is not only the attitude of banks but the regulation play the key role. Countries, which are often considered as tax havens (or at least as bank havens) like Switzerland or Hong Kong, provide relatively secret condition for their clients. Whereas the legislation is the main thing in terms of banking secrecy, countries with higher FSI can be seen as tax havens which want to be attractive as final stop of profit shifting.

When it comes to banks as a multinational companies practicing profit shifting, studies are based on the data from country-by-country reporting. For better results, data from further years have to be including to the further studies as soon as it become available. Results of analysis of this data provide a lot of information about concrete banks and countries which they use as tax havens. Overall, there are differences between banks and some of them do not practice tax avoidance, at least do not shift profits in huge amounts. Countries considered as tax havens are favorite for banks when they decide where to shift their profits. Not even the European ones like Luxembourg or Ireland but also several Caribbean islands. From the perspective of the Czech Republic, one fact is important: multinational banks operating on Czech market prefer next to the mentioned tax havens also home countries of their parent company. Further research should focus on new datasets related to the multinational banks and studied their activity in several consecutive years. Also the detailed analysis of tax havens' legislations should be beneficial.

Interestingly, there is also significant difference between countries. Some of them, which are known for the financial secrecy (like Switzerland) are not so popular when it comes to banks' profit shifting activities itself. It is caused by different interests of banks and their clients. Financial secrecy (in terms of banking privacy) is more important for clients than for the banks. Clients are more sensitive to sharing of information because personal taxation is based on tax residence and people, which want to avoid paying taxes, ten to hide information about part of their income. On the other hand, banks or other multinational companies focus on reduce their tax liabilities. Whereas they have a lot of opportunities to change the profit distribution within the group, hiding of information is not for them so important.

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Support of Industry 4.0 in Research Framing Documents and Trio Program

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Abstract. The article deals with the way in which the declared support of Industry 4.0 was reflected in the conceptual documents in the area of research, development and innovations of the Czech Republic - National Policy on Research, Development and Innovation for the years 2016-2020 and National Research and Development Strategy for Smart Specialization of the Czech Republic (background document for implementation European structural and investments funds). A key tool for its support is the Trio Program of the Ministry of Industry and Trade, which was created as a result of the implementation of the S3 strategy in the Czech Republic.

Due to the start of the program implementation in 2016, valid knowledge about outputs and results is not yet available, but it is possible to obtain the first information from financial and factual control of projects. The article identifies the main findings resulting from the factual and financial control of projects launched in August of this year.

Keywords: Industry 4.0, Research, Development and Innovation, Program Trio

1 Industry 4.0 as a part of research and innovation policy of the Czech Republic

1.1 Framing documents

The Industry 4.0 issue has received great attention in public space, the debate has been going on since the beginning of decade. In the end, it became part of government policy in the Czech Republic, after the basic theses and objectives were approved by the Government Resolution No. 729/2016 to Initiative Industry 4.0.[6]. However, the objectives and priorities of this policy are also reflected in conceptual documents on applied research, development, industrial research, etc. The key government documents are an updated National Policy on Research, Development and Innovation for the years 2016-2020, approved by Government Resolution no. 135/2016 [3] and the so-called National Research and Innovation Strategy for Smart Specialization of the Czech Republic, actualization by Government Resolution no. 634/2016.

The purpose of the National Research and Development Strategy for Smart Specialization of the Czech Republic [7, 8], hereinafter referred to as the "National S3

Strategy", is the effective targeting of European, national, regional and private) - to activities aimed at strengthening research and innovation capacity in the priority outlined prospective areas, key for the development of the national economy.

The final version of the National Research and Innovation Strategy for Smart Specialization of the Czech Republic was in the form of an update containing a fundamental change in the concept and focus of the design part approved by the Government of the Czech Republic on 11 July 2016. On 29 September 2016, a representative of the European Commission a letter announcing the approval of the update of the National S3 Strategy for the Czech Republic.

1.2 Smart specialization in the European context

Smart Specialization Strategy (S3 strategy) is a concept for growth based on Smartness, Sustainability and Inclusivity. In view of the European roofing, it is closely linked to the objectives of the EUROPE 2020 A European strategy for smart, sustainable and inclusive growth EUROPEAN COMMISSION 2020 (Communication from the Commission (2010) 2020, in short, Europe 2020) [1], in particular to those parts of it which are linked to investment in education, research, development and innovations.

Europe 2020 is a ten-year EU strategy that focuses on job creation and economic growth. It was launched in 2010 to create the conditions for smart and sustainable growth promoting social inclusion. The primary purpose of the S3 strategy is to promote economic growth and transformation towards a knowledge-based economy, taking into account the societal challenges and conditions of Member States and their regions.

The existence of the S3 strategy is also a prerequisite for the implementation of European Union regional policy interventions (European Structural and Investment Funds, ESIF) in the field of research, development and innovation support. According to the so-called General Regulation (Regulation (EC) No 1303/2013 of the European Parliament and of the Council) [2], it is incumbent on the Commission to prepare and submit to the European Commission a smart specialization strategy for those Member States or regions wishing to invest ESIF funds in the following thematic objectives:

- Strengthening research, technological development and innovation,
- Improving access to information and communication technologies (ICT), use and quality of ICT.

Failure to meet the ex ante condition would mean blocking the so-called interim payments by the European Commission and, in essence, avoiding the use of ESIF resources for that purpose in a given country or region.

A specific but key feature of the S3 strategy design and implementation is the emphasis on the so-called "entrepreneurial discovery process" (EDP), which in addition to public administration includes the participation of entrepreneurs, researchers and other socio-economic groups, including civil society as an innovation user (so-called quadruple helix). This process applies not only to defining the objectives of the strategy but must take place throughout the implementation of the strategy in order to provide both feedback and verification of implemented interventions as well as new ideas and recommendations for targeting prepared interventions and profiling proposed areas of specialization to which the interventions will be directed.

1.3 Czech approach

In the Czech Republic, S3 has been fulfilled by a specific approach. At national level, a National S3 has been set up, which defines objectives and priorities, and specifies national domains of specialization. At regional level (NUTS 3), 14 regional S3 strategies were created, which were subsequently declared as S3 annexes. They represent an autonomous view of regional actors on intelligent specialization in their territories. Their preparation was parallel to the creation of a national document. The Ministry of education, youth and sport, at that time responsible for the preparation of the S3 strategy (or fulfillment of the preconditions), has in fact made it possible to create regional documents within the separate competence of the regions.

The issue of Industry 4.0 is reflected in the priority Advanced machinery/technology for strong and globally competitive industry (automotive and other vehicle producers) and immediately in the priority Digital market technologies and electrical engineering, in section Electronics and electrical engineering in the digital era. “Industry 4.0 generates new requirements for servomotors, actuators and similar drives; manufacturing technologies require specific motors, often as embedded solutions.“ [5]

It is also emphasized the link to Electrical Engineering, the field of sensors (advanced sensors, actuators, data aggregators, new system parts and components, embedded systems, fibre-optic technologies and sensors and methods for the processing of sensor data) as well as the field of automation, robotics, mechatronics, measurement and simplified application of industrial automation and robotisation to new industrial processes, especially to human–robot/machine collaboration and virtual and augmented reality (development of glasses). Industry 4.0 also inherently includes industrial process automation, diagnostic systems, control and information systems, systems controlling technological processes, industrial transfer arms or equipment for intelligent transport systems.

2 Implementation of Industry 4.0 concept

2.1 Research and development programs of the Ministry of Industry and Trade

The adoption of these basic governmental concepts has not only had an impact on the focus of the objectives of the Operational Programs Research, Development and Education and Enterprise and Competitiveness for Innovation but has also been reflected in the new structure and objectives of national R & D programs. The result was also the adoption of the Trio program in 2015 and the preparation of the follow-up Trend program in 2018/19-22.

The Ministry of Industry and Trade has prepared a new program to support research and development, called TRIO, which was approved by Government Resolution dated May 25, 2015 no. 379 [4]. TRIO program is implemented through public tenders in research, experimental development and innovation in accordance to Law no. 130 / 2002 Coll., on support for research, experimental development and innovation [9].

TRIO program runs from 2016 — 2021 and the total amount of support in this period amount to 3 700 millions CZK. The first public tender (Call) was opened in the second half of 2015 and for 2016 is to support the approved projects allocated a total of 300 mil. CZK. In autumn 2016 was stated the second public tender with some 710 mil. CZK and in spring 2017, the third Call, with total amount 1070 mil. CZK

The program focuses on the development of potential of the Czech Republic in the field of key enabling technologies (KETs) such as photonics, micro and nanoelectronics, nanotechnology, industrial biotechnology, advanced materials and advanced manufacturing technologies. It closely follows the topics accentuated by Industry 4.0.

Only projects that reasonably expect at least one result of R & D from the following types of results (categorization according to Information System for Research, Experimental Development and Innovation).

- F - utility or industrial design,
- G - prototype, functional sample,
- P - patent,
- R - software,
- Z - pilot operation, proven technology.

In particular, the program will contribute to strengthening the competitiveness of the Czech economy by moving it to the knowledge-based economy.

The public funds are granted to support the development of new product features and increasing the efficiency, security, sustainability and reliability of processes (including energy and material cost reduction), utilizing new KETs knowledge. An integral part of these objectives is also the decline of the energy intensity of the economy, the efficient use of resources and the implementation of technological changes leading to the reduction of the use of materials with high production energy demands. Specific benefits of the Program include:

- increasing the innovative performance of the supported enterprises,
- strategic orientation of R & D in areas with the highest potential and benefits for the economy,
- increasing the applicability of research results in KETs,
- increase in R & D expenditure,
- developing effective cooperation between the business and research sectors,
- incorporating emerging top research centers and other capacities supported from public funds into the innovation system.

2.2 Program conditions and their fulfillment

The fundamental rights and obligations of the provider and the beneficiaries are framed in the wording of the Program, respectively in individual public tenders (the Call) and reflect the provisions of Act No. 130/2002 Coll., On the Promotion of Research, Experimental Development and Innovation from Public Funds and on Amendments to Related Acts.

Applicants for project support under Act No. 130/2002 Coll. are enterprises - legal entities and natural persons who are engaged in economic activities and which deal with the project in effective cooperation with at least one research organization. The applicant may also be a body with the status of a research organization, but must act as an enterprise in the proposed project, i.e. demonstrate the ability to co-finance the project solution from non-public sources, demonstrate the implementation of the results in practice and act as an enterprise. In this case, the project may not be solved in the effective cooperation of several entities.

Other participants in the project can be enterprises and research organizations - legal entities that meet the definition of a research organization by law, the Commission Regulation and the Framework. The assessment of whether it fulfills the definition of a research organization will be performed by the provider on a case-by-case basis for each entity when assessing the design of the project, in accordance with appraisal process of the Government Council for Research, Development and Innovation.

As a result of the adoption of the Trio program, it was necessary to revitalize the management and control mechanisms at the Ministry of Industry and Trade (MIT), which were suppressed after the completion of the TIP program and the activation of the programs of the Czech Technology Agency.

In connection with the implementation of this program, control mechanisms and rules of factual and financial control were set up. There are also the first findings from past inspections.

2.3 The first finding of support

In the first and second public tenders, about 200 projects were supported. Interest of applicants exceeds the earmarked allocation. As the projects are implemented only for a few months, the information about the realization is detectable from the outputs of the control.

The factual control of TRIO projects began at the end of 08/2017. The state of fulfillment of the material content of the projects from the beginning of their solution until the time of the inspection was verified. Appropriate written documentation was evaluated and physical check on site was carried out at the beneficiary, including expert interview with the researcher, the specific procedure and the results of the solution including the outputs were evaluated. In cases where another project participant participated in the project, the way of its cooperation with the beneficiary (expert report on material fulfillment) was assessed. In most cases, minutes of check-ins or internal meetings were submitted to fulfill the content of the project with other participants in the project.

Until 1 December 2017 (22 projects audited), no medium / high risk was incurred in the implementation of the phases. What is concerning the outcomes, the completion dates are usually planned until the end of the project and cannot be assessed yet.

Other Findings - Substantive factual and administrative:

- non-acceptance of the text of Annex P-2 (staging, outcomes) of the contract with the Ministry of Industry and Trade in the documents of the beneficiary, in particular the factual content of the annual report, changes of the planned phase terms without the consent of the Ministry of Industry and Trade – 6 findings,
- not entering new contracts with other participants or incomplete updating of contracts with other participants from the time the application was processed - 4 cases,
- incompleteness or confusion of information in annual reports, non-compliance with the formal model in Annex P-3 of the MIT contract – 20 findings,
- insufficient level of assessment in the opponent's report, total or partial non-compliance with the design of the MIT - 7 findings,
- the procedure for fulfillment of other obligations arising from the contract with the Ministry of Industry and Trade - 11cases.

The file being studied is still very small. Yet everything is obviously the accumulation of errors - on average two to three shortcomings. The most frequent offence is the lack of details in the annual report.

Control authority asked in all detected cases of deficiencies in the recipients‘documents to remove deficiencies and make replenishments within the specific deadline. Recipients are currently meeting deadlines. In the case of factual control, the finding is not from the point of view of error so crucial. The course of work corresponds to the solvers' obligations stated in the project application and treaty. The difference may be during the stages and the formalization of their real and planned course. Planned results of individual stages are usually achieved.

What is concerning financial control, the list of irregularities is larger. Typical problems are quality of internal control document for the start of project and financial management (absence, insufficient set-up and resource usage rules), misallocation of funds from the grant account, detention of resources, poor financial relations with other stakeholders, using of subsidy to pay VAT even though beneficiary is a VAT payer etc. 20 projects have been checked so far. There is summarization of findings:

- The internal control document was not in accordance with the terms of the Agreement -10 cases,
- The contract for participation in the project solution did not contain conditions similar to those stipulated in the Contract - 9 findings,
- Exclusion of costs covered from non-public sources that were excluded as ineligible (the funding ratio was respected and there was no breach of budgetary discipline) - 3 cases,

- Badly executed payments from a separate bank account corrected by the recipient during the calendar year (no budgetary discipline has been violated) - 6 findings,
- The bank account was not a separate current account (suspicion of breach of budgetary discipline) - 3 cases,
- Incorrect data in Financial Settlement -7 cases,
- Deferred allowance (suspicion of breach of budgetary discipline) - 6 findings.

The deficiency with the greatest impact on project implementation is a misconception of the obligations contained in the beneficiary's contract with MIT in the agreement with another participant. This, in a situation of insufficient coercion of the beneficiary, may not only result in the return of the subsidy misused by another participant but also in the negative financial impact on the beneficiary.

These mistakes and shortcomings are often repeated and subject to control findings. In the event of a breach of budgetary discipline, an internal control body initiates an appeal to the tax office, which will decide on the amount of the levy and the penalty.

3 Conclusions

The basic policy framework for Industry 4.0 support has been adopted in the Czech Republic. It has also succeeded in linking it with basic government documents in the area of research, development and innovation. A special national program has also been created to highlight issues related to Industry 4.0. Factual results will be evident in the coming months.

Despite the fact that so far there are no more significant outputs of the Program Trio, as a result of the fact that these are usually multiannual research projects, whose implementation started not earlier than in the second half of 2016, it is possible to draw on at least the findings of factual and financial control.

Factual information will be included in the annual reports submitted to the Trio Council, which are the subject of the opposition of external experts. Progress on project implementation will make it possible to evaluate the achievement of the Trio Program's objectives and the national S3 strategy in 2018.

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Philosophical and Economic Aspects of Cultural Tourism

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Abstract. This study is a part of a more detailed research attempting to better understand the phenomenon of travel and tourism. This particular contribution was motivated by growing significance of cultural tourism. Its aim was to find out what the term cultural tourism stands for, what tourists may be labelled as cultural tourists, what issues belong to the core of this phenomenon, and, last but not least, what economic potential cultural tourism has. Cultural tourism covers a lot of different phenomena, often depending on personal opinion. It seems to escape all efforts to clearly define its meaning as it refers to a lot of tourist activities. There are several classifications of cultural tourists, who often participate in other activities, too. The most significant phenomenon linked to cultural tourism is authenticity. Last but not least, the number of scientific texts on cultural tourism has been rising but it is still unclear how to quantify its economic impacts.

Keywords: Cultural Tourism, Cultural Tourist, Authenticity, Tourism Satellite Account.

1 Introduction

As Richards [13] puts it, view cultural tourism is viewed by policy makers, tourist boards and cultural attraction managers around the world as a significant potential source of tourism growth. The European Commission [5] states that cultural tourism accounts for some 40% of all European tourism. Cultural tourism covers a lot of different phenomena, often depending on personal opinion. It may focus on the issues of cultural identity, problems of space and place, it may feature such diverse things like great personalities, arts, religion, cuisine, sports, or industrial sites. It also includes urban tourism and the so-called festivalization of society linked to both traditional and newly-established events, highlighted by various projects like the European Capitals of Culture.

Initially, several questions connected to cultural tourism were identified. For instance, Richards [**Chyba! Nenalezen zdroj odkazů.**] can see three essential questions about cultural tourism – namely: Who are the cultural tourists? What are their motivations? Where do they go? – and adds that it is still different to answer them. This study, however, aims to answer slightly different research questions, namely:

- What does the term cultural tourism stand for?
- What tourists may be labelled as cultural tourists?
- What issues belong to the core of this phenomenon?
- Is cultural tourism an attractive research paper topic?
- What is the economic impact of cultural tourism?

2 Methodology

In order to answer the research questions, following research method were employed. Literature survey was used to find out relevant studies about cultural tourism. Then, selected sources were studied in more detail in order to highlight the most significant issues. The identified areas of interest were used to ask research questions and then further studied in selected sources.

Another method was statistical. Two databases, namely Web of Science and ScienceDirect [14] were searched for the number of studies in whose titles there were used words 'cultural tourism' in each of the ten years between 2008 and 2017. This approach was employed in order to find out whether or not the number of studies on cultural tourism has been rising and at the same time it helped the author determine the most relevant literature in this area.

3 Results

Definition of Cultural Tourism

There is no undisputed definition of cultural tourism. According to Mousavi et al. [7] the problem of defining cultural tourism reflects a complex relationship between culture and tourism. Richards [**Chyba! Nenalezen zdroj odkazů.**] states that proposing definitions of cultural tourism may lead to endless discussions about the definition of culture. Nevertheless, the same author provides two definitions of cultural tourism elsewhere [**Chyba! Nenalezen zdroj odkazů.**], a conceptual definition: 'the movement of persons to cultural attractions away from their normal place of residence, with the intention to gather new information and experiences to satisfy their cultural needs', and a technical one: 'all movements of persons to specific cultural attractions, such as heritage sites, artistic and cultural manifestations, arts and drama outside their normal place of residence' [12]. There are other definitions of cultural tourism by other authors, too.

For instance, Silberberg [15] understands cultural and heritage tourism as the 'visits by persons from outside the host community motivated wholly or in part by an interest in the historical, artistic, scientific or lifestyle/heritage offerings of a community, region, group or institution' [15]. Yun et al [19] use the following definition: 'cultural tourism covers all aspects of travel where visitors can learn about another area´s history and way of life'. This list of definitions is by no means complete, which only emphasizes the aforementioned problems with determining the clear meaning of cultural tourism.

This problem is further aggravated by the fact cultural tourism has changed significantly. Nowadays, not only are there different approaches to cultural tourism in different countries and on various continents, but also cultural tourists may be divided into distinct groups (e.g. [**Chyba! Nenalezen zdroj odkazů.**1], [4]). Whereas in the 17th and 18th centuries the Grand Tour was exclusively for the elite, current cultural tourism is for almost everybody and covers various activities and experiences [4]. Debes [4] adds it is cultural tourism, albeit under various labels like ethnic, shopping, gambling, theme, hallmark, event, Olympic, craft as well as material and immaterial culture, where trendsetters are currently focusing their attention. Richards [**Chyba! Nenalezen zdroj odkazů.**1] states that 'the classic image of cultural tourism still seems strongly tied to the European model of passive consumption of historic sites and museums'. The same author [11] maintains that whereas in the past cultural tourism was largely associated with high culture and the heritage associated with cultural tourism was largely fixed and tangible, the current cultural tourism includes mobile and intangible products of contemporary culture' [11].

According to Mousavi et al. [7] there is little doubt that culture is a key component of tourism product and it to a great extent determines the competitiveness and effectiveness of tourism destinations. These authors [7] add that cultural tourism is associated with both visiting monuments and sites (i.e. consuming products of the past) and consuming the contemporary way of life and culture of local people in different destinations.

Bína [2] distinguishes in his methodology of assessing touristic potential of Czech Republic´s settlements two components of touristic potential, natural and cultural. The latter includes cultural and historical sights, open-air folk museums, spas, congresses and conferences, cultural events, sports events, religious events, trade fairs and thematic markets, local products and border town specifics.

In conclusion, cultural tourism seems to escape any efforts to clearly pinpoint its meaning. On the contrary, it may accumulate new meanings as it has been spreading across the globe. People living outside Europe, the cradle of cultural tourism, tend to view and approach cultural tourism differently, with suggests that there is a huge potential for further widening the concept of cultural tourism, rather than making it narrow and clear.

Cultural Tourist

Cultural tourism entails the existence of cultural tourists differing from general visitors. Who are the cultural tourists, then? They are no longer a homogenous group of travellers as they might have been in the times of Grand Tours, which marked the beginning of cultural tourism. There has already been argued that cultural tourism itself has been expanding from the elite to almost everybody, from Europe to the whole world, from the fixed and tangible to the mobile and intangible. This suggests that the cultural tourist of the past was much different from the current one. This divergence is however balanced by a convergence, which looms as a threat the encroaching cultural globalization. Cultural forms have become globalized through the growth of personal mobility, expansion of the Internet and the media [11]. According to Debes [4], there are those who warn that global forces destroy authentic culture and identity and others who deem culture and identity as a worthwhile commodity.

There are several classifications of cultural tourists as for example Yun et al. [19] show. As Alzua et al.[1] argue, cultural tourists are a heterogeneous group pursuing a wide range of culture and heritage related activities, including visiting places of historical interest, places of military significance, sites commemorating important people, places with religious significance, and those of archaeological interest as well as enjoying ethnic culture and events, arts and cultural attractions, museums and galleries, attending local festival, fairs, and other events, and sightseeing in cities.

According to McKercher and du Cros [6] some researchers, like use demographic variables to identify what makes cultural tourists different from other ones, whereas other researchers prefer benefit segmentation. Kercher and du Cros (2003), however, examine centrality of cultural motives in selecting the destination as culture may be the primary or only secondary reason or even may not play any role at all. McKercher and du Cros [6] identified five types of cultural tourists: the purposeful one for whom culture is the main concern; the sightseeing cultural tourist focusing on cultural highlights; the casual one, not much involved in experiencing culture; the incidental cultural tourist who is superficially interested; and the serendipitous one, who does not deem cultural experience important but may find it accidentally enticing. These five segments tend to seek various types of experience and aim to gain various amounts of knowledge.

According to Nyaupane, Morais and Dowler [9], motivation of tourists in relation to cultural consumption may be classified as culture-focused, culture-attentive, and culture-appreciative.

As Nyaupane and Andereck [8] suggest, tourists visiting cultural heritage attractions can be divided into ‘true cultural heritage tourists’ and ‘spurious cultural heritage tourists.’ The former can be subgrouped into ‘tangible heritage’ and ‘intangible heritage’ tourists, whereas the latter into ‘nature,’ ‘sport,’ and ‘business’ tourists.

In conclusion, defining cultural tourism and cultural tourists is complicated as it means different things to different people [6]. As Yun et al. [19] maintain, it produces problems since it contains a wide range of cultural elements and it is not clear what kinds of cultural experiences should be included within the scope of cultural tourism. On the other hand, Yun et al. [19] add that cultural tourists participate in other activities, especially those related to nature, recreation, and entertainment, which leads them to the conclusion that cultural tourism should be integrated with other activities.

All in all, the centrality of cultural tourism as a trip motive and the depth of experience - as they are suggested by McKercher and du Cros [6] - seems to be an important issue in attempts to pinpoint the nature of cultural tourists.

3.1 Core Phenomena of Cultural Tourism

There are only few studies focusing on philosophical aspects of cultural tourism. Nonetheless, core phenomena of cultural tourism should be viewed as an important topic, too.

The most significant phenomenon mentioned in literature is authenticity. For instance, Wang [16] attempted to clarify the concept of authenticity in tourist experiences. Wang [16] sees three different approaches to authenticity - objective, constructive and essential. Objective authenticity uses an absolute criterion to measure authenticity, i.e. whether toured objects are original or fake. Constructive authenticity is according to Wang [16] also refers to toured objects but their authenticity is projected onto them by either tourists themselves or by someone else in terms of their points of view, beliefs, perspectives, expectations, preferences, interpretations, imagery, or else. Whereas the two above-mentioned approaches are object-related, existential authenticity is activated by tourist experience. Activities like camping, picnicking, mountaineering, or adventures contrast with the mundane. Wang [16] also distinguishes between intra-personal and inter-personal authenticity. Within intra-personal authenticity he further differentiates bodily feelings and self-making. The former is linked to, among other ones, relaxation, recreation, entertainment, refreshment, or excitement, whereas the latter suggests pursuing self-realization in risky and challenging activities like mountain-climbing, or ocean-cruising. Inter-personal authenticity is divided into two categories, namely family ties and touristic communitas. Family tourism may reinforce its members' togetherness. Communitas, as Wang [16] puts it, occur as an unmediated inter-personal relationship among pilgrims.

Richards [11] also reflects on the emergence of everyday or mundane as a source of authentic experience in tourism. In our everyday lives we develop skills and certain actions become automatic and in a way invisible, which is one reason why travel to other places is pleasurable as it provides us with new experiences and activities we need to focus on. Richards [11] also mentions other themes. For example, the dichotomy between real places and non-places points at the difference between the phenomenon of placefulness and that of placelessness. Richards [13] maintains that the raised interest in the concept of place indicates that the study of cultural tourism is following the spatial turn in the social sciences. Richards [13] summarizes that the experts seem to adopt either of the two approaches to place and placelessness, namely either a sense of loss for 'real' places, which links to authenticity, or an increasing desire for non-places represented by the mundane and everyday life, or by the McDonaldization of society.

Another discussed topic is the relation between culture and identity. Richards [13] realizes that experts write about conflicts over the 'ownership' of culture and the shifting boundaries of culture and economy. Richards suggests that perhaps 'everyday life' becomes 'culture' and adds we should ask the following questions: Are people looking for distinctiveness rather than difference? Are they looking for new distinctions, or simply more distinct experiences?

Whereas difference suggests certain relations between things, in case of tourism it is usually a relation between one's home and the destination, the word 'dictinction' hints at the fact that a destination may boast of a particular quality not to be found elsewhere. Richards [13] considers the focus on what might be distinct about places as an interesting development because tourism has usually been linked to the 'extraordinary' but the word 'distinct' suggests some aspect of the local, which is seen by local people as mundane or everyday routine, constitutes the sense of place or its authentic essence. In other words, local people's everyday life is tourists' adventure.

3.2 Cultural Tourism as Research Paper Topic

As this study is based on literature review of the area of cultural tourism, one of the author's aims was to find out recent and relevant research papers on cultural tourism. Two scientific websites were searched, namely Web of Science [17] and ScienceDirect [14]. In case of Web of Science, basic search for ‘cultural tourism’ in ‘Title’ was applied for individual years between 2008 and 2017 (as of 26th October 2017), that is in the last ten years. ScienceDirect [14] was searched as well. It was an advanced search in ‘All’ (i.e. books, journals, etc.) for ‘cultural tourism’ in ‘Title’ for all sciences in individual years between 2008 and 2017 (as of 26th October 2017), that is in the last ten years. The resulting numbers of research papers are listed in Table 1.

Table 1. Texts on cultural tourism as of 26th October 2017.

Year	Number of texts on cultural tourism - Web of Science	Number of texts on cultural tourism - ScienceDirect
2017	114	10
2016	208	9
2015	152	17
2014	125	12
2013	103	5
2012	101	10
2011	89	15
2010	113	3
2009	81	5
2008	53	6

As Table 1 shows, the number of texts on cultural tourism has been rising. The difference between the 2008 and 2017 figures is clear although the latter year has not ended, yet. The respective results for Web of Science [17] and ScienceDirect [14] slightly vary, though. Consequently, it is not possible to assess the extent of the rise. Moreover, there is another pitfall, namely the fact that the search results included articles whose titles used the searched words ‘cultural’ and ‘tourism’ without any direct relationship. It would be therefore useful to elaborate the way of looking for articles on 'cultural tourism’.

3.3 Economic Impact of (Cultural) Tourism in the Czech Republic

Initially, it was intended to gather statistical data on cultural tourism in the Czech Republic. Authors (e.g. [4], [11], and [10]) usually maintain that the utilization of culture in tourism has positive impact on the local economy as it helps create new jobs, and it also strengthens local identity and social cohesion. Plzáková [10] contends that the 2009 Eurobarometer survey determined cultural attractiveness as the second most significant motivation – after value for money – for European tourists in selecting their holiday destination. Although there are various methods of measuring how tourism contributes to the economic growth, including the input-output analysis or the tourism satellite account (TSA), it is nonetheless difficult to measure its impact (e.g. [10]).

These difficulties have manifested themselves in the fact that the attempt to find any statistics on cultural tourism in the Czech Republic brought no results. It was therefore decided to focus on accessible data on tourism in general instead. The aforementioned TSA gathers data on both tourism and the economy in order to determine the contribution of tourism in e.g. gross value added, gross domestic product and other indicators [18]. The Czech Statistical Office [3] has been doing the TSA for the Czech Republic since 2003.

Table 2. Main indicators of the national economy and tourism in the Czech Republic between 2003 and 2015 Tourism ratio on the Czech Republic's gross domestic product [3].

Year	Tourism ratio on gross value added (%)	Tourism ratio on gross domestic product (%)	Tourism gross domestic product (CZK mil.)
2003	3.4	3.5	90 792
2004	3.3	3.6	102 316
2005	3.0	3.3	99 079
2006	2.9	3.1	99 956
2007	2.7	2.9	103 079
2008	2.6	2.8	103 451
2009	2.7	2.9	104 293
2010	2.6	2.7	100 253
2011	2.6	2.7	102 275
2012	2.6	2.7	111 399
2013	2.8	2.9	117 932
2014	2.7	2.8	117 878
2015	2.7	2.8	126 323

Table 2 does not illustrate the impact of cultural tourism as attempts to find any relevant data were futile. It therefore provides general information on tourism in the Czech Republic. It indicates, for instance, that whereas nominal tourism GDP has been rising – from about 91 million CZK in 2003 to about 126 million in 2015, tourism ratio on both gross value added and gross domestic product has fallen from about 3.5% to below 3%. However, data collection for cultural tourism, particularly on the regional level, is a complex issue with the ticketing system being one of its few advantages. These difficulties are one of the reasons for UNWTO and other international bodies [18] to organize Workshop on Measuring the Economic Impact of Tourism in Europe: the Tourism Satellite Account (TSA) in November 2017.

Plzáková [10] emphasizes that the potential of cultural tourism has both direct and indirect impacts on the economy and adds that the economic impact of cultural tourism is most often considered when it comes to state (region, place), gross domestic product, employment and public budgets.

4 Discussion

This study, aimed to answer five research questions. The first two asked about the meaning of terms 'cultural tourism' and 'cultural tourists'. Literature review showed that defining cultural tourism and cultural tourists is complicated as it means different things to different people [6]. Cultural tourism seems to escape any efforts to clearly pinpoint its meaning. On the contrary, it may accumulate new meanings as activities labelled as cultural tourism have been spreading across the globe. It seems that in attempts to pinpoint the nature of cultural tourists it is necessary to put cultural tourism as a trip motive and the depth of experience as the main motive, it is suggested by McKercher and du Cros [6].

Concerning philosophical views of the core of cultural tourism, the concepts of authenticity and its meanings prove to be the most significant issue, followed by those of culture, identity, placefulness, and distinction.

Another research question was to show whether the number of scientific texts on cultural tourism has been rising. Statistical analysis done on Web of Science [17] and ScienceDirect [14] databases showed that the number of such texts has risen significantly.

Last but not least, the study asked about the economic impact of cultural tourism. There are ways of measuring this impact but they are still flawed. Nonetheless, international bodies, like UNWTO, as well as national ones, like the Czech Statistical Office in the Czech Republic, have been using and promoting various methods, most significantly the TSA. Admittedly, it is not easy to determine and apply the methodology of gathering information needed to assess the impact of cultural tourism on tourism in general and, consequently, there is a lack of statistics on cultural tourism.

5 Conclusion

This study shows that cultural tourism is an ethereal phenomenon that defies definition as well as exact measurement. Travelling and consequently cultural tourism has been changing due to the technological development, too. Currently, unprecedented developments in personal mobility make it much easier to travel than ever before, social media streamline communication and exchange of tourism-related information as well as ideas among people. Globalization changes cultural tourism as well as cultural tourists.

Another consequential fact is that international as well as national organizations are aware of the importance of linking tourism and culture as this connection may generate economic advantages for countries and regions that manage to exploit the fact that culture appeals to tourists and makes them choose a particular destination.

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Monetary Minute Currency – An Economic Value Setting Tool

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Abstract. My design of the currency called "Monetary Minute" (in abbreviation MMc) is based on postulating Time for a Value Commodity. The MMc is related to currently utilized currencies (like in $, €, £, and others) via so called Time Based Money (TBM), which was defined as a fragment of the annual GDP, p.c. which corresponds to one minute, i.e. as GDP, p.c. divided by 525600. MMc enables determination and comparison of apparent economical values in time units (Monetary Minutes) of the same/similar products or – in general – of all the economic entities expressed in different currencies. In the article, there are listed examples of application of the MMc (namely MM$, MM£, MM€, MMK) for determination and comparison value of several products and commodities in the U.S., the German, the U.K., and the Czech Republic markets.

Keywords: Time, Economical Value, Time-Based Money, Monetary Minute Currency

1 Introduction

Economy is a wonderful discipline, which is of the utmost importance in all kinds of entrepreneurship, business, social activities of humankind, as well as in everyday life of people. However, Economy has a vexatious Achilles heel in a definition of the Value [7, 8, 9]. The role of the Value for evaluation of economic entities and processes in applied economy, entrepreneurship, business, everyday human activities, etc. has been played by money for ages – in its various forms [10, 16, 20, 22]. Namely, as a commodity physical money (shells, corrals, stones, pearls, gold, …), representative money, paper money, banknotes/gold standard notes, coins, counterfeit money, fiat money, bank money, alternative/complementary money currencies based on time [21] (like so called Time Dollar, Time Credits, Service Credits [11]), and "Minuto" time vouchers [5], and other forms[6]. Related Values of all of them have been based on negotiation/bargaining/settlement/ agreement/market situation/ economic and political power or position of the participants (individual merchants, firms, companies, countries, banks, etc.) [17].

The problem is even magnified by the fact, that modern money systems are prevailingly debt-based (enabling fractional reserve banking) instead of Value-based [20]. Further, the amount of money in current economies - and consequently its Value

- is subjectively regulated by governments and central banks and/or by other monetary authorities on the basis of a declared monetary policy. These two aspects contribute/cause devastating financial crisis time to time e.g. [1, 2, 3, 4, 12, 13, 28]. Modern money is not tied to any “firm” or material background like gold used to serve for many years in the past.

In my previous works [17, 18], I have postulated Time as a Commodity for establishment/measurement/ evaluating a value of economic entities and processes. Reasons for this are obvious:

- everybody has at disposal just 24 hours or 1440 minutes, or 86400 seconds total in a day; this feature can be a firm foundation, or “commodity”, for a valuable time-steady money system, as an hour is 3600 seconds today, and will be the tomorrow and in future;
- time (namely the human life time) is the most precious value in the world, which is not a subject of inflation;
- time (especially the labor time) can be supposed as a specific commodity whose value is extraordinary per se;
- an amount of the time of a country/state is in a direct correlation with an increase or decrease of its population;
- this feature can be used as a very useful measure or as a natural regulator for the money supply of a currency of the countries or states;
- the amount of the time total is at disposal to countries/states (or broadly speaking mankind) for managing all the emerging challenges, possibilities, opportunities, threads, and other circumstances coupled with the increasing or decreasing number of population;
- the quality of the time-based currency could reflect/differ/measure a quality of managerial processes, effectivity, efficiency, productivity, as well as an influence of geographical, demographical, natural, political, social, and others factors in different places and historical on real economic processes.

In my works [17, 18, 19], I have defined a new currency called a “TBM” (for Time-Based Money), as a value of the GDP per capita divided by the number of minutes per year (i.e. 525600) [19].

I have tested the TBM values in the U.S. and the Czech economies, and later on in the Slovak, Polish, and Hungary economies, for span of 2011-2015 years, too. I have revealed - among others interesting features - that the TBM values expressed in relevant national currencies exhibited systematic increase in their values, however, the TBM values expressed in U.S. $ or in Euro showed erratic development in the span of time studied without any objective reasons [17, 18, 19].

In the current evaluation study, I have focused on the comparison of the living costs and/or incomes evaluated in so called Monetary Minute currencies (in abbreviation MMc), which were related to the currently utilized currencies (like in $, €, £, and others) via the above mentioned TMB.

2 Methods Used

This evaluation study is based on the method of qualitative analysis of secondary data and information available on the function of money – especially of the Time-Based Money in real economy. I have designed a new currency called a "TBM" (for Time-Based Money), (defined as a value of the GDP per capita divided by the number of minutes per year (i.e. by 525600) [17].

I calculated TBM values for the U.S., German, U.K., and Czech economies, respectively, in 2016 (the values of the TBM are presented in the Table 1). I took the data from the Czech National Bank [29], the Czech Statistical Office [30], the portal for statistics Statista [27], the D-Statis [15], the World Bank [32], the United Nations World Population Prospects [33], and the U.S. Census Bureau [31].

I used values of living costs and incomes in the relevant countries in the year 2016 from NUMBEO [23, 24, 25, 26]. I divided the individual items of the living costs by the relevant TBM of each of the countries; thus, I had obtained the living costs and incomes evaluated in MMc (see Table 2 and Figure 1). I re-normalized the values by the Average Monthly Disposable Salary - Expressed in Monetary Minutes - in the United States in 2016, i.e. the individual items of living costs were multiplied by the ratios: 27408/11389 for the Czech Republic 27408/31097 for the United Kingdom, and 27408/31111 for the Germany, respectively (see Table 3 and Figure 2).

3 Results

In the Table 1, there are given values of the GDP per capita and the TBM in current currencies of the Unites States, United Kingdom, Germany and the Czech Republic, respectively, in 2016. The individual values of the GDP per capita, and consequently of the TBM expressed in current currencies used in individual states differ considerably as the currencies differ in their nominal values.

Table 1. Values of the GDP p.c. and the TBM in Current Currencies of the United States, United Kingdom, Germany and the Czech Republic in 2016, source: own based on [15, 27, 29, 30, 31, 32, 33].

	GDP, p.c.	TBM
United States	55837 $	0.10623 TB$
United Kingdom	29898 £	0.05688 TB£
Germany	36 906 €	0.07022 TB€
Czech Republic	1007643 CZK	1.91713 TBK

In the Table 2, there is given a list of several food staffs and also salaries expressed in the local currencies and in Monetary Minutes values in the individual states. The values of individual items of the living costs expressed in MMc are systematically lower in the Czech Republic than in the other countries, because the related values in MMc are lower. The phenomenon can be observed in the Figure 1, too. Seemingly, it could be understood as the living costs are most advantageous (lower) in the Czech Republic in comparison with other countries under discussion. However, taking into account the level of allocated Average Monthly Disposable Salary (Net After Tax) expressed in MMC, which is about 2.4 times lower than the allocated amount of MMc Monthly in the United States, the overall picture changes considerably, as it is shown in the Table 3 and in the Figure 2.

Table 2. List of Several Food Staffs Prices and Average Monthly Disposable Salaries Expressed in Local Currencies and in Monetary Minute Values in 2016, source: own based on [15, 23, 24, 25, 26, 27, 29, 30, 31, 32, 33].

	Czech Republic		Germany		U.K.		U.S.	
	CZK	MMK	EUR	MM€	BP	MM£	USD	MM $
Meal for 2 People, Mid-range Restaurant, Three-course	500.00	261	45.00	641	50.00	879	50.00	471
Meal, Inexpensive Restaurant	115.00	60	10.00	142	12.00	211	12.95	122
Bottle of Wine (Mid-Range)	100.00	52	5.00	71	7.00	123	12.00	113
Beef Round (1kg) (or Equivalent Back Leg Red Meat)	215.86	113	9.58	136	7.76	136	11.58	109
Local Cheese (1kg)	172.54	90	6.89	98	5.59	98	10.77	101
Chicken Breasts (Boneless, Skinless), (1kg)	139.88	73	7.29	104	6.00	105	8.55	80
McMeal at McDonalds (or Equivalent Combo Meal)	120.00	63	7.00	100	5.00	88	7.00	66
Pack of Cigarettes (Marlboro)	95.00	50	6.00	85	9.00	158	6.50	61
Imported Beer (0.33 liter bottle)	35.00	18	3.00	43	3.79	67	5.00	47
Apples (1kg)	27.04	14	1.99	28	1.81	32	4.23	40
Domestic Beer (0.5 liter draught)	30.00	16	3.50	50	3.50	62	4.00	38
Average Monthly Disposable Salary (Net After Tax)	21835	11389	2184	31097	1770	31111	2912	7408

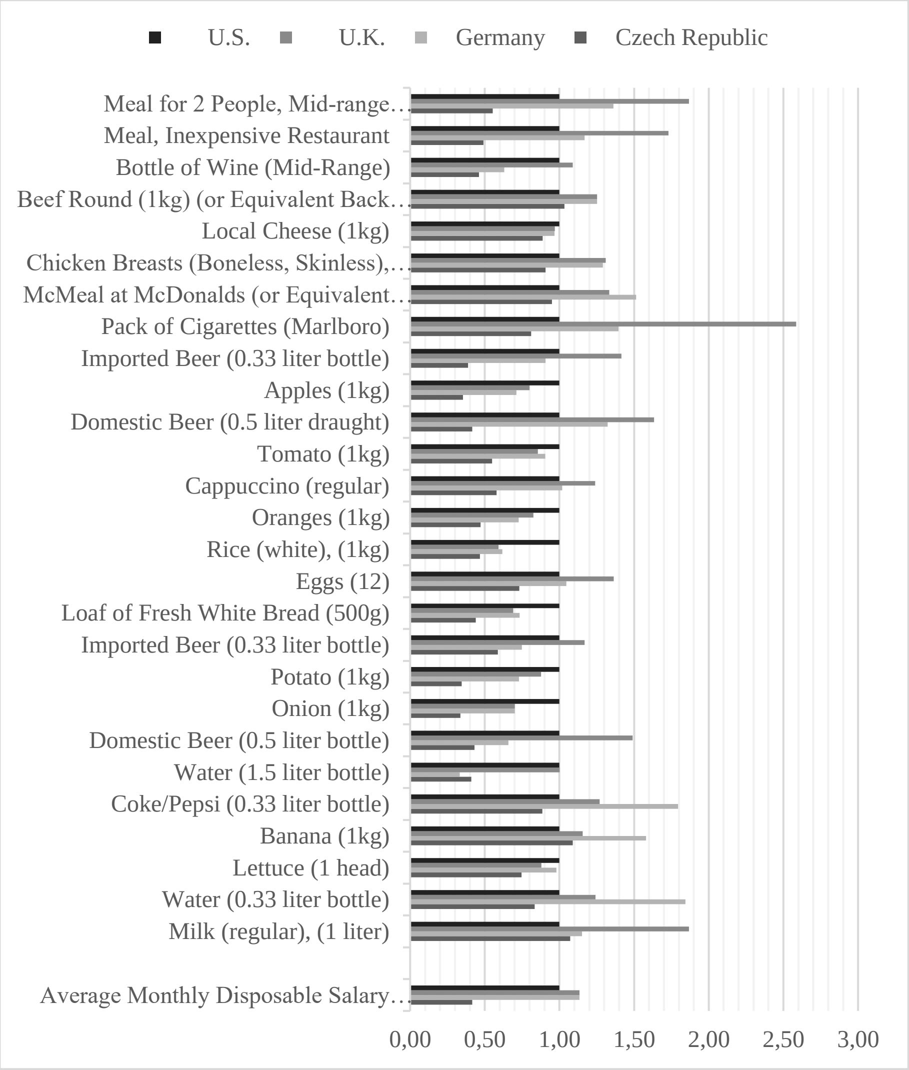

Figure 1. Ratios of the Several Food Staff Prices and Average Monthly Disposable Salaries Related to the Ones in the U.S. in 2016, source: own based on [15, 27, 29, 30, 31, 32, 33].

In the Table 3, there is given the same list of several food staffs in Monetary Minutes after re-normalizing them by the average monthly disposable salaries (as high as 27 408 MM$) in the United States in 2016. These relations among the re-normalized MMC values in individual states changed significantly when compared with related values given in the Table 2 and in the Figure 1 with relation to the U.S. market environment. Namely in the Czech Republic, the re-normalized MMK values of the selected food staffs are considerably higher than in the U.S. and in Germany.

Table 3. List of Several Food Staffs Prices in MMc Values after Re-Normalizing them by the Average Monthly Disposable Salaries (Expressed in Monetary Minutes) in the United States in 2016, source: own based on [15, 27, 29, 30, 31, 32, 33].

	MMCZK in Czech Republic	MM€ in Germany	MM£ in the U.K.	MM$ in the U.S.
Meal for 2 People, Mid-range Restaurant, Three-course	628	565	774	471
Meal, Inexpensive Restaurant	144	126	186	122
Bottle of Wine (Mid-Range)	126	63	108	113
Beef Round (1kg) (or Equivalent Back Leg Red Meat)	271	120	120	109
Local Cheese (1kg)	217	86	87	101
Chicken Breasts (Boneless, Skinless), (1kg)	176	92	93	80
McMeal at McDonalds (or Equivalent Combo Meal)	151	88	77	66
Pack of Cigarettes (Marlboro)	119	75	139	61
Imported Beer (0.33 liter bottle)	44	38	59	47
Apples (1kg)	34	25	28	40
Domestic Beer (0.5 liter draught)	38	44	54	38

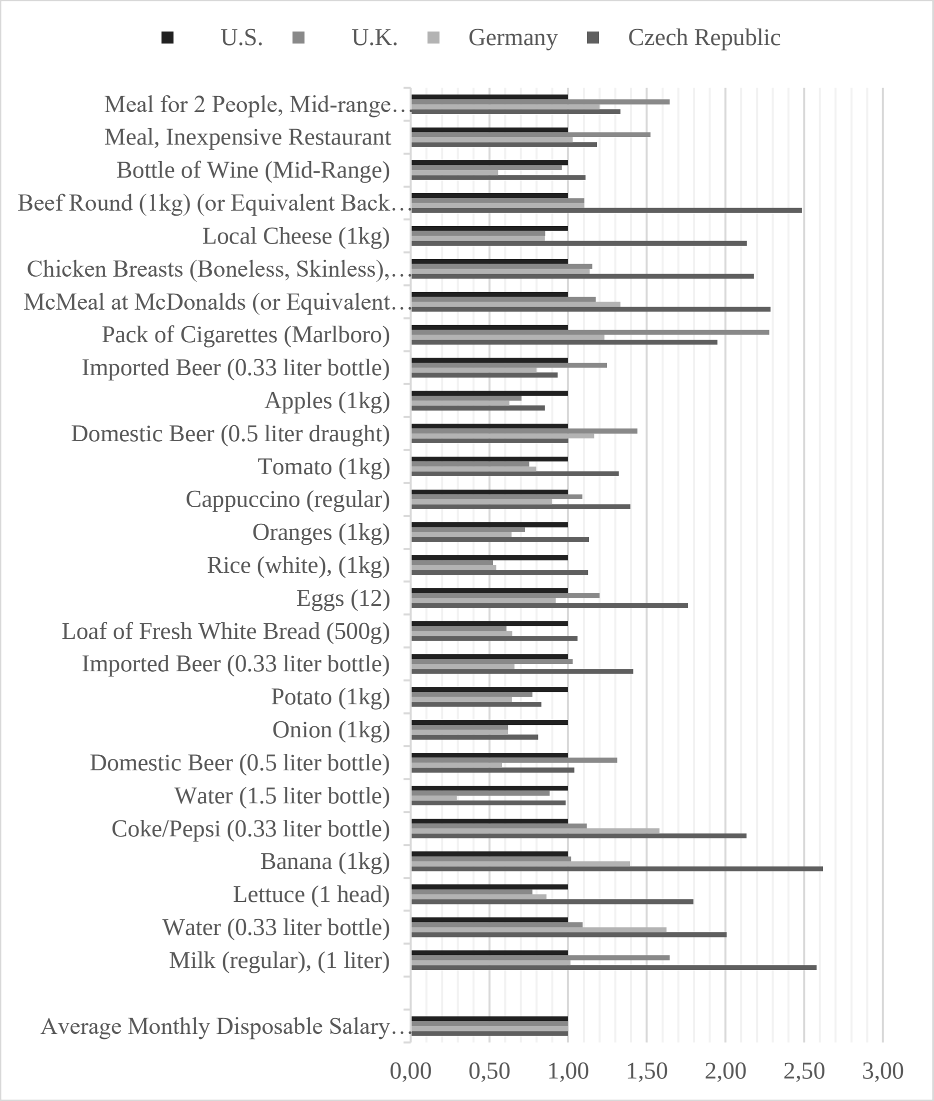

Figure 2. Ratios of Several Food Staffs Prices after Re-Normalizing them by the Average Monthly Disposable Salaries in the United States in 2016, source: own based on [15, 27, 29, 30, 31, 32, 33].

In the Table 4, there is given a list of several commodity prices in the Czech market, at randomly selected day April 26th 2017 (Collective of authors, 2017H). They were expressed in the U.S. dollars, Czech currency (CZK), EUR, Great Britain Pounds, and also in relevant Monetary Minute values, respectively. It can be seen, that prices of individual commodities expressed in individual currencies are very different and confusing. Meanwhile, the ones expressed in the related Monetary Minute currencies enable to compare and testify their values in the Czech market in relation to the currency market in Czech Republic. A noticeable overvaluation of the U.S. dollar against the values of other currencies in the Czech Republic at that time can be derived from these MMC values.

Table 4. List of Several Commodity Prices in the Czech Market Expressed in US$, CZK, €, £ Currencies, and in related MonMin Values (at April 25th 2017), , source: own based on [14, 29].

Commodity	Unit	Values in Traditional Currencies				Values in MonMin Currencies			
		US$	CZK	€	£	MM$	MMCZK	MM€	MM£
Electricity	1 MWh	31.854	783.02	29.25	24.837	300	408	417	437
Crude Oil Brent	1 Barel	52.30	1286.53	48.02	40.778	492	671	684	717
Natural Gas	MMBtu	3.5	74.969	2.80	2.377	29	39	40	42
Gold	1 oz	1265	31093.7	1161.51	986.35	11908	16219	16541	17340
Wheat	100 Bushl	409.25	10059.37	375.77	319.1	3852	5247	5351	5610
Cotton	100 Pound	79.36	1950.67	72.867	61,878	747	1017	1038	1088
Currency Ratio	CZK	24.58	1	26.77	31.524				
TBM		0.10623	1.917129	0.070218	0.056883				

4 Conclusions

This evaluation study is a part of my testing the idea of using Time as a prospective base/commodity for a new money system, which would be objective, predictable, dynamically evolving, and readily introduced in economy, business and everyday life.

I have focused on the comparison of the living costs and/or incomes evaluated in so called Monetary Minute currencies (in abbreviation MMc) in this article, consequently to my previous works [19], in which I defined a new currency called a “TBM” (for Time-Based Money) as a value of the GDP per capita divided by the number of minutes per year (i.e. 525600). The MMc were related to the currently utilized currencies (like in $, €, £, and others) via the above mentioned TMB.

The results of the current study show, that MMc enable comparison of apparent values of the same/similar products or - generally - all economic entities expressed in different currencies, and to reveal disparities among them. They revealed not just the differences in prices of selected food staffs but also the differences in affordability of the products taking into account the average monthly disposable salaries in different countries on the "homologized" Monetary Minute base.

The current nominal value of a specific economic entity expressed in Monetary Minutes, i.e. MM$, MM£, MM€, etc. differs in relation on which current money currency system - USD, GBP, EUR, etc. - is used, respectively.

Thus, the results show that the MMC can be useful for the comparison and testing values of different currencies on the currency markets and revealing disparities (overvaluations/undervaluation) among the values of currencies on the specific market.

Taking into account the results of the previous work [17, 18], in which the Time Based Money lit the light on the distortion effects of central banks currency politics on real economies development, I state that the TBM and MMc are prospective tools for tracing, measuring, and analyzing wide spectrum of value transformations in real economy, including production costs/efficiency diversities in different countries or regions, and different historical eras in a more objective way, than the current spectrum of currencies worldwide enable.

The quantitative accuracy and reliability of the results given in the study are limited by the accuracy and reliability of the figures available and the time of its creation. Nevertheless, the quality of the fundamental finding, i.e.: the currency MonMin can serve as a useful and practical tool for the Value determination/measurement of any economical entities (either elements and/or processes) is undeniable.

Note: I do not insist on the only term/name/title "MMc" for the currency called "Monetary Minute". The abbreviations such as TMc (for the "Time Money Currency") could be better for practical use (especially, when relating to the specific traditionally used money (like "Time Money Dollar" - TM$ or "Time Dollar" - T$, "Time Money Pond" - TM£ or "Time Pound"- T£, "Time Money EUR" - TM€ or "Time EUR" - T€, etc.)).

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Political Stability As Important Factor Of Development Of Tourism Destination – A Case study of Lipno nad Vltavou

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Abstract. Lipno nad Vltavou is one of the most dynamically developing municipality in the Czech Republic over the last twenty years. It is evident that the answer to this question consists in rare political stability and suitable and reasonable tourism management. The research question of this article is therefore if other actors in the micro region (so called "Union of Lipno municipalities") perceive the political stability in the area stable and the cooperation within the council as adequate. To answer this question a questionnaire survey with all of 15 municipalities in the Lipno region was a part of a project titled "Development strategy of the territory of the Lipno municipalities" implemented by the Institute of Hospitality Management in Prague in 2016. It was found that all the respondents have a positive statement about the political stability in the micro region and the political stability in the micro region is also perceived as the most important criteria influencing the cooperation within the council. The potential for further development of the micro region is seen by their representatives at first in the development of the tourism; on the contrary, the greatest threat is perceived in high level of bureaucracy, the lack of transport infrastructure, the migration of young people out of the region and a high degree of protection of nature and landscape.

Keywords: Lipno nad Vltavou, Political Stability, Tourism Development.

1 Introduction

1.1 Political aspect

Each tourism destination wants to be a successful and competitive. But what makes a tourism destination successful? There exist many factors which contribute or influence a success of tourism destination. We talk about specific combination of economic, social, political, environmental, technological and other factors which create a specific environment or circumstances for developing a tourism destination. Political factor as a factor of destination development, destination image or destination reputation is mentioned by several authors on the national level from different perspective (e.g. [16]; [8]; [11]). Political stability or instability has not been the focus of interest of any authors on the local or better said at the municipality level.

During the mid-1970's to early 1980's, tourism systems research boomed, and a plethora of tourism models were presented from both a theoretical basis, and in the context of planning, development, and management [17]. Tourism studies vary extensively in terms of quality and accuracy, and with respect to which aspects of tourism are included. Many authors have focused on evaluation of tourism impacts at the national level, for example Kabak, and Ülengin [10] using environmental indicators, or Lundie, Dwyer, and Forsyth [12] with the use of disaggregation of national accounts. Indicators have become a very important tool and method to measure the impact of tourism at the local level. According with Vehbi [18], an indicator is a quantitative model and a form of information that makes a certain phenomenon perceptible that is not immediately detectable.

There are many authors or institutions that have set up a theoretical approach to indicators, and others who have tried to determine them through practical application. The studies of the European Union [6], the Organization for Economic Co-operation and Development [5] and the World Tourism Organization [19] are commonly known as the most basic approaches. All of these theoretical approaches do not introduce the political indicators. Recently, The European Tourism Indicator System [7] was updated and contains one notion as a lesson learnt from the pilot phases: "Destinations piloting the ETIS have also emphasised the importance of obtaining relevant local political support for implementation and it can be useful to have this commitment publically announced."

1.2 Used approach and research question

The Institute of Hospitality Management in Prague was asked to implement a project for the tourism destination of Lipno nad Vltavou. The project named "Measuring the effects of tourism in the tourism destination of Lipno nad Vltavou" was provided by the Municipality of Lipno nad Vltavou and Lipensko, Ltd.

The main objectives of the project were to:

- determine the way of regular measurement of tourism effects and trends for the municipality of Lipno nad Vltavou,
- and determine the type, frequency and form of data collection.
- It is also important to determine the research questions of this project because there is a direct link with the research question of this article. These questions were to:
- assess whether there was or could be another way of alleviating the economic backwardness of the municipality than through the development of tourism,
- improve the current state of tourism in the municipality.

It was found that the municipality had no other choice how to develop the area that through the tourism. The unique current situation of this destination opened a new and fundamental question – what are the factors of such unique situation in the tourism sector? It is evident that the answer to this question consists in rare political stability and suitable and reasonable tourism management. This fact guided the authors to a question if other authorities in the micro region see it in the same light. Therefore, the research question of this article is if other actors in the micro region (so called "Union of Lipno municipalities”) perceive the political stability in the area stable and the cooperation within the council as adequate. The importance of the suitable tourism management has been already mentioned by many authors (e.g. [1]; [2]; [3]; [9], [14]; [15]), while the political stability has not been a subject of this attention.

1.3 Data collection

To answer the research question, a questionnaire survey was implemented as a part of a project titled “Development strategy of the territory of the Lipno municipalities” prepared by The Institute of Hospitality Management in Prague in 2016. The main objective of this project was to elaborate a strategy for the development of the area of member municipalities of the Lipno Municipal Association. The questionnaire survey was attended by all 15 municipalities in the Lipno region, which have an impact on the formation of a tourist destination – Lipno. Other data were collected from the Czech Statistical Office and other institution providing tourism statistics as Monitor – an information portal of the Ministry of Finance that provides free access to budgetary and accounting information at all levels of government and self-government.

2 Results

2.1 Destination Lipno nad Vltavou

Lipno nad Vltavou is very important tourism destination in the Czech Republic over the last twenty years. The main motive for the development of the village was tourism, because:

- it has a strategic position (it is not located in a specially protected area),
- it was built as a special purpose estate (formerly builders of the dam, nowadays holidaymakers),
- it does not show any fluctuations in the activities of the municipality and has a significant investor (Lipno Servis).

More than twenty years ago, the village of Lipno nad Vltavou decided to go towards the development of tourism and the improvement of the services provided. In 2012, Lipno nad Vltavou won the Best of Realty award for the strategic and territorial development of the municipality through tourism. At the same time, the newly built barrier-free Treetop Walkway became a tourist novel of the summer season of 2012. The prestigious European award in the seventh edition of the European Commission EDEN (European Destinations of Excellence) project was awarded to Lipno nad Vltavou in 2013 along with other eighteen successful European regions they also target handicapped visitors and tourists.

As it was stated before, the destination Lipno nad Vltavou is politically stable. Average attendance of residents in elections is 63.9%, and there are only two political parties in the Municipality Council – one party without political affiliation and the Communist Party of Bohemia and Moravia (the latter has had only 1 member for two election periods). The total number of members in the Municipality Council is seven. The share of new members in each new election period is the most frequently 57%, with the exception of 2002 when it was only 14%. The mayor of the Lipno municipality has been the same since 1990.

2.2 Results – Destination Statistics

The municipality of Lipno nad Vltavou registered 27 collective accommodation establishments (CAE) with 3 283 beds in 2016 (according to the source of the Czech Statistical Office, but the municipality itself registers 54 CAE). Including the individual accommodation facilities, the accommodation capacity is even higher, reaching 59 units with 286 beds, according to the statistics of the municipality. In the CAE, 91 210 guests were accommodated in 2016, of which 67% of the residents. They spent 405 122 nights in the destination with average stay of 4.4 nights. There are 662 inhabitants in the monitored village. It can be stated from the quoted statistics that Lipno nad Vltavou is a hyper-tourist center of tourism depend on the value of the Defert function is 525.5.

The development of basic indicators over time can be responsibly evaluated for the period of 2012-2016, as in 2012 the Czech Statistical Office published the so-called CENSUS - the actual state of the monitored indicators. For this reason, the data after 2012 are not comparable to the data in the period 2000-2011. The data are not available for the year 2012, respectively the data are in the regime “confidential data” (see Table 1). The change in the methodology can be seen especially in the number of overnight stays (Fig. 1).

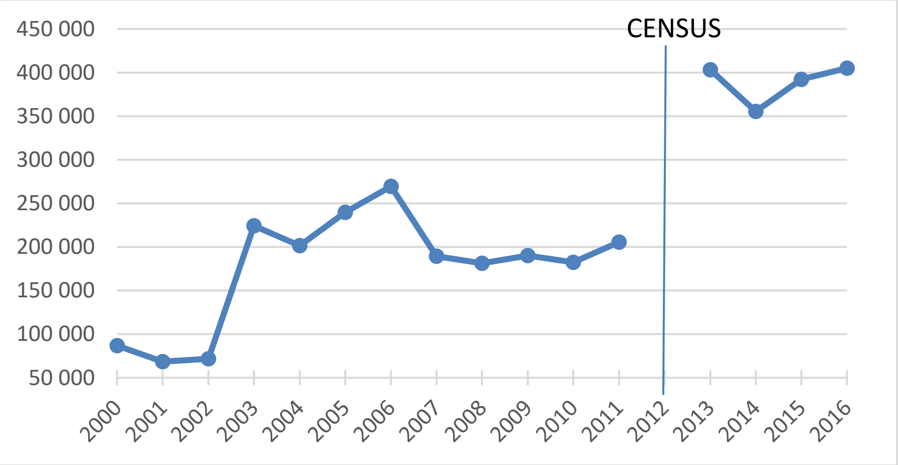


Fig. 1. Number of overnights 2000-2016,[4]

The Czech Statistical Office announced in 2012 and 2013 the percentage of the occupancy of bed capacity in selected municipalities in the Czech Republic. The average occupancy of beds in these years in Lipno nad Vltavou was 19.5% in CAE, while the average for the Czech Republic in 2013 was 34.8%. Lipno is a place with a higher proportion of individual accommodation and apartment apartments, which are not included in the CAE category.

Table 1. Tourism Statistics of Lipno nad Vltavou, 2000-2016, [4]

Year	Number of guests arrivals	Residents (%)	Number of overnight stays	Number of overnight stays (%)	Average overnight stays
2000	22 588	78%	86 913	81%	3.8
2001	20 025	78%	68 421	83%	3.4
2002	20 925	76%	71 874	79%	3.4
2003	43 999	58%	224 427	44%	5.1
2004	41 272	46%	201 349	34%	4.9
2005	40 503	39%	239 860	30%	5.9
2006	67 022	47%	269 414	37%	4
2007	34 589	37%	189 427	26%	5.5
2008	30 760	36%	181 159	22%	5.9
2009	37 344	46%	189 997	29%	5.1
2010	34 149	52%	182 211	36%	5.3
2011	43 306	53%	205 482	40%	4.7
2012	i.d.	i.d.	i.d.	i.d.	i.d.
2013	88 678	66%	403 132	51%	4.5
2014	81 951	65%	355 596	50%	4.3
2015	91086	71%	392052	59%	4.3
2016	91210	67%	405122	56%	4.4

Note: i.d. - individual or confidential data (explained above Fig. 1)

Other tourism statistics also testify a unique position of the destination of Lipno nad Vltavou. There are two main tourism fees – local accommodation capacity fee and local spa or recreational stay fee. Given that tracking tourism statistics is usually very problematic and often inaccessible, these statistics are an important indicator of the importance of tourism in a given location.

Lipno nad Vltavou was a subject of a comparison with other communities with similar number of inhabitants (501-1000 inhabitants) in the total volume of local accommodation capacity fee and local spa and recreational stay fee (measured in the CZK). It was found that in 2000 the destination had occupied tenth position in the total volume of local accommodation capacity fee out of the total number of municipalities and from 2004 to 2012 occupied second place. Regarding the ranking for the spa and recreational stay fee, Lipno nad Vltavou occupied tenth position out of the total number of municipalities in 2000, between 2005-2007 and in 2009 improved its position to the second place and in 2008 and between 2010-2013 was on the forth place of all the municipalities.

Table 2. The amount of selected local fees in Lipno nad Vltavou in 2000 - 2016 in CZK [13]

Year	Local Accommodation Capacity Fee	Local Spa or Recreational Stay Fee	In Total
2000	127 020	587 390	714 410
2001	201 140	864 640	1 065 780
2002	217 560	955 610	1 173 170
2003	320 580	1 853 160	2 173 740
2004	705 840	2 456 430	3 162 270
2005	819 560	2 553 840	3 373 400
2006	921 660	2 717 820	3 639 480
2007	910 860	2 684 680	3 595 540
2008	1 123 850	3 275 490	4 399 340
2009	1 231 860	3 458 180	4 690 040
2010	1 449 020	3 997 740	5 446 760
2011	1 447 830	3 736 350	5 184 180
2012	1 489 780	3 855 310	5 345 090
2013	1 556 895	4 139 072	5 695 967
2014	1 547 319	4 149 375	5 696 694
2015	1 660 916	4 389 089	6 050 005
2016	1 750 186	4 540 434	6 290 620
In Total	17 481 876	50 214 610	67 696 486

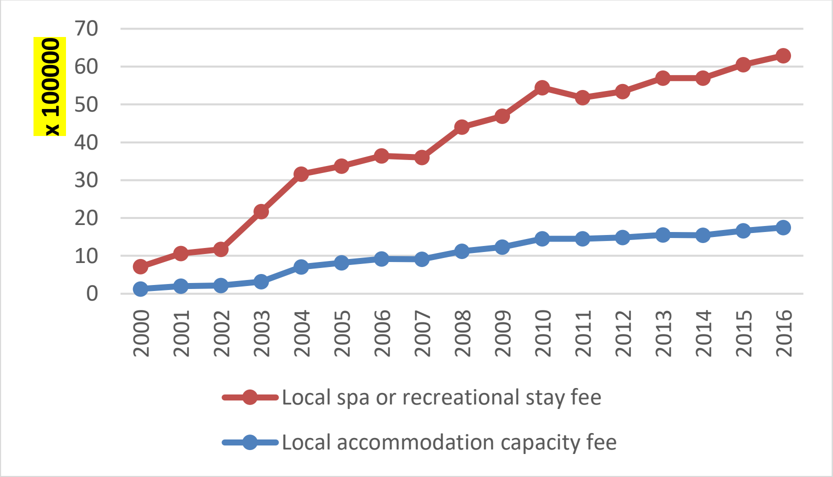


Fig. 2. Development of revenues of local fees directly connected with tourism in Lipno nad Vltavou [13]

Revenue from both local taxes directly associated with tourism is increasing over time period (Table 2, Figure 2). The local fee from the accommodation capacity has increased almost 14 times since 2000 and the local spa or recreational stay fee almost 8 times. As shown in Table 3, the revenues from both local fees have accounted for 13% of the total income of the municipality with fluctuations in individual years in total over the past 7 years.

Table 3. The amount of selected local fees in Lipno nad Vltavou in 2000 - 2016 in CZK [13]

Year	Total both fee in CZK	Total municipality revenue in CZK	% rates
2010	5446760	49268790	11.06%
2011	5184180	60237948	8.61%
2012	5345090	43350743	12.33%
2013	5695967	35130587	16.21%
2014	5696694	33679517	16.91%
2015	6050005	42584924	14.21%
2016	6290620	41080898	15.31%
Total	39709316	305333407	13.01%

2.3 Survey Results

This capture introduces the results of the survey in the micro region of Lipensko. As it was stated before, we expect that political stability is a very important factor of the involvement of any tourism destination.

The importance of political stability as an important factor in the formation and direction of the municipality was reflected in the initial question, where 18,4% of respondents stated political stability as a strong factor of this destination. The potential for further development of the micro region is seen by their representatives at first in the development of the tourism; on the contrary, the greatest threat is perceived in high level of bureaucracy, the lack of transport infrastructure, the migration of young people out of the region and a high degree of protection of nature and landscape.

In direct confrontation with the factor of political stability in the micro region, the outputs mentioned below were identified. It was found that the community supports the community-led local development – 73% of the respondents agree with this statement and 27% do not support this statement.

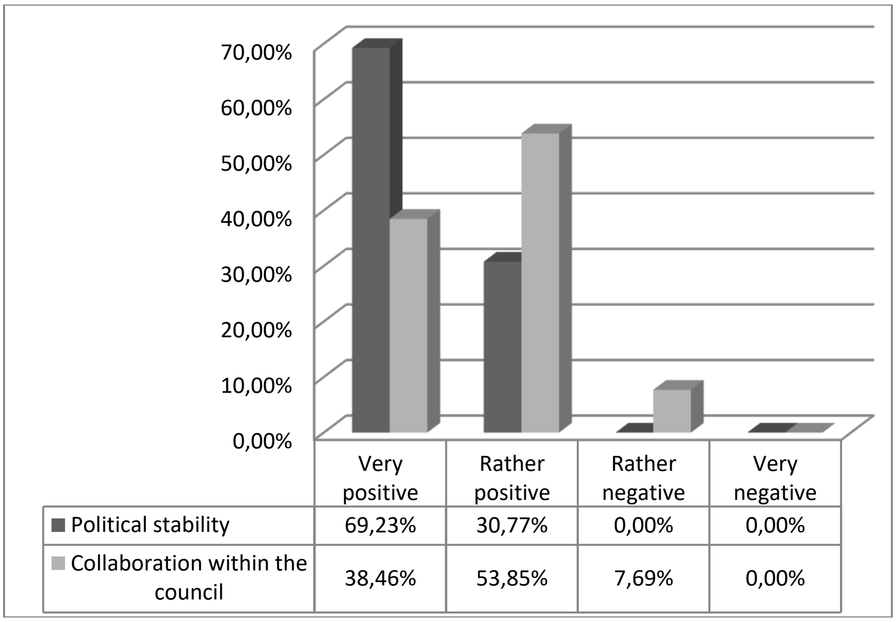


Fig. 3. Survey results – political stability and collaboration within the council

Figure 3 describes the results regarding the political stability and collaboration within the council. The majority of respondents (almost 70%) have a very positive statement about the political stability in the micro region; nevertheless the collaboration within the council is evaluated by the majority (54%) as rather positive.

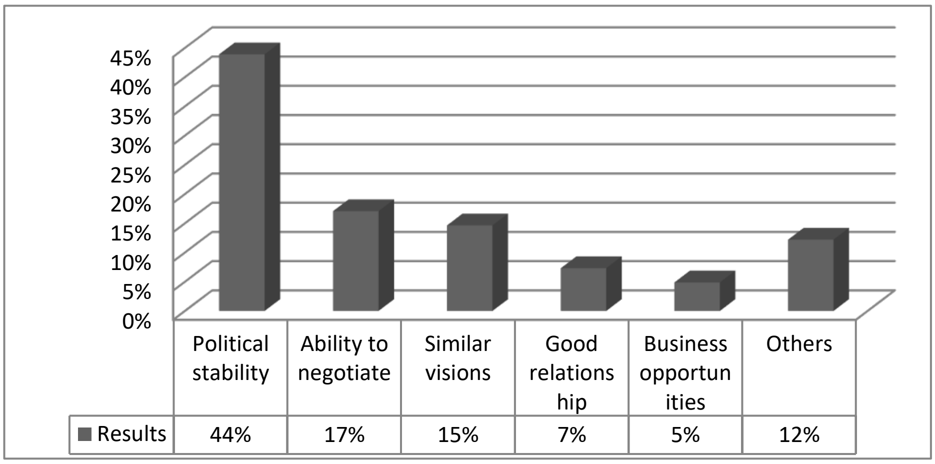
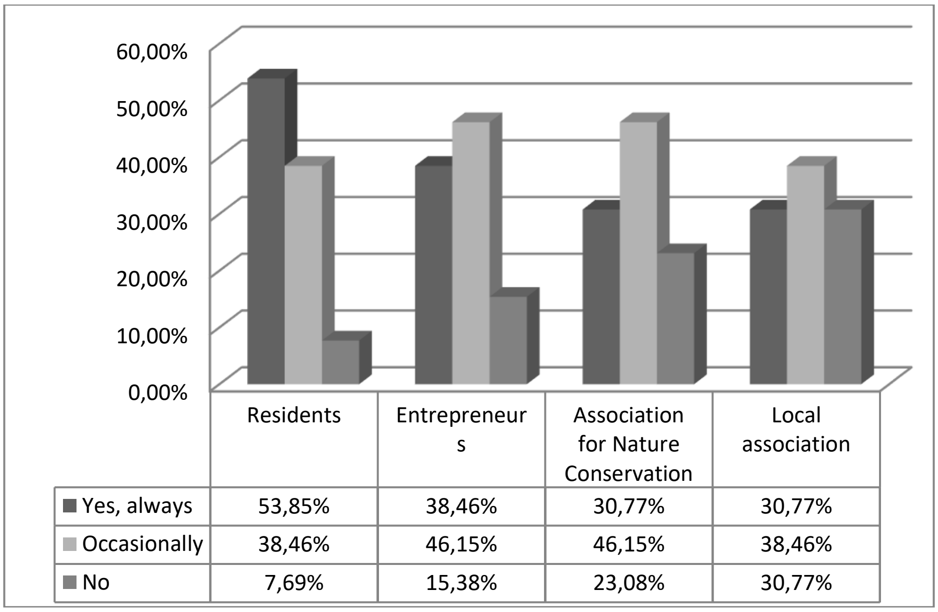


Fig. 4. Survey results – Criteria influencing the cooperation within the council

Criteria influencing the cooperation within the council are a subject of the Figure 4. The political stability is perceived as a major criterion influencing the overall cooperation (44%). Other important criteria are ability to negotiate and similar visions.



	Residents	Entrepreneurs	Association for Nature Conservation	Local association
■ Yes, always	53,85%	38,46%	30,77%	30,77%
■ Occasionally	38,46%	46,15%	46,15%	38,46%
■ No	7,69%	15,38%	23,08%	30,77%

Fig. 5. Survey results – Involvement in decision making

The last Figure 5 describes the involvement of other stakeholders in the decision making in the area. The majority of residents are always involved in this process (54%), nevertheless entrepreneurs, association for nature conservation and other local associations are involved rather occasionally but their involvement is the overall decision making is rather high (entrepreneurs – 85%, association for nature conservation – 77% and other local associations – 70%).

3 Conclusion

Lipno nad Vltavou is one of the most dynamically developing municipalities in the Czech Republic over the last twenty years. The main motive for the development of the village was tourism, because the destination it is not located in a specially protected area, it was built as a special purpose estate and especially because it does not show any fluctuations in the political stability. The mayor of Lipno nad Vltavou is in function from 1991, it means 26 years, what can be called as a miracle in the conditions of the Czech Republic.

The intensity of the tourism activity is reflected by the statistics. It can be stated from the quoted statistics that Lipno nad Vltavou is a hyper-tourist canter of tourism and the value of the Defert function is 525.5. Revenue from both local taxes directly associated with tourism is increasing over time period (Table 2, Figure 2). The local fee from the accommodation capacity has increased almost 14 times since 2000 and the local spa or recreational stay fee almost 8 times. As shown in Table 3, the revenues from both local fees have accounted for 13% of the total income of the municipality with fluctuations in individual years in total over the past 7 years.

The research question of this article was if other actors in the micro region (so called "Union of Lipno municipalities") perceived the political stability in the area stable and the cooperation within the council as adequate. The results of the survey in the micro region of Lipensko found that the community supports the community-led local development – 73% of the respondents agreed with this statement and 27% did not support this statement. All the respondents (100%) have a positive statement about the political stability in the micro region (69% very positive and 31% rather positive) and the collaboration within the council is evaluated by 93% as positive(39% as very positive and 54% as rather positive). Regarding the criteria influencing the cooperation within the council - the majority of respondents (almost 70%) have a very positive statement about the political stability in the micro region; nevertheless the collaboration within the council is evaluated by the majority (54%) as rather positive. It was also found that the political stability is perceived as a major criterion influencing the overall cooperation (44%).

Due to this exemplary development of a tourism destination, Lipno was a winner a number of awards. In 2012, Lipno nad Vltavou won the Best of Realty award for the strategic and territorial development of the municipality through tourism. At the same time, the newly built barrier-free Treetop Walkway became a tourist novel of the summer season of 2012. The prestigious European award in the seventh edition of the European Commission EDEN (European Destinations of Excellence) project was awarded to Lipno nad Vltavou in 2013 along with other eighteen successful European regions they also target handicapped visitors and tourists.

The potential for further development of the micro region is seen by their representatives at first in the development of the tourism; on the contrary, the greatest threat is perceived in high level of bureaucracy, the lack of transport infrastructure, the migration of young people out of the region and a high degree of protection of nature and landscape.

The indicators were mentioned in the introduction part as a tool that could help in the management of a tourism destination. The next research will be focused on the political stability in other municipalities or tourism destinations with regard to include a political indicator in methodical approaches.

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Hunting Tourism as a Modern Product for the Development of Czech Regions

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Abstract. Hunting tourism is good opportunity for rural regions in the Czech Republic. The aim of this article is to determine which areas have potential for hunting tourism and where it would be appropriate to actively focus on promoting hunting tourism. Potential was evaluated on the base of annual hunt per hectare as the maximum offer of an area. Data were collected for municipality with extended power as the smallest territorial unit in the Czech Republic. Hunt of furry game and feathered birds were calculated separately. Results of research were demonstrated by cartograms. Data were collected from The forest management institute. Totally 34 % of the territory is suitable for the development of hunting tourism of furry game and 18 % of the Czech Republic is suitable for hunting tourism of feathered birds. Mostly north-west of the Czech Republic - Karlovarský region, Plzeňský, Ústecký and some areas in Liberecký and Středočeský region, then Jihomoravský region are very suitable for the development of hunting tourism in terms of furry game. Very good potential for hunting tourism of feathered birds was recorded around rivers Vltava, Labe and Morava.

Keywords: Hunting tourism, Regional development, Tour operator

1 Theoretical framework

1.1 Hunting tourism

The issue of wildlife management has been a highly discussed topic in recent years. Hoofed game is overpopulated in some areas in the Czech Republic and hunters fail to reduce their numbers to a standardized numbers. The main task of the paper is to point out the possibilities of hunting in the territory of the Czech Republic in terms of hunting tourism, which in the future could become one of opportunity for the development of rural areas and the development of regions. Most tourists arriving to the Czech Republic go to Prague or the South Bohemian region. However, hunting tourism could attract foreigners into less visited regions and become a great phenomenon of the future.

Game control through hunting is one of the most important game management tools. Overpopulated game pieces cause considerable damages to farmland and forest stands. Based on estimates, annual crop damage ranges from 3.5 to 7 billion crowns. [2] Predominantly small farmers have a lot of damage, their competitiveness is reduced and then conflicts between interest groups are taking place. A large number of items also pose a risk for the spread of disease and the subsequent degradation of the entire population. The goal of hunting management in the Czech Republic is above all to take care of game and to increase its value and strength. Offering a part of the planned number of game pieces to foreign hunters can mean a solution to reduce overpopulated game numbers. At the same time, hunting tourism means significant income to the regions, whether in terms of tax hunting or the multiplier effect of consuming services that are important to ensure the hunt. Hunting tourism is very specific form of tourism. The demand for hunting is limited by number of wild animals in area. The higher number of animals per hectare an area has the better opportunity to develop hunting tourism it has.

New forms of tourism, such as agro tourism or ecotourism, under which hunting tourism is often ranked, are a source of valuable effects in the region, as they contribute to improving the quality of tourism services, thereby contributing to the growth of the social and economic potential of the area. [5]

The benefits of hunting tourism can only be enjoyed under the conditions of sustainability. Sustainable development of hunting tourism can be achieved by preserving environmental sustainability, economic viability and social adequacy. [3] Each of these pillars of sustainable hunting development, however, contains a great deal of problems and is so important for many scientists dealing with the issue. For example, Woodroffe and Ginsberg [7] consider that hunting tourism must also be useful for the conservation of natural habitats and contribute to the protection of wildlife, in order to achieve environmental sustainability. According to Morrill [8], hunting is less destructive than other forms of ecotourism, such as photographic tourism. The same view is held by Gössling [4]. According to him, hunters have less impact on the environment than photographers, as they do not require so much local amenities and infrastructure, which significantly reduces the degradation of the habitat.

According to the advice of the International Council for Game and Game Conservation (CIC) [1], the sustainable form of hunting tourism is one of the game's protection tools, as well as the use of natural resources, which can play a key role in reducing rural poverty. In many countries, especially in the developing world, organized hunting tourism has risen sharply in the last half-century. This trend is great economic and ecological importance. For the host country and its rural population, hunting tourism has a number of advantages - preserving ecosystems, generating income and employment in less-favored areas, economic and sensible use of natural habitats that are not suitable for agriculture or conventional tourism, building awareness among the local population the value of wild game that is otherwise considered to be harmful, disturbing and costly, to reducing the environmental impact compared to other forms of tourism and reducing poaching through the joint efforts of all those who are interested in generating income from hunting tourism [1].

1.2 Hunting possibility in the Czech Republic

In the Czech Republic there is possible to hunt furry game, mostly hoofed game such as red deers, roe deers, fallow deers, moufflons and wild boars. Small furry game is represented by hares, foxes, badgers and martens; even so just hares are objects of offer for hunting tourism as a motivation to go to different place for a hunt. It is also possible to hunt feathered birds from which mostly ducks and pheasants form offer for hunters.

2 Methodology

Potential of regions if they are suitable for the form of hunting tourism was evaluated on the base of annual number of hunt within municipality with extended power as the smallest territorial unit in the Czech Republic. To avoid data distortion in relation to different size of municipalities, number of hunt were recalculated per hectare. Hunt of furry game and feathered birds were calculated separately. Results of research were demonstrated by cartograms. Data were collected from The forest management institute.

3 Results of research

3.1 Annual hunt of furry game

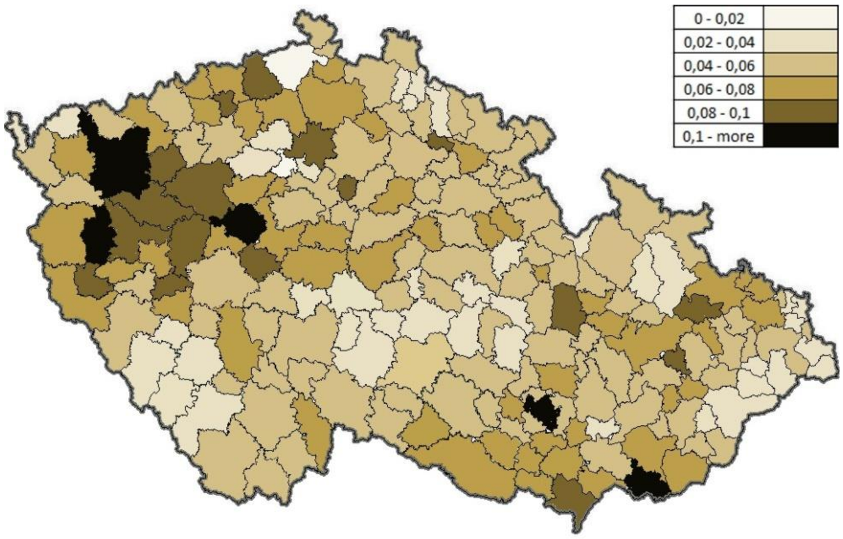

Fig. 1. Annual hunt of furry game per hectare

Municipality with extended power which has higher number of annual hunt than 0, 06 pieces per hectare is considered as an area with great potential for the development of hunting tourism. According to cartogram above it is visible that very suitable area for the development of hunting tourism is north-west of the Czech Republic, thus Karlovarský region, Plzeňský, Ústecký and some areas in Liberecký and Středočeský region. Also Jihomoravský region has good potential for the development of hunting tourism. Totally 34 % of the territory is suitable for the development of hunting tourism. In detail very high annual hunt of furry wild animals (more than 1 per hectare) was recorded in the following municipalities – Beroun, Karlovy Vary, Stříbro, Veselí na Moravě. (Brno was excluded because small hunting area). High annual hunt of furry game was recorded in municipalities – Bílina, Blovice, Břeclav, Dobříš, Horšovský Týn, Kralovice, Lipník nad Bečvou, Lysá nad Labem, Mělník, Moravská Třebová, Nová Paka, Nýřany, Podbořany, Rakovník, Rokycany, Ústí nad Labem and Vítkov. Jihočeský and Vysočina region have very weak potential for the development of hunting tourism in terms of furry game.

3.2 Annual hunt of feathered birds

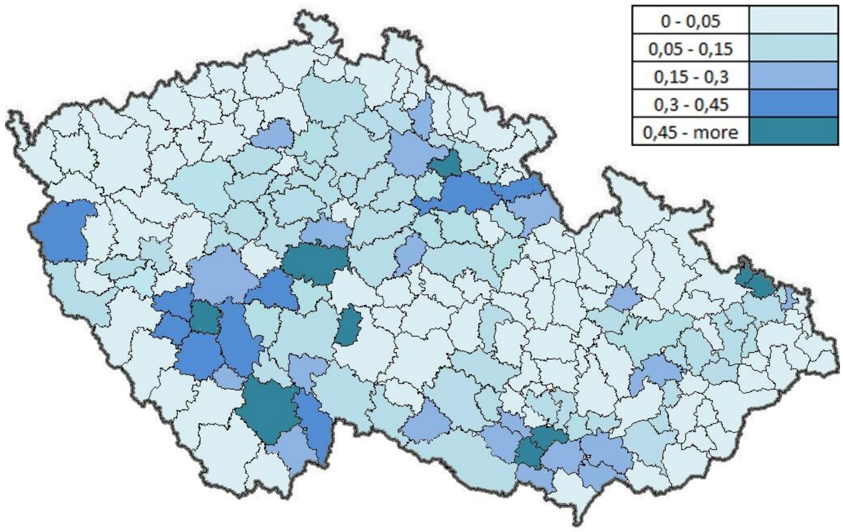

Fig. 2. Annual hunt of feathered birds per hectare

In terms of feathered birds, which can be hunted in the Czech Republic, it was established, that municipality with extended power which has higher annul hunt than 0,15 pieces per hectare is suitable for the development of hunting tourism. According to cartogram above it is visible that very suitable areas for the development of hunting tourism are parties around rivers – Vltava, Labe and Morava. Totally 18 % of the Czech territory is suitable for the development of hunting tourism. Municipalities with extended power which have very higher annul hunt of feathered birds (more than 0,45 pieces per hectare) are Benešov, Blatná, České Budějovice, Hlučín, Hořice, Kravaře, Pacov, Pohořelice a Židlochovice. High annual hunt of feathered birds was recorded in following municipalities – Dobruška, Horažďovice, Hradec Králové, Nepomuk, Písek, Sedlčany, Strakonice, Tachov and Třeboň. Vysočina region, Zlínský, Olomoucký, Karlovarský region have very weak potential for the development of hunting tourism of feathered birds.

4 Conclusion

Game hunting is an important instrument of game management in the Czech Republic. Wildlife is a national asset and must be properly taken care in order to preserve the highest quality genofond. Hunting tourism has many advantages. Not only it can be a solution to reduce overpopulated game, but it can also be a source of income for regions that are not suitable for classic tourism. Based on data evaluation for individual municipalities with extended power, it can be concluded that the largest offer in terms of the number of planned annul hunt of furry game is distributed unequally, mostly in north-west territory of the Czech Republic. High numbers of annual hunt of feathered birds were recorded around main Czech rivers – Vltava, Labe and Morava. All municipalities with very high or high numbers of annual hunt should develop possibility of hunting tourism. They should build appropriate infrastructure for hunters. Invest into building accommodation and also promote the area as hunting destination suitable for certain hunt. Very desirable and beneficial would be promotion of hunt in foreign countries, because foreign hunters spent more money for a hunt.

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Financing of Regional and Local Development by the Territorial Self-government Units in Poland Within the EU Cohesion Policies

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Abstract. The self-governmental sector is one of the most important ones in realisation of public assignments and missions. The territorial self-government in Poland is perceived as the most important investor and service supplier. Territorial self-government units perform own tasks with the aim of meeting common needs of self-governmental communities. Realisation of these tasks requires adequate infrastructure, equipment and financing. In this context, particular importance should be given to financing ventures contributing into social and economic development in regions and local communities. The aim of this paper is analysis of policies implemented in Poland so far, the policies which are set in the framework of the cohesion policy restricted to institution dimension of the regional and local development.

Keywords: Local Development, Regional Finance, Cohesion Policy.

1 Introduction

The self-governmental sector is one of the most important ones in realisation of public assignments and missions. The territorial self-government in Poland is perceived as the most important investor and service supplier [7]. Territorial self-government units perform own tasks with the aim of meeting common needs of self-governmental communities. Realisation of these tasks requires adequate infrastructure, equipment and financing. In this context, particular importance should be given to financing ventures contributing into social and economic development in regions and local communities.

Cohesion policy, also known as regional policy is one of the European Union and aims at equaling of work and living standards of all citizens in the European Community. The attempt to close the gap in social and economic development of all regions and local areas should be achieved through proper utilization of existing means, with application of supporting instruments directed at territorial self-government units which are interested in getting support for the pro-growth processes.

The aim of this paper (chapter) is analysis of policies implemented in Poland so far, the policies which are set in the framework of the cohesion policy restricted to institution dimension of the regional and local development Analysis of the literature and of other data sources lead to the conclusion that the systemic solutions concerning absorption of the EU funds in Poland support activities of the territorial self-government units as far as financing of social and economic development is concerned.

2 Regional and local development and self-governmental sources of its financing – basic definitions and their interpretations

Development is a long – lasting process of changes directed at something or somebody. Another interpretation of this notion indicates that it is a process of changes throughout which an object evolves into more complex and more refined forms. Development defined as above is quite near to the notion of progress which, in turn, is closely connected to such terms as progression improvement, amelioration or advancement in time. Both, development and progress are related to some processes which can be, more or less, connected with time and space. Taking into consideration place of origin of the development processes and their character, as well as conditions and factors shaping or influencing the phenomena in question, development can be defined as global, regional or local.

Global development can also be defined differently. B. Domański indicates that: "when it is related to regions, the concepts of economic or socio-economic development are mostly applied. The concepts are perceived as, firstly, immanent processes, and secondly as international actions of authorities" [3]. Another definition says that regional development is "a steady increase of living standard of the population and growth of economic potential in a big territorial unit, which includes i.a.: economic structure, natural environment and living standards, as well as urban and infrastructural development." [6].

Local development is defined differently in the literature referring to the subject. Firstly, local development is a process, not a state, so the effects of the development can be expected over a long period. Secondly, local development means purposive and mindful actions. Thirdly, the subject of local development are local authorities, inhabitants and entities which function in the local market. Another part of the definition stresses that local development refers to a smaller area (e.g. a local community or a town) than the regional development, and the local authorities are, in the first place, responsible for local development. Another feature in the defining description say about rational utilization of resources by the entities.

The self-governmental sector is one of the crucial components contributing to realisation of public aims in Poland. The territorial self-government is perceived as the most important service supplier and investor [7]. Territorial self-government units, through initialing social and economic development on their territories, fulfill own tasks, aiming at meeting the needs of their communities. In particular, the territorial self-government units realise goals for common good whose aim is to cater for the needs of the community through supplies of services available for everybody.

The system for self-government financing which functions in Poland and contributes into the local and regional development is shaped by many elements. In particular, it is conditioned by the existing structure of administrative division of the country, differences in development of the regions, dominating political concepts and by the current situation in public finance sector, [8]. Financial resources being at the disposal of self-governments decide about the power and level of self-dependence of local decision makers. The resources confirm stable economic situation and have influence over the potential for development in communes, countries and regions (voivodeships).

A system of self-governmental finances should meet numerous conditions described in the theory and present in the law, i.a., it should be transparent, stable and corresponding with the needs within the framework for financing of the public tasks commended to the self-government [12]. The question of budget revenues and their predictability for the local self-government budget is of particular importance as well as the legal power to decide about methods and places of allocation of the local revenues, as well as a necessity to channel some means for particular objectives.

The most important categories describing sources of self-government financing in Poland can be presented in the following way [11]:

- own income – appertained to the self-government totally and termlessly, connected with the local economic base and for which the local self-government is free to set levels for the revenues. The most common own-source revenues of the self-government include: local taxes and fees, fees for services supplied by the self-government, property income (dividends and other capital income, leasing, sales),
- transfers from the central budget and from other self-governments or from other (non-budget) sources, and in particular:
  - subsidies – transfers of general character, they are not dedicated to particular objectives and self-governments decide about their application,
  - grants – transfers having a strictly attached goal which cannot be changed without a consent from the donor,
- self-government's participation in sharing of revenues from some taxes between different levels of self-governmental administration and the central budget – in particular, the revenues from the personal income tax (PIT) and from the company income tax (CIT).
- returnable means – are part of a separate category of revenue and they technically cover deficit of the budget. The category includes bank credit, loans from other sources, as well as means from issuing municipal bonds.

A broader classification of financing sources for the territorial self-government in Poland takes into consideration the following division [4]:

- Public funds supporting realisation of tasks for territorial self-government units (including own income and budget transfers for self-government units), i. a.: local taxes and fees, income tax from activities of the self-government, subservient and subordinate units, property income, other own income, tax revenue collectible for self-government units according to the regulations, grants, subsidies, funds from the European Union budget.
- Private funds supporting realisation of the territorial self-government objectives, including: bonds or other credit instruments (bank bills and papers), loans, liabilities, leasing and other similar contracts.
- Hybrid financing and the remaining financial methods for realisation of objectives set for self-governments, i.a.: public-private partnership, project finance, venture capital, securitization, debt conversion and guarantees

3 Assessment of UE funds participation in the self-government expenditures – basic classification and data analysis

When analysing the question of expenditures made by territorial self-government units aimed at supporting regional and local development, it is important to refer to the structure of the expenditure which allows to assess the level of participation of self-governmental financial means in the total amount spent on investment. The crucial importance should be given to division of the expenditure- into the current and property ones. Property expenditures, in the first place on investment, have a pro-development character – they build infrastructure, create jobs, etc. However, current expenditures are in fact, connected with realisation of tasks assigned to self-government units by law. It must be stressed that the amount of property expenditure depends, above all, on the level of own income and possibilities to cover by it the liabilities resulting from investment [9].

Table 1. Financial data in total (mln of PLN) - all territorial self-government units. Source: own compilation based on [13].

		2012	2013	2014	2015	2016	2017
1	**Current income**	**156 468**	**163 169**	**171 722**	**176 067**	**200 491**	**202 596**
2	**Current expenditure**	**144 842**	**148 832**	**155 404**	**157 839**	**180 162**	**189 300**
3	Operational surplus	11 672	14 337	16 318	18 228	20 329	13 297
4	**Property income**	**20 945**	**20 290**	**22 616**	**22 952**	**12 943**	**21 178**
5	**Property expenditure**	**35 617**	**35 007**	**41 350**	**38 576**	**25 583**	**45 926**
6	Asset balance	-14 673	-14 718	-18 735	-15 624	-12 640	-24 747
7	**Total income**	**177 413**	**183 458**	**194 337**	**199 019**	**213 434**	**223 775**
8	**Total Expenditure**	**180 459**	**183 839**	**196 754**	**196 415**	**205 745**	**235 225**
9	Surplus/deficit	- 3 046	- 380	- 2 417	2 604	7 689	- 11 450

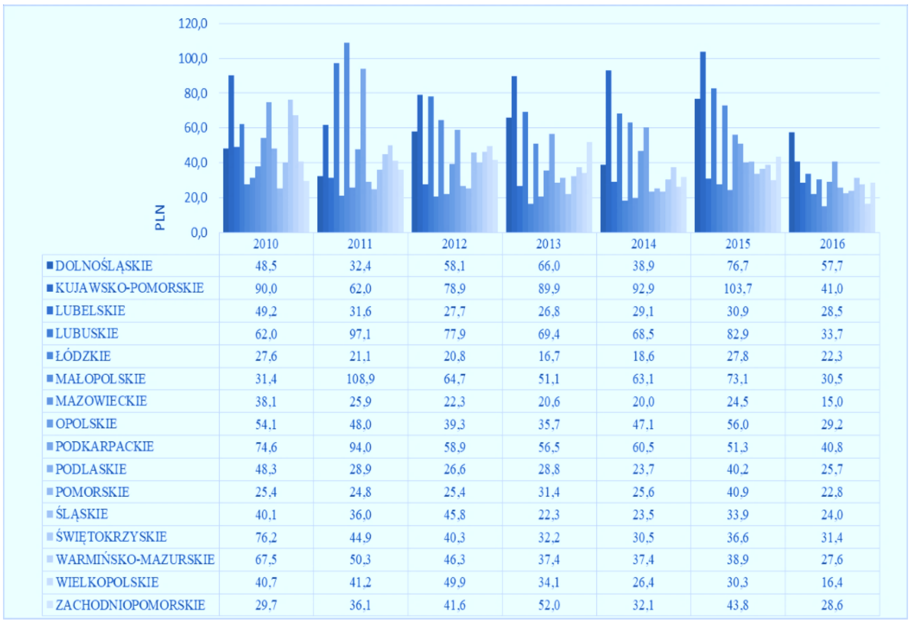
10	**Revenue**	**24 200**	**24 062**	**22 894**	**20 258**	**13 813**	**20 377**
a	New debt	12 649	12 959	11 246	8 096	5 400	14 379
b	Other revenue	11 551	11 103	11 647	12 162	8 413	5 998
11	**Expenditure**	**12 146**	**13 753**	**9 304**	**11 221**	**7 923**	**8 929**
a	Debt repayment	10 104	11 839	9 028	11 003	6 815	7 996
b	Other expenditure	2 041	1 914	277	218	1 109	934
12	**Financing**	**12 054**	**10 309**	**13 589**	**9 037**	**5 890**	**11 448**
13	**Budget balance total**	**9 008**	**9 928**	**11 172**	**11 640**	**13 579**	**- 2**

It can be observed that, over the researched period, average investment expenditures were fluctuating, showing a decreasing tendency. Such a situation was a result of, on one hand, intensification of investment activities resulting from accumulation of the EU projects in the implementation phase within the perspective 2007-2013. On the other hand, over that period, there appeared economic showdown and the European crisis which limited possibilities of public sector units, including local communities. It also needs to be stressed that, in the period when the biggest investment projects were implemented (2011-2012), differences between self-governments, as far as the implementation was concerned, were the largest.

Taking in consideration the value of accumulated investment, on average – the biggest investment projects were implemented by city boroughs followed by country boroughs and the smallest projects were realized by the mixed city-country boroughs. Such an outcome can be perceived as very obvious, considering the scale of needs of city communes. Equally, the latter is a group of communes featuring the largest diversity of the investment implemented [10]. Moreover, it can be added, that the most important item among the expenditures of the self-government units is the outlay on education which makes approx. 30 % of total expenditures in the period in question. The second largest category of expenditures are the ones connected to transport and communication, approx. 20 % of the total, followed by those on social welfare – about 15 %, and lastly, by the outlays on public administration and municipal utilities. The above mentioned five categories of expenditure have the largest influence on budgets of the territorial self-government units.

Over the last years, the units of territorial self-government in Poland have been implementing a considerable amount of pro-growth projects. Opportunities of receiving financial aid from the European Union budget have forced some actions to be taken by the self-government units in order to secure their own financial input, which was necessary to obtain the EU financing. This, in turn, resulted in increase of liabilities within the self-government sector. At present, self-governments have begun the second and probably the last development plan of such large dimension. This will be connected with a considerable increase of burden in their budgets and, in consequence, with a high level of debt servicing in the years to come. Data from multi-annual projections for self-government units confirm considerable differentiation of operational results of particular self-government units, which indicates a necessity of individual approach towards assessment of financial situation in those units. Nevertheless, it can be expected that the growing amount of repayable financing which even now burdens the self-governments considerably, will result in investment decrease in the nearest future.

The rule of financial self-dependence is mandatory for shaping the expenditures. The rule evinces itself in the authority given to the administrative bodies in order to establish a hierarchy of needs and ways of financing, after having considered a necessity to realise mandatory expenditures. Territorial self-government units have a right to decide about a division of financial means into current and investment tasks. Between 2010 and 2014 there appeared incremental increase of the EU financing, for the both, current and property expenditure. Due to the new financial perspective starting after 2014, there can be noticed a drop in the amount of financial aid in 2015. Higher level of financing for ventures focused on property tasks is planned by the self-government units for the years to come, i.e. after 2017. As said above, it applies to property expenditures. The reasons for such shifts in absorption of the EU funds can be found in the change of long – term financial framework.



	2010	2011	2012	2013	2014	2015	2016
■ DOLNOŚLĄSKIE	48,5	32,4	58,1	66,0	38,9	76,7	57,7
■ KUJAWSKO-POMORSKIE	90,0	62,0	78,9	89,9	92,9	103,7	41,0
■ LUBELSKIE	49,2	31,6	27,7	26,8	29,1	30,9	28,5
■ LUBUSKIE	62,0	97,1	77,9	69,4	68,5	82,9	33,7
■ ŁÓDZKIE	27,6	21,1	20,8	16,7	18,6	27,8	22,3
■ MAŁOPOLSKIE	31,4	108,9	64,7	51,1	63,1	73,1	30,5
■ MAZOWIECKIE	38,1	25,9	22,3	20,6	20,0	24,5	15,0
■ OPOLSKIE	54,1	48,0	39,3	35,7	47,1	56,0	29,2
■ PODKARPACKIE	74,6	94,0	58,9	56,5	60,5	51,3	40,8
■ PODLASKIE	48,3	28,9	26,6	28,8	23,7	40,2	25,7
■ POMORSKIE	25,4	24,8	25,4	31,4	25,6	40,9	22,8
■ ŚLĄSKIE	40,1	36,0	45,8	22,3	23,5	33,9	24,0
■ ŚWIĘTOKRZYSKIE	76,2	44,9	40,3	32,2	30,5	36,6	31,4
■ WARMIŃSKO-MAZURSKIE	67,5	50,3	46,3	37,4	37,4	38,9	27,6
■ WIELKOPOLSKIE	40,7	41,2	49,9	34,1	26,4	30,3	16,4
■ ZACHODNIOPOMORSKIE	29,7	36,1	41,6	52,0	32,1	43,8	28,6

Fig. 1. Revenue and expenditure of local self-government entities budgets. Funds from EU to finance programs and projects EU per capita. Source: own compilation based on [14].

Territorial self-government units in Poland were on a growth path when a short-term down turn took place. In that period, the self-government sector in Poland was strongly supported by the absorption of the structural funds from the European Union. In the oncoming period the self-governments will be confronted with new development opportunities for infrastructure and investment, although at the start there might be some difficulties in fund absorption within the new perspective. It is forecast that further implementation of investment plans based to a greater extent on debt instruments. However, presently, the level of self-governments' indebtedness is considerably higher and the absorption of the financial aid can prove much more difficult and burdened with definitely higher cost of borrowing.

4 Cohesion policies and the European funds in financing of regional development in Poland – assessment of the current situation

European Union Funds bring opportunities for territorial self-governments to implement pro-growth ventures, both infrastructural and those connected with development of local communities [1, 2]. Participation of the European funds in budget revenues of territorial self-government units is a measure of local authority engagement in sourcing of external financing. A share of the EU funds in territorial self-government revenues was steadily increasing in the financial perspective 2007-2013. However, since 2014, the participation of the EU financial aid in ventures run by territorial self-government units has been smaller, which might be a consequence of going through a preparatory stage for the new financial perspective before actual implementation of the perspective (see figure 2).

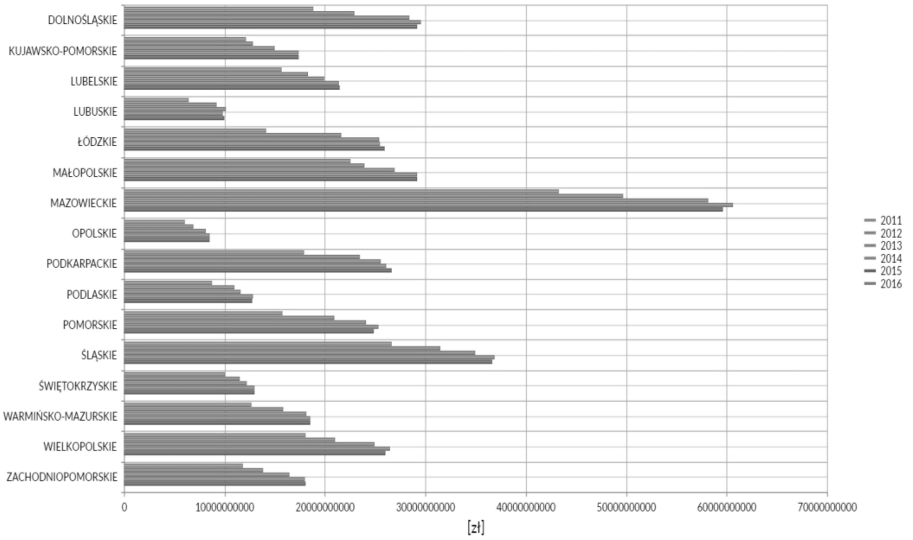


Fig. 2. Total value of the projects according to operational programmes and financing sources, NSRO 2017-2013. Source: own compilation based on [14].

In Poland, the European Union Funds in the new financial perspective 2014-2020 are implemented at the two levels – central and regional one. At the central level, there are European Territorial Cooperation Programmes and 8 national programmes financed by the European Fund for Regional Development (the EFRR), the European Social Fund (the EFS), the Cohesion Fund (the FS), as well as by the European

Agricultural Fund for Rural Areas Development (the EFRROW) and by the European Maritime and Fishing Industry Fund (the EFMR). When analysing the regional level, there are 16 two-found regional operational programmes planned for realization from the European Social Fund – 1 for Mazoria region and 15 for the remaining regions. The implementation of the programmes by the territorial self-government units for 2014-2020 is presented in the table below (see table 2).

Table 2. Implementation of the programmes for 2014-2020 contracts according to the legal form of the beneficiary – Self-Governments Units (as for 31.08.2017). Source: based on [15].

Operational Program	Total value	Expenditure qualified by the rules	UE input
Operational Programme Infrastructure and Environment 2014-2020	13 956 895 538	11 445 660 818	9 132 145 290
Operational Programme Development of Eastern Poland 2014-2020	3 127 774 773	2 821 554 935	2 352 919 059
Operational Program Knowledge Development Education 2014-2020	3 365 336 401	3 365 336 401	2 983 037 213
Regional Programme for Lubuskie Voivodeship 2014-2020	1 234 282 870	1 150 876 446	949 006 583
Regional Programme for Dolnośląskie Voivodeship 2014-2020	2 331 426 307	1 998 814 124	1 602 780 301
Regional Programme for Kujawsko-Pomorskie Voivodeship 2014-2020	1 169 059 207	1 119 648 560	897 167 550
Regional Programme for Lubelskie Voivodeship 2014-2020	2 229 015 787	2 058 491 548	1 721 221 700
Regional Programme for Łódzkie Voivodeship 2014-2020	3 100 724 948	2 516 038 793	1 967 965 437
Regional Programme for Małopolskie Voivodeship 2014-2020	2 565 785 269	2 374 224 588	1 845 825 086
Regional Programme for Mazowieckie 2014-2020	2 266 933 037	2 112 006 049	1 595 018 308
Regional Programme for Opolskie Voivodeship 2014-2020	1 147 851 120	1 108 017 191	926 926 505
Regional Programme for Podkarpackie Voivodeship 2014-2020	2 301 088 773	2 014 213 585	1 633 384 439

Regional Programme for Podlaskie Voivodeship 2014-2020	849 997 671	804 137 890	662 971 475
Regional Programme for Pomorskie Voivodeship 2014-2020	3 963 190 317	3 686 411 425	2 805 347 270
Regional Programme for Śląskie Voivodeship 2014-2020	3 432 252 195	3 067 044 933	2 506 121 913
Regional Programme for Świętokrzyskie Voivodeship 2014-2020	595 860 113	534 766 901	440 097 092
Regional Programme for Warmińsko-Mazurskie Voivodeship 2014-2020	949 455 437	897 167 164	716 937 820
Regional Programme for Zachodniopomorskie 2014-2020	1 327 253 286	1 197 198 902	989 779 262
Regional Programme for Wielkopolska 2014-2020	3 263 616 443	3 025 959 467	2 460 855 888

In the current years 2014-2020, from all aid available from the EU budget (aprox. 82,5 bln PLN) much more means have been transferred to the regional level. It is estimated that the regional self-government has at its disposal approx. 40 % of the cohesion policy aid, which is about 15 % more than in the years 2007-2013. It has been concluded that territorial self-government units are the greatest beneficiary of the aid. It is both a chance and a challenge for self-governments at the regional, county (the “powiat”) and communal level. The financial sources for territorial self-governments activities obtained from the European Union planning perspective for 2014-2020, divided into particular activities, are presented in the compilation below.

Table 3. Financial sources for territorial self-government activities obtained from the EU means in the financial perspective 2014-2020. Source: [5].

Field of operation	Operations financed within the EU aid
Technical Infrastructure	Territorial self-government unit can obtain EU funding for projects connected with waste utilization or water and sewage facilities. Communes can develop drinking water pipelines, sewage pipelines or sewage treatment plants.
Transport	European Funds also support development of transport infrastructure, roads and some accompanying elements of the infrastructure, as well as other means of transport. Some funds have to be used on city transport, especially its ecological forms. For instance, purchase of low-emission bus or tramway fleet can be supported.
Natural environmental	Self-governments can implement projects concerning environmental education or preparation of urban planning

protection	documentation. There also appear funds for remediation or reclamation of the affected areas, enhancing or making green infrastructure or ecological corridors.
Energy production	Co-financing can also cover ventures supporting energy saving. Self-governments can be granted financing for, e. g.: improved thermo-insulation of houses. In particular, buildings having institutional ownership (public company, local administration), but also the subsidies can support private home owners.
Information technologies	Electronic solutions are more and more common in administrative procedures. Self-governments can get subsidies to develop electronic and IT solutions in their regional programmes. Thanks to such support the so-called public e-services can be developed.
Social infrastructure	Within regional programmes, self-government units can be given support for construction, e.g. infrastructure in schools, kindergartens, hospitals, social care homes. However, financing for such purposes has not been planned for all regions (voivodships). Availability depends on a particular region.
Social activation	Self-governments which operate within various social projects included in regional programmes are able to co-finance measures preventing unemployment by acting through local employment offices. Social welfare and family support centres try to obtain co-financing of projects which activate people in difficult professional and social position.
Culture	Apart from e-culture projects, self-governments and culture can also realise investment ventures. Particularly, much appreciation should be given to financing of ventures aimed at preserving cultural heritage and historical sites renovation

In conclusion, it needs to be stated that the analysis of financial means allocation made above shows two aspects: participation of the means in expenditure on current actions and property development ventures, and also the identification of the areas currently co-financed by the EU aid. In the period analysed (2010-2014), there can be observed a very high participation of the EU funding in some projects implemented by the territorial self-government units as far as current expenditure is concerned. Nevertheless, in this category of expenditure, the EU funding share was low, (below 2%) in the total expenditure, because the EU projects have only a complementary character when referred to the core activity of the self-government. In case of property expenditure, the implemented projects received the EU financing at levels between 60% and 75 %. These projects made a considerable part of self-governmental investment, and therefore the participation of the EU funds in financing of all property expenditures was also at a high level.

5 Conclusions

The paper analyses influence of the EU funds on regional development in Poland. Apart from description of the basic terms and interpretations concerning the categories of the local and regional development it has been indicated that the importance of the EU cohesion policies and the EU funding has been growing for territorial self-government units. By introducing the effects of the EU funds participation in regional and local development in Poland, the role of the EU funding has been stressed, including the problem of indebtedness as a side effect of such policies. The EU – funds are meant to be the tools to enable realization of the planned pro-growth ventures whose objective are: a steady economic development, increase of competitiveness of the regions and diminishing disproportions between them.

It must be stressed that, for the Polish self-governments, effective application of the EU funds is absolutely crucial. However, Self-governments should not be under pressure to use up the whole amount available, as it is possible to waste money in missed ventures, or the process can excessively burden the budget (repayment and interest on loans). The EU funds should only contribute into development and not into costly and meaningless indebtedness. Many factors indicate that the system of expenditure of the EU funds in Poland is disciplined by strict regulations and debt limits. Nonetheless, a bad choice of a UE-funded investment in the current period can block implementation of some necessary investment over the following years. Application of the EU funds can contribute into some improvement of pro-growth infrastructure, but through the repayment of liabilities connected with gathering the necessary own capital for the project, a problem of l maintaining the effects can arise (e.g. keeping in good condition the infrastructure only from the self-governments own budget).

In the summary, it should be stressed that self-governments in Poland have to avoid wrong decisions in undertaking and implementation of numerous tasks and should try to adjust to the actual social and economic needs. In this context, it is necessary for self-governments to be involved in the rational implementation of the cohesion policy guidelines, focusing on long – term approach towards development.

Strategic management based on regional and local budgets should largely be a result of strength of public structures involved in the cohesion policy. Smart management, starting from proper software applications, through implementation of particular projects and their evaluation, should be coordinated at the national and regional levels. Moreover, it seems necessary to set these actions into long-term arrangements having many interactions at all administrative levels. Such approach should positively impact economic development on the micro- and macro- levels.

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The Validity of the Features of the Offer for Customers in the Area of the Product: the Comparison of the Assessment of Dairy Cooperatives from the Świętokrzyskie and Małopolskie Provinces

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Abstract. The aim of the article is to analyze the validity of the features of the offer for customers in the area of the product in the assessment of dairy cooperatives from the Świętokrzyskie and Małopolskie Provinces. Cooperatives' executives were asked to indicate features of the offer, which are valid, in their opinion, for such customers as consumers, companies - users (gastronomy), wholesalers, independent retail grocery stores, large retail chains, local retail chains, intermediary agents in food trade, other dairies, and other institutional purchasers. Cooperatives' representatives had to assess such product features as: product components, naturalness of the product, ecology of the product, healthiness of the product, the nutritional value, the width of the assortment, differentiation, product specialization. The results of the research show that cooperatives from Świętokrzyskie and Małopolskie Provinces rather differently assess the validity of the features of the offer for customers in the area of the product.

Keywords: Features of the Offer, Product, Cooperatives.

1 Introduction

Product refers to the goods and services the company offers to its customers. Apart from the physical product itself, there are elements associated with the product that customers may be attracted to. Among many attributes of the product such as quality, options, services, warranties, brand name, there are also features that attract the customer. However, as research results show [9, 10] different kind of the offer can attract the customers and every company should know what kind of the features of the product are valid. Therefore, the aim of the article is to analyze the validity of the features of the offer for customers in the area of the product in the assessment of dairy cooperatives from the Świętokrzyskie and Małopolskie Provinces. Cooperatives' representatives had to assess such product features as: product components, naturalness of the product, ecology of the product, healthiness of the product, the nutritional value, the width of the assortment, differentiation, product specialization in terms of the validity for such customers as consumers, companies - users (gastronomy), wholesalers, independent retail grocery stores, large retail chains, local retail chains, intermediary agents in food trade, other dairies, and other institutional purchasers.

2 A product - the theoretical background

A product may be defined as everything, both favorable and unfavorable, that a person receives in an exchange [14]. Broadly defined, a product is anything that can be offered to a market for attention, acquisition, use, or consumption that might satisfy a want or need [11]. A product is, to the potential buyer, a complex cluster of value satisfactions [15]. Products include physical objects but also services, events, persons, places, organizations, ideas, or mixed of these entities. Services are products that consist of activities, benefits, or satisfactions offered for sale that [11] have four unique characteristics that distinguish them from goods. Services are intangible, inseparable, heterogeneous, and perishable [14]. Products fall into one of two general categories. Products purchased to satisfy personal and family needs are consumer products. Those bought to use in a company's operations, to resell or to make other products are business products [18]. As claim Kotler, Keller, Brady, Goodman and Hansen products can be classified in several ways. In terms of durability and reliability, products can be non-durable goods, durable goods or services. In the consumer goods category [12], where a product is bought to satisfy on individual's personal wants [14], products are:

- convenience goods (staples, impulse goods and emergency goods) [12]. A convenience product is a relatively inexpensive item that merits little shopping effort [14] and is normally marketed through many retail outlets [18],
- shopping goods (homogeneous and heterogeneous) [12]. A shopping product is a product that requires comparison shopping because it is usually more expensive than a convenience product and is found in fewer stores [14],
- specialty goods [12]. A specialty product is a particular item for which consumers search extensively and are very reluctant to accept substitutes. An unsought product is a product unknown to the potential buyer, or a known product that the buyer does not actively seek [14],
- unsought goods [12]. Unsought products are products purchased when a sudden problem must be solved, product of which customers are unaware and products that people do not necessarily think of purchasing [14].

In the industrial (business) goods category, products fall into one of three categories: materials and parts (raw materials and manufactured materials and parts), capital items (installations and equipment), or supplies and business services (operating supplies, maintenance and repair items, maintenance and repair services, and business advisory services) [12].

Determining and satisfying the needs of customers through products that have value and accessibility and whose features are clearly communicated is the general purpose of any business [2]. Products are always usually some combination of tangible elements and intangible elements [18]. While tangible features are obvious, the intangible product features are hard to measure objectively, yet they may be important determinants of consumer buying decisions [1]. The product needs to have the right features for the right market [3]. Product features are specific design characteristics that allow the product to perform certain tasks. By adding or subtracting features, a company can differentiate its products from those of the competition [18].

Consumers buy products to satisfy their personal wants, whereas business buyers seek to satisfy the goals of an organization [18], so the product manager need to classify the types of customers, and to determine who the primary customers are [4], and as a result which customers are the most important [7, 8]. When consumers purchase a product, they are really buying the benefits and satisfaction they think the product will provide [18], so when consumers evaluate products or services, they often search for diagnostic information on specific product benefits [16]. Information from marketing research efforts and from databases can help in assessing customers' product design preferences. Being able to meet customers' desires for product design style and features at process they can afford is crucial to a product's long-term success [18].

3 The empirical verification of the validity of the features of the offer for customers in the area of the product

Research on the validity of the features of the offer for customers in the area of the product was conducted in dairy cooperatives from the Świętokrzyskie and Małopolskie Provinces, which had given their consent. The research tool was an interview questionnaire. The questionnaire was sent to all dairy cooperatives from the Świętokrzyskie and Małopolskie Provinces. Due to the willingness of representatives of cooperatives to participate in the research, interviews were conducted on a sample of 41% of dairy cooperatives from both provinces. Executives were asked to indicate features of the offer for customers, which are valid, in their opinion, for such customers as consumers, companies - users (gastronomy), wholesalers, independent retail grocery stores, large retail chains, local retail chains, intermediary agents in food trade, other dairies, and other institutional purchasers. The results of the interviews are presented in Tab. 1 and Fig. 1.

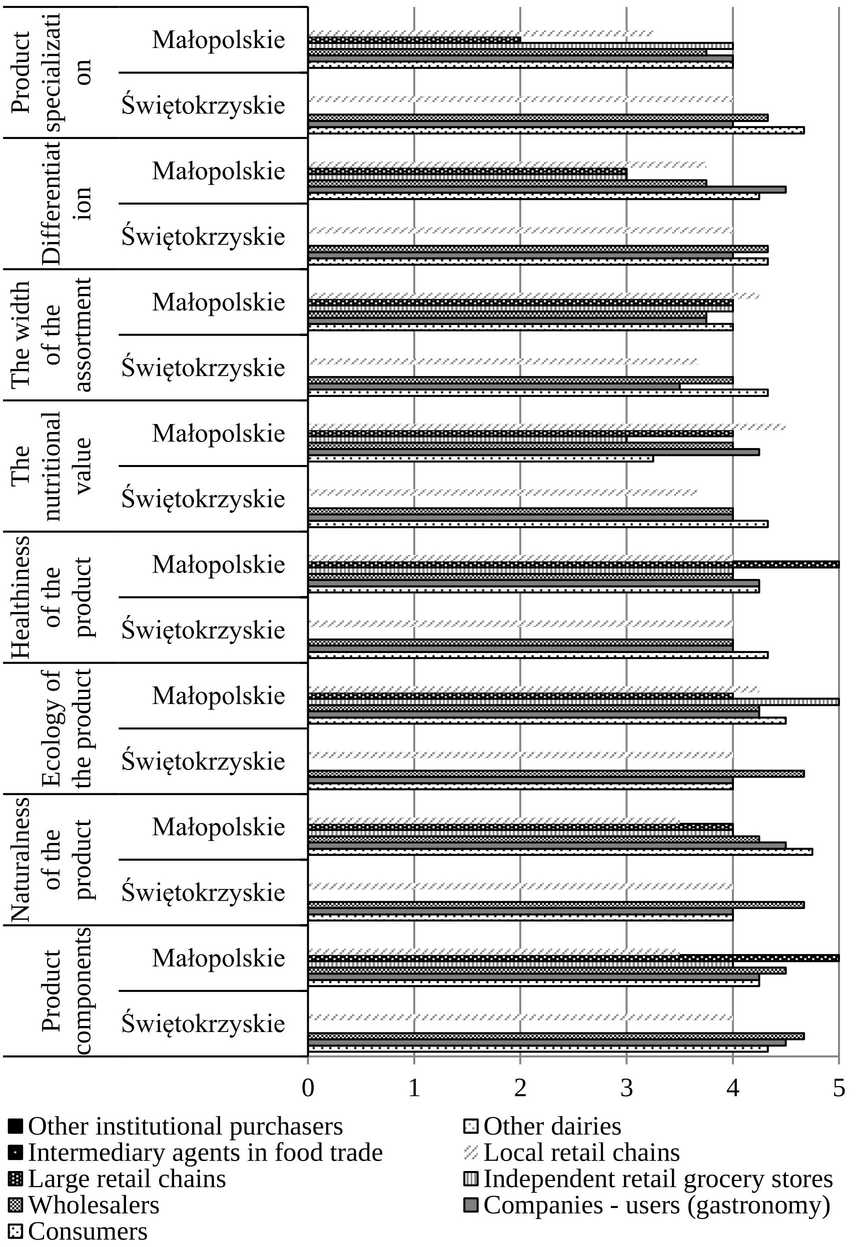
Basing on the research of importance of the types of customers of dairy cooperatives from Świętokrzyskie and Małopolskie Provinces [7], it is clear that cooperatives did not assessed the validity of the features of the offer for intermediary agents in food trade, other dairies, and other institutional purchasers, because they do not have such customers. The same situation is seen when analyzing the customers of dairy cooperatives from the Świętokrzyskie Province, because they do not have also such customers as independent retail grocery stores and large retail chains.

Table 1. The results of the research of the validity of features of the offer for customers in the area of the product in the assessment of dairy cooperatives from the Świętokrzyskie and Małopolskie Provinces [8].

Features / elements of the offer		**Consumers**	**Companies - users (gastronomy)**	**Wholesalers**	**Independent retail grocery stores**	**Retail chains - Large**	**Retail chains - Local**	**Intermediary agents in food trade**	**Other dairies**	**Other institutional purchasers**
Product components										
Świętokrzyskie	Mean rating	4.33	4.50	4.67	0	0	4.00	0	0	0
	Standard deviation	0.577	0.707	0.577	0	0	0.000	0	0	0
	Median	4	5	5	0	0	4	0	0	0
Małopolskie	Mean rating	4.25	4.25	4.50	4.00	5.00	3.50	0	0	0
	Standard deviation	0.957	0.500	0.577	0.000	0.000	0.577	0	0	0
	Median	5	4	5	4	5	4	0	0	0
Naturalness of the product										
Świętokrzyskie	Mean rating	4.00	4.00	4.67	0	0	4.00	0	0	0
	Standard deviation	0.000	0.000	0.577	0	0	0.000	0	0	0
	Median	4	4	5	0	0	4	0	0	0
Małopolskie	Mean rating	4.75	4.50	4.25	4.00	4.00	3.50	0	0	0
	Standard deviation	0.500	1.000	0.500	0.000	0.000	0.577	0	0	0
	Median	5	5	4	4	4	4	0	0	0
Ecology of the product										
Świętokrzyskie	Mean rating	4.00	4.00	4.67	0	0	4.00	0	0	0
	Standard deviation	0.000	0.000	0.577	0	0	0.000	0	0	0
	Median	4	4	5	0	0	4	0	0	0
Małopolskie	Mean rating	4.50	4.25	4.25	5.00	4.00	4.25	0	0	0
	Standard deviation	0.577	0.500	0.500	0.000	0.000	0.500	0	0	0
	Median	5	4	4	5	4	4	0	0	0
Healthiness of the product										
Świętokrzyskie	Mean rating	4.33	4.00	4.00	0	0	4.00	0	0	0
	Standard deviation	0.577	0.000	0.000	0	0	0.000	0	0	0
	Median	4	4	4	0	0	4	0	0	0
Małopolskie	Mean rating	4.25	4.25	4.00	4.00	5.00	4.00	0	0	0
	Standard deviation	0.500	0.500	0.000	0.000	0.000	0.000	0	0	0
	Median	4	4	4	4	5	4	0	0	0
The nutritional value										
Świętokrzyskie	Mean rating	4.33	4.00	4.00	0	0	3.67	0	0	0

	Standard deviation	0.577	0.000	0.000	0	0	0.577	0	0	0
	Median	4	4	4	0	0	4	0	0	0
Małopolskie	Mean rating	3.25	4.25	4.00	3.00	4.00	4.50	0	0	0
	Standard deviation	0.500	0.957	0.000	0.000	0.000	0.577	0	0	0
	Median	3	5	4	3	4	5	0	0	0
The width of the assortment										
Świętokrzyskie	Mean rating	4.33	3.50	4.00	0	0	3.67	0	0	0
	Standard deviation	0.577	0.707	0.000	0	0	0.577	0	0	0
	Median	4	4	4	0	0	4	0	0	0
Małopolskie	Mean rating	4.00	3.75	3.75	4.00	4.00	4.25	0	0	0
	Standard deviation	0.000	0.500	0.500	0.000	0.000	0.957	0	0	0
	Median	4	4	4	4	4	5	0	0	0
Differentiation										
Świętokrzyskie	Mean rating	4.33	4.00	4.33	0	0	4.00	0	0	0
	Standard deviation	0.577	0.000	0.577	0	0	0.000	0	0	0
	Median	4	4	4	0	0	4	0	0	0
Małopolskie	Mean rating	4.25	4.50	3.75	3.00	3.00	3.75	0	0	0
	Standard deviation	0.957	0.577	1.258	0.000	0.000	0.500	0	0	0
	Median	5	5	4	3	3	4	0	0	0
Product specialization										
Świętokrzyskie	Mean rating	4.67	4.00	4.33	0	0	4.00	0	0	0
	Standard deviation	0.577	0.000	0.577	0	0	0.000	0	0	0
	Median	5	4	4	0	0	4	0	0	0
Małopolskie	Mean rating	4.00	4.00	3.75	4.00	2.00	3.25	0	0	0
	Standard deviation	1.414	0.816	0.500	0.000	0.000	0.957	0	0	0
	Median	5	4	4	4	2	4	0	0	0

Scale: 1-5, where 5 – extremely important, 4 – very important, 3 – quite important, 2 – little important, 1 – completely unimportant, 0 – not applicable.



Scale: 1-5, where 5 – extremely important, 4 – very important, 3 – quite important, 2 – little important, 1 – completely unimportant, 0 – not applicable.

Fig. 2. The mean rating of the validity of the features of the offer for customers in the area of the product in the assessment of dairy cooperatives from the Świętokrzyskie and Małopolskie Provinces.

Taking into account the research results of the validity of the features of the offer for customers in the area of the product in the assessment of dairy cooperatives from the Świętokrzyskie and Małopolskie Provinces showed in Tab. 1 and Fig. 1 it can be seen that:

- Product components were considered as extremely important for wholesalers, and as very important for consumers and local retail chains both by cooperatives from Świętokrzyskie and Małopolskie Provinces. For companies - users (gastronomy) the product components were indicated as extremely important in the assessment of dairy cooperatives from Świętokrzyskie Province, and as very important in the assessment of dairy cooperatives from Małopolskie Province. In the same time cooperatives from Małopolskie Province assessed the validity of the features of the offer for independent retail grocery stores as very important, and for large retail chains as extremely important.
- Naturalness of the product was considered as extremely important for wholesalers in the assessment of dairy cooperatives from Świętokrzyskie Province, and for consumers and companies - users (gastronomy) from the point of view of cooperatives from Małopolskie Province. In the same time naturalness of the product was considered as very important for local retail chains both by dairy cooperatives from Świętokrzyskie and Małopolskie Provinces, and for consumers, companies - users (gastronomy) in the assessment of cooperatives from Świętokrzyskie Province. Moreover, cooperatives from Małopolskie Province assessed the validity of the features of the offer both for independent retail grocery stores, and for large retail chains, as very important.
- Ecology of the product was considered as extremely important for wholesalers from the point of view of dairy cooperatives from Świętokrzyskie Province, and for consumers and independent retail grocery stores in the assessment of cooperatives from Małopolskie Province. In the same time, the ecology of the product was considered as very important for consumers from the point of view of dairy cooperatives from Świętokrzyskie Province. Either cooperatives from Świętokrzyskie or Małopolskie Provinces assessed that ecology of the product is very important for companies - users (gastronomy), and for local retail chains. Additionally, cooperatives from Małopolskie Province stated that ecology of the product is very important for large retail chains.
- Healthiness of the product was considered as extremely important for large retail chains in the assessment of dairy cooperatives from Małopolskie Province. In the same time, the healthiness of the product was considered as very important for consumers, companies - users (gastronomy), wholesalers, and local retail chains from the point of view of dairy cooperatives from both the Świętokrzyskie and Małopolskie Provinces. Moreover, cooperatives from Małopolskie Province assessed that the healthiness of the product is very important for independent retail grocery stores.
- The nutritional value was considered as extremely important for local retail chains from the point of view of cooperatives from Małopolskie Province, and as very important for companies - users (gastronomy), and wholesalers in the assessment

of dairy cooperatives from both Świętokrzyskie and Małopolskie Provinces. In the same time, the nutritional value was considered as very important for consumers and local retail chains from the point of view of cooperatives from Świętokrzyskie Province. Cooperatives from Małopolskie Province stated that the nutritional value is quite important for consumers and independent retail grocery stores, and very important for large retail chains.

- The width of the assortment was considered as very important for consumers, companies - users (gastronomy), wholesalers, and local retail chains by both dairy cooperatives from Świętokrzyskie and Małopolskie Provinces. Additionally, cooperatives from Małopolskie Province assessed the width of the assortment as very important for independent retail grocery stores and large retail chains.
- Differentiation was considered as very important for consumers, wholesalers, and local retail chains in the assessment of both dairy cooperatives from Świętokrzyskie and Małopolskie Provinces. For companies - users (gastronomy) the differentiation was considered as extremely important from the point of view of dairy cooperatives from Małopolskie Province, and as very important in the assessment of cooperatives from Świętokrzyskie Province. Moreover, cooperatives from Małopolskie Province stated that differentiation is quite important for independent retail grocery stores and large retail chains.
- Product specialization was considered as very important for companies - users (gastronomy) and wholesalers from the point of view of both dairy cooperatives from Świętokrzyskie and Małopolskie Provinces. For consumers the product specialization was assessed as extremely important by cooperatives from Świętokrzyskie Province, and as very important by cooperatives from Małopolskie Province. In the same time, for local retail chains the product specialization was considered as very important by cooperatives from Świętokrzyskie Province, and as quite important by cooperatives from Małopolskie Province. Additionally, cooperatives from Małopolskie Province stated that the product specialization is very important for independent retail grocery stores, and little important for large retail chains.

4 Discussion

As can be seen, accordingly to cooperatives' executives for different types of customers other features of the offer are extremely important. The question is if the cooperatives know which of the features are valid for different kind of customers, do they take actions to meet these expectations? Comparing previously conducted research results with research results of dairy cooperatives it is seen that cooperatives not always meet these expectations, especially when comparing the responses of executives and students i.e. consumers of cooperatives' products and future managers.

There was conducted the research among students of business studies from Poland and Ukraine who had to assess products offered by cooperatives in the field of ecology, quality, and package. The research had aimed to show how future managers, i.e. current students of business studies from Poland and Ukraine, perceive products offered by cooperatives. Respondents were asked to assess the extent to which cooperatives pursue the following activities: offering organic products, offering products of high nutritional value, offering natural products, offering products with health claims, offering products produced with high quality ingredients, offering comprehensive products to the number of varieties and types, offering products tagged its brand, ensuring high quality of implementation, offering products in attractively designed packages, offering products in packages visually matched to other, offering products in convenient packages, and offering visually attractive products. These activities were divided and assigned to such fields as ecology, quality, and package. The research results showed that the respondents considered that cooperatives offer products in the average extend in all indicated fields [6].

In another research students were asked to assess the extent to which nationwide and regional dairy cooperatives pursue the following activities in the field of the ecology of products: offering organic products, offering natural products, offering products of high nutritional value, and offering products with health claims. Considering the data analysis, received as a result of conducting research, it turned out that actions of dairy cooperatives both from Poland, and from Ukraine in the sphere of the ecology of the products had been mostly averagely assessed. Only respondents from Poland perceived that nationwide dairy cooperatives offer natural products, and offer products of high nutritional value in the large extent. Responses of all respondents occurred that they better assess activities of nationwide dairy cooperatives than regional ones in the offering organic products, offering natural products, and offering products of high nutritional value. Regional dairy cooperatives on the other hand, were better assessed in the offering products with health claims [5].

D. V. Thompson, R. W. Hamilton, and R. T. Rust had created an analytical model which showed that choosing the number of features that maximizes initial choice results in the inclusion of too many features, potentially decreasing customer lifetime value. Authors suggest that firms should consider having a larger number of more specialized products, each with a limited number of features, rather than loading all possible features into one product [19].

Many researchers have created various tools useful both for managers in assessing the validity of the features of the offer for customers in the area of the product, and for customers to find out more about features of the product. A.-M. Popescu and O. Etzioni, in their article introduced OPINE, an unsupervised information extraction system which mines reviews in order to build a model of important product features, their evaluation by reviewers, and their relative quality across products. They decomposed the problem of review mining into the following main subtasks: I. Identify product features, II. Identify opinions regarding product features, III. Determine the polarity of opinions, and IV. Rank opinions based on their strength. According to authors given a particular product and a corresponding set of reviews, OPINE solves the opinion mining tasks outlined above and outputs a set of product features, each accompanied by a list of associated opinions which are ranked based on strength [17]. In order to help the customer and the manufacture/merchant R. Kumar V and K. Raghuveer have proposed a semantic based approach to mine different product features and to find the opinion summarization about each of these extracted product features by means of web user opinion expressed through the customer reviews using typed dependency relations [13].

5 Conclusion

Basing on the research results it is seen that cooperatives from Świętokrzyskie and Małopolskie Provinces rather differently assess the validity of the features of the offer for customers in the area of the product. What is also seen is that for different types of customers other features of the offer are extremely important. According to dairy cooperatives from Świętokrzyskie Province opinions' extremely important for consumers is product specialization, for companies - users (gastronomy) are product components, for wholesalers are product components, naturalness of the product, and ecology of the product. Other features of the offer for these types of customers are very important. For local retail chains, in contrast, all indicated features of the offer are the same very important. On the other hand, dairy cooperatives from Małopolskie Province stated that extremely important for consumers are naturalness of the product, and ecology of the product, for companies - users (gastronomy) are naturalness of the product, and differentiation, for wholesalers are product components, for independent retail grocery stores is ecology of the product, for large retail chains are product components and healthiness of the product, and for local retail chains is the nutritional value. Moreover, what is seen in the research results that other features of the offer for companies - users (gastronomy) and wholesalers are very important. In contrast, among other features that are very important, there are also features that are quite important, i.e. for consumers – the nutritional value, for independent retail grocery stores – the nutritional value, and differentiation, for large retail chains – differentiation, and for local retail chains – product specialization. However, for large retail chains such feature of the offer as product specialization is little important.

The results of the research are valid information for cooperatives, because basing on the knowledge on customers' product preferences cooperatives can meet the customers' expectations. Meeting customers' desires for product features is crucial to the cooperatives' revenues from sales and may lead to market advantage over competition.

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Modeling of the Investment Process in Russian Agriculture

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Abstract. This article contains quantitative evaluation of impact of investments in nominal capital on increasing growth rates of agricultural products. Evaluation was made by means of correlation regression analysis. The research includes developed and estimated ARDL-model which describes short term and long term impact of investments on growth rates of agricultural production taking into account reinvestment of some part of gross revenue. An amount of investments needed to provide average annual growth rates at the level of 5% in Russian agriculture was calculated in the article. Obtained results can be used for generation of development strategy of agriculture.

Keywords: Agriculture, Investment, Economic Growth, Autoregressive, Modeling.

1 Introduction

Different economic schools such as Keynesian and Neokeynesians, Marxist, Neoclassical consider investment to be a critical driver of economic development. When conducting large-scale socio-economic reforms aimed at ensuring sustainable economic growth and improving living standards of the population, a key place is given to encourage investment. Accordingly, the state of the economy or particular industry can be measured by the nature of the processes happening in the investment sphere. Agriculture is a major industry that supports the country's food security. The most important task of the economy is to provide and engage in an agricultural investment of a size necessary to operate with the pace of growth, ensuring food security of Russia, and a steady output of food products for export. Agrarian import ban make a big influence on Russia agriculture [3, 4]. In this regard, modeling of investment process in agriculture, with the purpose of establishing a methodological substantiation of calculation of the volume of investments necessary for expanded reproduction on the basis of innovation is relevant.

Economic theory looks at the investment process as part of reproduction, which is subject to the General laws of development. Various economic schools have taken a closer look at Issues of investment, accumulation and the efficiency of capital investments.

Among the popular scientific works are from A. Smith, J. Keynes, P. Samuelson, K. McConnell, Brue, W. Sharpe, G. Markowitz ect [1, 6].

Russian economic scientists dealt extensively with issues related to establishing investment activities among whom are Maslova, I. G. Usachev [2, 7].

Market practice raises theoretic questions which compel us to reconsider previously taken stance and wording. Reasons being that at different cycles of economic development functions, methods, and principles of investment manifest themselves in different ways. The investment activity is measured by the change in the long-term assets. [5].

2 The modern state of investment activity in Russian agriculture

Currently, the situation in the investment sphere of the Russian Federation can be characterized as extremely negative. 2014 marked a strong negative trend in the dynamics of investment in fixed capital and the economic downturn in the industrial sector. The reason for this is the significant complication of the financial and economic situation caused by the sharp decline in oil prices, which in turn led to a twofold devaluation of the national currency. The European Union also played a significant role by the introduction of sanctions, which blocked access of major Russian banks to cheap foreign credit. The excess return in the foreign exchange market in conditions of high volatility contributed to the flow of capital from the real sector into speculative, which further aggravated the situation in the economy.

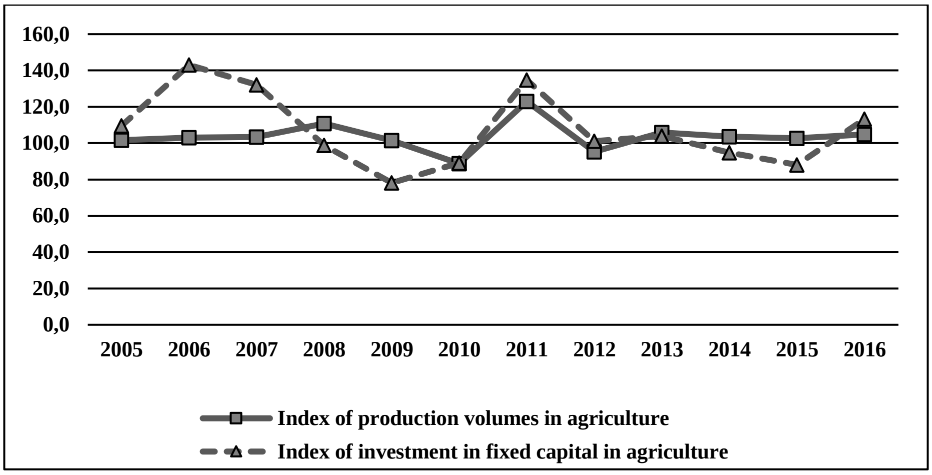

Fig. 1. The indexes of production volumes and investments in fixed capital in the agricultural sector of the Russian Federation from 2005-2016 years (% to previous year).

However, despite the negative economic and financial background, the agricultural sector, in contrast, has seen a steady increase in production volumes (Fig. 1).

In 2014-2015, the annual growth rate of production in agriculture were at the level of 3%, in 2016, this ratio increased to 4.8%, while increasing investment in fixed capital industry by 13.3% compared to the previous year. Nevertheless, there have been standards of the doctrine of food security for most types of food, as well as the expanded presence of Russian agricultural products in foreign markets. According to the Ministry of agriculture, Russia occupies the leading positions on the world grain market, the export of which in 2016 increased by 10.4%, the volume of exports of beet sugar increased 12.6 times, pork by 4.3% and poultry by 1.6 times, as well as vegetable oils at 24%. In the period spanning from 2014-2016, the industry had significantly increased the average profitability of production (Fig.2).

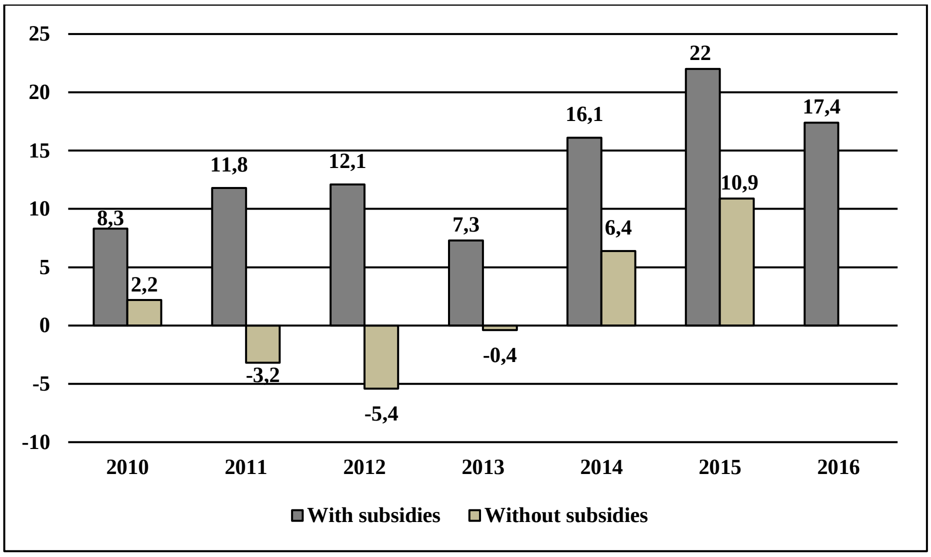

Fig. 2. Dynamics of average profitability of production in agriculture of Russia in 2010–2016 years, %

In the pre-crisis period, the profitability in agriculture excluding subsidies was characterized by negative values, while in 2014 there was a significant growth of profitability of agricultural producers, and this continued into 2015. The value of this indicator taking into account subsidies in 2016 fell by almost 5% to 17.4% due to falling prices of agricultural producers on domestic and foreign markets with above-average growth costs. Overall, during the crisis, the weakening of the national currency led to the growth in ruble revenues of the agricultural organizations for export activities. Alongside with the action of the food embargo it helped to reduce imports of food. The supply of food and agricultural raw materials from foreign countries, according to Russian Federal State Statistic Service, in the period of 2014-2016 fell by 38.4% in value terms from 40 to 25 million US dollar. This was particularly evident, with the dairy products, the volume of import in real terms decreased by 17, 6%, on meat – 36,2%, vegetables – more than 20%. However, despite these positive trends, the situation in agriculture remains difficult and controversial. There are still problems which have remained unresolved, due to their cross-sectoral macroeconomic in nature. First, there is a strong dependence of the sub-sectors of crop imported seed. The cultivation of sugar beet, sunflower and corn are of immense concern. The share of imported seeds for these crops is about 94%, 50% and 43%, respectively. It therefore implies that caution should be taken when discussing the last import substitution for these types of crop production. A similar situation is observed in the market of veterinary drugs, vaccines and feed additives. Secondly, the low level of material-technical base and slow introduction of innovative technologies in the industry poses a threat to losing agricultural organizations which ensure conditions for expanded reproduction, and leads to further reinforcement of the technical and technological backwardness of agriculture. The agrarian sector has shown a steady decline of agricultural machinery Park. The number of tractors in during 2014-2016 decreased by 14% to 223.4 m 259 thousand units, grain harvesters – by 12.67%, milking machines and aggregates of almost 12%. In addition, it was observed that essential improvement was made with the technological characteristics of agricultural machinery that could lead to an increase in performance with a smaller number in agriculture. In line with this, the problem of providing agricultural machines is a priority in the agricultural sector of the economy. Thirdly, there is an urgent need to fix the problem with the development of social infrastructure of rural settlements and improving living standards of agricultural workers. The most important condition for the maintenance of staff stability and development of labor potential of the industry is to ensure an acceptable level of life of workers based on real wage growth. For 2016, the wages in the agricultural sector amounted to about 65%, relative to the average level higher than the previous years. However, about 15% of people employed in agriculture receive remuneration below the minimum wage. In low-yield agricultural work 17% of the rural population is below the poverty line. Agricultural development is impossible without creating high-tech jobs; improved labor in agriculture and material incentives.

Consequently, the sustainable development of agriculture is connected with need for the restoration and development of entire sub-sectors of the industry – tractors and agricultural machinery, biological products, development of breeding and seed production base, the development of rural areas. The solution to these problems largely depends on stimulation of investment activity, which to date is not restored in the sector to pre-crisis level in 2013. First and foremost, the development of investment activity in agriculture is constrained by limited access of agricultural producers to preferential short-term and investment lending. Currently, access to cheap credit is enjoyed by a narrow range of agricultural organizations, which are characterized by high profitability, low profit, and especially unprofitable enterprises. In situations where profitable investment projects are available access to Bank lending is almost completely closed.

In order to stimulate investment activity in agriculture it is necessary to increase the availability of credit resources, as well as increased budgetary support, the growth of which should enhance the investment attractiveness of the agricultural sector. In accordance it is required to justify the investment resources needed to ensure sustainable economic growth in agriculture. This should produce a quantitative estimate of the impact of investments in basic capital on the growth rate of agricultural production in the retrospective periods, using methods of mathematical modeling and tools of correlation and regression analysis.

3 Materials and Methods

The theoretical basis for the specification of the dependence of the indicators of economic growth is from investment to form a model of the accelerator and multiplier. The impact of investment on national income growth is reflected in the multiplier model of investment developed by Jh. Keynes:

$$(I_t - I_{t-1}) = m \times (Y_t - Y_{t-1}) \,, \qquad (1)$$

where I – investment amount for a specific time interval, m – the multiplier (shows how many units will change national income by increasing investment in 1 unit), Y_t is the national income

This model shows that the increase in investment leads to an increase (accumulation) of national income, if the value of the multiplier is greater than 1.

Also, there is an inverse relationship, which is reflected by the accelerator model of investment suggested by George Clark:

$$I_t = a \times (Y_t - Y_{t-1}) \,, \qquad (2)$$

where a – the accelerator of investments (showing percentage of national income to be reinvested).

The accelerator model describes the relationship between the increase in national income and investment growth, i.e., shows what proportion of the increase in national income for a certain period turns into investment, in turn generating a multiplier effect.

However, in mathematical modeling of the dependence of agricultural production investment in fixed capital it should take into account that the pace of economic growth has an impact on the investments made not only this year, but in the previous periods, i.e. a time lag between making investments and receiving returns on them. This is due to the long payback period and low rates of capital turnover in agriculture. To reflect the indicated regularities of the investment process allows the autoregressive model with distributed lags (ADL Autoregressive Distributed Lags) – formula No. 3.

$$y_t = b_0 + b_1 y_{t-1} + b_2 x_t + b_3 x_{t-1} + b_4 x_{t-2} \,, \qquad (3)$$

where y_t is the gross volume of agricultural production in terms of value, y_{t-1} – y shifted by 1 year, x_t is investment in fixed capital of the agricultural sector, x_{t-n} – variable x is shifted by n years.

The model describes short-term (x_t – for 1 period) and long term (x_{t-n} – for two or more periods) the impact of investments in fixed capital of agriculture the growth of production volumes, taking into consideration the impact of the reinvestment of a certain percentage of gross income by the variable y_{t-1}.

Thus, the model autoregressive distributed lag that describe the influence of fixed capital investments on economic growth in the agricultural sector, constructed using the method of generalized moments will be:

$$y = 0,345 y_{t-1} + 6,133x + 0,476 x_{t-1} + 2,13 x_{t-2} + 2,147 x_{t-3} - 1382772 \quad (4)$$

4 Results and discussion

Compare actual and calculated values of production volumes in agriculture, obtained using the obtained model, auto regression with distributed lags (Fig. 3).

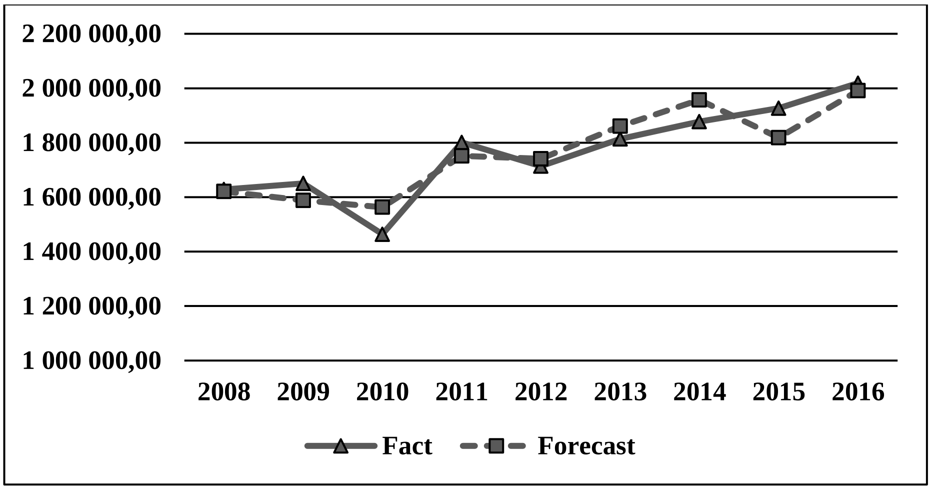

Fig. 3. Actual and calculated values of the volume of agricultural production (in 2005 prices), million rubles

Expected (estimated) value of output of agricultural production is quite close to the actual results. A good approximation of the data is also confirmed by high value of coefficient of multiple determination is 0.83, respectively; the resulting model can be used in determining the value of capital investment needed for sustainable economic growth in the agricultural sector. With the help of the econometric models the necessary volume of investments (in 2005 prices) are calculated to ensure the average annual growth rates of production volumes in agriculture at 5% to 2020 (table 1).

Table 1. Calculation of the necessary volume of investments into the fixed capital of the agricultural sector until 2020

Year	The volume of production of agricultural products in 2005 prices, given the growth rate of 5%, million rubles	Investments in fixed capital a/s in 2005 prices, million rubles	Investments in fixed capital in the prices of 2016, million rubles	The producer price index relative to 2016 according to the forecast of the RF Ministry of economic development, %	Investments in fixed capital in the prices of the current year, million rubles
2016	*2 018 728.12*	*247 169.83*	*611 254.40*	*100*	*611 254.40*
2017	2 119 664.52	275 885.70	682 269.12	104.60	713 653.50
2018	2 225 647.75	285 498.61	706 041.98	105.30	743 462.21
2019	2 336 930.14	276 805.18	684 543.01	112.20	768 057.26
2020	2 453 776.64	276 880.79	684 729.99	118.90	814 143.96
Total	-	-	-	-	**3 039 316,93**

Explaining the procedure for the calculation of presented indicators.

When using the autoregressive model, distributed lag, we determined the necessary volume of investments into fixed capital in 2005 prices. A change of 2.47 was used to bring this indicator to the 2016 prices, which is calculated as the ratio of the volume of investments for the year 2016 at current prices to the same period, expressed in 2005 prices: 611 254,40 / 247 169,83 = 2,47. Furthermore, with the use of producer price indices presented in the forecasts of the Ministry of economic development of the Russian Federation, we determined the volume of investment in the prices of the corresponding period.

Thus, in order to provide average annual growth rates of production volumes in agriculture at the level of 5% in the period 2017-2020 years it will require more than 3 trillion. RUB of investments in fixed capital of the industry. Assuming a crisis situation, the gradual exit from the crisis, the ratio between private and public investment is 20:80 and 40:60, and the dynamic development of the economy is 70:30.

5 Conclusion

Russian agriculture needs investments. The article contains analysis and prediction of agricultural production volumes. ARDL-model was used for this purpose. The model was subjected statistical tests to prove its reliability and high R-square – 0.83.

According to the results of prediction it is needed 3 bln. RUB to provide average annual growth rates of 5% in the period of 2017-2020.

Obviously, without solving the problem of increasing investment activities in a rational balance between market relations and the level of state regulation and support of agriculture, it will be difficult to ensure a sustainable development of the industry, the achievement of indicators of import substitution and the expansion of food exports.

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Employment Patterns of Small and Medium-sized Enterprises – Primary Research in Nitra Region

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Abstract. The rapidly changing market conditions of the 21st century also need to be adapted by companies, which include, among other things, the consideration and study of forms of employment, and possibly the introduction of new forms of employment, as we only think about how fast it is spreading. These forms of employment can be characterized by a distinct mark in terms of typical 8-hour employment, which is typical of the past, and can be mentioned as atypical. The basic aim of the research is to map the employment forms realized by small and medium-sized enterprises in Nitra Region, especially the so-called atypical forms of employment. For the primary data collection we used an online questionnaire survey, we analyzed 320 completed questionnaires. To analyse our research data we used basic descriptive statistical methods, cross-tabulation analysis and distribution. Based on the analysis we have come up with conclusions and suggestions.

Keywords: Employment Forms, Atypical Employment, Small and Medium Enterprises.

1 Introduction

The economic role of small and medium-sized enterprises is remarkable since they provide a significant ratio of the GDP beside export and import activity. Based on the data of the Slovak Business Agency, more than 70% of the employees are employed by a company representing the small and medium-sized business sector [14].

The rapidly changing market conditions of the 21st. century forced the companies to consider and study the current employment trends and introduce new forms of employment e.g. home office, part-time job. These forms of employment show completely different characteristics from traditional nine-to-five jobs, and can be called atypical

2 Theoretical framework

The issue of different forms of employment has been studied by several domestic and foreign researchers. Kazuya (2005) emphasises, that it is not so easy to clearly define what do we mean under typical and atypical patterns of employment, since what we accept today typical was considered to be atypical a few decades ago. Technological and infrastructural developments over the last decades required appropriate solutions, which can be characterized by flexibility [11, 12,]. Hanzelová [5] emphasizes the fact, that the scientific literature does not provide clear definition for typical and atypical patterns of employment. Following the labour market changes of the past period we can assume, that employment with a contract of indefinite duration and not a nine-to-five job can be considered atypical. [9]

The atypical employment patterns provide new possibilities for small and medium-sized enterprises; introduce the possibility to decrease the social contribution costs. Unlike to socially-protected employment status, these new patterns of employment provide numerous advantages and solutions of managing human resources. These new types of employment can cut costs and increases competitiveness and efficiency. [13] Hárs [6] listed the types of atypical employment patterns as the following:

- part-time employees;
- temporary workers (employees with fixed term contract, seasonal workers, casual workers);
- renting workforce;
- work at home, teleworking;
- flexible working hours;
- self-employment.

The increase of atypical employment patterns is driven by changing customer needs and efforts to provide cheaper and more flexible forms of employment. The adaptation to different life cycles and better work-life balance also encourage the increase of atypical patterns of employment. [8]

Part-time employment is one of the most known forms of atypical employment patterns. In case of part-time jobs the working time is reduced to 4-6 hours a day. According to Frey [4], the popularity of part-time employment pattern lies in faster increase of employment rate compared to full time employment pattern. The target group of part-timers can be diverse e.g. parents applying for childcare allowance, maternity leave, those who care about family members, older workers before old age pension. The employer and employee may enter a contract declaring shortened work time, or extension of shortened working hours to full time. Employees working on shorter work time receive a wage, in accordance with their working hours included in the employment contract. [1]

A mutual trust is required both form the employee and the employer to apply the atypical pattern of employment successfully in the organization. This level of trust, as a part of company culture, as Finna [2] emphasizes, is one of the pillars of long-term cooperation. The absence of cooperation as a key factor can weaken the performance of company in terms of efficiency, competitiveness and profitability [13].

Being familiar with the long-term economic benefits, that is to say, the shift from old tendencies happens, because it can maintain the competitiveness of the company or help to become competitive [10]. The labour market trends show, that employees and employers are ready for mobility and flexibility. Flexibility is considered to be long-term, which requires employees with special characteristics.

Table 1. The advantages and disadvantages of atypical employment according of the opinion of employer [3].

The advantage of atypical employment	The disadvantage of atypical employment
efficient labor utilization	the weakening of direct management control
less freedom (holiday) and sickness	the weakening of the team spirit
greater competitiveness	increased training costs
maximizing labor and skills	higher chance of internal communication cost

The research conducted by Frey [3] emphasizes the disappearance of regular and rigid forms of employment patterns, which are gradually replaced by atypical, irregular and flexible patterns of employment. It is important to mention, that this transformation is not a result of external constraints, but the managers of companies apply atypical forms of employment to maintain competitiveness of their businesses. They have recognized and accepted the importance of this change, which can provide help in hiring employees, decreasing unemployment or managing the fluctuation in customer demand.

3 Research objectives and methodology

The main objective of the research is to map the employment patterns applied in small and medium-sized enterprises of Nitra region, with a special emphasis to introduce, in what measure businesses apply typical and atypical patterns of employment in a rapidly changing economic environment of the 21$^{st.}$ century.

In order to achieve our research objective we decided to collect primary data with the help of questionnaire survey. We have created a database of small and medium-sized businesses operating in Nitra region. The questionnaire was sent via mail to companies. 320 completed questionnaires were returned and used to examine the issue. The primary data collection was implemented in the first quarter of 2017.

The questionnaire contained 21 questions, which can be categorized as the following:

- questions that focus on fundamental characteristics of research sample;
- the presence of different employment patterns in companies and the information about them;
- flexible employment and related beliefs;
- future plans for employment.

To analyse our research data we used basic descriptive statistical methods, cross-tabulation analysis and distribution.

4 Research results

38.84% of the questionnaires aimed collecting primary data were completed in Komárno district. Relatively high ratio of questionnaires was completed in districts of Nové Zámky (24.79) and Šala (11.57%). However, our main objective was to examine the employment patterns of small and medium-sized enterprises, we were also interested in the length of operation of business on the market. Closed questions were used to help our respondents to mark, how many years the company has been operating on the market, while adapting to the constantly changing customer needs, as well as meeting the social and legal challenges. A relative majority of companies in Nitra region has been operating on the market for 2-4 years (37.19%). However, it is also important to point out, that majority of the business involved in the survey have been operating on the market less than 10 years (79.34%). It means that we get insight into the employment patterns and policy of businesses, which adapt to rapidly changing market needs.

Table 2. The distribution of the examined sample in the districts, operating time

District	1 year	2-4 years	5-7 years	8-9 years	10 or more years	Total
Komárno	0.00%	10.74%	9.09%	9.09%	9.92%	**38.84%**
Nové Zámky	1.65%	10.74%	7.44%	4.13%	0.83%	**24.79%**
Šaľa	1.65%	3.31%	3.31%	0.00%	3.31%	**11.57%**
Nitra	0.00%	4.96%	0.00%	0.00%	0.83%	**5.79%**
Levice	0.00%	1.65%	2.48%	0.83%	2.48%	**7.44%**
Zlaté Moravce	0.00%	3.31%	0.83%	0.83%	0.00%	**4.96%**
Topolčany	0.00%	2.48%	0.83%	0.00%	3.31%	**6.61%**
Total	**3.31%**	**37.19%**	**23.97%**	**14.88%**	**20.66%**	**100.00%**

All the companies, providing data for this survey apply the pattern of nine-to-five job. Nearly half of the respondents marked the flexible work pattern as an atypical form of employment. Part-time employment is characteristic for 30% of the companies, while teleworking sound popular by 2%.

The absolute majority (50.41%) of businesses involved in our survey provide their business activities in the service sector. Significant rate can be observed in the agricultural sector (17.36%), and trade (14.88%). Although atypical employment pattern can be recognized in all the sectors studied, it is not a widespread phenomena yet.

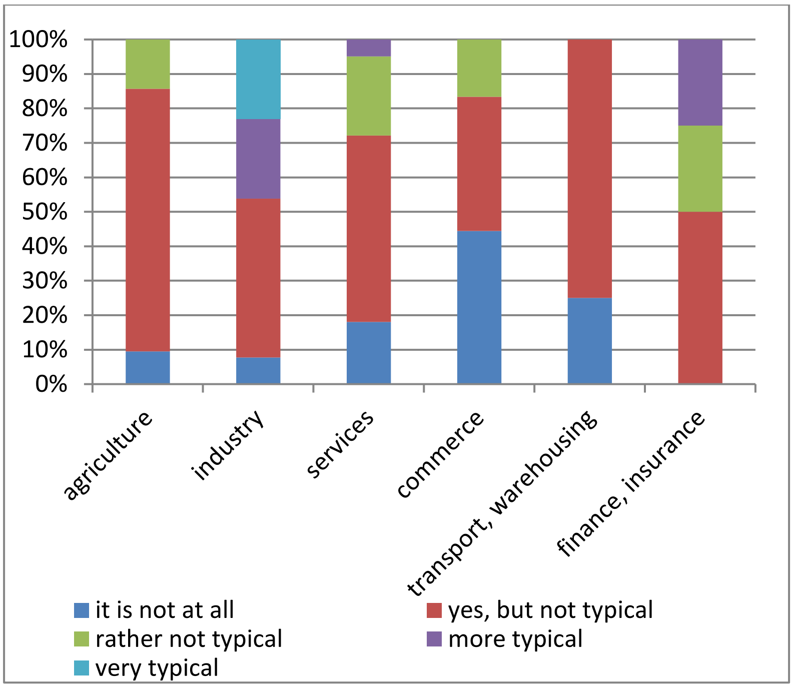

Fig. 1. Industry breakdown of atypical employment

While 23.08% of the companies in industry sector declared, that atypical pattern of employment is characteristic, other sectors involved in our research show little presence of atypical forms of employment.

By examining the complete sample it can be declared, that atypical patterns of employment can be found in 55.83% of companies, but it is not characteristic at all. The answers provided by respondents were evaluated on a 5-point Likert scale (1-not typical at all, 5- very typical). The median of responses is 2 and the IQR =0,5, which allows us to accept the median as an average response by small and medium-sized enterprises.

Assumption: Atypical patterns of employment are linked to seasonality; therefore, it is a favourite form of employment by companies in agriculture or service sector.

Each of the indicators (Phi, Cramer V, contingency coefficient) show significant value at 5% significance level. A significant correlation can be shown between the sector the business operates in and how much the atypical pattern of employment is characterisitc for the company.

Table 3. Phi, Cramer V and contingency coefficient of the econimic sector and the use of atyical forms of employment.

		Value	**Asymp. Std. Error**[a]	**Approx. T**[b]	**Approx. Sig.**
Nominal by Nominal	Phi	.683			.000
	Cramer's V	.342			.000
	Contingency Coefficient	.564			.000
Interval by Interval	Pearson's R	-.130	.041	-2.332	.020[c]
Ordinal by Ordinal	Spearman Correlation	-.153	.051	-2.760	.006[c]
N of Valid Cases		320			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

Applying cross tabulation we examined, which are those economic sectors, where atypical patterns of employment are applied, and which were the most characteristic forms of employment. 50.94% of the businesses involved in our research represent the service sector. The majority of companies in this group (28.4% of the total) declared presence of atypical employment patterns in the company, but it is not absolutely characteristic, because traditional patterns of employment are still popular to conduct some temporary tasks.

Table 4. Cross table for the appearance of the economic sector and atypical forms of employment within the companies surveyed.

	It is not at all	**Yes, but not typical**	**Rather not typical**	**Rather typical**	**Very typical**	**Total**
Agriculture	1,88%	14,38%	2,19%	0,00%	0,00%	18,44%
Industry	0,63%	3,75%	0,00%	1,88%	2,50%	8,75%
Services	9,06%	28,44%	11,56%	1,88%	0,00%	50,94%
Commerce	6,25%	6,56%	2,81%	0,00%	0,00%	15,63%
Transport, warehousing	0,94%	2,81%	0,00%	0,00%	0,00%	3,75%
Finance, insurance	0,00%	1,88%	0,63%	0,00%	0,00%	2,50%
Total						100,00%

18,44% of the researched companies represent the agricultural sector and fisheries. The overwhelming majority of companies in the sector (77.97%, which is 14.38% of the total sample) have a presence of atypical employment patterns, but those are not clearly characteristic. In this sector, the increase of atypical forms of employment is strongly determined by the seasonality, mainly because of cultivation, crop production, harvesting and foraging. Based on the answer of the respondents, atypical forms of employment are also present, but not clearly characteristic.

On the basis of statistical analysis conducted we can conclude, that Assumption is not completely valid, since atypical employment forms are applied not only in companies of agricultural sector, but other sectors of the economy as well. This is a positive factor, as it helps to make atypical employment patterns widespread, and can help the active population to make their work-life balance better.

Based on the analysis of data obtained, we managed to set up a chronological order of those atypical patterns of employment companies prefer.

Table 5. Preferred atypical forms of employment.

Sequence	Atypical forms of employment
1	Flexitime
2	Part-time employment
3	Seasonal / casual work
4	Employment with the fix-term employment contract
5	Work on telework / variable locations, hire of staff
6	Home work (incorporation)

Flexitime was the most popular atypical form of employment, which treats the required number of working hours in a month or week flexibly. Part-time employment was marked as the second, which means reduced hours of employment compared to full-time contractors. If the workload does not require a full-time employee, this pattern of atypical employment can be an ideal choice for cost-efficiency. Seasonal /casual work was third in a rank. As the research sample was mainly represented by companies of agricultural and service sector, it is not surprising, that seasonal work is mainly characteristic in the mentioned sectors and has gained a prestigious position.

By analysing the responds of the questionnaire survey we can assume, that 75% of the respondents have inadequate information about the atypical patterns of employment. It is positive that 44.17% of the companies show willingness to participate occasionally on trainings about atypical patterns of employment. The companies have already recognized the changing legal, market and social conditions, and they would like to respond to them. By employing atypical forms of employment, the consumer demand can be fulfilled at a higher level, also can change the employment of economically active population, and they can choose the most effective employment policy for themselves.

The organizational structure of companies requires the creation of different working positions within a company. After studying the scientific literature, the staff members who work in different positions can be classified as the following: employees performing operative tasks, employees at lower managerial levels, middle and senior management level. The grouping was necessary to examine which group is more likely to use atypical patterns of employment. According to the respondents, atypical forms of employment are less likely to be used by lower managerial levels (23%). Nearly one-third of the employees performing operative tasks work in different than a nine-to-five job, while atypical forms of employment are the most frequent among middle and senior management positions (43%). If the company uses atypical patterns of employment in case of operative tasks, the work is usually outsourced to students (24%) or pensioners (13%).

Our research sample clearly shows that better work-life balance is the biggest benefit of applying atypical patterns of employment. This fact can confirm our previous statement: the companies of the 21st. century put emphasis on the changing societal and social environment, and also consider the needs of their employees, since high quality private life is as important as their work.

Table 6. The advantage of atypical employment for the company.

Sequence	The advantage of atypical employment for the company
1.	Better coordination between work and private life
2.	More efficient labor exploitation
3.	Better job utilization in line with production requirements
4.	Cost savings
5.	Increase competitiveness

The further analysis of our primary research data revealed, that part-time job is the most frequently chosen form of atypical employment patterns, which means that an average employee employed part-time works 20-30 hours during a working week (78%).

Regarding the size of the companies, atypical employment patterns are mainly used by micro businesses, especially part-time employment seems to be popular. The fact is not surprising, since it is the group of companies that employ fewer people, often on a seasonal basis or to avoid layoffs. Surprising is the fact, that the most widespread employment pattern different from traditional nine-to-five working hours was the part-time job. It is important to emphasize, that in many cases the respondents were not familiar with the characteristic features, benefits, disadvantages and legal background of the employment pattern.

5 Conclusion

In the rapidly changing socio-economic environment of the 21st. century, due to constantly changing market and consumer demands we should emphasize the expansion of atypical patterns of employment as a different phenomenon from the standard nine-to-five employment form. The companies have already recognized this fact, but there is still low number of companies introducing atypical patterns of employment (part-time employment is popular). It is necessary to address this issue as soon as possible. The suggestion can be summarized as the following:

- Active support by the Labour Office - the Labour Office has already provided various forms of support to companies and start-ups. The programmes, primarily designed to start businesses are proposed to be supplemented by programmes to inform entrepreneurs about the atypical patterns of employment and the benefits of these new forms of employment, since the start ups should pay attention on the rapidly changing needs of their potential customers to satisfy their increasing standards, as well as pay attention on the cost-effective employment policy.
- Active support provided by local, regional and other economic organizations – there has been an increase in various organizations, companies and groups aimed at reviving the economic and entrepreneurial life. Their business events, conferences, forums should serve a task to provide information and emphasize the advantages of atypical forms of employment on the labour market.

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Producer Groups in the Czech Republic, Slovak Republic and Republic of Poland and their Market Share Potential

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Abstract. Collective cooperation in rural areas is not just a phenomenon of the past. Marketing cooperatives in the agricultural sector are hotly debated worldwide. The main benefits of collective actions can include the benefits of size, sharing of knowledge and information, effective solution of local problems. To support collective actions the governments of all these three countries had decided to support the creation of marketing organisations after joining the EU. For that reason they provided public financial support for newly established producer groups and the allocation was realized on the basis of the Rural Development Programme with the aim, among others, to increase market share potential of individual farmers. Based on data obtained from paying agencies, it can be concluded that there were not established a large number of market-significant groups within individual states and commodity groups. Only in Slovakia, under the first programming period, there were groups with a significant share, i.e. a share above 15%. In the next period, as in other countries, only cooperatives with a low share on the relevant market were supported. At the same time it was found that the rate of sales of active entities did not change significantly between Czech and Slovak entities. In most cases, sales are in the range of € 1–5 million. In Poland, cooperatives with revenues above € 1 million/year were established but there was also registered a significant number of cooperatives with sales below €1 million.

Keywords: Producer Groups, Poland, Czech Republic, Slovakia, EU, Support, Market Share, Rural Development.

1 Introduction

Collective cooperation in rural areas is not just a phenomenon of the past. Marketing cooperatives in the agricultural sector are hotly debated worldwide. In Europe, they played a key role in rural development in the first half of the twentieth century [7] and currently they are no less important in developing countries [10]. The importance of marketing cooperatives has been highlighted not only by the Organisation for Economic Co-operation and Development but also by other bodies, such as the Food and Agriculture Organisation of the United Nations (FAO).

The main benefits of collective actions can include the benefits of size, sharing of knowledge and information, effective solution of local problems [14], increased market reach, better negotiation position, possibility of increasing the added value, increased confidence and greater influence potential [11].

The Czech Republic, Slovakia and Poland had experienced analogous historical development. However, the structure of subjects which are active in agriculture had retained certain characteristic features and specific differences. In the Czech Republic, economic subjects are typically farm areas far larger than the EU average [6], which means that they can keep their prices lower due to large quantities of production. In Poland, on the contrary, there is a large number of small farmers who farm relatively small plots, which places them in comparison with the Czech economic agricultural producers at a disadvantage. This situation has been caused by historical development, whereby in Poland, socialist collectivisation had never been completed to the same extent as in the Czech Republic. Slovakia, meanwhile, is in this respect somewhere in-between these two extremes, while being somewhat closer to the structure of Czech agriculture (see Tab. 1).

Table 1. Characteristics of agriculture in CZ, PL, SK. [4]

	CZ	**PL**	**SK**
Number of agric. holdings	26,250	1,429,010	23,570
- of which utilised agriculture are < 5 ha (%)	18.6	54.4	58.9
Utilised agriculture area per holding (ha)	133.0	10.1	80.7
Employment in agriculture (%)	2.9	10.5	2.9
Agriculture, forestry and fishing (% of GVA)	2.5	2.5	3.8
Agricultural goods output (million EUR)	4,350.4	1,888.2	21,310.8
- of which: crop output (%)	63.5	48.6	62.3
- of which: animal output (%)	36.5	51.4	37.7

After joining the EU, the governments of all these three countries had decided to support the creation of marketing organisations. For that reason they provided public financial support for newly established producer groups and the allocation was realized on the basis of the Rural Development Programme with the aim, among others, to increase market share potential of individual farmers as it has been confirmed, that market concentration in food process industry leads toward positive influence on sectoral profitability [3]. This measure was enshrined in European legislation. Under the legislation, recognized producer groups were allowed to draw for the period of 5 years non-special-purpose funds, the level of which depended on the value of production supplied to the market, to a maximum of € 390,000. However, with regard to the set conditions, the most advantageous way for the subject is to draw funds for revenue under € 1 million. Revenues over € 1 million have reduced support (e.g. in the first year from 5% to 2.5%).

2 Aims and Methodology

The main aim of this article is to compare in what manner the support led to market share increase in the Czech (CZ), Slovak (SK) and Polish (PL) Republics. The authors focus on evaluating the support provided during the first programming period of the Rural Development Programme, i.e., the evaluation of measures announced for the period of 2004–2006. In the subsequent programming period (2007–2013), no support in this area was provided in the Czech Republic, which is why the situation is evaluated only for Slovakia and Poland.

The following steps are followed to meet the set goal. First, the total market shares for the whole set of supported entities are determined. Then, on the basis of the application of the methodology, the subjects are evaluated in terms of their activity [8]. The actual classification is based on the examination of each subject in publicly available databases for signs that might indicate whether an entity can still carry out marketing activities and that does not contradict the given conditions of the programme after the end of state subsidies. In this way, 3 categories were created: (i) producer groups which have not been engaged in marketing activities any more, or contradicted the conditions of the programme; (ii) still functional producer groups; (iii) and entities for which it was not possible to find out the required amount of information. In the third step, the market share of subjects that could be defined as still functional producer groups was evaluated.

Based on above-mentioned classification, authors collected data on produced commodities, their sales and value of national production in particular commodities. Due to the fact, that groups received their support upon registered sales, information on sales were sourced from Czech (SZIF), Slovak (APA) and Polish (ARiMR) paying agency upon official request. Obtained data were analysed, processes and individual entities were qualified according the above-mentioned categories (i, ii, iii). Data on value of national annual production of certain commodities were gained in 2017 from Eurostat. From the data obtained, the market share was subsequently calculated:

$$Market\ share = \frac{sales\ registered\ by\ national\ paying\ organisation}{national\ production\ value\ at\ producer\ price\ measured\ by\ Eurostat} \qquad (1)$$

Timeliness of registered sales data is limited by submitted payment requests. If, for example, the last payment is paid in the Czech Republic for 2010, the last available data comes from this year. In addition, it was not possible to use revenue data based on data from financial statements of the supported entities for several reasons: (i) it would not be possible to track revenues for individual commodities from the total revenue; (ii) not all the supported entities publish their financial statements in the Czech Republic and Slovakia; (iii) in Poland, financial statements are not available for small entities.

3 Results and discussion

3.1 The Czech Republic

The state started with the support of the sales organizations in 1999 when the Ministry of Agriculture of the Czech Republic opened its first financial support. Once the Czech Republic joined the EU, the possibility of support with some contribution of the EU has come into force. Within this support, 208 entities were supported in total, and they were able to use the funds to support the creation of sales organizations between 2005 and 2010. Under the conditions set by the Ministry of Agriculture of the Czech Republic and the Government of the Czech Republic, a minimum number of members was set - two farming entities were allowed to form a producer group. Many entities used this option. According to available data, the average number of members per individual commodity oscillated between 2 and 5 members. Multiple groupings were an exception.

For the categories mentioned (see Tab. 2), the value of the output marketed for the period (i.e. 2005¬2010) is between € 39,000 and 565 million. The largest sales were achieved for swine bred for meat and cereals; followed by oil crops, poultry and cattle bred for meal. On the other hand, the lowest sales were achieved for sheep and goats kept for meal; followed by nurseries of fruit trees. For all monitored commodity groups, sales of the registered groups (208) for the entire period (i.e. 2005–2010) reached approximate value of € 1.79 billion.

Table 2. Realized sales of the groups recognized by SZIF, RDP 04–06, Czech Republic. [5, 13]

Commodity	No. of groups	EUR (2005–2010)		Market share (%)
		Reg. sales	Production CZ	
Swine bred for meat	95	564,823,695	2,472,950,000	22.84
Cereals	118	548,729,096	5,188,840,000	10.58
Oil crops	122	279,072,211	2,080,710,000	13.41
Poultry bred for meat	46	232,263,967	1,378,120,000	16.85
Cattle bred for meal	75	106,256,757	1,158,960,000	9.17
Potatoes	12	22,924,514	618,730,000	3.71
Medical, aromatic, spice plants	9	17,730,017	299,750,000,	5.91
Flowers and ornamental trees	1	12,814,037	711,900,000	1.88
Nurseries of fruit trees	1	578,198		
Sheep and goats for meat	7	39,043	7,330,000	0.53

The registered groups achieved the highest market share in swine kept for meat, where registered sales for products accounted for 22.84% of total pig production in the Czech Republic. This high value, however, is based on the high number of the subjects (95) dealing with the trade in swine bred for meat. Consequently, this means that most of the listed groups did not achieved a significant market share in the commodity. Only 5 producer groups traded annual production worth more than 1%. 3 groups (*OD Maso, OD Vrchovina, Žďár Obchodní družstvo*) were an absolute exception because they surpassed the market share of 1.5%, which meant sales of about € 10 million. The shares of the other sales organizations ranged well below 1%.

The producer groups reached the second highest market share in poultry bred for meat (16.85%) cumulatively in 2005–2010. Despite the fact that 46 groups participated in the sale of 25% of the national production in 2007 and 2008, it should be noted that 40 entities supplied less than 1% of the national poultry production to the market. The most powerful groups were *OD Dešná, Frobe* and *Drubos*. These companies managed to realize more than 2% of the national poultry production in at least one of the monitored years.

Other important groups are oil crops and cereals. However, none of these commodities had any grouping that would realize a larger volume of produced cereals, respectively oil crops. While in the monitored period 118 groups supplied 10.58% of the Czech cereal production to the market, more or less a comparable number of groups (122) supplied 13.41% of oil crops to the market. In the case of cereals, no supported sales organization marketed cereals worth more than 1% of the production. In the case of oil crops, only one group was found – *OD Třebíč*. For other commodity groups, the situation is similar, i.e. most of the registered groups did not realize more than 1% of the production on the market.

With regard to the proportion of sales to the total production of the commodity group, it is necessary to highlight the company *HASINA*, which between 2006 and 2010 marketed products worth between € 2-4 million a year, in the group of medical and aromatic plants. However, the company has publicly identified itself as a trader in hops. The achieved sales would, for example, account for 8% of the value of hops produced in the Czech Republic in 2010.

Table 3. Share (%) of the active groups on agricultural production of a given commodity group, Czech Republic. [5, 8, 13]

	06	∑[1]	**07**	∑[1]	**08**	∑[1]	**09**	∑[1]	**10**	∑[1]
Swine bred for meal	0.04	1	0.36	6	0.47	6	0.56	6	0.44	6
Poultry bred for meal	0.26	2	1.31	2	1.21	2	1.31	2	1.61	2
Cattle bred for meal	0.26	1	1.07	5	1.86	5	1.45	5	1.26	5
Medical, aromatic, spice plants	-	-	0.18	1	0.10	1	0.09	1	0.10	1
Cereals	0.70	5	0.76	10	0.83	9	2.14	10	1.26	10
Oil crops	1.12	5	2.18	13	1.71	12	3.32	13	2.29	13

[1] The number of groups that provided data to the paying agency for the given year

After classification of the individual producer groups it can be stated for the given date that out of the 208 subjects only 15 groups are considered as active, 184 were cancelled or did not meet the basic criteria and for 9 it was impossible to find relevant information about their activities. The above-mentioned more important groups (*OD Maso, OD Vrchovina, Obchodní družstvo Žďár, Frobe, Drubos, HASINA and OD Dešná*) have been cancelled, have not continued in their activities, or it has not been possible to obtain information about their activities. As shown in Tab. 3, the concentration of supply was not achieved to a large extent in 15 active entities. Most producer groups did not achieve a market share of 1% on the relevant market, which can be seen as insignificant in terms of supply concentration. In 2010, the entities had the highest share in oil crops (2.29%), but this value is made up of 13 entities. The most significant share was achieved by *OD Třebíč*, which delivered goods worth almost

€ 3.8 million (0.9%) to the market. For poultry kept for meal, only 2 producer groups delivered to the market around 1.6% of the national production. However, this situation was significantly affected by the performance of *OD Dynín*, which in 2010 added to the market 1.42% of the value of the produced poultry bred for meal (€ 3.5 million).

3.2 Poland

The different structure of Polish agriculture is mainly due to different historical developments during the communist regime, where collectivization was not completed and a large number of farmers continued to produce individually, coordinated by the state apparatus through the state-controlled supply, marketing and processing cooperatives. After 1989, these cooperatives went through a complicated period, forced to sell off most of the property, and at the same time lost most of their members [2]. A national support policy for the creation of producer groups should lead to reverse integration. It has been applied continuously and without major changes since 1999 when it was financed by the SAPARD programme. After 2004, this policy has become a part of the Polish rural development policy (PROW) funded by EU funds. During the 1st programming period, 95 entities were supported, in the following – 1253 entities, and the programme continues also in period 2014–20.

Table 4. Realized sales of the cooperatives recognized by ARiMR, PROW 2004, Poland. [1, 5]

Commodity	No. of groups	EUR (2005–2011)		Market share (%)
		Reg. sales	Production	
Swine	30	232,279,154	17,558,640,000	1.32
Cereals and oil crops	37	228,730,531	25926460000	0.88
Milk	7	135,011,492	20,269,100,000	0.67
Poultry	7	68,934,458	10,682,130,000	0.65
Eggs	3	31,991,721	5,498,680,000	0.58
Flowers and ornamental trees	2	27,435,680	874,970,000	3.14
Tobacco	3	15,923,249	268,010,000	5.94
Potatoes	2	12,004,913	6,071,730,000	0.20
Sugar beet	1	6,502,518	2,500,740,000	0.26
Cattle	2	6,058,681	6,581,520,000	0.09
Hops	1	4,198,971	101,930,000	4.12

During the 1st monitored period, 95 supported subjects supplied goods worth € 769 million. Most subjects registered for the sale of cereals and oil crops (37), pigs (30). Other commodities were represented in minority terms (see tab. 4). However, given the market share achieved, none of these 67 groups reached market share above 1%.

The greatest share in swine was achieved by the cooperative *Lubawska Spółdzielnia Producentów Trzody "LUB-TUCZ"*, which marketed swine worth € 6.8 million in 2010 (0.3%). Other supported groups had a share of the swine market in the range of 0.03–0.1%. Of the 30 supported cooperatives, there are still 16 active ones. *Lubawska Spółdzielnia Producentów Trzody "LUB-TUCZ"* still continues in its activities. In the case of cereals and oil crops, 24 cooperatives do not continue to operate. Of the 13 remaining entities, none of them achieves shares more than 0.13% of the Polish production. Registered revenues of the entities range between € 1–3 million. For dairy cooperatives, only one ceased its activity. Other cooperatives registered sales in the range of € 1–10 million, which would correspond to 0.035–0.2% of the Polish milk production.

After classification of 95 subjects, 44 were still characterized as active. After deducting the inactive groups, the rest of the 44 entities added to the market goods worth € 473.3 million. As shown in Tab. 5, the overall market share of the still active registered sales on the relevant market at the Polish paying agency (ARiMR) is less than 1%. The exceptions are *Vitroflora* and *Zrzeszenie Plantatorów Tytoniu Proszowice-Opatkowice*. *Vitroflora*, focused on flowers and ornamental trees, steadily recorded sales of € 4–6 million in the monitored period, i.e. 3.2–4.3% of the Polish value of flower and ornamental tree production between 2007 and 2011. The cooperative *Plantatorów Tytoniu Proszowice-Opatkowice*, the smallest of the 3 supported tobacco-supplying cooperatives, is still active. The value of the production delivered to the market increased steadily over the monitored period, exceeding € 1 million, thus increasing the market share to 2.89%

Table 5. Share (%) of the active groups on agricultural production of a given commodity group, PROW 04–06, Poland. [1, 5, 8]

	06	∑[1]	**07**	∑[1]	**08**	∑[1]	**09**	∑[1]	**10**	∑[1]	**11**	∑[1]
Potatoes	-	-	0.05	1	0.13	1	0.07	1	0.02	1	0.01	1
Poultry	-	-	0.25	2	0.46	2	0.43	2	0.18	2	0.16	2
Flowers, ornamental trees	0.28	1	3.82	2	3.43	2	4.62	2	4.52	2	3.34	1
Milk	0.49	3	0.68	5	0.90	6	0.85	5	0.82	5	0.45	3
Cereals and oil crops	0.10	3	0.37	12	0.71	13	0.70	13	0.50	10	0.36	9
Swine	0.67	10	1.18	16	1.27	16	1.22	16	0.92	10	0.38	6
Cattle	-	-	0.05	1	0.06	1	0.06	1	0.08	1	0.08	1
Tobacco	1.08	1	1.71	1	1.74	1	2.89	1	-	-	-	-
Eggs	0.46	2	0.54	2	0.61	2	0.52	2	0.66	2	-	-

[1] The number of groups that provided data to the paying agency for the given year

Within the second programming period, 1253 entities were recognized for the sale of 19 different commodity groups. The highest number of cooperatives (Tab. 6) traded cereals and oil crops (457), poultry (276) and swine (275). From the values of the cumulative share of revenues for the period 2008–2014 it is clear that in Poland small producers integrated into small groups which have only a minor share on the domestic market. This is evidenced by the fact that despite the large number of cooperatives made for the purpose of cereals and oil crops sales, the total share of traded production of these crops for the whole monitored period was only 5.32% of the national production. This shows that the average cooperative supplied approximately 0.012% of the value of cereals and oil crops, which is less than at the groups funded from the PROW 04-06.

Table 6. Realized sales of the cooperatives recognized by ARiMR, according commodities, PROW 07–13, Poland. [1, 5]

Commodity	**No. of groups**	**EUR (2008–2014)**		**Market share (%)**
		Reg. sales	**Production**	
Cereals and oil crops	457	1,725,310,640	32,633,780,000	5.29
Poultry	276	2,039,381,098	14,224,300,000	14.34
Swine	275	949,476,277	17,659,400,000	5.38
Milk	98	533,964,869	23,104,620,000	2.31
Cattle	51	38,758,422	7,394,540,000	0.52
Potatoes	28	90,322,447	5,941,030,000	1.52
Eggs	16	82,608,649	6,669,520,000	1.24
Sugar beet	15	57,867,112	2,477,600,000	2.34
Flowers and ornamental trees	8	54,596,666	1,041,700,000	5.24
Energy crops	7	3,810,849	-	
Products of organic farming	6	3,312,665	-	
Tobacco	4	14,282,799	351,500,000	4.06
Sheep and goats (kept for meal, wool)	3	1,090,293	44,930,000	2.43
Hops	2	3,113,874	65,210,000	4.78
Rabbits	2	22,893,152	-	
Honey, bee products	2	461,573	-	
Horses (live, meat)	1	489,665	201,110,000	0.24
Medical, aromatic, spice plants	1	922,300	-	
Other animals kept for the skin	1	508,772	-	

The highest share of revenues in the value of the national production (cumulatively for 2008– 2014) is monitored at the group of poultry producers. Their market share surpassed 14%. From the point of view of the average group's share, the groups of hops producers (2.7%), tobacco (1.04%), sheep and goats (0.87%) had the highest average market share for the whole monitored period as well. On the other hand, the group of cattle producers (0.010%), cereals and oil crops (0.012%) and swine (0.019%) reached very low values.

At the same time, it has to be mentioned that the value of sales increased sharply in the last 3 years of the programme (i.e. between 2011 and 2013), when 60% of all new groups were established. In 2013, there is a high share of sales in poultry breeding (20.7%), growing tobacco (15.92%), cereals and oil crops (13.93%) and producing swine for meat (9.64%). Although these values within the agricultural sector may indicate a high degree of integration of individual producers into sales units, it is not possible to forget the large number of entities that made up such high stakes.

During the disbursement of the subsidy, the total turnover of the production delivered to the market increased (Tab. 7). It should be noted, however, that in the first year 102 applications were accepted, proving the turnover of agricultural products worth € 147.8 million, which corresponded to 0.71% of the Total Production of Agricultural Industry. With new entities, this value is continually increasing. From the data available for 2013 (753 group), it is clear that the value of output delivered to the Polish market is constantly increasing, amounting to € 1.4 billion, which corresponds to 6.24% of the Total Production of Agricultural Industry.

Among the most significant cooperatives for the commodity groups there are mainly *Grupa producentów drobiu* (poultry, sales in 2014 – € 20 million) with a market share of 0.8%, *Grupa producentów mleka ekołowiczanka* (milk, sales in 2014 – € 30 million) with a market share of 1% , *Gobarto hodowca* (swine, € 18.5 million in 2014) and a share of 0.7%, *Wielkopolska Grupa Zbożowa* (cereals and oil crops, € 16.5 million in 2014) with a share of 0.4%, Łukowskie Zrzeszenie Plantatorów Tytoniu (tobacco, € 2.5 million in 2014) with a share of 4.5%, and *Eggs Product Grupa Producentów Rolnych* (€ 7.2 million in 2014) with a market share of 0.8% on the Polish egg production.

Table 7. Share (%) of the active groups on agricultural production of a given commodity group, PROW 07–13, Poland. [1, 5, 8].

	08	$\sum^{1}$	**09**	$\sum^{1}$	**10**	$\sum^{1}$	**11**	$\sum^{1}$	**12**	$\sum^{1}$	**13**	$\sum^{1}$	**14**	$\sum^{1}$
Potatoes	0.37	4	0.28	4	0.71	9	0.96	13	2.59	20	2.75	20	2.90	17
Sugar beet	-	-	0.71	3	1.52	4	1.64	7	3.83	11	4.30	12	2.20	8
Poultry	0.70	4	3.25	19	5.30	32	8.37	57	14.06	89	17.74	131	18.25	155
Hops	-	-	9.87	1	3.28	1	4.45	1	15.71	2	2.94	1	6.34	1
Equines	-	-	-	-	0.23	1	0.63	1	0.80	1	0.60	1	-	-
Flowers, ornamental trees	-	-	-	-	-	-	0.79	1	4.11	3	5.32	4	7.12	4
Milk	-	-	0.17	4	1.03	10	1.65	18	3.03	33	3.50	51	4.34	74
Cereals and oil crops	0.77	26	2.02	67	3.01	106	3.61	158	5.61	220	7.52	251	6.05	257
Sheep and goats	-	-	0.99	1	1.05	1	1.52	1	3.03	2	2.42	2	1.54	1
Swine	0.68	13	1.35	27	1.99	40	3.04	59	5.32	87	7.32	124	10.87	166
Cattle	-	-	-	-	0.09	3	0.17	7	0.42	14	1.06	31	1.24	35
Tobacco	-	-	-	-	-	-	-	-	2.10	1	12.82	3	11.53	4
Eggs	0.29	1	-	-	0.16	1	0.29	2	0.97	4	1.58	6	3.64	13

[1] The number of groups that provided data to the paying agency for the given year

Polish groups face one significant problem - size. Only few groups reached sales above 1% of the Polish production of a given commodity. Also many groups marketed goods in value of tenth or thousandth percent of the national production with sales lower than € 1 million.

3.3 The Slovak Republic

Under the programme of the first programming period (Rural Development Plan), there were registered producer groups for 9 commodity groups. In the second programming period, there were registered producer groups for 6 commodity groups. Compared with the Czech Republic, it is clear that there are larger groups in Slovakia. To a large extent, this is influenced by the structure of economic subjects. While most entities in the Czech Republic are registered as Inc. (55%), in Slovakia, mainly cooperatives with a minimal number of members (5 natural persons or 2 legal entities) are registered. In Slovakia, therefore, it was not an exception that the groups (mainly in the first period) had more than 10 members; one entity even covered 73 producers in the tobacco trade. In the second period, the number of members is reduced, often to a minimum number (5).

Within the first programming period, 34 entities were registered (see Tab.8). Milk sales, i.e. commodity that requires immediate realization and processing, generated 37.4% of all sales (€ 206 million). In terms of importance, milk was followed by the sale of cereals, poultry and eggs, potatoes, swine. These 5 groups accounted for 94.8% of the registered sales revenue of the Slovak paying agency (APA). Other commodities were represented only marginally.

Table 8. Realized sales of the producer groups recognized by APA, according commodities, PRV 04–06, Slovakia. [5, 12]

Commodity	No. of groups	EUR (2005–2010)		Market share (%)
		Reg. sales	Production SK	
Milk	8	206,248,004	1,539,680,000	13.4
Cereals	12	123,608,727	2,282,780,000	5.4
Poultry and eggs	2	99,840,139	1,069,060,000	9.3
Potatoes	4	47,656,057	195,560,000	24.4
Swine kept for meat	3	45,543,519	1,037,240,000	4.4
Oil cops and legumes	2	15,658,105	897,640,000	1.7
Hops	1	7,795,449	8,730,000	89.3
Sheep (for meat, milk, wool)	1	3,739,545	52,140,000	7.2
Tobacco	1	1,443,637	1,230,000	117

Slovchmeľ, the only hops-producing group under this subsidy programme, boasts one of the most important business shares of all supported entities in all the rated states. The share of realized production in total production of Slovakia exceeded 89%. Slovchmeľ appears to be stabilized, with € 1.3 million in 2016, which corresponds to the registered values of the paying agency. *Odbytové družstvo Pestovateľov Tabáku* was to carry 117% of Slovak tobacco production. Although this figure is probably distorted, it can be seen from Eurostat that *Odbytové družstvo Pestovateľov Tabáku* carried out most of the produced tobacco in the SR during the monitored period.

However, this fact is of no relevance to the evaluation of the programme, as the cooperative ceased its activity even within 5-year support.

Table 9. Share (%) of the active groups, RDP 04–06, Slovakia. [5, 8, 12]

	05	Σ^1	**06**	Σ^1	**07**	Σ^1	**08**	Σ^1	**09**	Σ^1	**10**	Σ^1
Milk	7.11	4	11.32	5	12.12	5	11.82	5	9.14	5	1.89	1
Cereals	0.47	1	2.54	4	2.69	4	1.71	4	2.05	4	1.50	3
Oil crops and legumes	-	-	2.06	1	1.37	1	1.82	1	1.53	1	1.43	1
Sheep (meat, milk, wool)	3.57	1	9.31	1	10.79	1	7.65	1	11.96	1	-	-
Potatoes	5.83	1	18.87	3	21.21	3	30.14	3	37.73	3	23.36	2

[1] The number of groups that provided data to the paying agency for the given year

With regard to other commodities, the groups had a high market share for potatoes, milk or poultry and eggs (see Tab. 9). Especially for eggs, it is necessary to highlight the position of the *Ovogal Farm*, which held a market share of about 20% in the monitored period. A total of 8 cooperatives were devoted to milk sales, which accounted for 13.4% of the value of the milk production. Individual sales entities achieved different results. While 4 smaller dairy sales groups accounted for about 1% of the Slovak production, 4 larger entities reached a share of between 2% and 5%. In terms of milk, 3 cooperatives have ceased their activities, 5 are still active. The most significant share is reached by *ODM - odbytové družstvo mlieka* (2.9% in 2009), *Odbytové družstvo sever* (2.5%) and *Výrobno odbytové družstvo Mliečny východ* (2%); their shares did not change significantly during the monitored years.

Four groups were created due to potato sales, which in turn traded 24.4% of the Slovak potato production. Similarly to milk, half of the group had a low annual market share (2-3%), while the remaining two groups, *Zemiakarské OD* and *Zeleninárska spoločnosť, družstvo*, jointly realized 34% of the potato production in Slovakia in 2009.

In terms of cereals, the most important is *ODO - Odbytové družstvo obilnín Trnava*, with registered sales of € 4 million (1%), other groups sold cereals for around € 1 million a year. Only one group (*OOV Zempol – družstvo*) with a share of 1.5% (€ 2.5 million, 2010) and total revenues of € 2.5 million in 2016 remained active for oil cops and legumes.

Table 10. Realized sales of the producer groups recognized by APA, PRV 07–13, Slovakia. [5, 12]

Commodity	**No. of groups**	**EUR (2008–2013)**		**Market share (%)**
		Reg. sales	**Production**	
Cereals	28	319,894,246	3,068,030,000	10.4
Milk	16	245,352,099	1,561,780,000	15.7
Oil crops and legumes	10	111,922,320	1,264,560,000	8.9
Swine bred for meat	3	32,684,141	880,400,000	3.7
Poultry and eggs	2	14,534,689	1,267,810,000	1.2
Beef cattle (for meat)	1	5,207,071	844,370,000	0.6

For the second programming period (Tab. 10), no group achieved a market share above 15%. Of the 60 funded groups, the largest amount focused on the sale of cereals (28). Although the total share of sales of cereal production is more than 10%, due to the number of groups, their individual market power is negligible. OD obilniny KOSTRIN could be considered the most powerful group, which in 2013 made 1.15% of the Slovak production, but it was cancelled in 2014. In 2012, the smallest sales cooperative produced less than € 1 million in production, which would correspond to the value of the produced cereals in the amount of 0.13%. Out of 28 cooperatives, there are still 5 active ones with sales between € 1 and 3.5 million (0.2-0.6%). For milk, for which 16 groups were registered, the situation is similar. 8 groups no longer work. The most significant share on the milk market was reached by OD mlieka Levice (3.35% in 2013, € 8.8 million), with other groups reaching a market share of around 1%.

Within other commodities, compared to the Czech Republic and Poland, they managed to create entities that achieved an interesting market share. E.g. *OD Dvory* realized 2.84% of swine bred for meat; *OD Jevišovice* realized 2.31% of oil crops and legumes. However, like most of the registered and supported groups, these have been abolished. Of the total number of 60 registered and financed groups, only 17 are active today. They supply milk, cereals, oil crops and legumes on the market (Tab. 11).

Table 11. Share (%) of the active groups, RDP 04–06, Slovakia [5, 8, 12]

	08	Σ[1]	09	Σ[1]	10	Σ[1]	11	Σ[1]	12	Σ[1]	13	Σ[1]
Milk	5.28	6	10.46	8	10.70	8	10.46	8	10.21	8	4.46	2
Cereals	0.97	2	1.33	4	2.09	5	2.02	5	1.98	5	0.56	2
Oil crops and legumes	1.48	1	1.77	2	2.48	3	2.64	3	2.32	3	0.93	2

[1] The number of groups that provided data to the paying agency for the given year

4 Conclusions

Based on data obtained from paying agencies, it can be concluded that there were not established a large number of market-significant groups within individual states and commodity groups. Only in Slovakia, under the first programming period, there were groups with a significant share, i.e. a share above 15%. In the next period, as in other countries, cooperatives with a low share on the relevant market were supported. At the same time, it is possible to see a significant trend in the establishing and abolishing of the producer groups. In all three countries, the number of abolished entities was higher than 50%. In the Czech Republic, 88% of the funded entities were closed, in Slovakia it was 60% cancelled in the first period and 70% of the subjects in the second programming period. In Poland, 54% of the entities do not continue from the first period, and 1253 cooperatives were registered under the 2007–2013 Rural Development Programme, and the number of abolished cooperatives will significantly rise after 2018 when draw of 5 years funds ends.

At the same time it was found that the rate of sales of active entities did not change significantly between Czech and Slovak entities. In most cases, sales are in the range of € 1–5 million. In Poland, cooperatives with revenues above € 1 million / year were established but there was also registered a significant number of cooperatives with sales below €1 million. At the same time, it is possible to monitor a certain top in the range of purchases, and it is worth € 3–5 million. Only exceptions exceed this limit. This fact can only be attributed to the pragmatic performance of the entities which reached the maximum contribution (€390,000) in trades at € 3 million / year.

For minor groups of producers, it is meaningful to establish second-generation producer groups. In the case of the Czech Republic / Slovakia / Poland, it would be commodity-oriented umbrella associations that would support the interests of all small producer groups. It seems that, as in the Czech Republic and Slovakia, the number of producer groups is quite stabilized; low amount of the groups will not necessarily lead to the need for such umbrella organizations. However, in Poland, where there are tens and even thousands of small producer groups with minimal sales, such umbrella bodies would make sense. They would further strengthen the position of Polish farmers towards the government and the agri-food chain. Although the support of such bodies has been included into the Rural Development Programme 2014–2020 by the European Commission, unfortunately in the framework of the Polish Rural Development Programme 2014–2020 the support for the establishment of such entities has not been applied. A further wave of producer groups' abolishment can be expected, as they do not have a significant market share in their current configuration, so their economic advantage can end for farmers after receiving the last support payment.

Establishing and supporting the formation of producer groups make sense. In all three countries, there is still a group of farmers (mostly small family farmers, see Tab. 1) who are disadvantaged towards demand-side oligopsonic groups. Farmers bargaining position is therefore significantly worse and market integration could lead to the settlement of agricultural commodities market.

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The Innovativeness and Competitiveness of the Visegrad Group Countries in the years 2011-2016 - Selected Indicators

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Abstract. Visegrad Group is a group of four countries in the Central Europe, namely of the Czech Republic, Slovakia, Poland, and Hungary. These countries share not only similar history, but also similar economic development and geo-political ideas. Nowadays, the economic development of every country and its competitiveness on the world market is supported by the creation of innovation (knowledge-based economy). The aim of this article is to present the results of a comparative analysis of changes in innovativeness and competitiveness of V4 economies over a period of 5 years. The Summary Innovation Index (SII) was used in the European Innovation Scoreboard, as well as the Global Competitiveness Report and Global Competitiveness Index (GCI). The analysis shows that all members of V4 are so called moderate innovators; however, there are some differences among analyzed countries. The Czech Republic begins to diverge from other member states of V4 in terms of SII, and it has been increasing its GCI as well. Poland occupies one of the last positions in the V4 innovation ranking, where Hungary was the weakest in terms of competitiveness in 2016. Detail analysis of results is in this article.

Keywords: Competitiveness, Innovation, Visegrad Group.

1 Introduction

Innovativeness and competitiveness are frequently used terms in current globalized world. Both of them have been analyzed by many researchers in different points of view; see for example [1, 3, 8, 9]. Despite this fact, there exist no universal definitions of these terms.

As far as innovativeness is concerned, it can be defined as an ability of the country to produce and commercialize goods and services by using new knowledge and skills. Knowledge is the most comprehensive resource of all those which help developing wealth. Knowledge is dynamic, since it is created in social interactions amongst individuals and organisations [6], for example the SECI Model refers to the system of knowledge acquisition and sharing [5]. Other definition claims that it focuses on potential of the country to create, improve and use innovations with the purpose of generating economic value. It is quite obvious that these definitions are not same, but they are very similar and both of them emphasize the fact that innovativeness supports economic growth of the country. Innovativeness can be measured by several different tools, where one of the relatively frequently used is the Summary Innovation Index (SII).

The phenomenon of competitiveness is even more confusing. In simple words, it can be explained as the effort of the country to be competitive on the world market [7, 12]. However, there is still no generally accepted definition of the competitiveness; moreover, some authors have an opinion that the concept of macro-competitiveness does not exist. In spite of the controversy behind the definition of competitiveness, it is estimated that there exist more than a hundred of different form of indicators for quantifying this phenomenon. One of them is Global Competitiveness Index (GCI).

The aim of this article is to assess the innovativeness and competitiveness of the economies of the Visegrad Group countries using the SII and GCI indicators and to show the changes that have taken place in this regard in 2011 – 2016. [1]

2 Characteristics of the Visegrad Group countries

Countries of Visegrad Group, or Visegrad Four, namely the Czech Republic, Slovakia, Hungary, and Poland, can be found in the Central Europe. These countries share similar history, where all of them were on the east side of the Iron Curtain, which means under the influence of the Soviet Union. All countries went through transformation in the nineties of last century, and all countries also joined the European Union together in 2004. Nowadays, these countries share some similar opinions, for example in the terms of migration crisis. Because of the common history, these countries established the Visegrad Group in 1991 and had been cooperating even before they joined the EU. After their entrance they still have been cooperating, with greater or lesser success, not only in general ways, but also on the field of EU.

Based on the fact that Poland has currently more than 38.4 million inhabitants, the Czech Republic around 10.5 million of inhabitants, Hungary around 9.8 million, and Slovakia around 5.4 million, and, it is quite obvious that the level of GDP in billions of euro is the highest in Poland, while the Czech Republic is on the second position, Hungary is the third, and Slovakia the fourth.

However, it is better to use the level of GDP per capita for mutual comparison. According to this, the highest level has the Czech Republic, Slovakia is on the second place, Poland is the third, and Hungary the last. With respect to this information is good to add one interesting fact. Even if the development in the number of inhabitants in each country has not been steady, this number grew in the Czech Republic and in Slovakia (comparison of the number of inhabitants in the years 2000 and 2016), while it dropped in Hungary and in Poland. [4]

Deep analysis of GDP development shows that in all analysed countries was significant decrease in this indicator in the year 2009 (both in absolute value and in per capita) as a result of global economic crisis. However, the after crisis development is different. The Czech Republic was growing between 2009 and 2011, it was decreasing between 2011 and 2014, and it has been growing again since 2014. It managed to exceed pre-crisis year in 2011. Poland was on the last position in 2008, it has been growing since 2009 to 2015, it exceeded pre-crisis year in 2011, but it exceeded Hungary in 2012. However, it has dropped in 2016, where Hungary has exceeded this country again. Hungary has been growing since 2009 with one exception in 2012. It was on the fourth position before crisis and it is on the fourth position again in 2016. Slovakia has been growing since 2009, and it also managed to exceed pre-crisis year within one year already in 2010. [4]

3 Purpose, scope and methodology of research

The aim of this article is to assess the innovativeness and competitiveness of the economies of the Visegrad Group countries using the SII and GCI indicators and to show the changes that have taken place in this regard in 2011-2016.

The European Innovation Scoreboard (EIS) reports and the Summary Innovation Index (SII) were used to analyse the innovativeness of the V4 economies. The SII was created to identify and analyse instruments affecting socio-economic cohesion policy. The Community Innovation Survey, Eurostat and the OECD were used to calculate the level of innovation. The SII consists of 27 indicators, divided into ten dimensions, i.e. human resources, attractive research, innovation-friendly environment, finance and support, companies, innovations, linkages, intellectual assets, employment impacts and economic effects. These dimensions are grouped into four groups: framework conditions, investments, innovation activities and impacts. The Summary Innovation Index was adopted as 0-1, where 1 represents the highest level of innovation, while 0 is the lowest. [2]

The Global Competitiveness Report of the World Economic Forum (WEF) and the Global Competitiveness Index were used to analyse the competitiveness of the economies of the Visegrad Group. The current GCI methodology has been in use since 2007 and includes 114 indicators grouped into 12 pillars: institutions, infrastructure, macroeconomic environment, health and primary education, labor market efficiency, financial market development, technological readiness, market size, business sophistication, and innovation. The GCI methodology takes into account differences in the economic progress of the analysed countries. It identifies three stages of development: factor driven, efficiency-driven, and innovation-driven. Higher importance is given to the pillars of competitiveness, which are more important at a given stage of economic development of the country. This methodological approach is particularly important for countries with medium levels of economic development [11].

For the sake of clarity in some drawings and tables there were used symbols: for the Czech Republic (CZ), for Hungary (H), for Poland (PL), for Slovakia (SK).

4 Research results

4.1 Innovativeness of the Visegrad Group economies in the years 2011-2016 - indicator SII

The summary innovation index for all Visegrad countries was in the years 2011-2016 below the EU average. The average value was set at 100% (fig 1). All V4 countries belonged to the so-called moderate innovators. In the analyzed years, the highest values among the Visegrad Group countries were obtained the Czech Republic. In its case, the value of the index in 2016 was at the level of 84.4% and despite the decrease (compared with 2011 by 5.3 points) it was still the highest in comparison with other V4 countries. Poland, despite an increase in the index in 2.6 years by 2.6 pp (in 2016 - 54.8%) took the last place.

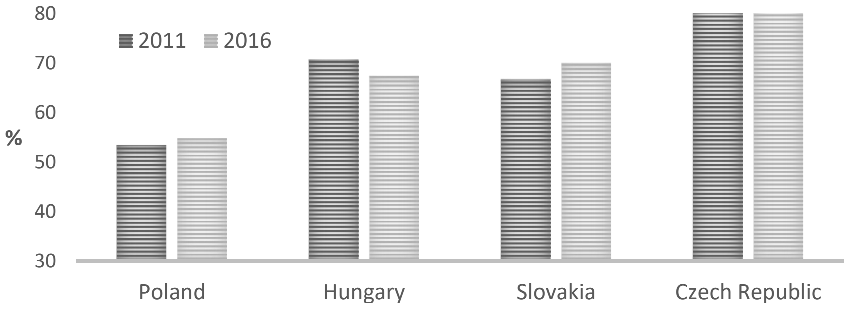

Fig. 1. Performance of V4 innovation systems in 2011 and 2016 [%], [2]

Analysis of V4 innovation data, broken down into 4 groups of indicators, showed both: differences in innovation level between these countries and significant changes over five years (table 1).

Table 1. Innovativeness ranking by four thematic groups EU and V4 in 2016 as compared to 2011 [points] [2]

Country symbol	Framework conditions			Investments			Innovation activities			Impacts		
	2011	2016	change	2011	2016	change	2011	2016	change	2011	2016	change
CZ	0.29	0.38	0.09	0.55	0.44	-0.11	0.41	0.34	-0.07	0.64	0.56	-0.08
SK	0.30	0.30	0.00	0.25	0.36	0.11	0.23	0.22	-0.01	0.62	0.64	0.02
H	0.26	0.30	0.04	0.27	0.29	0.02	0.27	0.20	-0.07	0.71	0.66	-0.05
PL	0.19	0.27	0.08	0.29	0.30	0.01	0.21	0.18	-0.03	0.47	0.41	-0.06

The Czech Republic in 2016 also reached the highest values in three of the four thematic groups, i.e. framework conditions (0.38 points), investments (0.44 points) and innovation activities (0.34 points). The weakest in this respect was Poland, which in the three groups got the lowest values, while in the fourth it overtook Hungary with only one point.

Despite the fact that the Czech Republic has reached the highest position among the V4 countries and the majority of the thematic groups during the period under review, some of them are deteriorating. In the case of three of the four thematic groups, the value of the index fell, i.e. investments (by 20%), innovation activities (by 17.1%) and impacts (by 12.5%). The remaining V4 countries did not record a fall in the value of the index in the area of investments. The largest increase was recorded in Slovakia (by 44%). In the case of the Czech Republic, the value of the indicator in the framework conditions group increased (by 31%). Poland (42.1%) and Hungary (15%) also recorded an increase in this figure, while Slovakia maintained its 2011 value. Among all countries in the Visegrad Group, the index in the innovation activities group decreased. The greatest decline was recorded, the memory already, the Czech Republic and Hungary. In the last group, the highest value of the index in 2016, despite its fall of 7%, was Hungary (66 points). Poland (12.8%) and Czech Republic (12.5%) also recorded a decrease. In the case of Slovakia there was an increase in its value (by 3.2%).

The dimensions of the SII in the V4 countries were also analysed (fig. 2). In the framework conditions group in 2016, the highest values in all three dimensions were obtained by the Czech Republic. The country raised the value of human resources and attractive research systems by 9 points (0.39 points and 0.33 points respectively) and innovation-friendly environment by 8 points (41 points). In the case of the human resources dimension Poland and Hungary have grown, although not as large as in the case of the Czech Republic. Slovakia has reduced the value of this dimension (by 5 points). In spite of this great fall, Slovakia was in second place with 0.38 points (just behind the Czech Republic). The lowest value was Hungary. Attractive growth systems, although not as impressive as in the case of the Czech Republic, gained Slovakia (by 2 points) and Poland (by 3 points), while the decrease (by 1 point) was recorded by Hungary. The increase in the value of this dimension in the case of Poland did not change its weakest position among the V4 countries. In the context of the innovation-friendly environment, all V4 countries have increased the value of the index. The highest (by 17 points) was recorded by Poland, which in this way lost in Slovakia.

In the investment group, the high values of the index in the finance and support sector recorded in 2016, just behind the Czech Republic (0.44 points), Slovakia (0.41 points). The increase in this indicator, compared to 2011, was the highest for this country (by 28 points). Only Czech Republic recorded a decrease in this dimension, but this did not affect the leader's position in this dimension. Also in the dimension of investment companies the highest value of the index was obtained in 2016 (despite a decrease compared to 2011 - by 2 points) Czech Republic (0.44 points). The biggest increase (by 3 points) of this dimension was obtained by Hungary, which gave them 34 points. The weakest result, despite 1 point of growth, gained in this dimension Poland.

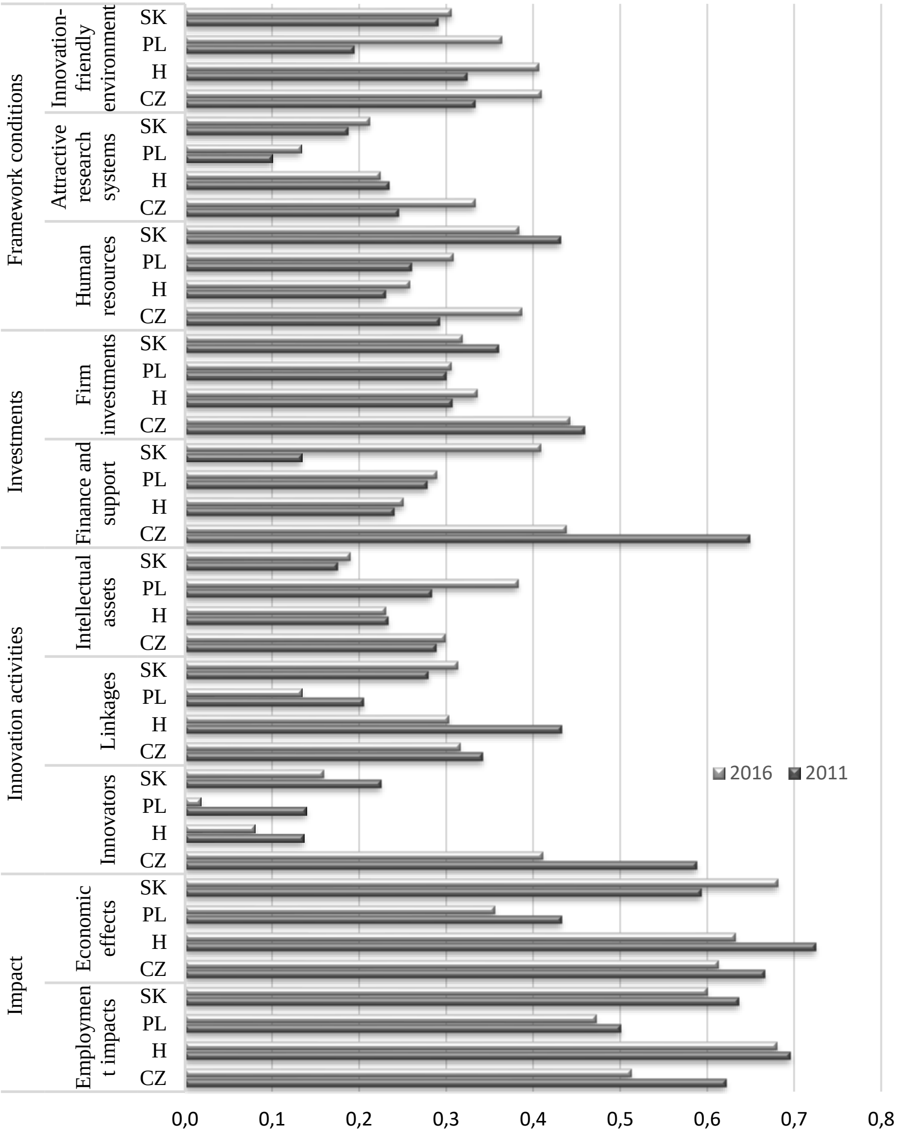

Fig. 2. The dimension of innovation belonging to four thematic groups in V4 countries in 2011 and 2016 [points] [2]

The next group of SII is innovation activities. This group includes the innovations which in the analysed years, in all the V4 countries, recorded a decline in the value of the index. The biggest decrease in this dimension (by 18 points) was obtained by the Czech Republic. In the case of Poland, the value of this dimension decreased by 12 points in the analysed period. This resulted in Poland obtaining only 0.02 points in this dimension and the last position among the Visegrad Group countries. Also in the

2016 linkages there has been a decline in the value of the index, in three of the four V4 countries. The largest decrease was in Hungary (by 13 points), followed by Poland (by 7 points). The drop in the value of this dimension in the case of Poland kept it at the last position among the V4 countries. On the other hand, a slight increase in the value of this dimension by Slovakia (by 3 points) allowed it to rank in front of Hungary. The last dimension in this group is the intellectual assets. The highest value in this dimension in 2016 was obtained by Poland. The first place gave it a 10 point increase in its value compared to 2011. The value of the index at the level of 38 points allowed Poland to overtake (by 8 points) the Czech Republic. Other countries such as the Czech Republic and Slovakia recorded a slight increase in this period (by 1 point) or in the case of Hungary remained at the same level.

The last thematic group influencing the SII is impacts, which include two dimensions: employment impacts and economic effects. In terms of employment impacts in 2016, all Visegrad Group countries recorded a decline in value relative to 2011. The Czech Republic lost the most significant share (by 11 points). For other countries, the falls were lower (at 2-4 points). The highest values of this dimension were recorded in Hungary in 2016. Slovakia was second. The decline of this indicator in the case of the Czech Republic has caused the country to remain in the third position just before Poland. In the case of economic effects, in 2016, the highest values at 0.68 points were obtained by Slovakia. This country is the only country that has seen growth (by 9 points). This caused Slovakia to move from rank 3 to 1. The remaining V4 countries, between 2011 and 2016, saw a decline in value of this dimension. The biggest fall was in Hungary (9 points) and then in Poland (by 8 points). However, this did not affect Poland's position in the ranking. The country is in this dimension still occupies the last place among the V4 countries.

4.2 Competitiveness of the Visegrad Group economies in the years 2011-2016 - GCI indicator

The Global Competitiveness Report from 2015-2016 located The Visegrad Group in two different groups: Advanced Economies - Czech Republic and Slovakia and Emerging and Developing Europe - Poland and Hungary [11].

In the years 2015-2016, the highest value of the GCI index among the V4 countries was noted by the Czech Republic. In the case of this country the index increased by 0.12 points compering to 2011 (fig. 3). The remaining countries decreased their value, in the analysed period, in turn: Poland - by 0.02 points and Hungary - by 0.11 points. Slovakia maintained its value at the same level.

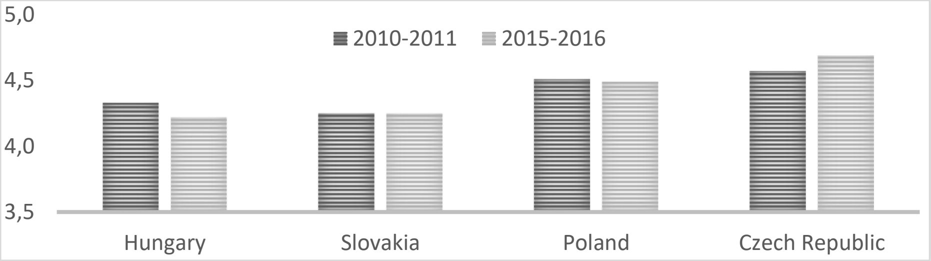

Fig. 3. Global Competitiveness Index in V4 countries in 2010-2011 and 2015-2016 [points], [10, 11]

The analysis of the competitiveness data of the V4 economies, broken down by 3 groups of indicators, showed differences in the level of competitiveness between these countries and the changes that occurred during the period under examination (table 2).

Table 2. The competitiveness index in V4 country by three subindexes in 2015-2016 as compared to 2010-2011 [points], [10, 11]

Country symbol	Basic requirements			Efficiency enhancers			Innovation and sophistication factors		
	2010-2011	2015-2016	Change	2010-2011	2015-2016	Change	2010-2011	2015-2016	Change
CZ	4.91	5.27	0.36	4.66	4.78	0.12	4.19	4.14	-0.05
SK	4.77	4.73	-0.04	4.43	4.34	-0.09	3.54	3.68	0.14
H	4.65	4.67	0.02	4.38	4.31	-0.07	3.71	3.57	-0.14
PL	4.69	4.91	0.22	4.62	4.64	0.02	3.76	3.70	-0.06

The Czech Republic, in comparison with the other V4 countries, achieved the highest index values in the years 2010-2016, in all subindexes, i.e. basic requirements (5.27 points), efficiency enhancers (4.78 points) and innovation and sophistication factors (4.14 points). The lowest in all three subindexes in 2015-2016, were Hungary.

Analysis of subindexes in V4 showed that the Czech Republic increased the index value in subindexes “basic requirements” by more than 7% and “efficiency enhancers” by 2.6%. It dropped in subindex “innovation and sophistication factors” (by 1.2%). In the subindex basic requirements, Poland (4.7%) and Hungary (4.3%) also recorded an increase in value. In the case of Slovakia, its value decreased and amounted to 4.73 points. Despite the fact that it was the only decrease in V4, it still had higher value than Hungary. In the case of subindex “efficiency enhancers”, the increase in the indicator value, apart from the already mentioned Czech Republic, was also noted by Poland, although its growth was insignificant (by 0.4%). Slovakia and Hungary have reported a decrease in the index value in this subindex.

In the last subindex “innovation and sophistication factors” only Slovakia, in the period under examination, gained an index increase. An increase of 4% allowed Slovakia to move up in ranking in the third position. The remaining countries recorded a decrease in the value of this indicator, the largest in the case of Hungary (by 3.8%). There were also analysed twelve pillars included in the three above-discussed subindexes (fig. 4).

There are four pillars in the first subindex, which is called basic requirements: institutions, infrastructure, macroeconomic environment and health and primary education. In the institutions pillar, the highest values in the years 2015-2016 get Hungary. The increase in the value of the index by 13.2%, compared to the years 2010-211, caused the country to move to the first position. The Czech Republic also recorded growth (by 5.1%). The other countries have decreased the value of the index in this pillar, the largest in the case of Slovakia (by 5.6%). In infrastructure most countries have reported an increase in the index value. The largest was in Poland (13.2%). Hungary and Slovakia increased the index in this pillar at a similar level (in turn 2.3% and 2.4%). The 2.1% decrease was recorded by the Czech Republic. In the macroeconomic environment, the V4 countries have not reduced the value of the indexes obtained in 2010-2011. The Czech Republic grew by 22.4%, followed by Poland (by 8.5%) and Hungary (by 6.5%). Slovakia kept the index unchanged. The last pillar of the discussed subindex is health and primary education. In this pillar only the Czech Republic increased the value of the indicator (by 3.3%). The value of the index at the same level was maintained by Poland (6.1 points). Indexes decreased only in Hungary and in Slovakia (by 3.4% and by 1.6% respectively).

Subindex efficiency enhancers include six pillars: higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness and market size. In the higher education and training pillar in the years 2015-2016, the Czech Republic and Poland recorded 5.1 points, of which Poland increased by 2%, while the Czech Republic maintained its level from 2010-2011. The largest increase in the index was recorded in Slovakia (by 2.2%). Hungary, as the only one among the V4 countries, saw a drop in its value (by 4.2%). In the pillar of goods market efficiency, in none of the countries discussed there was no decrease in the index. Most countries, i.e. Poland, Slovakia and Hungary, recorded growth (at 2.3 - 2.4%). The Czech Republic maintained its unchanged position. All the countries in question reduced the value of the indicator in the labor market efficiency index compared to the years 2010-2011. The biggest drop of 17% was recorded by Slovakia.

This country lost the first position, which it held in 2010-2011 together with the Czech Republic. A large decrease also recorded Poland (by 10.9%), Hungary (by 6.4%) and the Czech Republic (by 6.7%). In the case of the pillar of financial market development most of the V4 countries, i.e. Poland, Hungary and Slovakia, recorded a decline in the value of indices. This caused, that Poland lose its leading position (drop by 8.5%). All V4 countries recorded an increase in index values in the technological readiness pillar. The Czech Republic and Poland achieved the highest growth rate of 20%. In the last pillar of the market size, most countries in the period under review maintained the 2010-2011 index values. The increase, at the level of 2%, was recorded only by Poland.

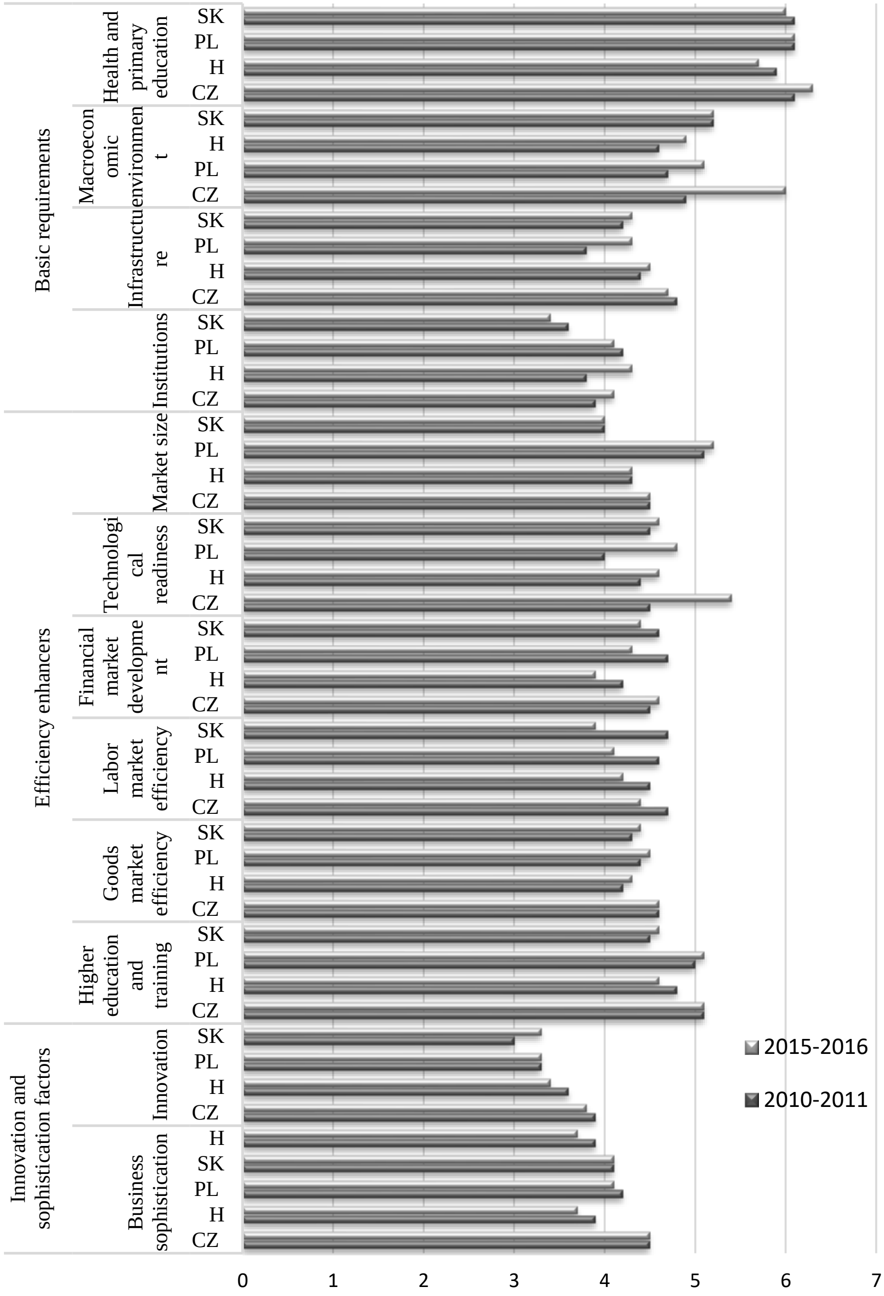

Fig.4. The competitiveness pillars belonging to the three thematic groups in the V4 countries in 2010-2011 and 2015-2016 [points], [10, 11]

The latest subindex is innovation and sophistication factors, which include two pillars: innovation and business sophistication. In the case of pillar innovation, only Slovakia recorded a growth of 10%. In Poland this indicator has not changed, but in other countries indicates decreased its value, i.e. Czech Republic (o 2.6%) and Hungary (5.6%). The second and last pillar is business sophistication. The highest values for this pillar in 2015-2016 were obtained by the Czech Republic (4.5 points), followed by Poland and Slovakia (4.1 points). Both the Czech Republic and Slovakia have not changed the value of this indicator from 2010-2011. Hungary and Poland recorded a decrease, respectively of 5.1% and 2.4%.

5 Conclusion

The article analyses innovation and competitiveness indicators of the V4 economies. On the basis of the comparison of these countries' indices, it can be seen that they differ both in terms of innovation and competitiveness.

Now, in terms of innovation, all V4 countries belong to the so-called moderate innovators. SII values obtained by these countries are within the range of 50-90% of the EU average. The results from the European Innovation Scoreboard reports from the years 2011-2016 show, however, an increasing gap in the level of innovation between these countries.

The analysis shows that the Czech Republic begins to diverge more and more in terms of the Summary Innovation Index from the other V4 countries. This country is starting to catch up with the so-called innovation followers. Poland is moving towards the group so-called catching-up countries. Poland occupies one of the last positions in the V4 innovation ranking for most thematic groups. The weakest results are obtained by the innovators dimension.

The competitiveness analysis of the V4 economies showed a significant difference between the surveyed countries. The Czech Republic, which is increasing its GCI index year by year, is the most competitive and innovative. In terms of competitiveness, Hungary was the weakest in 2016, which has even worsened in the period under review. Slovakia is trying to keep its value unchanged.

At present, the economic development of a given country is dependent on intangible factors related to knowledge. The transfer of knowledge contributes to a better use of available material resources in a given country. This is especially true in the Czech Republic, where knowledge dimensions are higher than in other V4 countries. Certainly, financial resources are needed to implement innovative solutions. Countries that are able to properly use their EU grants will improve their position. It is important for the V4 countries to look into their economies and translate them into innovative solutions. Only the development of the right strategy, which the Czech Republic is sure to accomplish, will allow the rest of the Visegrad Group to succeed and join the economies of the old European Union in terms of competitiveness and innovation.

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Analysis of Parliamentary Elections Costs in the Czech Republic

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Abstract. In recent years, more and more countries are in the so-called crisis of democracy. One of its symptoms is the lack of interest of a growing group of citizens on public affairs, which is reflected in long-term declining voter turnout. An exception is not even the Czech Republic, which, unlike most other European Union states, has no alternative form of voting that could have the potential to hinder the growing trend of apathy in society. However, every election in the Czech Republic is relatively costly, the country spends more than CZK 1 billion a year, most of which is the cost of municipalities. The aim of the paper is to analyze the most significant costs of these municipalities, using the data of the Czech Statistical Office and the Ministry of Finance of the Czech Republic. Significant differences in individual cost items have been identified, including in municipalities that are similar in size (number of eligible voters, number of electoral districts), as well as their powers (statutory cities, municipalities with extended powers, etc.). The possible way to reduce these differences (and costs) is to reduce the number of electoral districts, leading in particular to a fall in wage costs for members of the district electoral commission, which represent the most significant part of the total cost of municipalities.

Keywords: Elections, Voter Turnout, Voting, Costs.

1 Introduction

Before 1989, the ruling socialist regime used the election as a mechanism to test the loyalty of the population while maintaining legitimacy for the government without giving voters the real opportunity to express their preferences in the open competition of political parties. The breakthrough occurred with 1989, from which it is possible to consider the election as the real possibility for political parties to offer their visions and programs to fulfill them, but also voters with their right to freely express their preferences. [8].

However, the initial enthusiasm of citizens for the choice of political party choice has faded after more than twenty years of free society and democracy is at the so-called crisis point. Its manifestation is the declining interest of citizens in public events, and hence the declining electoral participation in most European states. [19] In the Czech Republic, this influence may influence the voting method, which remains in the current dynamic period, on the difference from other democratically developed countries, virtually unchanged. Only a traditional vote is allowed, consisting simply of the voter coming to the respective polling station and the ballot to the ballot box.

According to article No. 18 of the Constitution of the Czech Republic, every citizen who has reached the age of 18 years has the right to vote. [13] Whether or not to participate in the election depends, in addition to political conviction or awareness of the importance of the electoral process, on the circumstances surrounding his or her personal life [7]. Participants in the theory of participation [1, 9, 20] agree on a total of five approaches. The first is the theory of resources, which emphasizes the socio-economic factors and the physical ability of the citizen to sacrifice time and money to participate in the elections. The second is the so-called mobilization theory, respectively. The pressures of various social groups, along with the positive and negative mobilization potential of political parties. The third is the theory of a specific context, which can be briefly described as the influence of the importance of the individual elections in the voter's eyes, or even the charisma of the individual candidates. The other two theories deal with the sociological and psychological justification of the electoral participation, which, however, does not necessarily reflect only the objective political interests of voters, but also their influence on the social environment. [2] The objective of each country should be to set up such a mix of factors so that the turnout is as high as possible and the money spent on the elections is spent as efficiently as possible.

2 Elections in the Czech Republic

At present, a large number of elections are executed in the Czech Republic - elections to the Chamber of Deputies of the Parliament of the Czech Republic (Parliamentary elections), to the Senate of the Parliament of the Czech Republic (Senate), to the municipal councils, to the regional councils, to the European Parliament and presidential elections. In the last 20 years there has been a significant increase in the number of executing elections; since 1993 there have been 21 nationwide elections in the Czech Republic, and over the next ten years, 12 regular nationwide elections will execute. [21].

Such a number of many elections give citizens the opportunity to participate very much and fairly often in elections and to show their preferences at local and nationwide levels, but at the same time, a very high number of elections is very expensive, see Table 1. Since 2010, elections in the Czech Republic amounted to a total of CZK 4.25 billion. The most expensive was years 2010 and 2014 (more than CZK 1 billion); this was due to the execution of more types of elections at different dates (in 2010 elections to the Chamber of Deputies of the Parliament of the Czech Republic and elections to local self-government units took place in 2014, in 2014 also elections to regional self-government units, but also elections to the European Parliament).

Table 1. Costs connected with elections in the Czech Republic (mil. CZK) [11].

Type of elections	2010	2011	2012	2013	2014	2015	2016	2017*)
Parliamentary	516.7	20.3	80.8	489.8	55.0	3.4	42.1	516.5
Regional self-government units	514.5	34.7	494.1	8.0	491.3	42.4	476.2	26.5
European Parliament	25.0	0.0	0.0	0.0	450.0	3.7	0.0	0.0
Presidential	0.0	0.0	0.0	452.8	20.0	0.0	0.0	155.9
Total	**1,056**	**55**	**575**	**951**	**1,016**	**50**	**518**	**698.9**

*) Approved budget.

According to election participation, the elections to the Chamber of Deputies are generally considered to be the most important elections in the Czech Republic, the voter turnout is around 60% (see Figure 1). That is approximately three times higher than the Senate elections turnout. Generally, elections to the Senate and the European Parliament have the lowest turnout, which often does not reach 20%. [4]

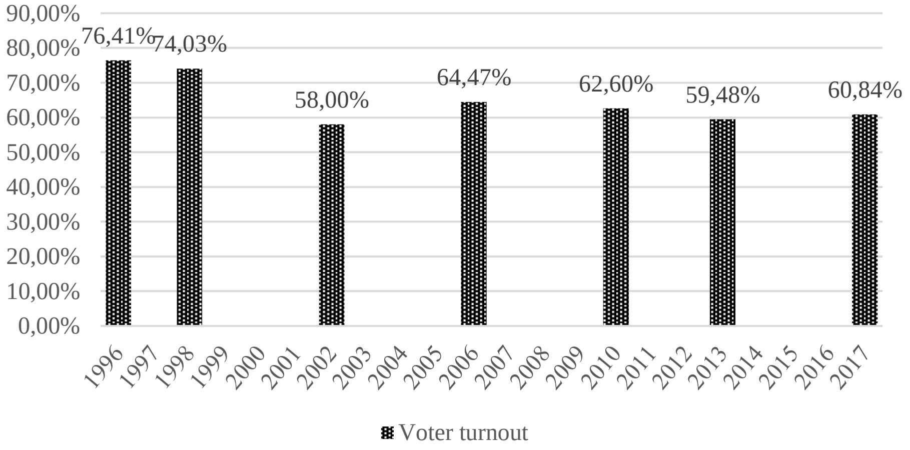

Fig. 1. Parliamentary elections voter turnout [4].

This paper focused on the analysis of the funds spent in connection with the preparation and execution of elections in the Czech Republic. Election data were selected for the elections to the Chamber of Deputies of the Parliament of the Czech Republic, which are considered the most important in the Czech Republic. Given that accurate and relevant data are available at the earliest one year after the elections, the paper used data about elections that took place in 2013 (financial data from the date of the same elections executed in autumn 2017, are not yet available in detailed bargaining). The aim of the paper is to analyze the most important cost items and to determine the basic characteristics, which would allow the evaluation of the individual municipalities' efficiency.

3 Results

The total costs of execution the Parliamentary elections amounted to almost CZK 420 million. The most significant part of these costs (CZK 318.47 million, i.e. approx. 75%) represented the costs of territorial self-governing units (municipalities and regions). The costs of the Czech Statistical Office, which processes the voting results, and the Ministry of the Interior, which participates in the organization and ensures the security of the voting process, was around CZK 50 million. Expenditures of other institutions (Ministry of Foreign Affairs and Ministry of Defence) are negligible:

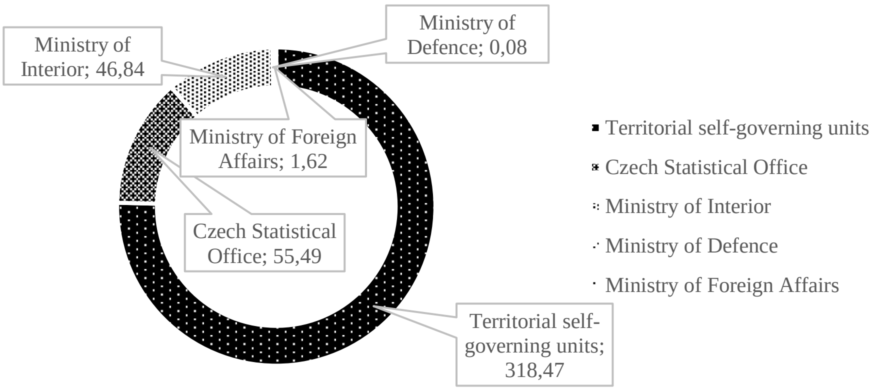

Fig. 2. Parliamentary elections (2013) costs [11].

Due to the very high share of costs of individual municipalities, the paper is focused on the analysis of these costs.

It is the duty of all municipalities to provide the polling stations in different ways - either by using their own resources (e. g, municipal offices) or by renting other premises (e. g. public buildings, schools, kindergartens, but also restaurant facilities, etc.). The electoral room must be equipped for each electoral district, among other things, by a ballot box, a portable electoral box, a sufficient number of ballot papers, blank envelopes bearing the official stamp and writing supplies.

For the modification of the ballot papers, special spaces are designated in the polling stations to separate the ballot. The number of these spaces is determined by the mayor of the municipality, taking into account the number of voters in the electoral district. For each district, the mayor of the municipality appoints a district electoral commission whose number is determined by the number of eligible voters. The minimum number of members of the commission is determined by the number of eligible voters. If there are less than 300 eligible voters registered in the electoral district, only four members may have the commission, otherwise, it is necessary to appoint a commission of at least five members. The maximum number of members of the commissions is not limited.

Furthermore, each polling station must have a telecommunication connection available, except that it can be equipped with computer equipment.

In general, it can be identified budget items that are most costly in terms of costs. These are mainly:

- Salaries of employees, respectively Other salaries (basic staff remuneration for training activities, methodological support, etc.);
- Other personnel costs (remuneration of members of the election commissions, remuneration for the distribution of ballot papers, cleaning of the polling station, all on the basis of working or working agreements with the relevant external staff);
- Purchase of other services (costs of service and rental of computer equipment, transportation, cleaning costs of the polling room provided externally, etc.);
- Purchase of material not elsewhere classified (costs for office supplies, paper, printer cartridges, etc.);
- Rent (the cost of renting the premises of the polling stations, authorized offices of the Czech Statistical Office (hereinafter referred to as the "reception area"), training rooms, etc.);
- Travel (in particular, the cost of transporting the voting results from the electoral district to the relevant take-over seat);
- Hospitality (staff and external employees' demands on meals).

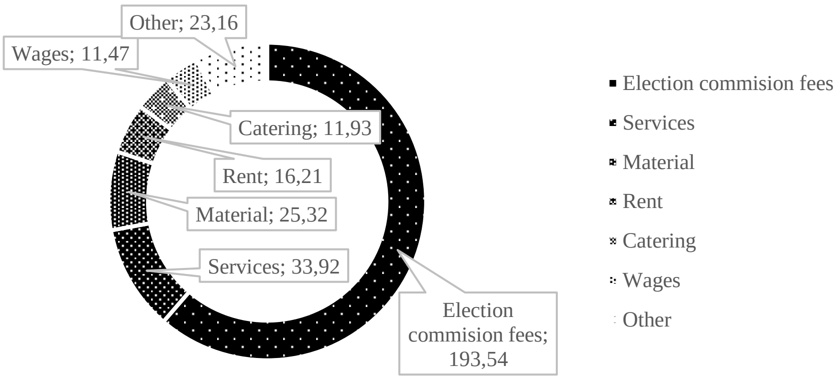

Fig. 3. Territorial self-governing units' costs (2013) – the most costly items [11].

All of the cost items above and other cost items appear as so-called variable variables, that is, their amount can be influenced by the relevant election authority (e. g. smaller number of members in district election commissions, more efficient purchases of office equipment or other services, securing polling stations and entertainment, etc.).

For the purposes of comparing the economy of individual municipalities, the indicators were used:

- The average total cost per electoral district,
- The average total cost per eligible voter.

Table 2. Main characteristics of electoral districts.

Number of eligible voters in el. districts	**Total number of eligible voters**	**Total number of el. districts**	**Average number of eligible voters per el. district**	**Average costs per el. district**	**Average costs per eligible voter**
0 - 100	55,973	771	71.38	12,660.51	192.20
101 - 200	286,694	1,912	149.35	13,683.50	95.03
201 - 300	339,423	1,375	246.08	14,897.50	61.20
301 - 400	384,772	1,108	347.60	15,951.92	46.21
401 - 500	417,001	925	447.30	16,747.31	37.59
501 - 600	563,121	1,013	548.95	17,523.97	31.94
601 - 700	797,141	1,210	651.28	19,067.64	29.30
701 - 800	1,681,401	2,236	749.70	19,829.95	26.47
801 - 900	2,304,046	2,713	849.61	21,428.83	25.25
901 - 1000	731,724	776	947.14	21,313.24	22.53
1001 - 1100	314,211	302	1,046.39	21,627.34	20.69
1101 - 1200	211,552	184	1,150.13	22,591.90	19.66
1201 - 1300	109,771	88	1,248.88	22,637.00	18.13
1301 - 1400	57,893	43	1,347.31	23,797.78	17.64
1401 - 1500	49,129	34	1,444.45	24,591.47	17.02
1500+	102,744	61	1,691.29	26,263.07	15.67
Total	**8,406,596**	**14,751**	**569.90**	**21,589.86**	**37.88**

It is clear from the analysis that the highest costs for one voter are in smaller municipalities, respectively in small electoral districts and with an increasing number of voters in the electoral district these costs are declining. However, the municipalities may affect the number of eligible voters in the districts only partially. In the Czech Republic, there is a high number of municipalities where the low number of inhabitants (and therefore the eligible voters) lives, but the electoral district (polling stations) has to be established. These small municipalities have higher costs per eligible voter, while municipalities with more electoral districts will realize "economies of scale" (Fig. 4):

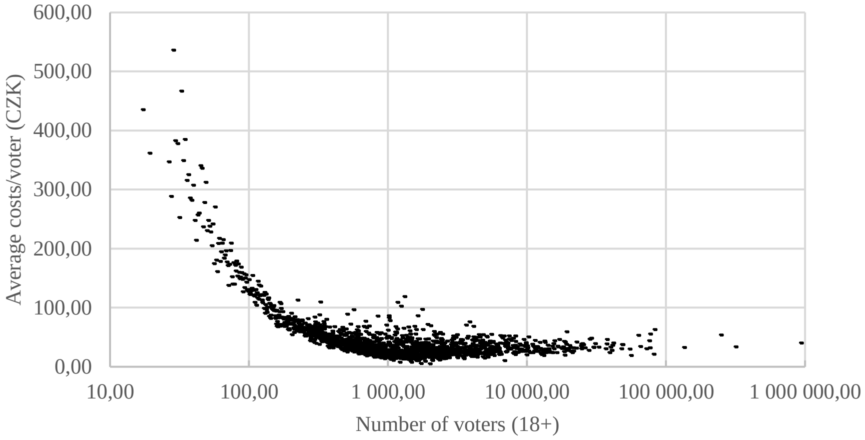

Fig. 4. Average costs per eligible voter (according to the number of eligible voters in municipalities).

A rather unexpected fact is the rising trend of costs per electoral district depending on the number of eligible voters in the municipality (Fig. 5). Larger municipalities have higher costs per electoral district (polling station, a unit of polling). This trend can be described by a logarithmic regression function $y = 2571.6ln(x) + 931.14$.

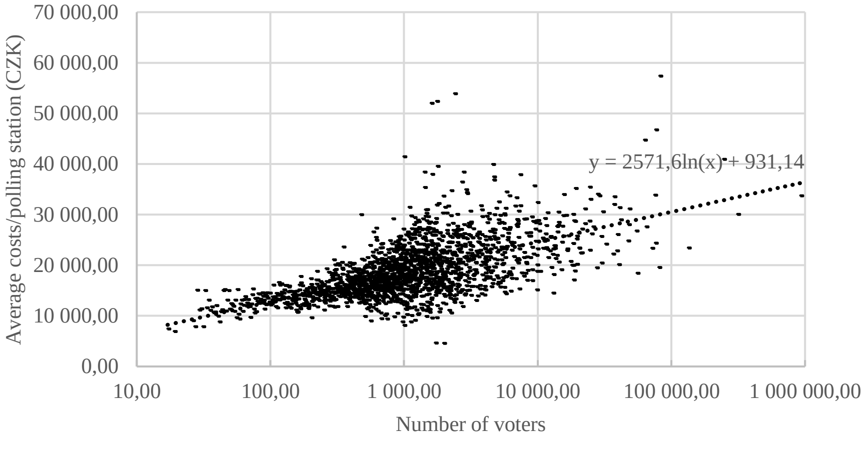

Fig. 5. Average costs per electoral district (according to the number of eligible voters in municipalities).

There is also a statistically significant difference in the amounts which municipalities with the same scope of competence [10] (divided into the Capital City of Prague, statutory cities, municipalities with extended powers (III.ST), authorized municipal authorities (II.ST) and municipalities with basic scope of state administration (I.ST) spend on one electoral district:

Table 3. Main characteristics of municipalities classified according to the scope of competence.

Municipality competence	Number of municipalities	Number of el. districts	Total costs	Average costs per el. district
Prague (capital)	1	1101	37,077,520	33,676.22
Statutory cities	25	2,294	71,548,342	31,189.34
III.ST	180	2,669	65,590,527	24,574.94
II.ST	183	944	20,718,348	21,947.40
I.ST	5,845	7,743	122,449,260	15,814.19
Total	**6,234**	**14,751**	**318,471,963**	**21,589.86**

For example, there were spent CZK 19,511.28 per one electoral district in Liberec, CZK 24,310.14 in Hradec Kralove and CZK 33,832.04 in Ústí nad Labem. The capital - Prague, which has more than 1,100 electoral districts, has a cost per electoral district of 33,676.22 CZK. The average national costs per one electoral district were only CZK 21,589.86.

4 Discussion and Conclusion

Contributions that work with electoral systems in terms of their cost-effectiveness are very rare. The reason can be the sensitivity of this topic from the point of view that "democracy is worth something" or “democracy is not free of charge”. Many researchers, however, pay attention to sociological aspects - they examine decision-making and voter preferences, or influences that have an impact on voter turnout. [3, 5, 6] The aim of this paper was to create and broaden the view of the perceptions of the election not only as a social problem of the choice theory [12] but also of the cost of the society itself. Motives for people should be, therefore, using their legal rights [13, 14, 15, 16, 17, 18] and to participation not only in order to determine the future direction of the territorial unit in which they live but also to use the public services offered to them by the country. Only then these services can be evaluated as effective and meaningful.

This paper analysed the costs of execution elections in the Chamber of Deputies of the Parliament of the Czech Republic. It was found that approximately 75% of the total costs of the elections (CZK 318 million) represent the costs of territorial self-governing units. Of this amount, the highest share (61%, i.e. about 194 million CZK) represents wages by the electoral district election commissions. The analysis of the distribution of costs according to the size of the municipalities showed that with the increasing size of the municipality, its average cost for one electoral district increases, and therefore does not realize any "economies of scale". In addition to this fact, the costs of similar municipalities (according to their competence) differ significantly, for example in the statuary cities by up to 73%.

The space to reduce these costs is in the number of electoral districts so (and therefore in electoral commissions or a number of its members) with maintaining the same availability of the polling station for citizens. This is partially possible for larger cities that establish polling stations in school premises, with more than one polling station in one such building. This would save a significant amount and make the election process more cost-effective and more efficient.

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Care Farms in the Strategy of the Multifunctional Development of Rural Areas

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Abstract. The following text, using the paradigm of multifunctional rural development, points out the new possibilities for exploiting the potential inherent in family farms. The idea of care farms, combining care services with elements of agricultural production, allows to introduce innovative solutions related to the processes of ageing of societies. Implementing rural care services improves the quality of senior's life, provides a new source of income for the farm and also helps to reduce inequalities in access to social services for inhabitants of villages and small towns. The content of this article is in the field of economic and social analyses of rural areas, and the reflections, using the achievements of sociological and economic researches, were based on existing sources and achievements of own researches. The descriptive analysis was used in the presentation.

Keywords: Care Farms, Ageing of Societies, Multifunctional Development, Rural Areas

1 Introduction

Care farms are a relatively new solution in some of the European Union countries and completely innovative in Poland. They are becoming a part of the multifunctional rural development model, in particular, the development of multifunctional agriculture. The task of care farms is to combine a day or long-term care with elements of agricultural production and farming. This activity may be an effective response to: 1) the deepening process of the ageing of Polish society; 2) the need to level the social inequalities in access to care services in rural areas in Poland, especially when it comes to daily care; 3) to seek directions for multifunctional rural development.

The purpose of this article is to indicate how the idea of care farms is implemented in Polish conditions. The article is a part of the economic and social analysis of rural areas and shows three important aspects that influence the need for the research: the need to implement multifunctional rural development, the intensive ageing phenomenon of the society and the need for an alternative solution for the development of care services in the countryside.

2 Multifunctional Development of Rural Areas

In polish rural areas positive phenomena can be observed - less agricultural character of the countryside, age of inhabitants is extending, above average population involvement in social work, high satisfaction of life among inhabitants of rural areas, shaping the quality and diversity of the natural environment by agriculture and non-agricultural activities, as well as negative phenomena - low productivity in polish agriculture (only about 30% of the average level in agriculture in EU-28) or high share of rural population in the population living in Poland in extreme poverty (over 60%) [4]. Many of them point to the need for exploration of alternative ways of farming in rural areas, therefore to its multifunctional development.

The basic premise of multifunctional rural development is launching of the non-agricultural functions in rural areas, enabling them to use their potential and create new jobs. M. Stanny [10] focuses on: raising the standard of living of rural families through creating the non-agricultural workplaces, the actions for the multifunctional agriculture (development of non-market agricultural functions), building the local initiatives, identities and the activation of rural communities.

As noted by M. Kłodziński [9], the development of non-agricultural forms of economic activity in rural areas is and will be a slow process, requiring timing in different types of activities based on such factors as human entrepreneurship, capital, demand, promotion, comprehensive infrastructure, good education level, skills of strategic planning, etc. Undoubtedly, multifunctional rural development must be supported by adequate funds. Implementing the concept of multifunctionality of agriculture and rural areas, assuming the economic strengthening of farms and increasing the competitiveness of the agri-sector was the primary goal of the Rural Development Program (RDP) for the years 2007-2013. In the current programming period, the support for RDP 2014-2020 non-agricultural rural development and job creation was limited to Leader action, providing co-financing for the development of entrepreneurship in rural areas under the Cohesion Fund and its programs.

According to Czarnecki, Kłodziński and Stanny [3], the transformation of the country towards multifunctionality is basing mainly on the reorganization of the three basic ways of using rural space: production, consumption and protection. These mentioned rural functions can be found in three basic types and three mixed types, that are their own combination (Holmes typology):

- type 1 - productive agricultural, predominantly productive,
- type 2 - investment and settlement attractiveness, with the dominance of consumer values,
- type 3 - bidirectional, a combination of production and consumption values,
- type 4 - *peri-urban*, in which values of production, consumption and protection are competing,
- type 5 - marginalized agriculture, assuming potential integration of production and protection values,
- type 6 - protective, emphasizing socially relevant values, corresponding to the objectives of sustainable development and protection.

For types 4, 5 and 6 perfectly suits the idea of the concept of nursing homes because the protective function emphasizes socially relevant values, compatible among others with the objectives of sustainable rural development.

One of the directions of multifunctional rural development is agritourism - in the case of agritourism farms, it is possible to develop additional activities related to care for seniors, disabled, orphans or sick people, with relatively small expenditures (existence of the home base, experience in working with people). It is difficult to disagree with P. Wasiak [1] that caregiving is a ‘promising direction for additional non-agricultural activity, which however requires many complex actions - a friendly approach of the whole social environment to those problems and a good cooperation between the various resorts and public administration sectors in the field of health, social affairs and agriculture. The idea of care farms can be a great opportunity for rural development’.

3 The Ageing of Societies

The analysis of demographic trends made by the most prestigious international organizations and prominent demographic researchers clearly indicate the occurrence of the ageing of the world population on an unprecedented scale. According to the definition, population ageing means increasing the proportion of elderly people while decreasing the percentage of children. In literature, as the metric threshold of age, it is usually taken 60 (WHO) or 65 years (UN, Eurostat). There are many measures and classifications of the degree of ageing of society. According to the UN criteria, the population is considered to be old, with the proportion of people aged 65 and over - exceeding 7%, and the percentage above 10% indicates the phase of advanced age. According to projections of the Central Statistical Office [5], in Poland, the proportion of people aged 65 and over in the total population in 2050 will be 32.7%, and people aged 80 and over will constitute 10.4% of the total population (in 2013 - 3.9%).

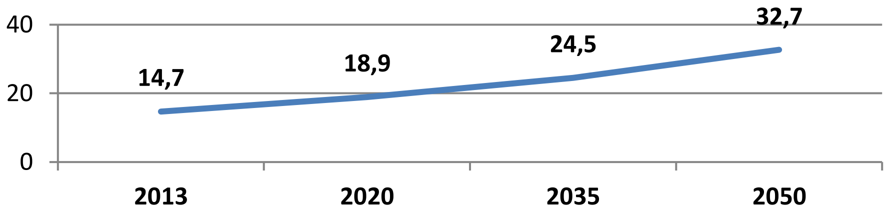

Fig. 1. Participation of population aged 65 and over in total Polish population (in %) in years 2013, 2020, 2035, 2050 [5].

The ageing of societies is quite complex. As noted by A. Klimczuk [8], there are at least ten effects of ageing of populations: feminisation of the population, increased demand for social care and health services, decline in political dynamism and political preferences, changes in demand for social education and the need to change the means of financing public expenditure, changes in family structure and in local communities (e.g. deurbanization), changes in the structure of consumption and investment and also changes in innovativeness and productivity of human work.

These data undoubtedly lead to an analysis of the phenomenon, wide discussion and the development of an effective strategy that takes into account the process, its dynamics and the consequences of occurrence. In this situation, the emphasis should be placed primarily on changes in an ineffective: care and social security systems. Concerns about the ageing of societies should be treated as a challenge for societies. To meet this challenge will depend on immediate concrete action, which, in anticipation of the effects of increasing number of older people in the population - will reduce its consequences in advance. One of such activity may be the caregiving farms in question.

4 Care Farms

The initiative to create care farms in Poland is related to the searches for innovative solutions aimed at realizing important social goals. On the one hand, we have to look for alternatives to the existing (and very imperfect) healthcare model, and on the other hand, we have to seek for new opportunities for economic activity for rural residents. Care farms are a very interesting proposition for the owners of the small family farms who, because of their economic potential, are not able to compete on the market, but have significant assets that enable them to develop their businesses in a different way - linking them to agricultural work.

Caring farms, also called social farming, have the task of combining the day or long-term care with elements of agricultural production and farming. According to the definition, a caring farm is a form of support for social care and integration, carried out within the framework of a farm engaged in agricultural activity [2]. The idea of their operation has been successfully implemented in many European countries such as Italy, France, Norway, Belgium, Austria, Germany and Great Britain and in the United States. The services provided by these farms are offered not only to seniors but also to people with disabilities (including intellectual), to people affected by professional run out of steam or depression, as well as people diagnosed with autism. Care farms in these countries are part of a broader perspective of the use of farms, creating opportunities for therapeutic activities. In the literature of the subject [5], this type of activity is called "green care", that besides purely caring functions also serves as a therapeutic function.

The history of care farms around the world dates back to the sixties, but in the Netherlands, in the nineties they were just flourishing. Then the Dutch state introduced care solutions where health system concerned people could benefit not only from the classic forms of care but also innovative solutions. The effectiveness of this system and the attractiveness of care solutions served as an example to other countries - and today Poland is also reaching for these solutions.

The creation of Polish model of caring farms primarily aims to build a network of farms that fit in with the idea of social agriculture and in developing appropriate solutions for their development needs. In Poland, there are problems already raised in the following aspects:

- advanced ageing processes of the Polish population, resulting in a significant increase in the demand for care services that the current care system is unable to provide,
- the need to minimize disparities in access to care services for rural residents and to eliminate the consequences of social inequalities,
- the need to constantly seek directions for multifunctional development of rural areas in order to secure, alternative for agriculture employment, and the occupational activation of the inhabitants,
- raising the level and quality of life of the inhabitants.

The development of care farms is undoubtedly a major legal and organizational challenge for the owners of these holdings, but also a great opportunity for the stability of non-agricultural income. It should be paid more attention to the social context of the ageing of the Polish society, in which the care for a senior is being significantly modified. This is mainly related to the transformations of a contemporary family in Poland, departing from the traditional model in which the care for an older person was the domain of the closest relatives. The role of women in society (traditionally attributed to the role of caring) for the sake of professional activity and participation in the sphere of public life has also been modified. Poland is also characterized by the significant emigration of young people in the last decade resulting in the phenomenon of "euro-orphanage", that originally defined the phenomenon of children left in the country of immigrant parents and now includes the term deprivation of physical ability to care for elderly parents living in the country. According to Iwański [7] “due to the process of ageing of the population, the low birth rate and the labour migration of people at productive age abroad, will be increasing the need for care benefits in the coming years. [...] There will be growing a demand for services in the form of an environmentally and half-environmentally, that will be responsible for supporting the family in the care for a senior.” One of the important ways to solve this problem can become the possibility of executing care in care farms.

From the perspective of seniors, caring in the care farms can be very attractive because of keeping the social contacts and living in rural areas, in contact with nature, and the ability to participate actively in the life of the farm. This is undoubtedly an interesting offer for all those for whom the life in the country is of value in itself. For seniors coming from rural areas, staying in close to their habitual conditions may determine the quality of their lives.

The current social policy system that is addressed to seniors, in practice differs from the model assumptions. In this situation, the implementation of the concept of the care farms is due to the numerous advantages of the development of social agriculture, which can be analysed from three perspectives: the senior requiring support and his family having difficulties in providing care, the farmer providing the service and the whole local community.

Table 1. The advantages of social farming [2].

Farmer	Local society	Senior demanding support
• a new source of income • economic improvement of the farm • the possibility of work activation of members of the farm, especially women 45+ • the pro-social orientation of the farm - actions for the local community	• the increase of factors integrating the community - also in the intergenerational dimension • improving the economic situation of the local community • the increase of the use of care services in rural areas - reducing the inequalities in their access in rural areas • the increase in proactive attitudes among rural residents	• gratification of daily needs of life • maintaining social contacts • the ability to participate in the wider society • implementation in a social (integrational), therapeutic function

The advantages of social agriculture are understood as part of the Rural Development Program for years 2014-2020. Final solutions adopted in Poland are taking into account the existing legal and socio-economic conditions. Leading a care farm is possible by the people engaged in farming activities or by people who are household members of these farms. Such a farm, in order to provide care services, must establish a new entity - it may be a business entity or a social economy entity. The offer of the activity of a social farm should be directed primarily to everyone over 60 years of age. Three types of organization of care are recommended: daily residence, family homestay and 24-hour care facility conducted within the framework of economic activity. From a senior's point of view (for which the socio-psychic condition is important to stay as long as possible in his or her own environment) and the provider itself (due to the degree of involvement and the need for expenditures), it seems that the 24-hour care facility is the least attractive. The advantage of daycare is that it is more accessible because of the costs incurred by the beneficiaries themselves (or their families), as well as self-government entities obliged to care for the elderly. The characteristics of the services provided by care homes are shown in Table 2.

Starting a caring business in Poland is now possible with financial support from several sources. These are government programs that support seniors' activities and projects financed by the European Union. These projects can co-finance the launch of such activities in some programs even up to 80% of the costs incurred.

Table 2. Care services provided by nursing homes [2].

Beneficiaries of care services 60+	Type and scope of services provided
• people with daily difficulties - reduced psychophysical ability or disability • people with a sense of loneliness and withdrawal from social contacts • people with difficulty in organizing leisure time • people who lack any support from the family	• care and nursing services: - daily stay - at least 1 warm meal - help with basic life tasks - transport from and to the facility • activation and improvement services: - free time organization - contact with animals, - collective meals preparation - handicraft, etc. • support services for participants and their families (support and counselling)

It is also worth mentioning that the possibility of taking care activities is an interesting proposition for agritourism farms, which - as already mentioned, have appropriate infrastructure adapted to the needs of guests - tourists, and also an important experience in contacts with clients and conducting a business activity. In this context, caring farms can also be an alternative path for the development of agritourism farms.

5 Conclusion

The activation of the rural inhabitants and utilizing endogenous potentials for the local development is an extremely important issue in the sustainable development of rural areas. Taking innovative ventures that leads to a satisfactory life in rural areas and increasing opportunities for non-agricultural actions is still a challenge. The inclusion of the multifunctional development of new forms of activities such as caring farms is an interesting proposition, worth promoting.

There is a good climate in Poland for developing a network of caring farms. Although in comparison with other European countries, Poland is still delayed in this area, however, there are important steps already taken to implement good practices already developed in other European countries. An example is an inclusion in the Strategy for Responsible Development of two projects: Caring Farms and Active and healthy senior – farmer, as well as activities intensively conducted by the Agricultural Advisory Centers to prepare potential participants in the network of care farms to properly perform new tasks.

Poland has well prepared facilities for the development of this form of operation – as an example of which is a large network of agritourism farms with well-equipped technical infrastructure, as well as farmers or members of their families who have experience in care for elderly or disabled people, acquired in the country or during the work done abroad.

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Cost on Equity in the Condition of SMEs in the Czech Republic: A Preliminary Study

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Abstract. This paper is focused on the cost of equity in SMEs in conditions of the transitional economic in the Czech Republic. The research question is what the actual level of this indicator in conditions of the different segments of SMEs is and how is in large companies. The second question is whether there are any differences between the three segments of SMEs and between SMEs and large companies. The third question is whether the level of equity cost differ in the different branches in which the SMEs operate. And the last question is whether the equity cost is affected by selected factors. The research is based on the set of 16,302 companies data of which were obtained from the Albertina database. The results confirmed the findings of previous research: the highest costs are associated with the capital employed in micro and small firms and in the field of Accommodation, meals and hospitality. The factor affecting the level of the equity cost was identified the volume of sales achieved. The results are limited by many factors however they can contribute to the overall view of the capital employment in the Czech Republic as the transition economy and as an introduced study for the next research as well as for practice of companies.

Keywords: Cost of Equity, SMEs, Risk Premium, Modular Method.

1 Introduction

The estimation of equity capital costs for corporations is close to the indicator of the economic value added as a modern tool for evaluating business performance. Although this indicator is associated with the development of financial theory at the end of the 20th century, the idea of equity cost and economic profit is older and is associated with the names of A. Marshall, L. Walras and others [25]. The idea of equity cost arose from the thought that the capital use in specific conditions should bring at least as much as it can be obtained by using the same amount of the capital in other conditions with the same risk, in the other words by using it in another area, taking into account the level of risk [12, 17, 8].

Cost of equity reflects the return on "unrealized, missed opportunities" plus the risk premium associated with the specific area of capital use. This approach became the basis for one of the methods quantifying the cost of equity (r_e) where the profitability of risk-free investment (capital use - r_f) is increased by the risk premium corresponding to the degree of risk exposure (r_{POD}) – see equation (1):

$$re = rf + rPOD \tag{1}$$

The equity cost indicator can be considered as an objectified performance of capital in relation to the conditions of its use, a normative performance. The difference between this and the actual performance is an information for both the internal and the external performance evaluators of a particular company. This point of view became the base for our analysis.

The decomposition of the risks which are to be reflected in the risk premium in the calculation is the corner stone of the indicator cost of equity practical calculation. There are many theories and approaches which are subjects of a number of studies and researches.

Specific question is the determination of r_e in condition of emerging countries. The economy of these countries is in the process of transition to the market principles and it brings many specific factors to the economic system and economic processes. These imperfections bring into the practice and behaviour of the firms some specifics which form a specific structure of business risks, which are commonly called as country risk. It exposes investor to additional risks. The breakdown of this risk into the specific types of risk has been carried out differently by different authors. Boyer et al. (Boyer et al. 2017) defined the risks in emerging markets in the areas as follows:

- Financial markets which are illiquid and lack transparency,
- Less developed regulatory, corporate governance and legal framework,
- Inability to repatriate earnings,
- Economic uncertainty,
- War and/or political instability,

One of the many questions is which of the risks do investors demand compensation for and how much additional return is required.

The aim of our research is to find out the actual level of the equity cost in conditions of the different segments of SMEs in the Czech Republic as a transition economy and to find out if there are any differences in the level of this indicator in the segment of SMEs and in large companies and in different branches. The results may become a basis for further examination of the cost of equity and its use in the Czech Republic.

Based on earlier empirical research, the following hypotheses can be formulated:

- The amount of capital costs will be highest in the segment of micro and small firms whose activities can be expected to have the highest level of risk
- The amount of capital costs depends inversely on the amount of the company's debt - the higher debt ratio is usually associated with a higher level of risk.
- The amount of capital costs depends inversely on the size of the firm - it can be assumed that with the growing size of the firm, the level of risk decreases,

- The amount of capital costs depends inversely on the size of the company's sales - it can be assumed that the higher sales volume reflects the stronger position of the company and hence the lower risk.

2. Literature review

The interest of economic practice in the application of EVA has opened up a number of questions and has stimulated a number of research projects. They deal with the various aspects of the cost of equity, most often the methodology how to determine the amount of capital costs is discussed. In the literature two approaches are employed: One relies on the theoretical link between future realized returns and the cost of equity, the second relies on the theoretical link between the cost of equity capital and the priced risk. Many other researchers have attributed the cost of equity capital to various factors that affect the amount of capital costs. They analyze the role of corporate governance, IFRS implementation, audit firms, voluntary disclosure, financial leverage [24, 3, 16, 5, 7, 10, 13, 18, 21, 24, 28]. Many researchers deal with the level and role of this indicator in the specific national conditions [15, 9, 17, 19]. They conclude, the high level of equity cost is a constraint as well as great differences between the costs of equity in the national economies [12, 15, 31].

Another line of research focuses on the application and determination of cost of capital in emerging countries [18, 21, 6, 9]. Their goal is to verify the possibility of methods used to determine the cost of equity in the condition of emerging economies and its reliability in the given conditions or in a special branches [1, 17, 9] or segments of firms [21, 26]. The other researchers try to define a specific model suitable for these specific conditions [17, 20, 22, 23].

In the Czech Republic, much attention is paid to the costs of equity, particularly in the field of practical application. However, the underdeveloped capital market and the transition economy create relatively little scope for this research. The principle and the calculation of economic value in conditions of Czech enterprises are dealt with the authors, i.e. [22, 23, 30]. Extensive research on the level of cost of capital and *EVA* value was carried out at the end of 90th and the results are presented in [11]. This issue is also dealt with some other young researches [2, 19].

At the end of the 90s, a model of the authors I. and I. Neumaier was created for the Czech condition. The aim was to allow the quantification of the risks of capital use in an individual company [22, 23]. This system is designed for economic practice for benchmarking purposes. It is based on the modular method, i.e. the return on risk-free investment is increased by a risk premium. For the purposes of the risk premium calculation, this is divided into four sub-indices. For the calculation of these indices, the data of accounting statements compiled according to Czech accounting standards are consistently used. Although this concept does not eliminate the problem of reliability and differences in accounting data, a single, uniform base for benchmarking the performance of capital in the conditions of specific national economy was created which serves for the companies´ comparison.

Based on the literature review, it can be stated that the literature examined so far has not paid much attention to the issue of SMEs as a specific area of the economy. And in the Czech contexts, factors that can affect the level of equity costs have not been explored in more detail. This has become a stimulus for our research, to which the introductory study contains this article.

3. Research Methodology and the Sample

3.1 Model r_e calculation

In the Czech Republic the low level of capital market does not allow to measure effectively the real level of the risks which the equity undergo in the specific segments and branches. This fact was one of the incentives creating of a specific calculation model which was created by Inka and Ivan Neumaier, designated as INFA model. This model is available on the website of Ministry of Industry and Trade of the Czech Republic [14]. In our research we utilized this model to calculate the cost of equity employed in companies operating in different segments and industries.

Model INFA uses the following expression:

$$r_e = r_f + r_{LA} + r_{POD} + r_{FINSTAB} + r_{FINSTRU} \qquad (2)$$

where:

- r_e – costs of equity,
- r_f – risk-free rate,
- r_{LA} – risk premium for the size of the company or liquidity of the shares,
- r_{POD} – risk premium for business risk,
- $r_{FINSTAB}$ – risk premium for financial stability,
- $r_{FINSTRU}$ – risk premium for financial structure.

The risk-free rate (r_f) is derived from the yield of 10-year government bonds. Its values are published on the website of the Ministry of Industry and Trade (MIT). In the period 2015-2016, the risk-free rate was 0.58 % and 0.48 % respectively.

The risk premium for the size of company (or liquidity of shares - r_{LA}) depends on the size of so-called "available resources" (or charged resources - UZ), which is a summary of equity, bank loans and bonds. If it exceeds the amount of 3 bilions, the risk premium is 0%, if the amount is lower than 100 milion, the risk premium is 5.00%, if the amount is between 3 bilions and 100 milion, than the risk premium is calculated as $(3\text{-}UZ)^2/168.2$.

The risk premium for business risk (r_{POD}) is dependent on the indicator of production power ROA (= $EBIT/A$), which is compared with the indicator x_1 calculated as follows:

$$x_1 = (available\ resources\ /\ assets) * UM \qquad (3)$$

where UM = interest/(bank loans+long term liablities incl.financial ĺease).

If *ROA* is greater than x_1, then r_{POD} is the minimum of the r_{POD} in the industrial sector, if *ROA* is lower than 0, then r_{POD} is 10%. If the *ROA* is between these values, r_{POD} is calculated according to special formula:

$$rPOD = \{ (x1 - ROA)2 / x12 \} * 0,1 \qquad (4)$$

The risk premium for financial stability ($r_{FINSTAB}$) depends on the ability to settle liabilities, on liquidity: the value of current liability (*CL*) is compared with the recommended limits of *CL*, i.e. 1.0 – 2.5. If *CL* is lower than this interval, the risk premium is 10%, if *CL* is higher, the risk premium is 0%, if *CL* is in this interval, the risk premium is calculated according the formula:

$$(2.5 - CL)2/(2.5-1.0)2 * 0.1 \qquad (5)$$

Boundary values of the interval may be replaced in the individual calculation by values obtained in the sector.

The risk premium for financial structure ($r_{FINSTRU}$) is the difference between r_e and *WACC*: if these variables are equal, the risk premium is 0%. The maximum allowed value is 10% [15].

3.2 Structure of the sample and data source

As data source for the calculation of r_e we used the financial statements of the analyzed firms, which we obtained from the database of Albertina. The selected file included in total of 16,302 companies. More detailed information about the structure of the sample of the companies with regard to segments and industries is given in Table 1. Wholesale a retail trade and manufacturing companies represent the largest share according to branch structure, small companies represent the largest share according to segments structure.

Table 1. The structure of the sample

Segment	Micro	Small	Medium	Large	Total
Administrative and support activities	294	418	89	26	827
Professional, scientific and Technical activities	851	554	112	41	1608
Real estate activities	339	205	50	6	600
Information and communication activities	170	278	102	35	580
Accommodation, meals and hospitality	376	326	56	7	765
Transport and storage	146	558	106	64	974
Wholesale and retail trade; repair of motor vehicles	949	2355	949	217	6593
Construction	488	866	215	47	1616
Water supply, waste and	32	129	68	29	258

sanitation					
Electricity, gas, steam and air conditioning supply	9	53	40	50	152
Manufacturing	748	1912	1314	595	4669
Total	4402	7654	3129	1117	16302

4. Research results

Based on the financial statements data and INFA model the indicator re was calculated for each company. The statistic characteristics of the re values reached in the sample are presented in table 2. The average values of re are relatively high in all segments of firms, they are in the range of 24 % and 35 %. The highest level of re was found in the segment of micro-enterprises, the lowest level in the segment of large companies. This result is in line with the first hypothesis assuming – the highest risks and the highest cost of equity were found in the segment of smallest (micro) firms.

Table 2. Value of re in the segments of SMEs and in the large companies – statistical characteristics.

Segment	Micro	Small	Medium	Large
Median r_e	0.2296	0.1858	0.1517	0.1315
Min r_e	0.0558	0.0447	0.0209	-0.0162
Max r_e	9.9215	9.9344	9.8425	9.7387
Average	0.3553	0.3129	0.2861	0.2479

More detailed information of the level of capital costs in Czech companies provides their breakdown by subject area/branches defined according to NACE – they are presented in table 3. The highest average value of the equity cost (r_e) was found in the branch of Electricity, gas, steam and air conditioned supply in the segment of micro firms and in the branch of Accommodation, meals and hospitality, which is relatively high in all segments. But the highest level is surprisingly in the segment of large and medium companies. The relatively high level of the equity cost was found in the branch of Real estate activities in the segment of small companies. It can be considered as the reflection of the branch specifics in the segment of small firms. Relatively high level of the equity cost was identified in the branch of Electricity, gas and steam production in the segment of micro firms. It can be also considered as the reflection of the branch specifics, which is too demanding compared to the micro-firms conditions.

Table 3. Value of r_e in the branches according to segments of SMEs and in large companies

Segment **Branch**	**Micro**		**Small**		**Medium**		**Large**	
	median	*average*	*median*	*average*	*median*	*average*	*median*	*average*
Administrative and support activities	0.2127	0.2935	0.1558	0.2480	0.1235	0.2556	0.1312	0.2532
Professional, scientific and technical activities	0.2106	0.2745	0.1783	0.2487	0.1558	0.2742	0.1378	0.1514
Real estate activities	0.2558	0.4447	0.1935	***0.6614***	0.1759	0.5068	0.7252	0.7870
Information and communication	0.1968	0.3130	0.1875	0.2217	0.1553	0.1974	0.1525	0.2307
Accommodation, meals and hospitality	0.2858	0.4215	0.2510	0.5022	0.1776	***0.8481***	0.1427	***1.0279***
Transport and storage	0.2299	0.4557	0.2017	0.2884	0.1723	0.2568	0.1705	0.2919
Wholesale and retail trade; repair of motor vehicles	0.2534	0.3663	0.1928	0.3180	0.1688	0.3011	0.1437	0.2202
Construction	0.1976	0.3239	0.1826	0.2929	0.1458	0.2860	0.0959	0.1930
Water supply, waste and sanitation	0.1928	0.2648	0.1891	0.2993	0.1528	0.1486	0.1313	0.2142
Electricity, gas, steam and air cond. supply	0.2773	***1.5965***	0.1773	0.2056	0.1442	0.5445	0.1273	0.3259
Manufacturing	0.1929	0.3833	0.1829	0.3076	0.1428	0.2622	0.1237	0.2452

The values of the equity cost level (r_e) in the sample are presented in table 4, where the interval distribution of the values is performed. Most firms reached the cost of equity value in the interval of 10% - 29%. Financial analysis of the business sphere for 2015 made by MIT CR shows the average value of r_e in the same period in the average amount of 10.16%. It is a little lower than the resulting values in our sample. The reason can be in the fact, that into the „business sphere" there are included firms selected according to whether they form the value for owners, i.e. if the value of the indicator *EVA* is higher than 0. Due to the lower risks in such companies the value of equity cost is lower. Our results offer a more realistic statement about the situation in the companies in the Czech Republic.

The values of r_e found in our study are relatively high, higher than in the selected firms in the study of the MIT CR - is corresponding to the complexity of the sample. The results thus can be considered as a complex reflection of the higher risk of the business in the transition economy (Boyer et al.) The structure according to the branches make this reflection more detailed.

Table 4. Interval distribution of the r_e in the sample and the segments of SMEs

Interval r_e	=< 0,09		0,10 - 0,29		0,3 - 0,49		0,5 - 0,99		>= 1,0		*Total*
	abs.	*%*	*abs.*	*%*	*abs.*	*%*	*abs.*	*%*	*abs.*	*%*	
Micro	324	7.36	2950	67.01	936	21.26	34	0.77	158	3.59	4402
Small	1258	16.74	5263	68.86	726	9.48	85	1.11	322	4.21	7654
Medium	884	28.25	1898	60.67	201	6.42	32	1.02	114	3.64	3129
Large	389	34.83	629	56.31	43	3.85	15	1.34	41	3.67	1117
Total	2855	17.51	10740	65.88	1906	11.69	166	1.02	635	3.89	16302

In the last step of this preliminary study we tested the link between the value of r_e and selected indicators which could characterize in more details the condition of the firms operations. The idea was to analyze those characteristics that reflect the risks to which the equity have to face in the company. Based on the empirical findings we selected the indicators as follows: the volume of liabilities, the volume of assets, the volume of sales in absolutely amount and financial leverage as the ratio indicator representing the capital structure. The results of the analysis of correlation dependence between cost of equity and the selected indicators are presented in the table 5.

Table 5. Corellation r_e and selected indicators in the segments of SME

Correlation of r_e with: in the segment:	**Liabilities**	**Assets**	**Sales**	**Financial leverage**
Micro	0.085803	0.010368	-0.00182	0.013432
Small	0.092980	0.055660	-0.05570	0.104296
Medium	0.184335	0.088171	-0.05928	0.158886
Large	0.017020	0.017020	-0.01781	0.127574

The resulting values of correlation revealed overall a very low dependence between the cost of equity and selected indicators.

The correlation between the cost of equity (r_e) and sales is relatively low but negative, i.e. the cost of capital is lower when the amount of sales is higher. It confirms empirical experiences when the sales represent a stable financial position in the market and thus lower level of risk. The differences between the segments are quite high. The highest dependence was detected in the segment of medium firms.

The correlation of r_e and the volume of assets show relatively low level, but positive. This may be considered inconsistent with empirical experience, but it could be the reflection of the real conditions in these firms. The highest level was found in the segment of medium SMEs. These findings are relatively interesting due to the overall stability of firms in this segment as a result of the good equipment.

The correlation between r_e and the liabilities is also very weak, but positive. The positive relation corresponds to the empirical experiences. But the significant role of debt in the financial stability of the company allows to expect the higher dependency and the stronger relation. The highest level of correlation was detected in the segment of medium sized companies.

More accurate statement of the effect of debt on the equity costs provides correlation of r_e and financial leverage. The correlations values are not high, however, they are positive. It always reflects the negative impact of the debt on the financial stability resulting in the higher cost of equity. The highest value was found in the segment of medium SMEs.

5. Conclusion and discussion

Based on the analysis several conclusions can be formulated. The business risk in the Czech Republic as one of the emerging (transition) countries is relatively high. Consequently, the cost of equity (re) as the required return on capital is relatively high in the companies throughout the branches and across the segments. The highest values of the cost of equity were found in the segment of micro-firms and in the branch of hospitality and accommodation. From the four selected indicators the amount of liabilities and financial leverage was identified as the factor most affecting the cost of equity level. These findings are consistent with the formulated hypothesis and correspond to the empirical findings. The results also bring new findings in the field of differences among the segments of firms. A significant difference has been revealed between micro and small enterprises on the one side and medium and large enterprises on the other. The differences between SMEs and large companies are not so great. In the segments of SME´s the position of the medium sized companies is closer to the large companies.

The results of our analyses have some limitation. The first limitation lies in the sample and data used for the calculation. Financial statements based on the Czech accounting standards do not provide a reliable information of the companies´ economic situation. The next limitation (besides it can be considered as an advantage) lies in the method of calculation, which is based only on the financial data, not on the capital market and market data. The values of cost on equity are not fully the objective information. But on the other hand, these data are uniform and provide the unified bases for the inter-company comparison. The final reservation can be expressed to the risk decomposition, included into calculation, which do not sufficiently reflect real business risks in the transition economy.

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Spatial and Financial Aspects of National Parks Functioning in Poland Based on the Example of the Parks Situated along the Borderland of Lower Silesia Region and Liberecky and Kralovehradecky kraj

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Abstract. The article presents a national park not only in the category of an area, but also as an actively managed unit. Empirical studies were conducted based on the data originating from the financial records of Stołowe Mountains National Park (SMNP), Karkonoski National Park (KNP) and the data collected by the Central Statistical Office. The level of tourist oriented function, performed by the territorial communes linked to SMNP and KNP, was researched and the analysis of both parks' activities was conducted. The study allowed presenting the cross-border aspects of area specific nature protection forms. The scale of activities performed by the analyzed units indicates that the power of park's influence as an entity is quite significant. It is of vast importance for the development of a tourist function in the municipalities which are connected by territory and qualifies parks for playing the role of a partner in the cross-border EU projects.

Keywords: Protected Area, Tourist Function, Space Management, National Park, Nature, Cross-border Region

1 Introduction

The area specific nature protection forms represent the permanent component of space – crucial not only from the perspective of maintaining processes of both domestic and international importance, but also of major significance for local and regional development. The transport of pollutants and the requirement to ensure continuity of ecological passages emphasize how irrelevant administrative borders are for the processes occurring in natural environment. It results in referring to a particular protected area not as a separate territory, but as a part of the global network. In Polish conditions, legislation in the aspect of spatial planning and environmental law not always ensure effective protection of natural resources [19]. The problem is particularly important at the level of local spatial policy [5]. Simultaneously, the above-mentioned observations mean the need for emphasizing the nonexistence of protected areas separation from the remaining ones – mutual impacts are unavoidable. Additionally – as Becken and Job have observed – protected areas not only render services for the benefit of natural environment protection, but also constitute the source of income for both, a region and a country [1]. Similar observations are made by Przybyła and Kazak [15]. The above presented track of thought is, however, not the universally applicable one – since along with the permanently intensified cooperation between the cross-border protected areas such as, among others, Polish and Czech Karkonoski National Park in Sudetes[14], there is an ongoing discussion over the negative impacts which the establishment of the area forms of nature protection has on the development of economic life. This, however, does not change the fact that Polish-Czech borderland represents an example of positive transformations, possible to occur in ecosystems as a result of complex anthropopressure reduction in the neighborhood of protected areas. Similar situation is in Polish-Czech borderland (Tatra National Park) [9].

The process of sustainable local management can be effectively improved by the use of decision support systems in decisions making in spatial planning to mitigate the negative impact of development and to choose optimal and acceptable solutions [6]. Managing the ecological disaster from which the discussed area suffered in the past can serve as the model to be replicated by other areas if the need arises. Even more so, since in many cases ecological disasters require the reevaluation of priorities by not only those who manage a particular protected area, but also by public authorities – frequently representing a few neighboring countries. The problem of a vicious circle – “environment degradation – decreasing immunity – increasing susceptibility to disasters resulting in even more extensive environment degradation” is quite universal and refers not only to Europe [11]. Geopolitical, economic and ideological changes resulted in the fact that the problems of natural environment and economic development became the global top problems frequently covered in professional in literature [8]. The social attitude to protected areas still remains the subject matter of heated debates. Adopting the standpoint of prohibitions and limitations, listed by the legislator and resulting in the identification of protected space with the category of an isolated area and constituting a separate entity in relation to its environment, is very simple. All it requires are adequate legal regulations – in Polish reality the Nature Conservation Act. It is much more difficult to perform the evaluation of a national park as an entity taking active part in economic life of a region – especially a cross-border region.

The purpose of the article is to present a national park in the category of an area and in the category of an active unit playing the role of an investor and an entity influencing economic growth. The study is based on the example of two national parks situated in Lower Silesia region – Karkonoski National Park (KNP) and Stołowe Mountains National Park (SMNP). The choice of the above-mentioned parks is not a random one – their neighbouring territory, with the Czech areas administratively belonging to Liberecky kraj and Kralovehradecky kraj, allows presenting the cross-border aspect of the area specific nature protection forms. Empirical studies were conducted based on the data from financial and accounting records of the above-mentioned national parks. Because of changes in the accounting policy for study was selected the period 2008-2014 (data was comparable). Additionally, data collected by the Central Statistical Office (Local Data Bank) were used as well as the legal acts, including the local law acts. The adopted period of analyzing the financial aspects related to national parks functioning ensured conducting adequate observations in terms of the three organization and legal forms based on which Polish national parks were functioning in recent years: the State budget unit together with an ancillary entity, as well as the State budget unit and the State legal person.

2 SMNP and KNP – spatial perspective

SMNP is situated in Lower Silesia region in the area of four municipalities covered by Kłodzki district, i.e. the municipalities of Kudowa Zdrój, Lewin Kłodzki, Szczytna and Radków. The protected area of 6.340 ha was established based on the regulation by the Council of Ministers dated 16th September 1993 (Journal of Laws 1993 no. 88 item 407). The above-mentioned legal act also indicates the area of protective buffer zone covering 10.575 ha with the State border as part of its borderline. Four years later the protective buffer zone borderline was modified and its area was reduced by 60 ha [18]. The natural attractiveness of the space covered by two of the above-mentioned municipalities results in placing additional area specific forms of nature conservation within their territory – lower in relation to the national park. The location of SMNP, in terms of transport routes, is quite characteristic and contradicts the stereotype approach to the protected area as an isolated territory. A motorway, so-called The Hundred Curves Motorway, crosses Radków, Karłów and Kudowa Zdrój. The neighbourhood of the international E-67 highway, connecting the capital of Lower Silesia and Prague as well as the short distance to border crossings in Kudowa Słone and Tłumaczowo, make the Park area easily accessible not only for Polish tourists. The attractiveness aspect, regarding its cross-border dimension, is enhanced by the Broumovsko Landscape Park on the Czech side.The following locations are situated in the vicinity of the Park: Polanica Zdrój, Duszniki Zdrój and Kudowa Zdrój. This means the implementation of health and spa oriented tourism in the close vicinity of protected areas.

KNP - the second of the discussed parks is also situated within the administrative borders of Lower Silesia region. KNP is territorially connected with six municipalities: Szklarska Poręba, Piechowice, Jelenia Góra, Podgórzyn, Kowary and Karpacz. It is one of the oldest Polish national parks which was established following the regulation by the Council of Ministers issued on 16th January 1959 (Journal of Laws 1959 no. 17 item 90). The area of KNP covers 5.580 ha and is surrounded by the protected buffer zone the area of which is 11.265 ha. The spatial distribution of KNP is uneven regarding particular municipalities. It major part is situated in Karpacz municipality since over half of this municipality is covered by the discussed form of area specific nature protection. KNP is not the only national park in Karkonosze, because on the Czech part of the mountains Karkonossky Narodni Park (KRNAP) has been functioning since 1963. Territorial connection and the above described cooperation between KNP and KRNAP indicate complex approach to specific activities aimed at nature protection. Similarly to SMNP, spa tourism is also carried out in the neighbourhood of KNP – Cieplice Śląskie Zdrój, as a spa resort, constitutes an administrative part of Jelenia Góra city.

3 The space of national parks vs. the development of touristic function

The method of managing space occupied by national parks is imposed by the legislator based on the Nature Conservation Act dated 16th April 2004 (Journal of Laws 2004, No. 92, item 880 with later amendments). The diversity of areas covered by protection and taking the form of national parks forces the application of individual standards, as a supplement to the general principles, which are adequate to the characteristics of a particular territory. This role is played by the decisions made by a given park manager. It has to be emphasized that nature conservation is the statutorily specified priority task of any national park. Sharing the area with visitors and its educational activity is subordinate to its primary task consisting in nature protection. The example of SMNP proves best that the stereotype identification of the protected area with and isolated territory is totally incorrect. In case of KNP one can also hardly speak of the area isolation since it is visited by over 2 million people annually. The space covered by national parks is by no means an autarchic fragment in either natural or administrative terms. The broadly understood nature specific bonds are not, in any way, dependent on administrative (and therefore artificial) borders whereas the area of a national park itself still constitutes an integral - even though separated form typical management principles - part of a municipality.

It has to be emphasized that there is a significant difference between KNP and SMNP in the length of their functioning. KNP is almost 35 years older regarding the role of a major actor at the local economic scene. Moreover, KNP covers the area which, from the historical perspective, is much more attractive in terms of tourism. Therefore many attributes characteristic for both discussed parks are different. It would be a serious mistake to interpret these differences in the categories of KNP and the municipalities situated in The Karkonosze Mountains either as an advantage or as an inefficiency of SMNP or even the indolence of municipalities situated in The Stołowe Mountains.

Since one of the national park functioning purposes is the provision of its area, thus complex characteristics of a national park area, as well as the consecutive evaluation of park's functioning as an entity, require the analysis of territorially connected municipalities from the perspective of their tourism specific function. For this reason Baretje and Defert ratio (1) was calculated [7].

$$\frac{the\ number\ of\ beds\ in\ area\ x\ 100}{the\ population\ in\ given\ area} \quad (1)$$

Among the municipalities connected by territory with SMNP the highest values of the above ratio are obtained by Kudowa Zdrój. The reverse is true for Szczytna municipality, where the tourist function is minimal and the long-term perspective (data for the period 1999-2015) shows a disappearing trend. As a result of short distance between SMNP and the municipalities of Duszniki Zdrój and Polanica Zdrój, as well as including these municipalities to the socio-economic environment of SMNP, the discussed ratio was also calculated for them. Regarding Baretje and Defert ratio the municipalities of Duszniki Zdrój and Polanica Zdrój are the dominating ones comparing to these territorially connected with SMNP. It also indicates a higher level of tourist function development in spa oriented municipalities (see table 1).

Table 1. Baretje and Defert ratio for municipalities connected whit SMNP (years 2008-2015).

Specification	2008	2009	2010	2011	2012	2013	2014	2015
Kudowa Zdrój	12	18	17	17	26	28	29	30
Lewin Kłodzki	9	8	6	8,	9	9	7	7
Szczytna	3	3	2	2	2	2	2	2
Radków	7	8	10	10	12	12	12	11
Duszniki Zdrój	27	25	26	27	32	27	32	33
Polanica Zdrój	19	19	19	17	25	24	24	24

In case of KNP the above-mentioned ratio values indicate the cumulating tourist traffic in two municipalities – Karpacz and Szklarska Poręba. The domination of Karpacz municipality contradicts the thesis following which the establishment of protected areas blocks the development of tourism. 50% of this municipality is covered by protection in the form of a national park (see table 2).

Table 2. Baretje and Defert ratio for municipalities connected whit KNP (years 2008-2015).

Specification	2008	2009	2010	2011	2012	2013	2014	2015
SzklarskaPoręba	68	68	53	54	65	61	64	61
Piechowice	7	9	8	7	8	7	8	8
Jelenia Góra	3	3	2	2	3	3	3	3
Podgórzyn	25	21	18	15	18	17	17	14
Karpacz	150	145	140	173	191	199	213	213
Kowary	4	4	4	3	3	3	2	2

The method of managing space occupied by national parks is imposed by the legislator based on the Nature Conservation Act dated 16th April 2004 (Journal of Laws 2004, No. 92, item 880 with later amendments). The diversity of areas covered by protection and taking the form of national parks forces the application of individual standards, as a supplement to the general principles, which are adequate to the characteristics of a particular territory. This role is played by the decisions made by a given park manager. It has to be emphasized that nature conservation is the statutorily specified priority task of any national park. Sharing the area with visitors and its educational activity is subordinate to its primary task consisting in nature protection. The example of SMNP proves best that the stereotype identification of the protected area with and isolated territory is totally incorrect. In case of KNP one can also hardly speak of the area isolation since it is visited by over 2 million people annually. The space covered by national parks is by no means an autarchic fragment in either natural or administrative terms. The broadly understood nature specific bonds are not, in any way, dependent on administrative (and therefore artificial) borders whereas the area of a national park itself still constitutes an integral - even though separated form typical management principles - part of a municipality. The comparison of a tourist function implementation in the municipalities territorially connected with KNP as well as these connected in their territory with SMNP clearly indicates a higher level of the discussed function development in the municipalities situated in The Karkonosze Mountains. The value of Baretje and Defert ratio reached by Kudowa Zdrój in the latest analysed period (i.e. 2015) is seven times lower than the value obtained by the municipality of Karpacz in the same period. The number of tourists is also different in the discussed national parks – annually KNP is visited by 2 million people, whereas SMNP estimates its annual number of visitors at the level of 367 000 [13].

4 Financial aspects of SMNP and KNP functioning

The actors of economic scene can be described by means of numerous features. In order to characterize SMNP and KNP as entities it was decided to analyse the structure and value of assets at the disposal of both units, to present their revenues and the costs incurred. The value of remunerations paid was also quoted to illustrate work oriented functions of both Parks. Due to diverse organizational and legal forms, which were present in the period 2008-2014, the underlying empirical research (in all three above-mentioned spheres) was performed in the following way: in the period 2008-2012 – separately for a State budget unit (BU) and an ancillary entity (AE); in 2011 – for a State budget unit (as of 1st January 2011 ancillary entities were liquidated whereas their functions, assets, liabilities, etc. were taken over by parent budget units) and in the period 2012-2014 – for a State legal person (SLP). Correct inference required summing up the values adequate for a State budget unit and an ancillary entity functioning along with such unit (the period 2008-2010). Therefore the below presented tables include the row called: “At the disposal of SMNP” (or KNP) which contains the aggregated data.

The data presented in table 3 illustrate that the value of assets (balance sheet total) at the disposal of SMNP has tripled in the analyzed period and in 2014 reached the level of 20,7 million PLN. This confirms the unit dynamic development. Moreover, the assets structure shows that fixed assets constitute their leading component – the element of tangible fixed assets. High increase in the value of fixed assets occurred in 2011, 2012 and 2014. It has to be emphasized, however, that in 2012 as a result of stock taking the presented fixed assets were valued at the level of 436.662,41 PLN (tourist route, forest path, bridge). The increase in fixed assets value by almost half a million PLN was not related to SMNP expenditure. Jumping increase in 2014 resulted from the transfer of the land from off-balance sheet to the balance sheet (in 2015 the change of accounting policy was continued. As a result this change data has became incomparable, so the study is finished in 2014). In 2012 the value of current assets went up fivefold - the increase in value amounting to 2,3 million PLN resulted mostly from higher volume of cash in the till and on the bank account..

Table 3. The assets of SMNP and the Ancillary Entity at SMNP in the period 2008-2014 in thousands PLN.

Specification	2008		2009		2010		2011	2012	2013	2014
	BU	AE	BU	AE	BU	AE	BU	SLP	SLP	SLP
Fixed assets	790	3955	1706	3764	1615	4904	8035	9506	9315	14748
TFA including:	614	3955	1059	3764	1011	4904	7509	9004	8438	13869
1. NFA	392	3955	504	3764	777	4904	7161	8315	8106	13662
2.FAUC	221	0	555	0	234	0	348	689	333	207
Current assets	821	1408	867	1442	440	151	539	2873	5080	5996
Balance sheet total	1611	5363	2573	5206	2055	5055	8574	12379	14395	20744
At the disposal SMNP	6974		7779		7110		8574	12379	14395	20744

Legend: BU – budget unit SMNP, AE – Ancillary Entity at SMNP, SLP – State legal person SMNP, TFA – tangible fixed assets, NFA – net fixed assets, FAUC – fixed assets under construction, At the disposal SMNP = balance sheet total BU+ balance sheet total AE

In case of KNP the value of assets in the period 2008-2014 increased by over 214%. Jumping increase in 2013 resulted from the transfer of the land from off-balance sheet to the balance sheet. As in the case of SMNP fixed assets represent the dominating component of assets. The significant values of fixed assets under construction have to be emphasized – in 2011 they amounted to over 2 million PLN. KNP maintains the lower level of current assets comparing to SMNP.

Referring to the information presented in both above tables the issues related to fixed assets under construction and intangible assets have to be explained. Fixed assets under construction illustrate the value of carried out investments – it means that the analyzed units, in the period 2008-2014, performed works aimed at increasing the fixed assets value used for the implementation of statutory goals. The value of fixed assets does not equal the value of tangible fixed assets in cases of intangible assets occurrence among the components of a given unit assets. Zero value of intangible assets does not, however, mean their physical absence, but only indicates that they were not completely written off. In is worth emphasizing that SMNP and KNP obtain revenues not only from the budget grants. The income earned based on financial operations also constitutes their source of revenues (mainly interest), as well as

Table 4. The assets of KNP and the Ancillary Entity at KNP in the period 2008-2014 in thousands PLN.

Specification	**2008**		**2009**		**2010**		**2011**	**2012**	**2013**	**2014**
	BU	**AE**	**BU**	**AE**	**BU**	**AE**	**BU**	**SLP**	**SLP**	**SLP**
Fixed assets	1042	6197	1966	5809	3704	5730	11111	11089	24894	24607
TFA including:	1042	5905	1936	5593	3239	5612	10850	11089	24740	24522
1. NFA	924	5905	1448	5593	2766	5612	8839	1164	24415	24100
2.FAUC	119	0	488	0	473	0	2011	24	325	421
Current assets	273	943	344	870	357	167	490	912	1991	1987
Balance sheet total	1315	7140	2310	6679	4061	5897	11601	12001	26885	26594
At the disposal KNP	8455		8989		9958		11601	12001	26885	26594

Legend: BU – budget unit KNP, AE – Ancillary Entity at KNP, SLP – State legal person KNP, TFA – tangible fixed assets, NFA – net fixed assets, FAUC – fixed assets under construction, At the disposal KNP = balance sheet total BU+ balance sheet total AE

revenues included in the category of the other operating income (grants from the National Fund for Environmental Protection and Water Management, the Regional Fund for Environmental Protection and Water Management, proceeds from the sale of redundant assets, received contractual penalties, etc.) and also revenues form performed business activities (sales of timber, animals, admission and resources sharing fees, housing rents, lease of land and buildings, etc.). The level of revenues is presented in tables 5 and 6.

Table 5. Revenues of SMNP and the Ancillary Entity at SMNP in the period 2008-2014 in thousands PLN.

Specification	2008		2009		2010		2011	2012	2013	2014
	BU	AE	BU	AE	BU	AE	BU	SLP	SLP	SLP
Total revenues, including:	77	5539	74	3604	773	3652	3423	5163	4754	9403
1. ST	0	3169	0	1403	0	1869	1983	2610	2480	2485
2. A&R	0	1470	0	1537	0	1338	1334	1769	1719	2036
At the disposal SMNP	5616		3678		4425		3423	5163	4754	9403

Legend: ST – The sales of timbe, A&R – Admission and resources sharing fees, At the disposal SMNP = total revenues BU + total revenues AE,

Table 6. Revenues of KNP and the Ancillary Entity at KNP in the period 2008-2014 in thousands PLN.

Specification	2008		2009		2010		2011	2012	2013	2014
	BU	AE	BU	AE	BU	AE	BU	SLP	SLP	SLP
Total revenues, including:	130	5889	428	6456	662	4119	4023	11957	10863	14714
1. ST	0	677	0	687	0	945	482	873	1134	1173
2. A&R	0	2484	0	2639	0	2211	2563	2728	2833	3086
At the disposal KNP	6019		6884		4781		4023	11957	10863	14714

Legend: ST – The sales of timbe, A&R – Admission and resources sharing fees, At the disposal KNP = total revenues BU + total revenues AE,

Table 7. Costs of statutory activities incurred by SMNP in the period 2008-2014 in thousands PLN

Specification	2008		2009		2010		2011	2012	2013	2014
	BU	AE	BU	AE	BU	AE	BU	SLP	SLP	SLP
Operating costs	2533	4745	2670	2900	2673	3323	5676	6696	6770	6913
Other operating costs	12	51	0	26	0	48	19	28	106	56
Financial costs	0	19	0	14	0	3	5	0	0	7
Total costs	2545	4815	2670	2940	2673	3374	5699	6724	6876	6976
At the disposal SMNP	7360		5610		6047		5699	6724	6876	6976

Table 8. Costs of statutory activities incurred by KNP in the period 2008-2014 in thousands PLN

Specification	2008		2009		2010		2011	2012	2013	2014
	BU	AE	BU	AE	BU	AE	BU	SLP	SLP	SLP
Operating costs	2381	5445	5501	6063	6440	3767	12494	12900	12779	16158
Other operating costs	0	209	0	251	0	254	4	361	15	130
Financial costs	1	1	0	0	0	0	22	29	40	32
Total costs	2382	5655	5501	6314	6440	4021	12520	13290	12834	16320
At the disposal SMNP	8037		11815		10461		12520	13290	12834	16320

The costs incurred by the discussed national parks (see tables 7 and 8) in their major part refer directly to activities having impact on the development of their tourist function – they derive from actions related to the tourist oriented provision of park area, environmental education and ensuring the sustainability of park natural and cultural resources. It means that the above-mentioned issues are directly associated with maintaining nature uniqueness as fundamental for the area attractiveness.

While assessing both costs and revenues of national parks, the financial result calculated on their basis is not significant. National parks in Poland represent the organizations for which nature protection, rather than profit, remains the priority. Therefore, the loss incurred cannot be assessed negatively. This, however, does not change the fact that when managing funds, national parks have to follow public spending rules, the most important of which is the compliance with public procurement law. The level of costs and revenues is primarily used to present the scale of activities carried out by the analysed entities. Among the projects implemented by SMNP in the analyzed period the following, among others, should be listed as taking advantage of the European Union funds:

- within the framework of the project: “The revitalization of infrastructure in Szczeliniec Wielki – Views without borders” implemented as part of the European Territorial Cooperation Operational Program: Cross-border cooperation The Czech Republic - The Republic of Poland 2007-2013,
- within the framework of the project: “The development of plans for protective tasks covering Nature 2000 area on the territory of Poland” implemented as part of Infrastructure and Environment Operational Program 2007-2013.

KNP has and still is implementing the EU projects within the framework of Infrastructure and Environment Operational Program, the European Territorial Cooperation Operational Program: Cross-border cooperation The Czech Republic - The Republic of Poland and the European Territorial Cooperation Operational Program for Central Europe. The cooperation between KNP and KRNAP opens opportunities for the development of local communities [10].

Additionally, both units keep renovating tourist routes and extend their educational offer. SMNP and KNP are significantly improving the level of safety in the tourist subregion, not only by maintaining tourist routes, but also through Volunteer Mountain Rescue Service co-financing.

The above presented facts lead to the conclusion that national parks guarantee complex approach to the managed space. The so-called “hard” investments supplemented by “soft” activities in the sphere of ecological education also support the development of qualified tourism. The cross-border nature of KNP is manifested in creating the Polish-Czech tourist product – also as a result of EU funds implementation, e.g. within the framework of the project entitled: “The development of KRNAP and KNP tourist infrastructure” resulting in, among others, the establishment of Information Centre in Karpacz on the Polish side and the revitalization of monastery garden in Vrchlabi on the Czech side. The territorially connected municipalities can take advantage, at no cost, of the effects resulting from both park activities - among others establish an individual tourist product using values within the borders of protected areas.

5 Final remarks

National parks should not be associated with space only – they also represent living economic organisms. For the territorially connected municipalities they not only mean statutory prohibitions imposed on the usage of space, but also opportunities for partnership in accomplishing common interests covering: cultural and natural heritage protection and preservation, local community integration and local patriotism promotion, the development of tourist function with particular emphasis on sustainable tourism and also the establishment of a cross-border tourist product.

The limitations referring to the implementation of national parks' space, provided for in the Nature Conservation Act, are commonly known. Accessing data characterizing national parks as entities is much more difficult since it requires the knowledge of financial and accounting documentation. In the summary of findings referring to the analyzed period (2008-2014) it has to be emphasized that the value of assets at the disposal of both units, the level of revenues, or the volume of statutory costs allow stating that KNP and SMNP represent entities having impact on the development of the territorially connected municipalities not only by means of statutory prohibitions, but also through active, independent actions. Public disclosures of information about the discussed national parks open a chance for cross-border cooperation intensification and also facilitate searching for a cooperating partner in the course of EU projects implementation.

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Comparison of ICT Development in V4 Countries

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Abstract. The development of the companies, society or economy is nowadays closely connected with ICT. The increase of the technological options and the ICT development leads to higher demand for technical equipment but also for the IT knowledge. In global economy, the changes and trends in one country influence other countries in their development. As the ICT level has a huge impact on so-called digital economy or on Industry 4.0 (especially in changing the business models as a tool in changing the impact of ICT on economy) the aim of this paper is the comparison of the ICT development in V4 countries. The comparison focuses on the competitiveness of countries in technological readiness and the position of countries in the digital economy and society. Results of our multidimensional evaluation present the conclusion that the Czech Republic occupies the leading position among V4 countries in competitiveness in technological readiness. The most lagging country has been identified Poland in investigated factors.

Keywords: ICT, Digital Agenda, Comparison of Countries.

1 Introduction

Information and communication technologies (ICT) belong to the necessary basics for the everyday life of nearly each company or each person in the developed society. Internet, various online communication tools, social networks, data repositories, etc., are becoming a common part of life. Thus, new concepts such as "Digital Economy" or "Industry 4.0" which is related to the expansion of ICT in society come into being. Digital economy is related with the huge expansion of the usage of computers, laptops, tablets, smart mobile phones, and similar devices, and broader internet connectivity [17]. The digital economy now permeates lot of aspects of the world economy, impacting sectors as varied as media, energy, transportation, mechanical engineering, industry, banking, retail, education, publishing or healthcare. ICT are transforming the ways social interactions and personal relationships are conducted, with fixed, mobile and broadcast networks converging, and devices and objects increasingly connected to form the Internet of Things [16].

The necessity to be online changes the behavior of people and companies. In the Czech Republic, the material of the updated State Policy on Electronic Communications - Digital Czech Republic v. 2.0, The Road to Digital Economy was approved in 2013. It supports the construction of high-quality infrastructure including high-speed Internet access, digital services development and digital literacy [14].

New forms of business are emerging and digital information and its transmission becomes a major business advantage [21]. As a result, the new concept, Industry 4.0, sometimes called the Internet Things [2] or the Fourth Industrial Revolution, has also started to be important for the future development. Most of the developed countries react in preparation of Industry 4.0 programmes – in the Czech Republic it is the National Industry Initiative 4.0 [13].

ICT and their implementation in economic practice are changing both existing process models and actual business models. The changes in these models are analyzed by major consulting and advisory companies. Also, the Massachusetts Institute of Technology IT has developed a respective approach in cooperation with Deloitte [11]. Beyond those broad models there are also models focusing on specific issues such as electronic invoicing processes [3] or electronic procurement [5, 10, 22]. Models focusing on new business models pertain in particular to the concept of industry 4.0 as e.g. presented by Basl & Sasiadek [1] or in Zimmermann [25]. This concept is also reflected in a new concept of socially responsible development [17], which then reflects for example in the concept of Smart Cities. Other research papers examine the impact of ICT on the economy [4], ICT development and ICT level comparisons in selected countries [15], the impact on economic growth [8] or on the economic system as a whole [6]. Comparison of countries by selected ICT-indexes was analyzed for example by Kuncová and Doucek [12]. The Czech Republic, Slovakia and Hungary were also compared from the ICT point of view to show the evidence of stock market reaction to ICT investment [9]. List of other articles aimed at ICT in V4 countries can be found in the paper of Piotrowicz [19].

This paper focuses on the comparison of the ICT level in the Czech Republic, Slovakia, Hungary and Poland, ie. V4 countries (Visegrad Group). The aim of the analysis is to determine the extent to which the development of ICT in the Czech Republic has shifted to companies, state administration or among ordinary citizens and how the Czech Republic is in the use of ICT services compared to selected countries, namely its closest neighbors.

2 Data and methodology

Variety of statistics and surveys could be used to compare ICT in selected countries. The data used in the following comparison comes mainly from the Eurostat databases [7] and from the documents The Global Competitiveness Reports (2009-2016) [22] and the Europe Competitiveness Report [24]. Each of these documents compares selected countries from multiple points of view using different methodologies. The Global Competitiveness Report identifies the so-called Global Competitiveness Index (GCI), an index of the overall competitiveness of countries, which includes 12 basic pillars (Table 1). Out of them the 9th pillar covers 9 parts aimed at ICT (Table 2). It accounts for 17% of the GCI.

Table 1. Pillars of the Global Competitiveness Index [22].

No.	Name
1.	Institutions
2.	Infrastructure
3.	Macroeconomics Environment
4.	Health and primary education
5.	Higher education and training
6.	Goods market efficiency
7.	Labor market and efficiency
8.	Financial market development
9.	Technological readiness
10.	Market size
11.	Business sophistication
12.	Innovation

The second index that is aimed at measuring competitiveness of the European countries is the Europe 2020 Competitiveness Report. It focuses on three core areas:

- Smart growth,
- Sustainable growth,
- Inclusive growth.

Inside the areas 7 different flagship initiatives are mentioned, one of them Digital agenda. Digital agenda belongs to the first area (Smart growth) and accounts for 25% of this part and 14% of the total score.

Table 2. Parts of the 9th pillar of the Global Competitiveness Index [22].

9. Technological readiness
9.01 Availability of latest technologies
9.02 Firm-level technology absorption
9.03 FDI and technology transfer
9.04 Internet users
9.05 Broadband Internet subscription
9.06 Internet bandwidth
9.07 Mobile broadband subscription
2.08 Number of telephone lines
2.09 Mobile telephone subscription

Data from Eurostat [7] is also focused on the Digital Economy and Society, which includes four main parts:

- Use of ICT by households and individual users,
- The use of ICT in companies,
- Digital skills,
- ICT sector.

The first part is further divided into 5 areas (Internet access and computer use, Internet use, E-commerce, E-government, Regional ICT statistics), which are further divided into a total of 35 indicators. The second part of business data includes 3 domains (E-commerce, Internet connection, E-business) containing a total of 8 indicators. The Digital skills Section contains only one subset (ICT users) divided into 9 indicators. The last ICT sector does not have any sub-areas, only 3 indicators are listed.

For the comparison of the situation in the V4 countries, data of the 2014 year were mainly used but to see the development during 5 years period, sometimes also data from 2009 year were used.

Each area was evaluated separately via TOPSIS method that belongs to the multi-criteria evaluation of alternatives methods [20]. The basic concept of the TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) method is that the best alternative should have the shortest distance from the ideal solution (taken from the alternatives compared) and the farthest from the non-ideal alternative. The method is also able to rank the alternatives using the relative index of distance of the alternatives from the basal alternative. Higher relative index of distance means better alternative. As the GCI and European Report index has its own scale 1-7 for all criteria it is not necessary to use any other method for multi-criteria evaluation, but the Eurostat data is in various units and scales and that is why the TOPSIS method is applied on all criteria including the indexes to be able to compare them.

The results were then summarized for overall evaluation of the whole area in Digital agenda, Technological readiness and Digital Economy and Society. The main aim is not only to compare the countries and analyse the changes during years but also to see if there is any difference in the country ranking according to what ICT data are used.

3 Results and discussion

First of all, the share of ICT sector on GDP and its development since 2009 till 2014 is compared. Fig.1 shows that the trends in all V4 countries were more or less stable without big increase/decrease. The best country from this point of view was Hungary followed by the Czech Republic, Slovakia and the last one was Poland. The share was formed mainly by ICT services in all countries – from 70 % in Hungary to 90 % in the Czech Republic. The similar situation was in the number of persons employed in the ICT sector as % of the total employment where the highest percentage share was in Hungary (about 3.5%) – Table 3. Data show small increase during 5 years in the Czech Republic and Hungary (about 1-2% increase) and higher increase in Poland and Slovakia (about 25%) but this change does not improve the position of these countries as they were worse than the first two ones.

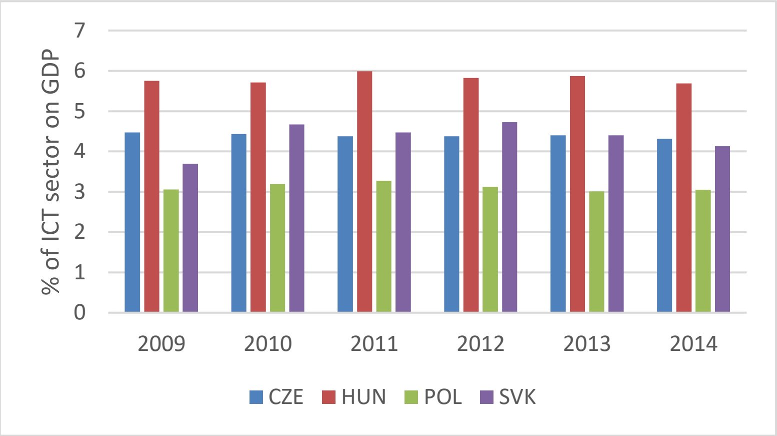

Fig. 1. Share of the ICT sector on GDP in V4 countries in the years 2009-2014 [7].

Table 3. Percentage of the ICT personnel on total employment [7].

Total	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Czech republic	2.76	2.7	2.79	2.79	2.76	2.81
Hungary	3.37	3.63	3.69	3.65	3.54	3.41
Poland	1.58	1.71	1.76	1.84	1.91	2
Slovakia	2.2	2.72	2.85	2.79	2.78	2.77

Next part of the analysis is aimed at the Digital agenda score taken from the European Competitiveness Report (Table 4). According to the score on the scale 1-7 the best two were again the Czech Republic and Hungary, the worst seemed to be Slovakia. The order of these countries from 2014 is not good as all 4 were in the worse part of the European Union.

Digital agenda is formed by 3 indicators: ICT readiness formed by 6 criteria, ICT usage (4 criteria) and ICT impact (4 criteria). For the comparison of countries TOPSIS method was used first to evaluate the countries in each indicator separately and afterwards the results of the indicators were used as new criteria for 2nd TOPSIS analysis. The results are in Table 5. Hungary was the best in ICT impact (mainly in ICT PCT patents, applications/million pop.) and ICT usage (with the best value in Government Online Service Index which was 70% compared to 50% of other countries) but it was poorer in ICT readiness. That is why finally it is at the second place close to the Czech Republic. This country was the best one in ICT readiness, especially in Internet bandwidth (kb/s per user) with 100.1 meanwhile in Hungary it was only 15. Poland was the worst one in ICT usage (worst values in all 4 criteria), Slovakia in ICT impact. The results of the TOPSIS method coincide with the Digital agenda score (although for the score different principle was used).

Table 4. Comparison of the countries - Digital agenda, year 2014 [24].

Country	Ranking (out of EU28)	Score (scale 1-7)
Czech republic	17	4.31
Hungary	21	4.3
Poland	23	3.98
Slovakia	27	3.71

Table 5. TOPSIS analysis results – Digital agenda 2014.

Country	ICT readiness	ICT usage	ICT impact	Final score
Czech republic	0.77486	0.47575	0.47012	0.67765
Hungary	0.23218	0.65175	0.93010	0.64413
Poland	0.66197	0.00000	0.20042	0.32476
Slovakia	0.17197	0.43397	0.07213	0.31809

GCI index measures the competitiveness in all 12 pillars and the 9th of them is connected with ICT – it is Technological readiness with its 9 criteria. Nearly all V4 countries had better position (except of Poland) and better score in 9th pillar of GCI than in GCI itself (Table 6) so they were better in technological readiness than in other pillars together. At first glance the results differ in the position of Poland (better than in Digital agenda) and Hungary (worse than in Digital agenda). When all 9th GCI pillar parts were taken as criteria for the comparison via TOPSIS, we see the same order (Table 7) that the best country in both years was the Czech Republic followed by Poland (which was closer in 2014 than in 2009) whilst Hungary and Slovakia were relatively far. Comparing all countries in both years together the best were the Czech Republic and Poland in 2014 followed by the Czech Republic and Poland in 2009 and then the other two countries appear. The biggest change between 2009 and 2014 can be seen in the criterion "Number of telephone lines" which increased by 390% (Hungary) or 607% (Poland) and 628% (Czech Republic). Another big increase can be registered in the criterion "Internet bandwidth" with 128% (Slovakia) or 310% (Poland) and 380% (Hungary) increase since 2009 till 2014. Other criteria were more or less stable with no big change between years. In all 4 countries, the decrease about 3-8% during 5 years can be seen in the criteria "Availability of latest technologies", "Firm-level technology absorption" and "FDI and technology transfer". This situation indicates a deterioration or loose in comparison with the developed countries. The better position of Poland was caused by the fact that the criteria "Mobile broadband subscription" and "Number of telephone lines" where Poland was the best country had higher weight in GCI 9th pillar (22%) whilst in Digital agenda they influence only the indicator ICT readiness (where Poland was also the second best country) but in the other two areas (ICT usage, ICT impact) Poland was the worst (or second worst) one.

Table 6. Comparison of the countries from the GCI point of view, year 2014 [22].

Country	GCI rank	GCI Score (1-7)	GCI 9. pillar rank	GCI 9. pillar Score (1-7)
Czech republic	**31.**	4.69	29.	5.43
Poland	**41.**	4.49	41.	4.78
Hungary	**63.**	4.25	48.	4.6
Slovakia	**67.**	4.22	44.	4.64

Table 7. TOPSIS results for GCI 9th pillar – Technological readiness.

Country	Score 2009	Score 2014
Czech republic	0.77227	0.68140
Poland	0.52194	0.51227
Slovakia	0.28057	0.28702
Hungary	0.25342	0.39362

For the last comparison, the data from Eurostat – Digital Economic and society was used. As it was mentioned before it covers 4 parts (each with several criteria):

- Use of ICT by households and individual users,
- The use of ICT in companies,
- Digital skills,
- ICT sector.

The first area covers the usage of internet by households and individual users, especially criteria like “Connection to the Internet”, “Computer use”, “E-commerce”, “E-government” etc. As opposed to previous comparisons Slovakia was the best country in 2014 (mainly because of the E-commerce). In the same area, the Czech Republic had the worst results (mainly because of the E-commerce). Although in the 3rd and 4th area Slovakia was again the best country. It is because the 3rd area “digital skills” is aimed at the computer and internet usage of individuals (how many activities related to computer or internet the individual carried out) so if only 2 criteria (instead of 9) were used (with the highest number of activities at internet/computer), the Czech Republic or Hungary would be on the top. The 4th area has only 3 criteria in which Slovakia is not the best one but as it is not poor in any of these criteria, the method put it into the first place. Only the 2nd area (ICT usage by enterprises) is different, the Czech Republic seems to be the best one (because of the best values in E-commerce and Connection to the internet). In total score Slovakia was the best country but only because of the equal weights of all criteria. As the data differ from the previous analysis (households and enterprises were separated, criteria for skills were added), the final order is also different.

Table 8. Comparison of the countries - Digital economic and society, 2014 [7].

Rank (TOPSIS results)	**1. area Househ.**	**2. area enterpr.**	**3. area digital skills**	**4. area ICT sector**	**Total**
Czech republic	4. (0.221)	1. (0.739)	3. (0.505)	4. (0.302)	**2. (0.502)**
Poland	2. (0.363)	3. (0.279)	2. (0.514)	3. (0.333)	**4. (0.266)**
Hungary	3. (0.239)	4. (0.090)	4. (0.185)	2. (0.667)	**3. (0.295)**
Slovakia	1. (0.978)	2. (0.389)	1. (0.647)	1. (0.684)	**1. (0.711)**

4 Conclusions

The aim of the paper was to assess the situation in ICT and the digital economy in the V4 countries. Countries were compared on the basis of various indexes and ICT indicators aimed at the technological readiness, digital agenda, and from the point of view of the digital economy and society. The paper did not aim at the explanation of the reasons for the situation in ICT in individual countries. The results obtained indicate that the V4 countries were not among the top EU countries in the field of ICT, mainly in the use of the Internet by households, the digital knowledge of people, the availability of the latest technologies and their use by companies. The Czech Republic was particularly successful at the corporate level in the area of E-commerce and internet connection of companies. From the households point of view there was also a big problem with the so-called E-government agenda, where the Czech Republic was below the EU average and it was third in 2014 from V4 countries. Nevertheless, the level of ICT measured by GCI index was slightly higher in the Czech Republic than in the V4 countries, and especially firms were well prepared for activities related to the development of Industry 4.0. On the other hand, the share of ICT on GDP was highest in Hungary and the households or individual usage of internet and computers seemed to be the best in Slovakia. Only Poland was not at the V4 top from any ICT point of view. The future comparison with other developed EU countries (especially Germany) could show where the main problems in the ICT development are.

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Problems of Poverty and Motivation of Workers to Labour in the Field of Agriculture as Effects of Stagnant Economy

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Abstract. The aim of the present article is to reveal the consequences of the stagnant economy in Russia. The key problems here are: the high level of taxation, the presence of complex bureaucratic procedures, corruption, the underdevelopment of the regulatory and legal mechanism, the existence of a significant proportion of people with unofficial employment and hidden incomes, as well as a high burden on social infrastructure, financed by federal and regional budgets. The paper found that the most low-paid sectors in the country's economy are the following sectors: agriculture, education, health and services. Forced saving on wages was a tool for restraining prices for rising food costs on the one hand, as well as inadequate opportunities for preserving products until the spring, on the other hand, lead to the fact that processors of agricultural raw materials have an excellent opportunity to extract huge profits to their advantage throughout long period of time. The main task at the first stage of development of the economy should be concentrated on the elimination or minimization of poverty, especially in the agrarian sector of the economy (as a backbone of the economy), and then on the development and introduction of innovations and the growth of labor productivity.

Keywords. Economy, Wages, Subsistence, Working Poor.

1 Introduction

In modern conditions of the post-crisis Russian economy, a period of stagnation has come, in which the level and quality of life deteriorated sharply, real incomes and expenditures of the population for final consumption decreased, trade decreased, industrial production and investment in fixed assets decreased. In such conditions, the differentiation between the rich and poor parts of the population has become even greater. The existence of a huge difference between the level of remuneration of workers in certain sectors of the economy still does not motivate people to perform highly productive work and stimulates them to change their employment and activities. An example of this is the existence of chronic poverty among workers in the agricultural sector (for more than twenty-five years) and a reduction in the motivation of workers to work in the industry as a whole. A sharp decline in gross agricultural production is hampered by the growth of labor productivity of certain industries in the advanced regions of the country and the availability of state support. In order for the agro-industrial complex to become a real driver for the development of other sectors of the economy, it is necessary to intensify investments in the fixed capital of the industry and improve the development of rural social infrastructure, to solve the problem of chronic poverty, with a priority focus on the growth of professionalism, productivity and wages, and a reduction in staff turnover. In modern conditions, an integrated approach and systematic improvement of the social and economic situation is required, especially in rural areas, without which it is impossible to develop the country's agriculture and improve the quality of life.

2 Methodology and purpose

The aim of the study is to find ways to solve the existing problem of chronic poverty and increase the level of motivation of workers to work in the agricultural sector. The theoretical basis of the research is classical and modern works of domestic and foreign scientists on poverty and motivation of workers to work in the agricultural sector and analysis of the factors that determine it. The methodological basis of the research was the classical general scientific methods of research, both theoretical, based on analysis, synthesis, formalization of materials on the subject under study, and experimental ones, based on the identification of similarities and differences in the approaches studied. The paper uses tabular and graphical methods, a method of statistical analysis of performance indicators, an interdisciplinary approach for a comprehensive study of the problem. The system-functional, statistical, monographic calculation-constructive, economic-mathematical, index and graphical and other methods of research were used in the work.

3 Literature review

Among foreign scientists studying the dynamics of workers' motivation to work, the trends in their income growth and labor productivity in agriculture, the names of A. Dorward [5], Johnston, Bruce F. & Mellor, John W. [12], Timmer [25], Christiaensen L., Sarris A. [4], D. Gollin, D. Lagakos, M. Waugh [6], Caselli [1], Mc. Millan and Dani Rodrik, Restuccia, Yang, and Zhu [19], Schultz, T.W. [22]; Hayami and Ruttan [9]; Huffman, W., Evenson, R. [10] and others scientists.

In the Millennium Declaration, it was stated that by 2015, the number of poor people in the world had to be cut exactly by half. In some developing countries, the achievement of this goal has been successfully implemented. However, as studies by Cervantes-Godoy, D. & Dewbre J. show, there is a direct correlation between the costs of research and the growth of the agricultural economy [2]. Currently the costs of research are clearly not sufficient.

Low level of wages has a direct impact on the level of future pensions, which leads to the choice of the sphere of application of the labor [3].

Another problem of chronic poverty of workers employed in the agricultural sector is related to the seasonal nature of agricultural production. The workers of this industry live practically without wages for a year, and then they have to sell their harvest for a pittance, trying to get at least some reward for their work, often below their cost price for the exacerbating the state of chronic poverty. This is noted in the research of Dorward A. [5] and Christiaensen L., Sarris A. [4].

The paradox of time is that the time given to a person for life goes away irrevocably, it cannot be returned. In this regard, every sensible person decides which life path to choose, what profession to choose, and which industry to work in. According to our research, the labor productivity of workers in the agricultural sector is more than 30 time slower than the level of labor productivity in the oil and gas industry. Analogous conclusions are contained in the writings of the scientists Caselli [1] and Restuccia, Yang and Zhu [19] who also note that the difference in the level of labor productivity is very differentiated by branches of the economy [6].

The problems of convergence of the level of remuneration of people engaged in high-tech production and people with low skill level (in non-agricultural sphere) are updated with the help of economic and mathematical modeling in the work of Caselli F. [1]. As the matter of fact issues of gender discrimination in the wage rate have a direct impact on employment in agriculture [7].

The level of person’s education also influences the level of his income, and the relationship between long-term poverty and limited opportunities for education, especially for the rural population, is absolutely obvious in modern conditions. The poor become poorer, the rich get richer. The new technological structure, to which the modern society has approached, hypothetically as samisen increase in the level of education and competence of specialists for work in go modernized technology and for the introduction of new innovative technologies. The results of our studies based on the official data of the Federal State Statistics Service showed that there are approximately 0.5 mid-level specialists and 0.3 people of working professions per one specialist with a high reeducation. In this regard, the polarization of society is growing, and modernization comes to a dead end. In their works, well-known Russian scientists Gimpelson, V., Kapelyushnikov, R.I. note that "under current conditions, structural changes in employment in the Russian labor market occur," and "maintaining a high level of employment and low unemployment can cause the illusion of relative stability and mask the true causes of imbalance in the labor market" [8, 13].

In Hurst, P., Termine, P., Karl, M. "Agricultural workers and their contribution to sustainable agriculture and rural development" it is noted that "farmers and plantations cannot become sustainable jobs if workers do not get decent employment and living conditions, and if they cannot participate in making decisions that affect their lives and jobs". The authors state that the contribution of 450 million agricultural workers around the world is a "talented and motivated group of people who, with proper support, can not only improve their own livelihood, but also ensure sustainable agriculture and rural development." At the same time, the authors note that the common needs and interests of people include: the fight against poverty (both agricultural workers and small farmers and their families, which form the basis of the world's poor); the right to freedom of association and the creation of their own independent organizations; improvement of health, safety and environment on farms and plantations, and others [11].

In Huffman, W. "Science for Agriculture: A Long-term Perspective," it is noted that public and private research in the field of agriculture has a direct impact on productivity growth [10].

This idea is also confirmed in the work of Hayami, Y. "Agricultural Development: An International Perspective" (1988), who noted in 1988 that the development of land, water resources, and over all agricultural development are dependent on national government sand scientific institutions dealing with providing assistance for the development of rural areas. In our opinion, this topic has not lost its relevance to the present time. Modern agriculture largely depends on the state support of promising scientific directions and the introduction of innovation son a scientific basis [9].

Specialists from low-paid sectors of the economy got more paid, despite the existing level of training of specialists. Therefore, "the economy is faced with the nontriviality of the sector a redistribution of labor" [14, 15].

Behavioral economics explaining the reasons for people's behavior in labor activity, as well as the protection of personal, private information, which includes information on the level of remuneration of workers, was studied in the works of Loewenstein, G.D. Haislesley, E. [17, 21]. In this case, according to Sent E. -M., it is subject to state regulation and intervention [23].

Foreign experience shows that the cost of payment for workers in the agricultural sector increased when the supply of labor decreased. This is confirmed in their work Levitt, S.D. & List, J.A. [16]. A similar situation is observed now. Leading organizations that implement innovations in the territory of Russia are ready to pay employees two to three times higher wages in the industry for their professional competencies and contribute to the growth of labor productivity and gross agricultural output.

In Mc Quillin, B. & Sunden R., it is noted that the coherence of individual preferences within the regulatory and behavioral economy is in three dimensions: happiness, self-esteem of wealth and freedom influence the reconciliation strategy, or the strategy of protest to state bodies, the government, etc. [18].

According to McMillan, Rodrik, Millan, Margaret, and Dani Rodrik, as labor and other resources shift from the agricultural sector to others, there is a clear increase in productivity and income growth. At the same time, "The speed with which this structural transformation takes place is a key factor that distinguishes successful countries from unsuccessful ones." The authors also note in their work that "Developing economies are characterized by large productivity gaps between different parts of the economy" [19]. This should be fully accepted.

Nevertheless, Schultz, T. W. in his work notes that in low-income countries the issue of ensuring food security becomes an elusive goal [24].

According to Cervantes-Godoy D. & Dewbre, J., "the gains from investing in agricultural research, development, expansion and sustainable improvement in agricultural productivity" are to study fact or productivity based on empirical evidence. Using regression analysis, the authors proved that the growth of labor productivity in agriculture can influence poverty reduction [2]. This conclusion is also confirmed by Thirtle, Linand Piesse who study the influence of the growth of total factor productivity on the poverty indicator, measured in percentage of the population living on less than $ 1 a day [25].

4 Research results

According to the official statistics, a sixth of all workers in Russia cannot financially support themselves and their families. In recent years, a significant part of the working population has appeared in Russia, whose income was below the subsistence level of the able-bodied population. According to the Federal Service of State Statistics of the Russian Federation [20], about two million Russians receive wages at a level below the subsistence level. This number is more than 7% of the total number of working population. Given that the majority of the working population has dependents who need to be supported for the same wages, then the total number of poor working people is at least 12 million people (which is almost 20% of the total working population) [20]. Approximately 60% of all poor people in the country are people of working age, of which 90% are working.

Another reflection of the realities of a stagnant economy is that the level of wages in the public sector (where about one third of the economically active population is working) is catastrophically low. At the same time, the wage gap between the state and non-state sectors tends to grow every year. The proportion of poor employees in the public sector is four times higher than in the non-state sector.

At the same time, it is the public sector that is the mainstay of the country's budget system. As the main source of replenishment of the budget are income from labor payment (table 1).

Table 1. Structure of monetary income soft he population of the Russian Federation by sources of income for the period from 2009 to 2016.

Indicators	2009	2010	2012	2013	2014	2015	2016	2016/2009 in %
Total cash income, bln. ruble including (in percentage):	100.0	100.0	100.0	100.0	100.0	100.0	100.0	188.5
Remuneration of labor, including hidden wages	67.3	65.2	65.1	65.3	65.8	65.6	64.7	96.1
Income from business activities	9.5	8.9	9.4	8.6	8.4	7.9	7.8	82.1
Social payments	14.8	17.7	18.4	18.6	18.0	18.3	19.2	129.7
Income from property	6.4	6.2	5.1	5.5	5.8	6.2	6.3	98.4
Other income	2.0	2.0	2.0	2.0	2.0	2.0	2.0	100.0

According to the Federal State Statistics Service, from the data presented in the table it follows that for the period from 2009 to 2016 certain changes occurred in the structure of monetary in comes of the population. On the one hand, the share of income from entrepreneurial activity and labor payment has decreased. Incomes of labor payment, including hidden wages, decreased by 2.6 percentage points (from 67.3% in 2009 to 64.7% in 2016). The share of income from entrepreneurial activity decreased from 9.5% in 2009 to 7.8% in 2016 (by 1.7 percentage points). On the other hand, the share of income from social payments increased from 14.8% in 2009 to 19.5% in 2016, i.e. by 4.7 percentage points. The share of income from property and other income has not changed.

A significant increase in the share of social payment a decrease in the level of official incomes of the population aggravate the economic situation of the country and its population, leading to dependency. According to the World Bank, social assistance to people in need of social supports hould be direct and targeted so that "there all y poorest 20% of the population receive not a quarter of all resources al located for social support, but much more". The citizens have high hopes for the state, as the state is forced to reduce and restructure governments pending.

Let us consider the structure of the use of cash income in Table 2.

Table 2. The structure of money expenditures by the population of the Russian Federation (in percentage).

Years	Purchase of goods and services	Mandatory payments and contributions	Savings	Buying foreign currency	Increase (+), decrease (-) at the hands
2009	69.8	10.5	13.9	5.4	+0.4
2010	69.6	9.7	14.8	3.6	+2.3
2011	73.5	10.3	10.4	4.2	+1.6
2012	74.2	11.1	9.9	4.8	0.0
2013	73.6	11.7	9.8	4.2	+0.7
2014	75.3	11.8	6.9	5.8	+0.2
2015	71.0	10.9	14.3	4.2	-0.4
2016	72.6	11.4	11.2	4.0	+0.8
2016/2009 (+/-)	+2.8	+0.9	-2.7	-1.4	+0.4

From the data presented in table 2, it follows that in the structure of the use of monetary incomes by the population of the Russian Federation, the share of costs for the purchase of goods and services increased (by 2.8 percentage points), as well as for payment of mandatory payments and contributions (by 0.9 percentage points) and there is also a small increase in cash income remaining at the hands of the population (by 0.4 percentage points). The decrease in the share of savings (by 2.7 percentage points), as well as currency purchases (by 1.4 percentage points) indicate a decrease in the amount of cash.

There are also noted significant changes in the structure of the receipt of money from the social insurance fund of the Russian Federation (see Fig.3).

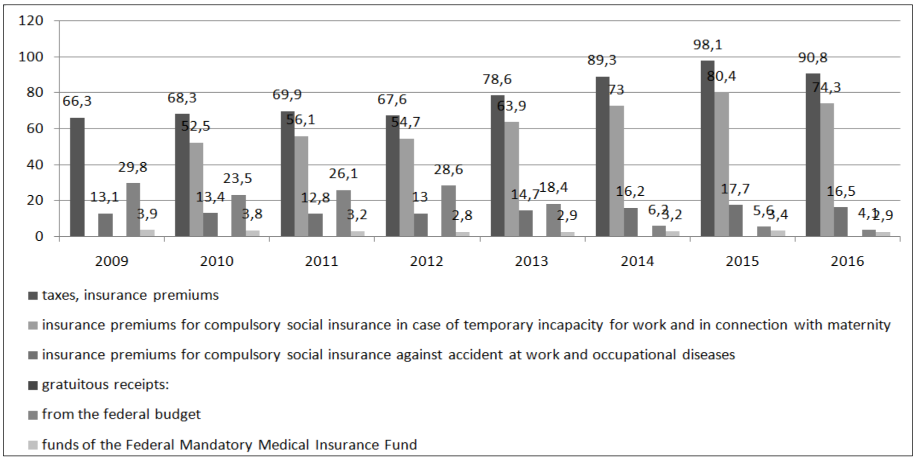

Fig. 1. Structure of the cash flows of the Social Security Fund in the Russian Federation (in percent).

From the data presented in the figure it follows that the greatest share of cash receipts falls on taxes and insurance premiums: from 66.3% in 2009 to 90.8% in 2016 (by almost 24.5 percentage points). The size of insurance premiums for compulsory social insurance in case of temporary disability and in connection with maternity is noticeably increasing: from 52.5% to 74.3% (21.8%). The gratuitous receipts from the Federal budget, the funds of the Federal Fund of Mandatory Medical Insurance are significantly reduced.

The activation of scientific and production potential, a reference point for the transition from a socially-oriented to a market economy will achieve the goals set. In our opinion, the creation of official jobs will help to solve the problems of poverty and the removal of the problem of dependency. Official tax payments will be the source of cash flow to the budget. Uncertain economic prospects continue to limit consumption growth and investment, especially in the agricultural sector. Geopolitical events and sanctions have a beneficial effect on the diversification of enterprises and industries. However, some time is required in order to re-equip the main production assets (buildings, structures, machinery, equipment, new technological lines, etc.).

The state saves on employees' salaries, which in the future can lead not only to a high level of staff turnover and a shortage of qualified specialists, but also to the growth of corruption. Levitt and List have argued that lab experiments in corruption may lack external validity because they often fail to incorporate some relevant features [16].

According to research of R.I. Kapelyushnikov, "in the budgetary sector, workers with low wages, low education, low labor discipline really concentrate; as a rule, there are more often women, elderly people "[8, 13, 14, 15].

The consequences of a stagnant economy are the existence of organizational contradictions that are not conducive to the development of small and medium-sized businesses. Among them, the high level of taxation, the presence of complex bureaucratic procedures, the partial appearance of corruption, the underdevelopment of the regulatory and legal mechanism, the existence of a significant proportion of people with unofficial employment and hidden incomes, as well as a high burden on social infrastructure (primarily health care and education), financed by federal and regional budgets. In combination, the above reasons worsen the social security of Russians not only in the able-bodied, but also in the pension period.

According to the resolution of the Government of the Russian Federation from January 1, 2018, the minimum wage will rise to 85% of the subsistence level of the population, and from January 1, 2019 - to 100%. According to the Ministry of Labor and Social Protection of Population, this will reduce the level of poverty and inequality in the country [24].

The minimum wage is calculated on the basis of the value of the consumer basket, the composition of which does not yet meet the rational consumption norms for maintaining human health. Saving money by the state on wages, poor public medical care, the emergence of a significant number of private, expensive clinics exacerbates economic growth and the preservation of public health. Poor people who are not able to timely fill the costs of labor physical and mental efforts are irretrievably undermined by health, and there is no interest in increasing labor productivity and introducing innovations. The transition to an innovative, informational, cognitive economy under such conditions may not occur very soon.

The lack of demand for major, leading, senior and junior specialists and an increase in the demand for skilled, unskilled and unskilled labor of the working professions lead to a loss of time for retraining of specialists. On the other hand, specialists from the sectoral economies (agro-industrial complex (including agriculture), processing, light and heavy industry) often leave their care in the sphere of services and services, where the level of remuneration is higher and of any special qualification, as a rule, not required. Low wages create a deficit of personnel in certain industries. In particular, for the period from 1990 to 2016, In the agricultural sector, the reduction in the number of employees was more than five-fold. At the same time, the level of remuneration of workers in this sector does not exceed the average for the country's economy in all federal districts of Russia (Table 3).

Table 3. Average monthly nominal accrued wages of workers in the Russian Federation by type of economic activity (rubles) [Calculated by authors according to: 20].

Indicators	2009 y.	2010 y.	2012 y.	2013 y.	2014 y.	2015 y.
Total in the economy	18637.5	20952.2	26628.9	29792	32495.4	34029.5
Agriculture, hunting and forestry	9619.2	10668.1	14129.4	15724	17723.7	19721.1
The ratio of the level of wages in the agricultural sector to the average for the economy, %	51.6	50.9	53.1	52.8	54.5	58.0
Total in the economy	22404.6	25376.9	32466.0	36212.0	39944.8	41961.4
Agriculture, hunting and forestry	10825.1	11883.9	16038.3	18001.0	20259.2	22840.7
The ratio of the level of wages in the agricultural sector to the average for the economy, %	48.3	46.8	49.4	49.7	50.7	54.4

Indicators	2009 y.	2010 y.	2012 y.	2013 y.	2014 y.	2015 y.
Total in the economy	13987.4	15613.6	20020.4	22481.0	24601.3	25632.1
Agriculture, hunting and forestry	7922.6	8602.0	11457.1	12811.0	14836.6	16237.5
The ratio of the level of wages in the agricultural sector to the average for the economy, %	56.6	55.1	57.2	57.0	60.3	63.3
Total in the economy	22269.0	25034.5	31598.4	34735.0	37269.9	39082.9
Agriculture, hunting and forestry	10645.9	11708.1	15248.8	17340.0	18910.3	20005.9
The ratio of the level of wages in the agricultural sector to the average for the economy, %	47.8	46.8	48.3	49.9	50.7	51.2
Total in the economy	16606.4	18657.6	23788.5	26398.0	28347.1	29615.6
Agriculture, hunting and forestry	8352.4	9422.8	12930.2	14555.0	16197.8	18142.1
The ratio of the level of wages in the agricultural sector to the average for the economy, %	50.3	50.5	54.4	55.1	57.1	61.3
Total in the economy	14065.7	15560.1	19822.7	22496.0	24311.3	25470.7
Agriculture, hunting and forestry	9986.0	11397.9	14520.2	16214.0	18137.6	20388.9
The ratio of the level of wages in the agricultural sector to the average for the economy, %	71.0	73.3	73.3	72.1	74.6	80.0
Total in the economy	11431.9	12569.2	16725.0	19358.0	20930.1	21719.8
Agriculture, hunting and forestry	7804.0	8942.4	11014.1	12726.0	14023.8	17268.8
The ratio of the level of wages in the agricultural sector to the average for the economy, %	68.3	71.1	65.9	65.7	67.0	79.5
Total in the economy	20892.7	23531.5	29057.8	32548.0	35468.1	37930.5
Agriculture, hunting and forestry	13388.1	14971.0	19279.7	20563.0	22638.9	24582.0
The ratio of the level of wages in the agricultural sector to the average for the economy, %	64.1	63.6	66.3	63.2	63.8	64.8
Total in the economy	23157.8	25814.2	33584.0	37578.0	40875.7	43163.5
Agriculture, hunting and forestry	12563.1	14281.0	20023.2	20183.0	23759.0	27080.7
The ratio of the level of wages in the agricultural sector to the average for the economy, %	54.2	55.3	59.6	53.7	58.1	62.7

Over a long period, the level of remuneration of workers in the agricultural sector was so low compared to the average for the economy, and quite logically people moved to more paid industries, and agriculture lost a significant part of competent specialists. The ratio of the wages of workers in the agricultural sector for more than twenty-five years in the Russian Federation was significantly lower than that of workers in other sectors of the economy (see Fig. 2).

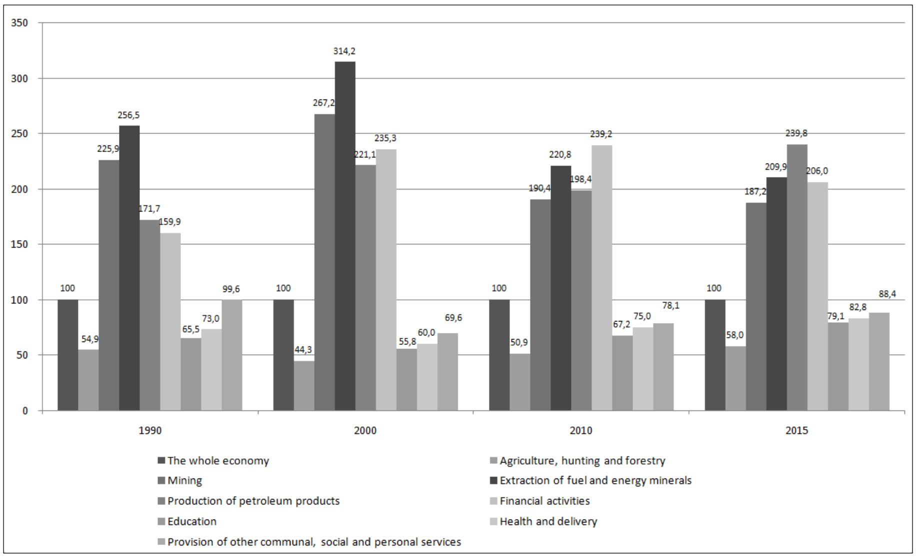

Fig. 2. The ratio of the level of wages in selected sectors of the economy in the Russian Federation for the period from 1990 to 2015 in relation to the average for the economy value (in percent) [Calculated by authors according to: 20].

From the data presented in Figure 2 it follows that the most low-paid sectors in the country's economy are agriculture, education, health and services. The most paid branches of the economy, where the level of labor remuneration always exceeds the national average (100%), are the following branches: mining, petroleum products and financial activities.

Another important indicator that graphically characterizes the situation of chronic poverty in the agricultural sector is the indicator of the specific weight of labor costs in the cost of production: crop production, livestock production, milk and grain production (see Fig. 3).

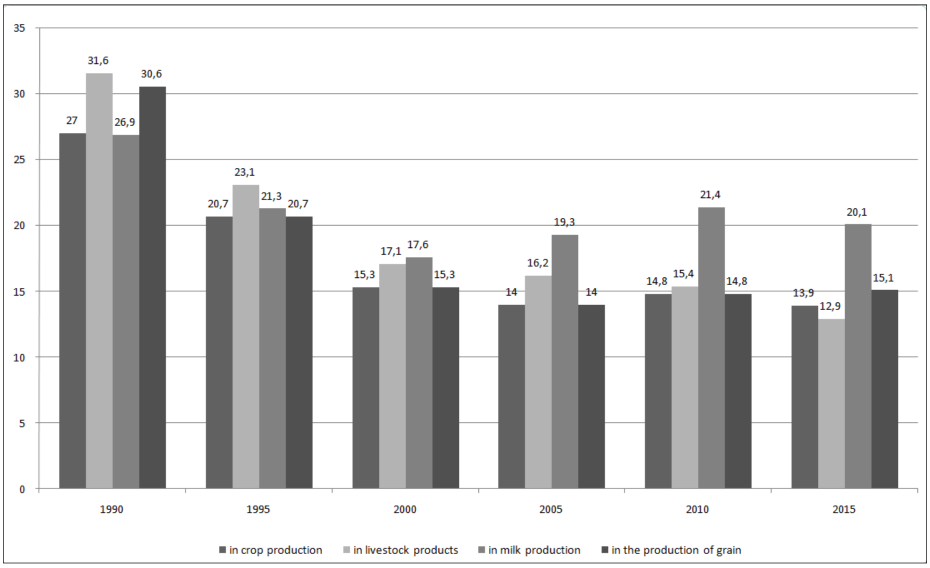

Fig. 3. The proportion of labor costs for workers in the cost of production: crop production, livestock, milk and grain production for the period from 1990 to 2015 (in percent) [Calculated by authors according to: 20].

From the data presented in Figure 3, it follows that in 1990 27% of money was spent on labor costs in the crop sector in the cost of production, in 2015 the value of this indicator decreased to 13.9% (i.e., by 13.1%). In 1990 in the structure of the cost of production of livestock products 31.6% of money was needed to pay for labor, in 2015 it was only 12.9%. In the production of milk for wages in 1990, 26.9% of gross output was directed, in 2015 - only 20.1%. In the production of cereals in 1990, wages accounted for 30.6% of the cost of production, and in 2015 –for only 15.1%. Forced saving on wages was a tool for restraining prices for rising food costs on the one hand, as well as inadequate opportunities for preserving products until the spring, on the other hand, lead to the fact that processors of agricultural raw materials have an excellent opportunity to extract huge profits to their advantage throughout long period of time. Together, this aggravates the process of impoverishment of the villagers and the village as a whole. It is important to note that this situation is typical for many countries, especially developing countries and some European countries. It is this reason that restrains the motivation of workers to work in the agricultural sector.

In addition to the insufficiently high level of motivation of workers to work in the agricultural sector, another key problem in the development of the agricultural sector is that the level of technical equipment of agricultural organizations in the Russian Federation has become extremely low (Table 4).

Table 4. Provision of agricultural organizations of the Russian Federation by agricultural machinery (units) [20].

Indicators	**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2016**	**2016 in % to 1990**
Tractors for 1,000 hectares of arable land, units	11	9	7	6	4	3	3	28.3
Load of arable land on one tractor, hectares	95	108	135	181	236	307	305	321.1
Crops on 1,000 hectares, units								
Combine harvesters								
grain harvesters	7	6	5	4	3	2	2	30.3
corn harvesters	12	15	8	5	1	0	0	-
potato harvesters	25	56	46	32	16	15	15	61.2
flax harvesters	22	34	32	22	24	14	13	59.6
beetroots harvesters (without haulm harvesters)	17	18	16	11	4	3	2	12.1
Crops, hectares								
On one combine harvester								
grain harvester	152	173	198	253	327	422	425	279.6
corn harvesters	80	68	120	215	817	2008	2497	3121.3
potato harvesters	41	18	22	31	62	67	65	158.5
flax harvesters	46	29	31	46	42	70	75	163.0
beetroots harvesters (without haulm harvesters)	61	55	62	93	278	396	423	693.4

As can be seen from the table, the number of tractors per 1,000 hectares of arable land has decreased by more than 71.7%. At the same time, the load of arable land per tractor increased by 3.2 times. The number of beetroot harvesters in the country decreased by 88%, grain harvesters - by 70%, flax harvesters - by almost 40.4%, potato harvesters - by 38.8%. One corn harvester has 31 times more arable land, a beetroot harvester – by 7 times more, a grain harvester has accounted for almost three times more cereal crops, the load on a flax harvester increased by an average of 63%, on a potato harvesting machine - by 58.5%.

Thus, there is no growth of labor productivity due to the increase in the level of technical support. It will be practically impossible to ensure the country's food self-sufficiency without introducing innovations, raising the level of the fund-raising and power-building capacity without regular monitoring of the level of territorial development of the main factors of agricultural production, and without the appropriate state support. The overall economic stagnation has a direct impact on the deterioration of the development of the most important branch of the economy - the agro-industrial complex and agriculture. This situation may ultimately affect the development of other sectors of the economy. The decline in agriculture's GDP share results partly because post-farm gate activities (such as taking produce to market becomes commercialized and taken over by specialists in the service sector) and partly because producers substitute chemicals and machines for labour. Producers receive a lower price and in return for which their households spend less time marketing [12]. In 1990, one worker in the agricultural sector produced so many products that 7 additional jobs were required in other sectors of the economy (in particular, in agricultural machinery, in processing, in trade, and others).

The problems of the development of the economy of the agricultural sector are studied by many scientists. In the works Cervantes-Godoy, D. & Dewbre, J. issues questions Economic Importance of Agriculture for poverty reduction [2, 3-5]. Gender dimensions of agricultural and rural employment consider in their works Choi, J, Laibson, D, Madrian, B.C. & Metrick, A. [3]. We totally agree with Timmer, that there should be government interventions into input and output prices through subsidies, taxes and trade policies that influence the prices of imports and exports [25]. Issues of behavioral economics based on knowledge of psychology are studied in the works Levitt, S.D.& List, J.A. [16], Loewenstein, G.D., Haislesley, E. [17], Mc Quillin, B. & Sunden R. [18], Rizzo M.Z.& Withman, D.G. [21], Sent, E.-M. [23] and others. As E.-M. Sent and Mc Quillin, B. & Sunden R. say, now the relations between economics and psychology have become a popular topic under the heading of behavioural economics though the history leading to this development has not been straightforward. Scholars forcefully claimed that economics would have benefitted from incorporating findings and theories from psychology. It has been long time since they were appreciated [18, 23]. Human behavior can be divided into rational and irrational. It is mentioned by Loewenstein, G.D. Haislesley, E. that as people consider quality and price in deciding what to buy and where to buy stuff, and make other such decisions in consumption, economic behavior is perceived to entail rationality and self-interest. However, there is a side of human behavior that seems to neglect rationality and tends to evoke self-destruction. Such behavior is displayed through making unstable investments, gambling, and activities that involve health risks such as smoking, excessive drinking, and even overeating that leads to obesity. An increasing number of economists are encouraged to look into the ability of people to perform reliable methods that show self-interest because of the developments and new findings in behavioral-economics research [17].

In the economy, everything is interconnected. The development of some industries stimulates the growth of others. The crisis state of some industries entails destructive degradation in other sectors. We see the way out of the current situation in a complex of interrelated measures aimed at stimulating the development of innovations, strengthening the basic production assets, raising the level of capital-labor ratio, energy efficiency, exceeding labor productivity growth rates over the growth rate of wages and others. As for the agriculture sector, a number of systemic issues need to be addressed: the raw material economy should be closely linked to the non-raw material (with the processing of agricultural raw materials in a closed production cycle), while observing international quality standards for manufactured products, an organizational and legal mechanism protecting the interests of small and medium-sized producers with a reference to the output of products to the world market. For this, it is necessary to develop logistics, marketing, and Internet commerce. At present, there are all resource opportunities in the country for this purpose, and we hope that a comprehensive solution of the identified problems, attracting competent labor resources, stimulating the development of innovations will achieve the goals and overcome the crisis.

5 Conclusion

Problems of poverty and motivation of workers to work in the agricultural sector are relevant not only for the Russian Federation. This problem is typical for most foreign countries and is based on, first and foremost, the availability of an inter-sectoral disparity of prices (between prices for agricultural products and industry). In addition, the low cost of agricultural raw materials does not allow commodity producers to save on mineral fertilizers, machinery and seeds (or feed). The only way to save in these conditions is to save labor costs. Proof of this is the fact of a reduction in the share of labor costs in virtually all branches of agriculture (crop production and livestock) and key agricultural products (meat and milk). To prevent deterioration of the current situation, it is necessary to regularly monitor the main economic indicators to make good management decisions when taking preventive measures to increase labor productivity and to improve production performance. Undoubtedly, measures of state support and price regulation are necessary for agricultural products, based on the economic feasibility of investing money where it is favored by natural and climatic conditions. Stimulation and introduction of innovations, development of logistics, marketing, including electronic marketing in the development of the economy of the agricultural sector will be the basis for the growth of gross agricultural production.

In conclusion, we must also say, that a contradiction is revealed between the fact that increasing poverty prevents any economy from developing, and that in agriculture poverty of working people is associated with historical peculiarities. This situation is always inherent in all countries and regions in different times. However, at present, the displacement of the labor force due to the increase in labor productivity and the competence of employees is an objective requirement of the time.

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Environmental Condition for Innovations in ICT – Czech Republic vs. Israel

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Abstract. The following work should briefly outline environmental conditions for innovative entrepreneurs and start-ups in an area of information and telecommunication technologies, conditions in the Czech Republic and comparison with Israel as one of the world innovation leaders with moreover similar size of the population as the Czech Republic. In 2017 was Israel the second most innovative state in the world by the Global Competitiveness Report with own sets of local specific conditions which are settle in the way it can be in useful for taking some directions and experiences. Although some studies shows correlations between ICT and economic growth only in some sectors and in some stage of economy evolution or correlation only if there are also fulfilled other conditions as investments to human resources, in general, studies mostly yield evidence of strong positive correlations between ICT areas and economic growth in modern economies as it participates in the reduction of transaction costs, increases production factors productivity and creates completely new solutions for current problems.

Keywords: Innovation, Information and Communication Technologies, Productivity.

1 Introduction

1.1 Importance of ICT for economy

Information and communication technologies can be considered from two sides; from production of ICT as supply side and consumption of ICT as demand side. Production of ICT can be very important for its creation of a substantial part of an economy and can be preferable in some phase of economy development to be supported by state authorities. Considered supply side then must be diversified of quality of production and its size of added value. Also consumption side is important as it responsible for effective functions and elements used by people e.g. E-government applications, internet connectivity and coverage etc. There are many synergy co-effects and correlations between both sides and which are important to raise with ICT a sustainable economic growth.

Initial studies that bring together ICT, economy and productivity growth were done by Oliner and Sichel [11] on a global level, followed by series of studies other authors

Jorgenson and Stiroh [6] with the study of U.S. economy, Oulton [12] with the study of ICT influence on the economy in the United Kingdom. Majority of authors agree with the correlation between investments to ICT and economic growth [5].

For illustration we can specify following:

- increasing penetration of 10% will increase GDP by 1,21 % in developed countries, by 1,38 % in developing countries [14],
- ICT participate on GDP by 5 % in USA, in EU by 3,5 %, in Israel 17 % and in Czech Republic by 4,5 % [15],
- area of ICT participate on increase of overall productivity by 20 % and 30 % by investments in ICT [10],
- globally ICT account 6 % of world´s economy, 20% of the economic value of ICT come from ICT industry, developing hardware and goods and 80% of benefits comes from using ICT [12].

As the area is complex with global links and under turbulent development there are also studies indicating a neutral correlation between ICT and economic growth in some sectors [8]. Nevertheless, generally can be stressed out that slow accepting of new information and communication technologies innovations is the reason for the backwardness of European countries in contrast with Asia or high-tech countries as Israel. European Commission published in 2015 document called Digital Agenda which is one of the seven pillars of Europe 2020 strategy [3]. Digital Agenda focuses on ICT to help with economic progress and innovations as European Commission strongly recommend to focus on ICT development.

ICT pillar concentrate on following topics:

- achieving the digital single market,
- enhancing interoperability and standards,
- strengthening online trust and security,
- promoting fast and ultra-fast internet access for all,
- investing in research and innovation,
- promoting digital literacy, skills and inclusion,
- ICT-enabled benefits for EU society.

The European Commission targets to digital society which brings benefits from the digital single market. It is meant to be developed and harmonized services which work globally among EU citizens as eGovernment, eHealth, Telemedicine, Smart-cities etc.

2 Comparison of ICT environmental conditions

2.1 Israel innovation & ICT approach

There are many pieces of knowledge to be reference and analyse about Israel economy way and especially areas that are linked to Israel ICT entrepreneurs and their field of innovation. Behind parts with positive results we could find various reasons; generally Israel´s people mentality, business culture as known Israeli approach called chutzpah and all the different challenges that nation is facing regarding compulsory army service where assertiveness and pro-action behaving is a part of casualty. Also there is stable long-term support of state or public research, strong universities support and support of small and medium entrepreneurs with the focus on high-tech start-ups.

Although we admire that information we could also find a few deficiencies and warnings growing up from the narrow specialization.

“A decade ago, Israel had far the highest density of start-ups in the whole world, and draw up more venture capital than anywhere. Today, the entrepreneurial pace feels more like warmish than hot” [7]. Currently Israel authorities proposing and putting in place new ways of supporting entrepreneurs and lower down their business administration.

By examining environment area of SME country which is very similar to Israel with focus on ICT start-ups - USA we pull into those data; approximately 1 million of a new business are set up every year, 40 % of them finish their activity within one year and within 5 years overall collapse 80 % of them - 800 000. From the 200 000 remaining businesses within next 5 years stops activity also 80 % - 160 000. So it means that till 10 years discontinue 96 % of initial businesses [16].

Behind those numbers are different reasons but a few of them are valid especially for ICT companies and are worth to be highlighted. One of them is “Failure to anticipate or react to competition, technology, or other changes in the marketplace” [9]. This experience from micro range goes around to the macro area of ICT complying what was already spotted about accepting of innovations in ICT and importance of ICT as business and users technology.

2.2 Innovation environment comparison

State economy with effectively set up state administration, enforceable law and low entrepreneurs barriers can use its full potential to increase life standard and global growth of positive factors, which returns in creation on new innovations and improvements, realizing and commercializing them. In table 1 was chosen 10 countries with similar size of population as the Czech Republic and Israel (+/-20 %). For those countries were obtain data from a branch of World Bank - World Bank Group’s Doing Business initiative [17] which brings information about the easiness of doing business – establish and running companies in selected countries. Complete ranking compares 189 countries. By comparing this study with similar studies of organizations Insead [5] and World Economic Forum [18] we are getting similar results.

Demonstrated comparison of chosen countries helps us in getting another relevant data for the study. Israel was ranked by position 53 from 189 countries, which is relatively low position in contrast with above findings of his strongly developed ICT area, top innovative environment and high number of start-ups not only ICT focused. As the reasons can be pointed out the unstable political background in the region which cause limitation of long-term investment and predomination of short and middle term investments, furthermore high corporate taxes and high taxes of high-income persons [15]. The Czech Republic in this comparison achieved better results with 27th place of ranking. Items in which Czech Republic scores considerably better results are foreign trade with 1st place opposite to ranking 58th of Israel, getting electricity, rank 13th against 91st place of Israel, registration of property, rank 32nd against 127th place of Israel and area of tax stress which places the Czech Republic on 53rd place against 103rd of Israel. Israel achieves better results in areas of starting business, property permits and investments protecting. Substantial of problematic parts of Israel are caused by geographical placement of country, historically difficult geopolitical situation and tax burden.

Table 1. Entrepreneurs and business conditions in selected states with similar size. Source: Own elaboration based on [17].

Country	**Population (mil.)**	**Overall ranking 2016**	**Starting a business**	**Construction permits**	**Getting electricity**	**Registration property**	**Getting credit**	**Protecting investors**	**Paying taxes**	**Foreign trading**	**Enforcing contracts**	**Resolving insolvency**
Singapore	5.4	**1**	10	1	6	17	19	1	5	41	1	27
Hong Kong	7.2	**5**	4	7	9	59	19	1	4	47	22	26
Switzerland	8.1	**20**	69	45	5	16	52	78	18	22	22	41
Austria	8.5	**21**	106	47	17	26	59	36	74	1	6	18
Portugal	10.5	**23**	13	36	25	27	97	66	65	1	20	8
Czech Republic	10.5	**27**	81	130	13	31	32	53	53	1	68	26
Bulgaria	7.3	**38**	52	51	100	63	28	14	88	20	52	48
Hungary	9.9	**42**	55	88	117	29	19	81	95	1	23	65
Israel	8.1	**53**	56	96	91	127	42	8	103	58	77	29
Serbia	7.2	**59**	65	139	63	73	59	81	143	23	73	50

Data on figure 1 illustrate gross domestic expenditures on research and development. Czech Republic´s amount of expenditures on R&D is long-term staying behind of OECD countries average. In closer comparison were in 2015 gross domestic expenditures on research and development 1.947 % of GDP, in contrast to expenditures of compared country Israel – 4.253 % of GDP. In the period from 2007 to 2013 raised expenditures significantly almost by 40 % in the Czech Republic. However, in recent period counted from the year 2013 was growing tendencies slowing down and by the year 2015 expenditures slightly decreased from 1.973 % to 1.947 % of GDP. Germany as the neighbour and the biggest export partner for the Czech Republic, strongly focused on innovations and technology development has expenditures of 2.927 % of GDP. OECD countries have average expenditures on R&D 2.38 % of GDP.

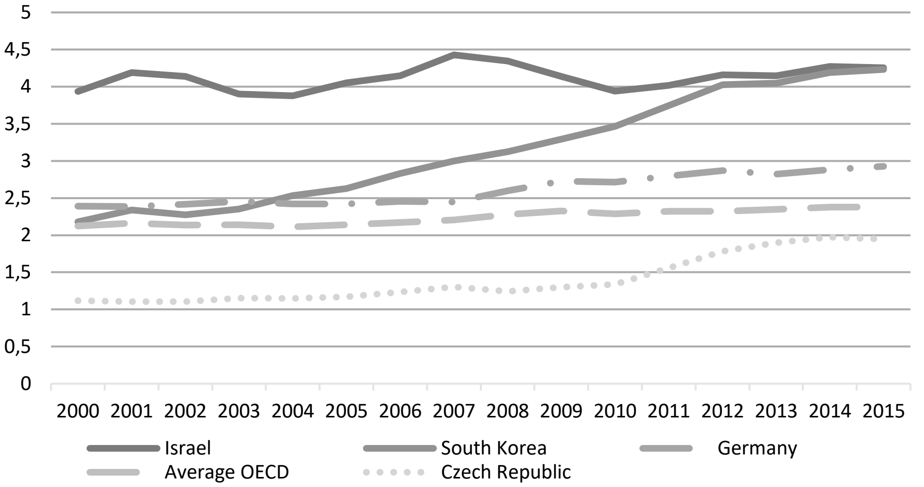

Fig. 1. Gross domestic expenditures on R&D, (%), 2000 – 2015. Source: Own elaboration based on [10].

Figure 2 demonstrates innovation activity by structural expenditures of firms on R&D and compare the Czech Republic and Israel. On figure can be seen that in the segment of services are expenditures in Israel on R&D 71.4 % of total expenditures compared to 38.2 % expenditures in the Czech Republic. Also segment high-tech has a higher representation in Israel – 20.1 % compared to 7.6 % expenditures in the Czech Republic. The Czech Republic has a higher share in non-resource based manufacturing industries which share is equal to 54.7 % compared to 25.6 % in Israel. Important is also information in the segment of SMEs, where expenditures in Israel are equal to 60.1 % compared to 45.7 % share in the Czech Republic.

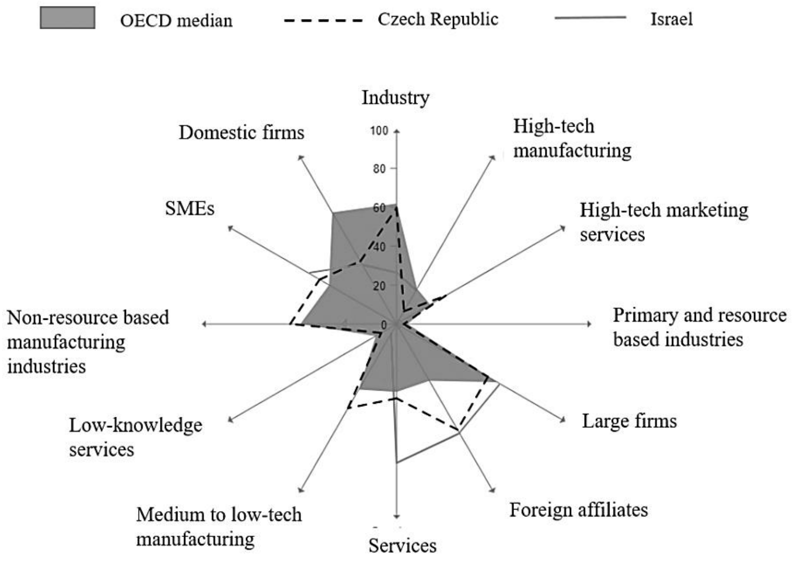

Fig. 2. Comparison of structural expenditures of firms on R&D in Czech Republic and Israel. Source: Own elaboration based on [1, 2].

Figure 3 ilustrates combination of data from Czech Statistical Bureau and Central Bureau of Statistics Israel [2, 1]. This comparison demonstrates innovation activity by the size of entrepreneurs in both analysed countries. Comparison suggests us almost double innovation activity in Israel - 83 % firms with some kind of innovation activity in Israel and 83 % innovative firms in the Czech Republic. In the segment of large firms the difference is not as significant - 77% of large firms innovate in the Czech Republic compared to 83 % of large firms which innovate in Israel. One of the reasons of the considerable difference is more stable baseline of material, financial and human resources by large firms for innovation purposes. In the segment of medium firms is difference 59 % in the Czech Republic compared to 88 % in Israel. The greatest difference is in segment of small enterpreneurs where in Israel innovate 85 % from total amount of entrepreneurs in the segment and in the Czech Republic only 35 %. On of the main reasons behind those results is stable state support of new entrepreneurs projects, startup incubators, material and financial subsidies followed strong support of private sphere. In the Czech Republic was innovation support negatively influenced by the financial crisis, when companies reduced their investments to innovative solutions especially to non-technical innovations and solutions.

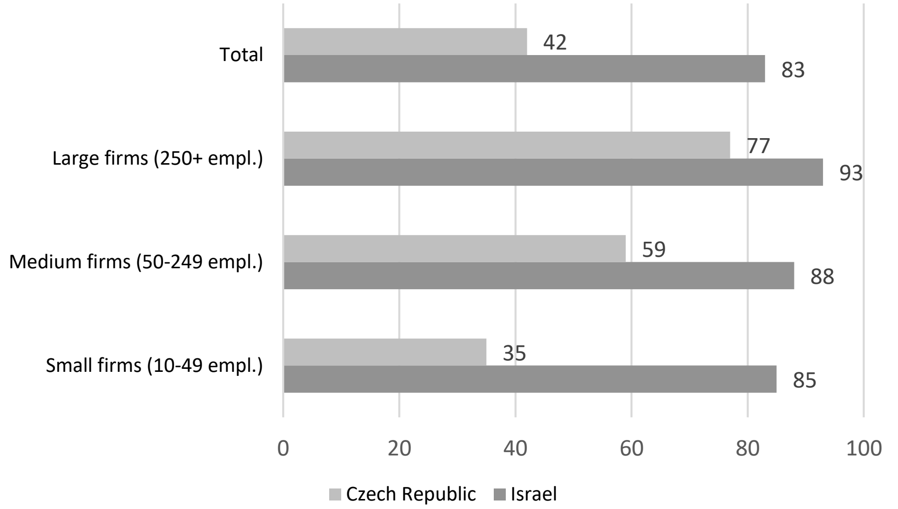

Fig. 3. Comparison of innovation activity Czech Republic vs. Israel, 2012-2014. Source: Own elaboration based on [1, 2].

Figure 4 shows the comparison of chosen criteria innovation system the Czech Republic and Israel. The comparison is based on data from databases of OECD, Czech Statistical Bureau and Central Bureau Statistics of Israel [10, 2, 1]. Bottom and top is represented by lowest/highest 5 values and figure are divided by its median on the bottom half and upper half.

The left part of figure 12 is devoted to companies' innovations and R&D. Column (a) compares R&D expenditure which was already described above. Column (c) indicate a difference in a number of registered patents which are marked as triadic. Among triadic patents belongs patents that are registered by European Patent Office (EPO), the United States Patent and Trademark Office (USPTO) and the Japan Patent Office (JPO) [12]. It´s obvious that Israel with value 3.5 registered patents per 1 bio. USD belongs among upper half countries in contrast to placed Czech Republic in the bottom half of OECD countries with value 0.14 registered patents per 1 bio. USD. The similar is relevant for column (d) where the compared number of registered trademarks is. Israel reach the value of 1.33 registered trademarks per 1 bio. USD opposite to the Czech Republic with 0.24 registered trademarks per 1 bio. USD.

In the right part of the figure are data corresponding to entrepreneur's innovations. Column (e) shows the amount of risk capital invested to start-ups. In this area has Israel in the long-term the highest rate of risk capital with 0.38 % GDP. Czech Republic with value of 0.006 % GDP belongs to OECD countries with the low volume of risk capital and lack of investors willing to support high-risk projects. Column (g) represent the index of entrepreneurs' environment. In this respect the Czech Republic brings better results. In scale of 0 – 6 where 0 stands for strong entrepreneurs barriers and 6 for low, reach Czech Republic – 4.18 and Israel 3.5.

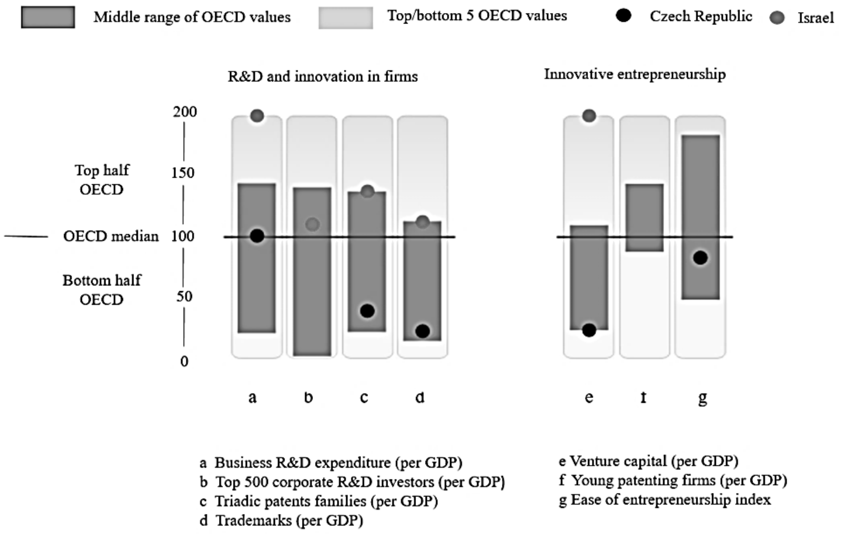

Fig. 4. Comparison of national innovation systems Czech Republic vs. Israel – 2014. Source: Own elaboration based on [1, 2].

3 Conclusions

Information and communication technologies are an instrument that can bring new effective ways and solutions to the economy and social environment. Their support on a national level by a maintenance of correct business atmosphere with the proper legal environment, supporting public research and development, subsidizing of new entrepreneurs ideas and start-ups is a proper way how to create and increase national wealth.

ICT is a resource of economic growth on side of demand and side of supply. Is it necessary to distinguish which site is preferable to support by the government. The Czech Republic strongly supported individual ICT producers of hardware components resulting to be 9th biggest ICT exporter in the world. Unfortunately, this counts only assembling imported parts which results low added value of manufacturing and offering low-income jobs. By looking to the close history we can see slightly better support be increasing state expenditure on R&D although still below the average of OECD countries and far below the top technology and innovative countries as Israel is. It is very questionable why in the Czech Republic in the period of the financial crisis where expenditures on R&D growing but recently in the overall world economic prosperity are expenditures constant moreover slightly decreasing. Low expenditures on R&D, tiny support of small entrepreneurs and innovative start-ups with increasing administrative burden is the reason why results in comparison of innovation activity in the Czech Republic are far behind results from Israel.

The Czech Republic can improve economic growth instead of supporting a new investment of companies producing low added value goods supporting by different types of subsidies public R&D and new innovative start-ups to become the high-tech country. As a country for comparison was chosen Israel which is an innovative leader in high-tech ICT industry, growing correct business environment by rising up start-ups and supporting them what generally makes country economically strong with a modern economy and business structure. Although we also demonstrated there are some areas which needs to be improved or which are specific and related to the geographical and geopolitical situation.

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Transforming Sustainability Challenges into Competitive Advantages for Enterprises: A Perspective of Sustainable Business Models

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Abstract. Traditional economic-oriented business models often have problems when faced with increasingly serious sustainability challenges. The advent of Industry 4.0 makes it necessary to transform sustainability challenges into competitive advantages for enterprises. Using a case study of a Chinese enterprise named GEM, this paper attempts to explore how sustainability challenges can be transformed to create competitive advantages. The research provides three conclusions: First, enterprises can transform sustainability challenges into competitive advantages by developing a sustainable business model, with environmental, social, and economic values. Second, a value proposition is the soul of the sustainable business model. Enterprises need not only focus on "how to do" but they must pay even more attention to "what to do", so it is advisable to integrate a value proposition into the enterprise strategy and business process. Finally, a sustainable value proposition consists of sustainable economic, environmental, and social values, and their individual importance varies in sustainable business models for different industries where the demand for environmental and social value is increasingly important.

Keywords: Sustainable Business Model, Value Proposition, GEM

1 Introduction

Population expansion and technological progress are leading towards unsustainable levels of global production and consumption is unsustainable. Resource depletion, environmental pollution, ecological deterioration, questionable food safety, unfamiliar fatal diseases, and so on, have all become increasingly serious sustainability challenges. Industry 4.0 makes it necessary that enterprises transform sustainability challenges into competitive advantages. Traditional economic-oriented business models are often inadequate when faced with sustainability challenges [6, 26], a recent situation that has been forcing enterprises to rethink their role in society and reflect on the idea that profit may not be foremost among many important business performance criteria. This is reinforced by the fact that global sustainable development and the welfare of future generations will depend on current decisions and actions by enterprises [15]. At present, there is a growing need for enterprises to address social, environmental, and economic issues through sustainable business practices [16], so sustainability has become one of the key factors for ensuring long-term business success [27], and traditional economic-oriented business models have started the transformation to sustainability-oriented business models. Therefore, research into the practice of sustainable business models is an emerging field that has attracted increased attention from academia, business, and political agents [12, 23].

Unlike traditional economic-oriented business models, sustainable business models involve a broader domain including all stakeholders and the natural ecosystem, with the goal of improving the economic, environmental, and social effects of enterprise activities [3]. Several studies have proved [8, 19, 22, 26] that sustainable business models can enable enterprises to better adapt to the complex business environment while gaining economic, social, and environmental value, and that sustainability challenges can be transformed into competitive advantages [2] and enhanced business opportunities [1]. However, academic research on sustainable business models has just started [6, 12], and comprehensive case studies are rare [6, 26], so only a few tools are currently available to assist enterprises in developing sustainable business models [8]. The accelerating need to identify new pathways for the innovation and design of sustainable business models has led to increased attention [11, 26]. To explore how sustainability challenges can be transformed into competitive advantages for enterprises, this paper attempts to exploit a sustainable business models canvas.

2 Methods and literature overview

For traditional business models, Osterwalder and Pigneur [17] proposed a market-oriented business models canvas, and on this basis, the sustainability-oriented business models canvas has been developed. Product-service Systems (PSS) have been studied by researchers from a wide range of fields and are considered pioneering innovations in the development of sustainable business models [20, 25]. Zhu and Lin [13] proposed a conceptual framework for sustainable business models composed of a sustainable value proposition, sustainable value creation, sustainable value delivery, and sustainable value capture. Based on the business model canvas proposed by Osterwalder and Pigneur [17], Upward and Jones [26] and Kurucz et al. [11] developed the Strongly Sustainable Business Model Canvas, which is a thorough revision and extension of the original business model canvas. Geissdoerfer et al. [8] brought together design thinking and sustainable business model innovation to refine the creative process of developing sustainable value propositions and improve the overall business modelling process. In the sustainable business model framework proposed by Bocken and Short [2], analysis was conducted to promote the discussion regarding the role of new methods of value proposition, value creation and delivery, and value capture in contributing to sustainability. Joyce and Paquin [10] proposed the Triple Layered Business Model Canvas as a way to coherently integrate economic, environmental, and social concerns into a holistic view of an enterprise business model. Broman and Robert [4] studied a Framework for Strategic Sustainable Development [FSSD], and França et al. [6] integrated FSSD with the business model canvas. To help enterprises in bridging the design-implementation gap in sustainable business models innovation, the Cambridge Business Model Innovation Process was developed by Geissdoerfera et al. [9]. Based on case studies of eleven organizations from diverse sectors, Morioka et al. [15] proposed a theory and practice-based framework of sustainable business models. These studies have important value for the theoretical and practical application of sustainable business models, but there are still shortcomings. First, the priorities for the sustainable value proposition elements are not sufficiently clear. Second, the enterprise positioning is weakened or even ignored. Third, the logical relationship between the sustainable business models elements is also not clear. Finally, the theoretical framework for sustainable business models is so abstract that it is difficult to put into practice.

Given the exploratory nature of the research objective, this analysis will be conducted using a case study. Using theoretical (rather than random sampling) selection criteria, an enterprise in China named Green Eco-Manufacture (GEM) was chosen. This paper uses evidence from a variety of sources. First, enterprise documents, including leader’s speeches, announcements, research reports, academic papers, books, etc., were collected. Second, in August 2016, senior managers, core technical staff, and surrounding residents of Jingmen subsidiary of GEM, Jingmen Urban Mineral Resources Recycling Industry Park, and Huishouge Internet Co., Ltd., were interviewed to gather first-hand information. Third, on the basis of the interviews, the business premises, production equipment, and processes of the enterprise were directly observed, and Huishouge APP was experienced. At the same time, a case study database was established, forming a relatively complete chain of evidence.

3 Results

Compared with traditional business models, sustainable business models have the following characteristics. Solving the problem of sustainable development and promoting sustainable economic, environmental, and social development are the primary factors driving the decision-making process and providing motivation for enterprise. The scope of enterprise stakeholders is broad and extends from the economic to the environmental and social fields. Enterprises make a profit to exist but they do not just exist to make a profit [24], they also pursue environmental and social values and design their sustainable business models based on a long-term perspective.

An increasing number of scholars have accepted that these business models integrate the value proposition, value creation and delivery, and value capture, so they provide the basic logic of business models research [2, 15]. Sustainable business models are based on traditional business models, so the basic logic of business models research also applies to sustainable business models [9].

Based on the characteristics and research logic of sustainable business models, this paper defines sustainable business models as a comprehensive program, designed to promote economic, environmental, and social sustainable development in order to create, deliver, and capture sustainable value for enterprises and their broad stakeholders with a long-term perspective. Based on previous research, Fig.1 shows a sustainable business model canvas.

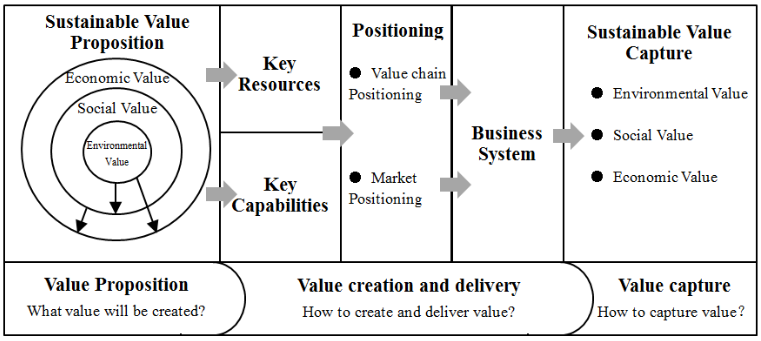

Fig. 1. Sustainable business model canvas.

3.1 Sustainable Value Proposition

The value proposition reflects the existence value of enterprises [21], which is the positive contribution of the enterprise to human development in their process of production and operation. The value proposition is at the core of the business model [17]; it is a key leverage point for enterprises to transform their business model [18], and it must be related to sustainability issues [24]. Sustainable business models are challenged to create and deliver not only financial value, but also, when it is achieved, a so called sustainable value that can be seen as the delimitation of an economic, environmental and/or social need for current and future generations, and they must provide satisfaction for the corresponding stakeholders [15]. Defining a sound value proposition is fundamental for the existence, survival, and prosperity of enterprises [5]. Therefore, the sustainable value proposition contains three parts, a sustainable economic value proposition, a social value proposition, and an environmental value proposition.

3.2 Sustainable Value Creation and Delivery

During the phase of sustainable value creation and delivery, the main issues to consider when implementing the value proposition are enterprise resources, their ability, and the inter-enterprises network, which means having strong connections to generate competitive advantages [21]. When making business decisions, enterprises should consider not only economic but also social and environmental drivers. To this end, enterprises should focus on their tangible and intangible resources and capabilities [14], and deal with relationships with partners [15]. Therefore, in order to achieve their sustainable value proposition, enterprises need to consider what key resources and capabilities they have, what key resources and capabilities they need to obtain, and how to obtain them. To deal with the relationship with partners, enterprises also need, based on the sustainable value proposition, key resources and capabilities to establish their positioning, including their value chain positioning in the production system and market positioning in the consumer system. Value chain positioning refers to the role the enterprises should play and what business they should conduct in the value network. Market positioning refers to the identification of target customers and the determination of the products and/or services to be offered. The value proposition, key resources and capabilities, and positioning determine the enterprise business system, which in turn defines the role and value exchange relationship between enterprises and stakeholders in the value network.

3.3 Sustainable Value Capture

If enterprises just rely on the value proposition and value creation and delivery but can't capture value, it would be difficult to ensure their continued successful operation [21]. However, enterprises make a profit to exist but they do not just exist to make a profit [24]. In the sustainable business model, enterprises should pursue economic values under the premise of environmental and social values.

4 Discussion

In 2001, GEM was registered in Shenzhen City, and was the first enterprise in China to put forward the business concept of "limited resources, unlimited circulation" firstly in China in 2003.Since its inception, GEM has been actively advocating the exploitation of "urban mining", and has created a unique business model for doing so.

4.1 GEM's Sustainable Value Proposition

GEM's sustainable value proposition can be summed up as the thought of "oneness of man and nature". GEM is an abbreviation for Green Eco-Manufacture, and each letter has a significant meaning: G represents green, E represents ecology, and M represents manufacturing. The overall objective of GEM is to develop an environmentally friendly industry by saving the limited resources and optimizing human living space through green manufacturing.

GEM's environmental value proposition is "to eliminate pollution and recycle resources", and to strive to resolve the dual pressures of environmental pollution and resource shortages. Their social value proposition is "to legitimize business, make a reasonable profit, be responsible for society and our staff", and to strive to take social responsibility and benefit the world. Their economic value proposition is "to innovate and upgrade, reduce costs, improve quality and efficiency", to strive to create an environmentally friendly enterprise that is efficient and competitive, and to strengthen the capacity for profitability and sustainable development.

4.2 GEM's Sustainable Value Creation and Delivery

Key resources and capabilities. GEM has broken through the key technical barriers for treating and recycling used batteries, electronic waste, end-of-life vehicles, etc., and has built sixteen circular industrial parks, six recycling systems for urban mining, and an intelligent environmental information platform based on Internet of Things technology.

Positioning. Based on the sustainable value proposition and the use of their key resources and capabilities, GEM's value chain positioning is as the leading enterprise in urban mining and recycling, and their market positioning is as a high-tech materials supplier for replacing raw materials.

Business system. GEM has established a closed-loop business system as shown in Fig. 2. While developing their process for urban mining, GEM proposed integrated waste disposal ideas that combine "internet + recycling + garbage removal + waste disposal", and have built six urban recycling systems which include systems for batteries and electronic waste, 3R chain stores in communities for recyclable good, cooperative recycling systems with public institutions and large enterprises, regional renewable resource recovery and distribution markets, and a system of "internet + recycling". In the phase of material extraction and regeneration, GEM has built five industrial chains related to recycling and regeneration of used batteries, recovery and utilization of nonferrous metals, recycling electronic waste, comprehensive utilization of end-of-life vehicles, and recycling of waste residue, gas, and water. With respect to remanufacturing, GEM has regenerated and reused scarce resources such as cobalt, nickel, tungsten, and so on, to produce new materials for batteries, wood-plastic composites, electrolytic copper, automotive components, battery power packs, and so on.

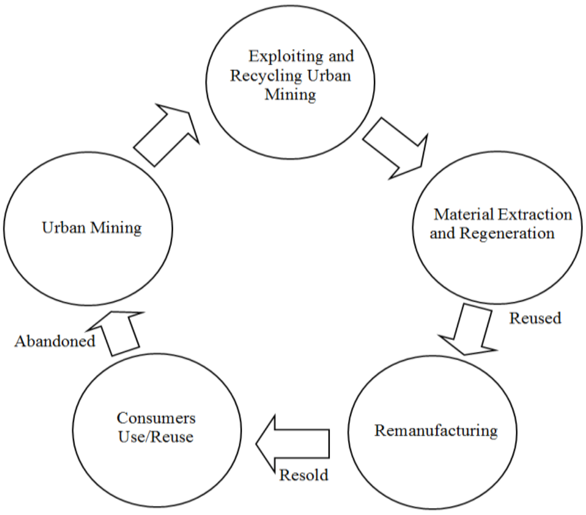
Exploiting and Recycling Urban Mining
Material Extraction and Regeneration
Reused
Remanufacturing
Resold
Consumers Use/Reuse
Abandoned
Urban Mining

Fig. 2. GEM's closed-loop business system.

Measures to help people lift themselves out of poverty. Responding actively to the national call for poverty alleviation, GEM has been developing an environmentally friendly industry in a number of counties, through the provision of funds, the development of markets, the introduction of technology, the creation of employment and by offering other supports. They are forging a new path whereby green industries can assist in poverty alleviation.

Promoting public welfare. GEM has assumed a socially responsible role by organizing and participating in various forms of public welfare and charitable activities. Their social donations amounted to 3.5 million yuan in 2016, and they have achieved a level of harmony between enterprise interests and social benefits.

Encouraging green development. GEM has created National Circular Economy Education Demonstration Base opening to the public, and urban mining museums in each industrial park; in 2016, 28,507 people attended their exhibits. To improve environmental awareness among college students and the public, GEM has been conducting programs aimed at bringing “environmental protection into the campus” along with other social welfare activities.

4.3 GEM’s Sustainable Value Capture

Environmental values capture. In 2016, GEM disposed of a total of 3 million tons of waste, recycled 37 types of resources, and regenerated 58 different products. Their efforts saved 2.84 million tons of standard coal or 13.83 million barrels of oil, reduced solid waste emissions by 22.7 million tons, and prevented 1,850 hectares of deforestation, 116.6 million tons of water pollution, 7.5 million tons of CO2 emissions, and 63,111 square kilometers of soil pollution. At present, their annual recycling of small used batteries accounts for 10% of the Chinese total; recycling lithium-ion battery cathode materials accounted for more than 20% of the national market, and accounts for the recovery of nearly the same amount of cobalt resources. The recovery of waste household appliances accounted for more than 15% of the country’s total, the recovery of tungsten accounted for 8% of China’s total tungsten exploitation from nature, the disposal of waste circuit boards accounted for more than 20% of the domestic total, and the recovery of germanium resources accounted for 6% of the global total. Driven by enterprises like GEM, recyclables and renewables have become important resources to support the national economy.

Social values capture. Through the promotion of the concept of green development and the improvement of six recycling systems, GEM has constructed a recycling network for transferring waste resources from residents to communities and to society as a whole, which promotes a transformation in enterprise operations and individual lives, and improves the level of environmental awareness. Their targeted measures designed to help people lift themselves out of poverty encourage the poor to share in the achievements of enterprise development, a process which aids in the unification of the enterprise’s social responsibility and economic performance. By actively organizing and participating in various aspects of social public welfare and charity activities, GEM takes a level of responsibility for social benefit. As a result, GEM has been awarded a number of honorary titles by the state, earned praise from the public, and created a good corporate social image.

Economic values capture. GEM has created a value-added model based on recycling waste and urban mining. Business income and profits increased continuously, climbing from RMB 570 million and RMB 97 million in 2010 to RMB 7,836 million and RMB 366 million respectively in 2016, with a respective average annual growth rate of 54.8% and 24.2%.

5 Conclusion

To some extent, the sustainable business model canvas discussed in this paper overcomes the shortcomings from existing research, and enriches the sustainable business model theory. The following three conclusions are reached: First, enterprises can transform the challenge of sustainability into a competitive advantage by developing a sustainable business model, with environmental, social, and economic values. Second, the value proposition is the soul of the sustainable business model, enterprises need not only focus on “how to do” but they must pay even more attention to “what to do”, therefore it is advisable to integrate the value proposition into the enterprise strategy and business process. Finally, the sustainable value proposition consists of sustainable economic value, environmental value, and social value, and their importance differs in sustainable business models for different industries where the demand for environmental and social values is increasingly important.

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The Evaluation of the Quality of Agricultural Economic Growth in China

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Abstract. Based on the connotation of the agricultural economic growth, this paper objectively evaluates the sequence development level of agricultural economic growth quality and the regional differentiation characteristics in China from four dimensions of the agricultural production efficiency, agricultural economic structure, the farmers' quality of life and the sustainable development level, and put forward to promote the adjustment and optimization of agricultural economic structure, take the resource-saving and environment-friendly sustainable development road, and improve the efficiency of agricultural production which is beneficial to the enhancement of the agricultural economic growth quality and the shift of the agricultural economic development mode.

Keywords: Agriculture, Growth Quality, Entropy Method.

1 Introduction

Agriculture is the basis of a country's economy and the foundation of a country's development. The agricultural problem has always been the focus of government and economists. Considering China, with the rapid development of economy and the continuous acceleration of urbanization and industrialization process, the transformation of the agricultural sector has been demanded.

We can see that over the past 30 years of reform and opening up, China's agriculture has achieved great success, providing sufficient sources of production factors for the rapid growth of the country's economy, and successfully feeding more than 20 percent of the world's population with less than 10 percent of the world's arable land. However, the rapid urbanization and industrialization of the transition period have caused a series of corresponding problems and a great impact on the agricultural sector. These problems can be systematically summarized as follows. First, the unit agricultural input is not proportional to output. Second, progress in agricultural technology has been slow. Third, agricultural sustainable development capacity is weak. Fourth, the quality of rural labor is not high enough.

2 Literature Overview

In modern times, many western bourgeois thinkers such as Adam Smith, David Ricardo, Freidrich Liszt and other people held the one-sided view that the development of the society is merely a kind of economic phenomenon, and the development process is the process of the material wealth growth. However, with the deepening of people's understanding, Thomas and Barro found that economic development is not equivalent to economic growth [1, 10]. Comparing with economic growth, economic development has broader contents, including the reform and improvement of social structure in terms of economy, politics, culture and law. As Liu broadly defined that improve the quality of economic growth refers to continuously improve the stability of the economic growth, the sustainability of economic growth mode, the coordination of economic growth structure and the harmony of the economic growth efficiency [7]. As Chao and Hui proposed that the extension of economic growth should be defined as the economic aspects that are closely related to economic growth, including four dimensions: the structure of economic growth, the stability of economic growth, the welfare change and the fruits distribution of economic growth, the utilization of resources and the cost of ecological environment [2].

In fact, agricultural economic growth is the growth of quantity rather than quality. In order to fundamentally realize the transformation of the quantity of agricultural economic growth to quality, we must recognize the connotation of agricultural economic growth quality.

Based on the connotation of the quality of agricultural economic growth, this paper evaluates the quality of agricultural economic growth in China. The scholars above are mainly based on the perspective of the whole national economy to study the quality of China's economic growth, but rarely discuss the quality of agricultural economic growth. Actually, we should pay more attention to the quality of agricultural growth and the transformation of agricultural development mode while focusing on the "three rural issues "(agriculture, rural areas and farmers).

3 Methods

3.1 The construction of evaluation index system of China’s agricultural economic growth quality

The quality of agricultural economic growth is the quality of economic growth during the agricultural economic growth period. The concept of agricultural economic growth quality is based on the meaning of economic development. Its content is not only limited to the improvement of the utilization efficiency of resources, labor, capital and other production factors, but should also include the optimization of the economic structure, the promotion of the quality of farmers' life, the sustainable development of ecological environment and a series of content related to the development of agriculture, rural areas and farmers. The quality of agricultural economic growth is the development and supplement of agricultural growth mode. Therefore, when establishing the index system, we should cover all aspects of agricultural development as much as possible to establish a complete, systematic and comprehensive index system. Building an index system of assessment of agricultural economic growth quality is helpful to understand the process of agricultural development, the impetus, and resistance of agricultural economic growth and the direction of the agricultural economic growth.

Taking the connotation of agricultural economic growth quality as a starting point, following the purpose, scientific, systematic, feasibility, comparability and pertinence principles, on the basis of previous research results, this study chooses 26 comprehensive indicators which can reflect the intention and level of the quality of agricultural economic growth as the indicator elements of the study. The 26 indicators elements are not completely irrelevant, but at a certain level of abstraction to reflect the different aspects of the agricultural economic growth quality. In this paper, 26 index elements are systematically classified to establish the evaluation dimension of agricultural economic growth, namely, the dimension of agricultural production efficiency, the dimension of the agricultural economic structure, the dimension of farmers' life quality and the dimension of sustainable development.

Based on the above principle and previous research, and combining the requirements of the agricultural economic development status, we set up an evaluation indicator system of agricultural economic growth quality (see Table 1).

Table 1. The evaluation index system of China’s agricultural economic growth quality.

First grade indexes	Order	Second-grade indexes	Unit	Index nature
Agricultural production efficiency	1	Agricultural GDP	100million yuan	positive
	2	Farmers per capita net income	Yuan/100 hundred people	positive
	3	Agricultural labor productivity	100million yuan/100 hundred people	positive
	4	Agricultural land productivity	Kg/ha	positive
	5	Per capita grain production	100 hundred tons/100 hundred people	positive
	6	TFP growth rate	%	positive
	7	Industrial structure adjustment capability index	%	positive
	8	Per capita water resources	100million cubic meters/100hundred people	positive
	9	Unit sown area production value	100million yuan/thousand	positive
	10	Unit area machinery total power	100hundred kW/thousand hectares	positive

	11	Per capita electricity consumption	100hundred kw/100hundred	positive
Agricultural economic structure	12	Effective irrigation rate	%	positive
	13	Acres of arable land water resources	100million cubic meters/thousand hectares	positive
	14	Rural minimum subsistence allowance	100hundred yuan	positive
	15	Urbanization rate	%	positive
	16	Engel coefficient	%	positive
Famers' quality of life	17	Per hundred people above junior high school	%	positive
	18	Rural employment rate	%	positive
	19	Illiteracy and semi-illiteracy rate	%	negative
	20	Chemical fertilizer usage	100hundred tons/thousand hectares	negative
	21	Pesticide usage	Tons/thousand	negative
	22	Disaster rate	%	negative
	23	Forest cover	%	positive
Sustainable development	24	Soil erosion control area	Thousand hectares	positive
	25	Health personnel	Person	positive
	26	Percentage of investment in science and technology education	%	positive

3.2 The determination of evaluation method of China's agricultural economic growth quality

After establishing the evaluation index system for the transformation of agricultural development mode, we should first determine the weight of each index. At present, the method of determining index weight is divided into two categories: subjective weight assignment and objective weight assignment. The subjective weight assignment mainly includes Delphi method, analytic hierarchy process and so on. The objective weight assignment method mainly contains factor analysis method, entropy method, optimal sequence diagram method and variation coefficient method. This paper adopts the entropy method.

Entropy method is mainly used to determine the weight by obtaining information entropy of each index. If the information entropy is smaller, the degree of disorder of information is lower, the index variance is bigger, the more information is transmitted, and the more weight is given to the index. On the other hand, if the information entropy is greater, the degree of disorder of information is higher, the index variance is smaller, the less information is transmitted, the less weight is assigned to the index. Information entropy is an objective description of the degree of divergence between indicators, and it does not add any man-made factors. Therefore, the results are objective, authentic and scientific by using information entropy to determine the weight of the index and to evaluate the transformation of agricultural development mode.

In order to evaluate the level of agricultural economic growth quality of m year in a certain area, the evaluation index system has n indexes, and establishes mathematical model: The domain is $U=\{u_1,u_2,...,u_m\}$, each sample consists of data representation of m indicators, namely $u_i=\{X_{i1},X_{i2},...X_{im}\}$, and can get the original data matrix of the evaluation system $X=(x_{ij})_{m\times n}$, the data standardization matrix is $B=\{b_{ij}\}_{m\times n}$, The larger the gap between index value x_{ij}, the more important the index is in the comprehensive evaluation. The information entropy value of x_j is $e_j=-k\sum_{i=1}^{m}b_{ij}\ln b_{ij}$ the constant k in the formula is related to the sample number m of the system. If the index value is all equal, then the index will not function in the comprehensive evaluation, the higher the order degree of a system, the greater the information entropy, conversely, the lower the information entropy. Therefore, we can calculate the weights of each index according to the difference degree of each index value and the tool of information entropy, providing the basis for multiple indexes comprehensive evaluation.

For a system with a complete disorder of information, e = 1; When the m-sample is in a completely disordered state of distribution, $b_{ij}=1/m, k=1/\ln m,$ $0\le e\le 1$.The information utility value of the index of the item j is determined by the difference between the information entropy e_j and 1. By using the entropy value method to estimate the weights of each index, the essence is to calculate the value coefficient of the index information, the higher the value coefficient, the greater the importance to the evaluation, the weight of index of the item j is $w_j=d_j/\sum_{j=1}^{m}d_j$.

For the evaluation of the sample, it is possible to use the product f_{ij} of the weight w_j of item-j index and the evaluation index proximity x'_{ij} of item-j of sample-i in the standard matrix as the evaluation value of, namely $f_{ij}=w_j x'_{ij}$, The evaluation value of sample-i is $f_i=\sum_{j=1}^{m}f_{ij}$.

For the evaluation system of the multilayer structure, according to the additive of information entropy, using the index information utility value of the lower structure, the weight W_j corresponding to the upper structure is determined according to the proportion. The utility value of each index of the lower structure is summed up, the sum D_k of utility value of different kinds of indexes, is obtained, and then the sum of utility values of all indexes. The weight of the corresponding subsystems of $W_k = D_k / D$, the weight of the index corresponding to the upper structure is $W_j = d_j / D$, therefore, the evaluation value of the index corresponding to the upper structure is: $f'_{ij} = \sum_{i=1}^{n} W_j x'_{ij}$, if a high level contains k points, then the evaluation value of the upper structure: $F = \sum_{i=1}^{k} \sum_{j=1}^{n} W_j p_{ij}$.

3.3 The steps of comprehensive evaluation by entropy method

Firstly, process the value of each index dimensionless. Convert each index value x_{ij} into a relative number x'_{ij} without units, while the numerical specification is within [0, 1]. In this analysis, the dimensionless method of sampling linear type is: for the positive index (the larger the better index), $x'_{ij} = \dfrac{x_{ij} - \min(x_j)}{\max(x_j) - \min(x_j)}$; for the reverse index (the smaller the better index), $x'_{ij} = \dfrac{\max(x_j) - x_{ij}}{\max(x_j) - \min(x_j)}$.

Secondly, the coordinate translation and normalization of dimensionless data. In order to eliminate the effect of the normalized logarithmic calculation, coordinate translation for x'_{ij}, the formula is: $b_{ij} = x'_{ij} + A$, A is the translation amplitude, $A > \min(x'_{ij})$. The closer the value of A is to $\min(x'_{ij})$, the more significant the evaluation result is (A = 0.01). After the coordinate translation normalized the data according to the calculation formula is: $p_{ij} = b_{ij} / \sum_{i=1}^{m} b_{ij}$, and the normalized matrix $P = \left(p_{ij}\right)_{m \times n}$ is obtained.

Finally, calculate the entropy value e_j and redundancy of the index d_j. Among them: $e_j = -k \sum_{i=1}^{m} p_{ij} \ln p_{ij}, k = 1/\ln n; d_j = 1 - e_j$, measured the difference between the indexes, the smaller the entropy value e_j is, the larger the differential coefficient d_j is, the more important the indexes are. On this basis, calculate the weight $w_j = d_j / \sum_{i=1}^{n} d_j$ and further can get the comprehensive evaluation score of agricultural economic growth quality in the i year $F_i = \sum_{j=1}^{n} (w_j \times p_{ij})$.

4 Results

4.1 Analysis of the evaluation index system of China's agricultural economic growth quality

Based on the formula of entropy method above, the regional disparity of the quality of agricultural economic growth in China from 2000 to 2012 was calculated to evaluate the regional distribution of agricultural economic growth quality.

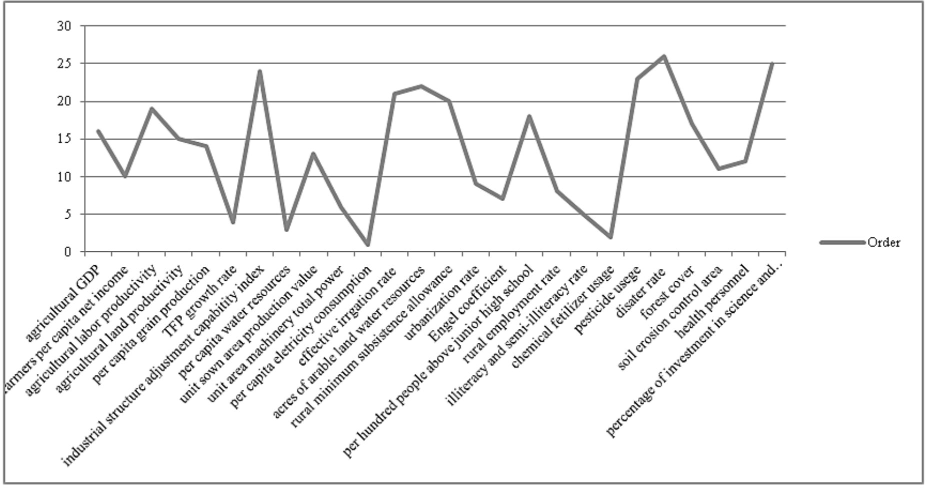

Fig. 1. The weight of each evaluation index of China's agricultural economic growth quality.

Using entropy method, we can obtain the weight of 26 indexes according to the collected data (see **Chyba! Nenalezen zdroj odkazů.**). Most of the data of this article from "China Statistical Yearbook", "China Compendium of Statistics 1949-2008", etc., some information can be directly obtained by the data, and some of the data which cannot be directly acquired is obtained by simple calculation and transformation.

From the perspective of the evaluation index weight of China's agricultural economic growth quality in Fig. 1, the weights of per capita electricity consumption, fertilizer application rate, per capita water resources, TFP growth rate, illiteracy and semi-illiteracy rate, etc., were higher. It means the above indexes have an important influence on the quality of agricultural economic growth. On the whole, the four aspects of agricultural production efficiency, agricultural economic structure, farmers' life quality and sustainable development of China's agricultural economic growth is not negligible importance, anyone will affect the quality of China's agricultural economic growth.

4.2 The comprehensive evaluation of agricultural economic growth quality of different regions in China

According to the weight of each index in the evaluation system of the process of China's agricultural economic growth quality, the comprehensive scores of each subsystem and the quality of agricultural economic growth are calculated, and the results are shown in Tab. 2.

Table 2. The comprehensive evaluation of China’s agricultural economic growth quality.

District	**Agricultural production efficiency**		**Agricultural economic structure**		**Farmers' quality of life**		**Sustainable development**		**Weighted total factor**	
	Score	Order	Score	Order	Score	Order	Score	Order	Score	Order
Beijing	0.14497	1	0.11186	4	0.12467	6	0.06716	28	0.44866	3
Tianjin	0.12787	3	0.115	3	0.08844	29	0.06231	29	0.39362	8
Hebei	0.09319	11	0.07603	8	0.12199	7	0.11101	12	0.4022	6
Shanxi	0.05362	19	0.02922	19	0.1014	21	0.12933	7	0.31357	20
Inner	0.0426	23	0.01796	26	0.10193	20	0.15169	1	0.31418	19
Liaoning	0.09837	9	0.05732	11	0.09509	25	0.12577	9	0.37654	9
Jilin	0.09389	10	0.01842	25	0.09073	27	0.12523	10	0.32826	13
Heilong	0.06034	18	0.00546	31	0.10031	22	0.14281	3	0.30892	21
Shanghai	0.13944	2	0.16968	1	0.09071	28	0.04933	30	0.44916	2
Jiangsu	0.12446	4	0.09011	6	0.12119	9	0.06981	27	0.40556	5
Zhejiang	0.10755	6	0.1114	5	0.13763	1	0.10263	15	0.45922	1
Anhui	0.04033	27	0.03078	17	0.12478	5	0.09464	21	0.29053	24
Fujian	0.10402	7	0.06536	10	0.10643	17	0.04023	31	0.31603	18
Jiangxi	0.04371	22	0.0307	18	0.09856	24	0.11172	11	0.28469	26
Shandong	0.11454	5	0.07113	9	0.12675	3	0.09457	22	0.40698	4
Henan	0.06921	14	0.04276	12	0.1335	2	0.09386	23	0.33933	12
Hubei	0.08034	12	0.0257	20	0.09404	26	0.09552	20	0.29559	23
Hunan	0.07752	13	0.03626	16	0.10254	18	0.10235	16	0.31867	15
Guangdong	0.06505	16	0.08279	7	0.11054	15	0.08514	25	0.34352	11
Guangxi	0.04042	26	0.02309	23	0.10244	19	0.09684	19	0.2628	29
Hainan	0.09929	8	0.03817	14	0.07436	31	0.0719	26	0.28371	27
Chongqing	0.03308	29	0.01623	28	0.09924	23	0.10127	17	0.24982	31
Sichuan	0.04127	25	0.01905	24	0.10891	16	0.14856	2	0.31779	16

Guizhou	0.00661	31	0.006	30	0.11752	11	0.12684	8	0.25695	30
Yunnan	0.04219	24	0.01613	29	0.11668	12	0.13378	6	0.30879	22
Tibet	0.00732	30	0.15961	2	0.11835	10	0.11082	13	0.39611	7
Shaanxi	0.06734	15	0.02319	22	0.12516	4	0.13998	5	0.35567	10
Gansu	0.03572	28	0.01685	27	0.12163	8	0.14217	4	0.31636	17
Qinghai	0.05226	20	0.04213	13	0.11508	13	0.11035	14	0.31982	14
Ningxia	0.05117	21	0.02321	21	0.1144	14	0.09788	18	0.28665	25
Xinjiang	0.06264	17	0.03694	15	0.08192	30	0.09347	24	0.27497	28

We found that China's agricultural economic growth quality differences between provinces from Tab. 3, the comprehensive score of agricultural economic growth quality factor of the national 31 provinces (autonomous regions and municipalities) are between 0.249819 ~ 0.459216 in the 12 years from 2000 to 2012. The main characteristic is the eastern provinces, especially the southeast coastal areas, have the highest quality of agricultural economic growth, the second in the central region and the lowest in the western region. Among them, the eastern region accounted for 9 of the 11 provinces with high-quality factors for agricultural economic growth, and 2 in the west. The central provinces accounted for 6 of the 10 provinces that at the middle level, 3 in the west and 1 in the east. Of the 10 provinces with lower scores, 5 were in the west, 4 in the central and 1 in the east.

The four subsystems of agricultural production efficiency, agricultural economic structure, the farmers' quality of life, agricultural sustainable development all have different degrees of contribution to China's agricultural economic growth quality. Moreover, the farmers' quality of life and sustainable agricultural development are the main factors that affect the quality of agricultural economic growth process, and achieved remarkable results. Farmers' life quality subsystem contributed 32.29% of the increase in the 12 years, and the agricultural sustainable development subsystem contributed 30.97% of the increased score., this shows that from 2000 to 2012 with the development of the economy, China has made great progress in per capita electricity consumption, fertilizer application rate, per capita water resources , TFP growth rate, illiteracy and semi-illiteracy rate, per unit area agricultural machinery total power, Engel's coefficient and rural employment rate. The agricultural production efficiency subsystem contributed 21.29% of the increase in score, while the agricultural economic structure subsystem contributed 15.43% of that. The contribution of the agricultural economic structure subsystem is less than the weight of its own, which indicates that the change of agricultural economic structure lags behind economic development. In addition, the contribution of agricultural production efficiency subsystem is less than its weight as well, which proves that the agricultural development in the 12 years is extensive and not sustainable. The rural developed at the cost of resource consumption and environmental pollution, and only achieved the growth of agricultural output, but not the corresponding economic development and social progress, resulting from the less attention being paid on the elevation of the living standards of rural residents.

5 Conclusion

For one thing, innovating the technological level of agricultural production and improving the technical efficiency. This includes three aspects, first of all, to increase innovation and development of new technologies. We should speed up the construction of a modern agricultural technology system, vigorously train scientific and technological leaders, deepen the Production-Study-Research cooperation, and improve the development of agricultural science and technology. Besides, we should vigorously develop diversified, socialized agro-technology, popularize the service organizations and farmers' cooperative organizations, regularly conduct professional training and cultivate practical talents on the labor force in the countryside. Secondly, strengthen the contact between scientific research institutions and agricultural production personnel, so that the research of agricultural science and technology can be applied to agricultural production to a greater extent, and promote the development of actual productivity of agriculture. To deepen reform of rural science and technology system, increase the investment in agricultural scientific research, increase subsidies for farmers using agricultural technology, encourage scientific research institutions and technical personnel at all levels to increase the research and development for the agricultural products market, and promote the construction of folk scientific research organizations. Thirdly, perfect the agricultural technology promotion system. We should strengthen the promotion of advanced practical agricultural technologies, focusing on the promotion of good varieties, water-saving irrigation, formula fertilization, integrated pest control, crop cultivation and management. Besides, we should establish the novel diversified system of agricultural technology promotion, strengthen the public welfare function of agro-technical extension service, promote the agricultural sci-tech household project comprehensively, foster the agricultural science and technology demonstration household and enhance their ability of radiation-driven. We should strengthen the construction of agricultural sci-tech service platform, perfect the network of the agricultural sci-tech trade market and accelerate the transformation of sci-tech achievements.

For the other thing, improve the quality of agricultural labor force. Attaching importance to the education and cultivation of the quality and competence of the rural labor force, we should pay attention to the following aspects: first, we should continue to increase the investment in rural education, pay attention to the education in rural and backward areas, realize the improvement of rural education in Shaanxi province, and improve the education age and level of the agricultural population. Second, improve the efficiency of investment in education. We should increase the input of basic education in rural areas and improve the effectiveness and efficiency of the investment; we should strengthen the cultivation of the students majoring in agriculture and forestry, and encourage them to join in the actual production and operation. Third, we should pay attention to the training of farmers ' professional skills, and make them change from experience-based to knowledge-based, from go-it-alone to an organizational type, from an identity style to a professional style.

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Conceptual Impact of Selected Aspects of GDPR on Corporate Administration and Business Competition

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Abstract. The General Data Protection Regulation (GDPR) was enacted in 2016 and will apply to automated processing and filing systems as of 25th May, 2018. However, the general awareness about the GDPR in the EU, and in particular in the Czech Republic, appears rather weak. Therefore, it is highly instructive to identify selected aspects of the GDPR, discuss their impact on businesses and especially their corporate administration, predict challenges and problems, and, most importantly, propose solutions in re how to adjust and comply with the GDPR requirements. This can be achieved based on both a fresh primary investigative data yield from Czech Businesses and comparatively explored secondary data which originated in different EU member states. Indeed, the mandatory and direct application of the GDPR is on its way to inevitably create new duties and will change many features of the corporate administration. However, the expected effective and efficient enforcement of the GDPR might ultimately reshape the current mechanism protection of intellectual property and increase the fairness of business competition.

Keywords: GDPR, Corporate Administration, EU, Competition, Controller and Processor.

1 Introduction

Under the auspices of the ten year strategy Europe 2020, and with the awareness about the need for the development of the technological potential of European economies [3], the European Commission moved to prepare and propose the Data Protection Reform Package. The proclaimed drive for smart, sustainable and inclusive growth, along with the critical importance of digitalization and virtualization, is among the principal engines behind this reform project. Hence, the European Commission presented a proposal COM (2012)11 for a Regulation on the protection of individuals with regard to the processing of personal data and on the free movement of such data. The concern is laid upon both the data storing and analyzing as well as the portability of the data, which is closely linked to the need of the Internet´s users´ need for transferring data they had been building up, such as in emails or e-address books[23]. Immediately, a part of the professional, as well as the laic, public, realized that this can become a truly important piece of legislation affecting both the public and private sectors across the EU and having an impact on competition as well as corporate administration. In other words, the European Commission made it clear that mandatory rules on the processing of personal data in the EU are to be unified and set centrally from above. The opening significant wave of reaction and feedback followed. While certain businesses launched into a constructive dialogue and preparation, other businesses opted for ignorance or even fell into the pitfall of misconceptions. The four years long proposal stage ended in 2016 when the General Data Protection Regulation ("GDPR") was enacted with an application provision which surprised many – pursuant to Art.99, the GDPR shall apply from the 25th May, 2018 period. No cascade, selective or other progressive application mechanism was previewed, and the GDPR will basically apply throughout the entire EU, without any exceptions, starting 25th May, 2018. This led to a second wave of reaction and many "steamed-up" critical comments, often coming from the rank of businesses.

Pragmatically, at this point, *Alea iacta est*, the die is cast, and it is futile to make philippics on the (in) appropriateness of this Rubicon crossing. The GDPR is like *Hannibal ante portas,* and it is both wise and necessary to understand both its wording and underlying philosophy and concepts correct existing misunderstandings and draw practical points to be addressed by corporate administrations.

Since the GDPR has a massive reach and definitely belongs among the "more demanding" regulations, imposing duties to a large pool of subjects and threatening them with sanctions, it appears that the current corporate administration built upon today's intellectual property and competition demands, needs adjustments and that mistakes and negligence in this field can create a noticeable competitive disadvantage.

Considering the extent and depth of this material, its sophisticated and multi-disciplinary features and the limitation of available information resources, it is beyond the scope and capacity of this paper to provide a comprehensive and exhaustive list. Instead, this paper approached this subject matter both from theoretically academic and practical business perspectives, while focusing on a general approach to necessary corporate administration issues and possible changes due to selected aspects of the GDPR, and in particular their intellectual property and competition aspects.

2 Literature overview

The literature overview regarding the impact of selected aspects of GDPR on corporate administrations must necessarily start with a re-confirmation of the EU commitment to the doctrine of the famous four freedoms of movement on the single internal market [8] in the 21st century, digitalized, context [12]. This commitment represents the overlap of business, law and information systems/information technologies in our global society, which is full of contradictions [Vivant, 2016] and with the permanently blurred distinction between historical truth and reality [6].

Indeed, the post-modern, highly competitive global society is exemplified by digitalization [15], increasingly more complex and dynamic organizations [18], and the value of information, especially data with business significance, regardless whether they are about the business itself or its past, current or potential customers. Indeed, the EU understands that the operation of the single market and the competitiveness of European business is critical, that digitalization is indispensable in the global society [13] and the data is to be used but not abused, i.e. needs to be protected and ideally have the same legal regime across the entire EU. Indeed, data privacy legislation has been evolving with the modern IS/IT on both sides of the Atlantic since 1960s [22], see the German Act from 1970 and the Swedish Data Protection Act from 1973.

3 Sources and methods

Since the GDPR is a regulatory piece of the EU legislation and neither cascade application nor exceptions to its provisions are included, it is a reform, general and fully mandatory legal framework newly defining personal data and the regime of its protection in the EU, and possibly even beyond. This ultimately determines both the sources and methodology to be used in order to explore the impact of selected aspects of GDPR on corporate administrations.

Since this is a multi-disciplinary and multi-jurisdictional topic, an open minded approach needs to be embraced and a myriad of sources need to be explored. This research has to entail the GDPR and its official interpretation instruments, the academic writing and the field search, via interviews involving ultimate addressees of the GDPR, the businesses facing the need to make the necessary corporate administration changes.

This heterogeneity of source determines the selection of methods and the cross-disciplinary and multi-jurisdictional nature points to the processing by Meta-Analysis [21], while using a critical interpretation and application of selected GDPR provisions. This needs to be supported by the holistic perception of national contexts and by case studies. The primary and secondary sources are explored and the yielded knowledge and data are confronted with the expectation of the new real status quo. Since this paper covers legal and economic aspects, it focuses more on qualitative data and methods than quantitative, and includes deductive and inductive aspects of legal thinking [17], as legal theoretic orientation reflects legal science which is argumentative, not axiomatic [11]. Consequently, the dominating qualitative research and data are complemented by the quantitative research and data and their discussion is refreshed by Socratic questioning [1], and glossing.

The cornerstone of the mentioned Meta-Analysis is the performance and exploration of the field case study entailing the interviewing of seven Czech corporations. This pilot and pioneering investigation in the form of a questionnaire involved a representative sample. Namely, seven Czech corporations from various industries (a jam producer, a construction company, personal-human resources agency, etc.) were selected. They all have 250-500 employees, are active in the private sector and either produce and commercialize goods or provide services and do not processes special categories of personal data (sensitive data). In order to reach the maximum potential from this equilibrated sample, the questionnaire included seven open questions targeting the awareness, preparation, endorsement, impact and predictions regarding the GDPR and its enforcement.

4 Legislative overview

The post-Lisbon EU has both supranational and intergovernmental natures with normative characteristics centered on the concept of the single market with significant institutional features and a competing interest group [10]. EU law, which is neither a typical international law nor a typical federal or state law, is integrated into national laws in a fierce and penetrative manner, i.e. by making use of a national procedural setting to directly incorporate and enforce its norms with the national jurisdiction of the EU member states [2] and the instrument for it, par excellence, is the Regulation. Hence, after launching the strategy Europe 2020 for the smart, sustainable and inclusive growth with a particular focus on the digital market, the focus of the European Commission turned to the Data Protection Reform Package and the preparation and enactment of a Regulation about general data protection became a top priority. The choice of the Regulation, instead of the Directive, was based upon the fundamental treaties of the post-Lisbon EU, TEU and TFEU, while observing the Charter of Fundamental Rights and building upon the already existing e-Privacy Directive [25], and the need to overcome various diversities [4] and [14] hindering the operation of the internal single market with a negative impact on business and even consumers. An overview on legislation based on TEU, TFEU and Charter is given in Table 1.

Table 1. The mapping overview of the legislative background for the GDPR

Legislative Instrument	Provision
TEU Art.6	1. The Union recognizes the rights, freedoms and principles set out in the Charter of Fundamental Rights of the European Union of 7 December 2000, as adapted at Strasbourg, on 12 December 2007, which shall have the same legal value as the Treaties.
TFEU Art.16	1. Everyone has the right to protection of personal data concerning them. 2. The European Parliament and the Council, acting in accordance with the ordinary legislative procedure, shall lay down the rules relating to the protection of individuals with regard to the processing of personal data by Union institutions, bodies, offices and agencies, and by the Member States when carrying out activities which fall within the scope of Union law, and the rules relating to the free movement of such data. Compliance with these rules shall be subject to the control of independent authorities.
Charter of	1. Everyone has the right to the protection of personal data concerning

Fundamental Rights Art.8	themselves. 2. Such data must be processed fairly for specified purposes and on the basis of the consent of the person concerned or some other legitimate basis laid down by law. Everyone has the right of access to data which has been collected concerning him or her, and the right to have it rectified. 3.Compliance with these rules shall be subject to control by an independent authority.

Thus, the GDPR sets general rules for the protection of personal data of natural persons and on free movement of this data (Art.1). These rules apply only to personal data as defined by the GDPR (Art.4) and only to subjects identified by the GDPR, i.e. mostly to the so-called controllers (Art.24) and processors (Art.28). So as to enhance compliance, the drafting of private codes of conduct is encouraged (Art.4). In case of a violation of duties set by the GDPR, such as the violation of the set principles (Art.5 et foll.) or of the rights of a data subject (Art.12 et foll.), the GDPR sets a strong monitoring mechanism, including even the internal data processing officers (“DPOs”) (Art.37) and the outside public supervisory authority. The remedies, liability and penalty provisions are robust (Art.77 et foll.) and have an administrative, civil, even a potentially criminal nature. Thus, along with the compensation, damages and other private instruments, the administrative fines can reach EUR 20 million or up to 4% of the total worldwide annual turnover (Art.83). Logically, academic, professional and laic discussions about the GDPR focus on what and who exactly is covered by the GDPR, what exactly the GDPR demands and what must be done in order to comply with the GDPR, and if the GDPR is more a threat or an opportunity for businesses. Illustration of the GDPR structure is given in Table 2.

Table 2. Structure of the GDPR

Part	Selected provisions
Preamble (1)-(173)	…...
Chapter I General provisions Art.1-Art.4	Protection of personal data of a natural person (Art.1) All processing by EU subjects even without EU (Art.3) Definitions (Art.4)
Chapter II Principles Art.5-Art.11	Lawfulness of processing (Art.6) Conditions of consent (Art.7) Processing of special categories of personal data (Art.9)
Chapter III Rights of data subject Art.12-Art.23	Transparency (Art.12) Information and Access to personal data (Art.13) Right of access by the data subject (Art.15) Right to rectification (Art.16) Right to erasure (right to be forgotten) (Art.17) Right to data portability (Art.20)
Chapter IV	Responsibility of the controller (Art.24)

Controller and Processor Art.24-Art.43	Processor (Art.28) Controllers and processors cooperation with the supervisory authority (Art.31) Notification of a personal data breach to the supervisory authority (Art.33) Data protection impact assessment (Art.35) Data protection officer (Art.37)
Chapter V	Transfer of personal data to third countries or internal organizations
Chapter VI	Independent Supervisory Authority
Chapter VII	Cooperation and consistency
Chapter VIII	Remedies, liability and penalties
Chapter IX	Provisions regarding specific processing situations
Chapter X	Delegated acts and implementing acts

Regarding the question about “what is covered”, one academic stream suggests that the re-definition of personal data and the new categorization of personal data (especially the recognition and special regime for sensitive data), both brought by the GDPR, have clear benefits and increase the transparency of the personal data processing [7]. It is emphasized that the GDPR, by categorizing personal data, prohibits processing of special categories of personal data (Art.9) and provides a set of exemptions, such as a rather comprehensive research exemption to this general prohibition of sensitive data [19]. Further, the GDPR provides for a pseudonymization (Art.5) and understands it as a technique to be combined with additional security measures [5]. However, data that is used to single out a person should be considered personal data and thus GDPR applies to behavioral targeting, i.e. online profiling by using cookies or other methods [25].

The academic press points to the fact that personal data breaches are frequent, often have a cross-border nature and seldom are effectively and efficiently sanctioned [16]. Namely, data protection authorities, labelled by the GDPR as “supervisory authorities,” appear to regard the importance of the personal data protection and the approach to it in a rather different manner [20]. The introduction of the GDPR should improve the cooperation of data protection authorities and in general improve and synchronize the entire system [16], e.g. it should lead to a unified rigorous application of the GDPR to behavioral targeting via online profiling, without necessarily always tying this set of data to the particular individual [25].

This needs to be appreciated in the context of the current business setting and conduct, where personal data is an indispensable commodity and for some businesses storing, processing and analyzing personal data, especially about customers, is at the core of their business model [23]. It is suggested that, although the storing and analyzing of personal data under GDPR can be a subject of a conceptual criticism, it seems that the GDPR is on the right track towards the data portability in the EU [23]. Well, it is a right idea, but how should it be materialized? What exactly businesses have, or should, or should not do? These are the burning questions …

5 Results and discussion

Information about the large majority of the world population is collected and processed, often for private business purposes, e.g. Facebook collects information about over 1.5 billion people and Google over 90% of Internet users [25]. The density and intensity of data processing, especially the personal data processing, in the EU is extremely high and logically a harmonized, or even unified, legal regime is a must, and not only for a digital market pursuant to the Europe 2020.

The GDRP, along with other instruments, such as the Charter and ePrivacy Directive, creates a new framework for the processing of personal data. The GDPR aims to meet the current challenges related to the data protection, strengthen online privacy rights and boost European digital economy [22]. The GDPR is a regulation and this is self-explanatory regarding its force. However, provisions about private codes and other indices, even from competent authorities, indicate that the application of the GDPR will not be totally rigidly unified across the EU.

It seems that, so far, explanatory notes and other intrinsic documents provided by the EU, namely the European Commission, do not manage to remove unclearness. Hence, it continues the rather reduced awareness about the exact meaning and extent of the GDPR duties. Academic literature on the topic is rather fragmental and focuses on just a few, often for daily business marginal, aspects and thus general hesitations prevail. Headhunters and education providers react to it by searching for specialists understanding the GDPR and present them to the subject of duties of the GDPR. In the Czech Republic, for example, the recruiter, Hays, offers financial recompense for recommendation of a good client to be an “inhouse lawyer – data privacy” and even a gdpr.cz domain was created to offer GDPR classes for significant fees.

In order to understand better this, as yet, not researched field, a set of interviews was performed with a rather homogenous group of businesses, which will be subject to the GDPR. Namely, seven Czech corporations with 250-500 employees were interviewed based on seven open questions. These corporations were from various industries, but none of them processes special categories of personal data (sensitive data).

Interestingly, this piloting testing supports what has been already intuitively suggested. Boldly, corporations are ready to make administrative and even financial efforts to comply with the GDPR, but they have a hard time to understand what exactly the GDPR expects from them. They are realistic about the impact of the GDPR and recognize that an unfair competition behavior is possible. At the same time, they are optimistic and hope that this will be just temporary and, over time, the GDPR and its requirements will become both clear and fairly enforced. Further, as is often the case, a segment of Czech corporations perceive the GDPR as another futile administrative burden from Brussels. Based on the above provided literature and legislative overview, it can be suggested that this feeling in respect of the GDPR is caused rather by a lack of communication and explanation more than by the intrusive or inherently wrong concepts of the GDPR. Boldly, all point to the one big need – the need for more information ideally provided by a certified, or other official, authority.

Table 3. Summary of the interview of seven Czech corporations regarding the GDPR

Question	
1. Are you ready for GDPR?	All corporations are studying GDPR, arranging for training of competent persons and undergoing an audit regarding what type of data and processing they perform. No corporation is ready at this point, but all work towards being compliant in 2018.
2. Is GDPR needed?	Three corporations perceive the GDPR as needed due to the current partial regulatory vacuum. However, two corporations consider current legislation as sufficient and perceive the GDPR as another unnecessary normative burden from Brussels.
3. Are GDPR duties clear to you?	All corporations perceive the GDPR as unclear and are afraid that they might misunderstand certain provisions and make wrong preparatory steps. They miss certification authorities or other organs able to provide them with explanations.
4. Are theoretically set general conditions of the GDPR a challenge for you?	All corporations like the fact that these general conditions are universal and thus apply to all businesses dealing with certain types of data. All corporations perceive this as fair and indicate that they will use external experts (lawyers, IT specialists) in order to achieve the compliance with the GDPR.
5. What are the biggest issues linked to the GDPR implementation?	All corporations recognize a noticeable administrative burden created by the GDPR and four of them underline that this will cause significant financial expenditures which will reduce the capacity of the given corporation to modernize and develop.
6. Will the GDPR have an impact on the competition?	All corporations fear that the GDPR will have a negative impact on the competition, especially they expect unfair competition behavior by their competitors and (fictive) denunciations about (alleged) breaches of the GDPR to competent authorities. They all are afraid that the GDPR will become an instrument for “dirty” business battles, especially since the GDPR administrative fines are really high.
7. Will the GDPR create a competitive disadvantage for you?	Three corporations do not worry about that and think that even if some corporations will not observe the GDPR or try to manipulate it against their competitors, this will not significantly hurt the competition and its fairness. The corporations think that their competitors will not comply and so might save time, money, effort, etc. However this competitive disadvantage for compliant businesses will be just temporary, because over time the GDPR system will be put truly into the practice and everyone will have to comply.

Knowledge is power and communications are an indispensable necessity in the 21st century. The Europe 2020 fits this line. The above tables demonstrate that the GDPR will have an impact on business conduct and ultimately corporate administration and that the employment of IS/IT, the liability issue and the efficiency and efficacy of the

GDPR enforcement are interrelated and important for businesses. Businesses appear to be aware about the existence of the GDPR, but they do not understand fully its requirements. Some businesses even do not see a raison d'être for the GDPR. Nevertheless, they dare not ignore it and recognize that the GDPR has the potential to change the landscape of business and business conduct in the EU. The most surprising common denominator from all interviews, backed by a further field search, is that businesses are inclined to at least partially "outsource" some or even all duties and requirements generated by the GDPR. Boldly, they prefer hiring external specialists in addition to certain adjustments of their internal corporate administration, i.e. to cooperate with free-lance experts rather than to have a GDPR specialist on staff. This might be a Czech particularity, because Czech corporations acted in a similar manner to the new legal liability of executives, i.e. instead of internal changes and professional liability insurance, they heavily rely on external advisors and so attempt to transfer the liability to them [9].

In addition to the Czech drive to push the "GDPR issue" out, rather than take it in and make internal changes even regarding human resources, Czech businesses expect that there will be black sheep among themselves, ignoring or cheating vis-à-vis GDPR requirements and this will have an unfair competition impact. This further confirms that the GDPR is perceived by businesses as a short-term threat, rather than an opportunity. However, it is possible to observe a trust in the enforcement mechanism and ultimately an effective and efficient application of the GDPR, because businesses believe that in the long term the unfair competition impact might evaporate.

Indeed, these findings match the legislative overview. The GDPR is complex, and businesses are struggling to understand what exactly is newly expected from them, i.e. to what extent and how they should change their corporate, and other, administration to comply with the GDPR. They study and make some changes, but they feel a further need to employ external experts. Hence, there are clear efforts and costs to expend. Over time, these efforts and costs should be less dramatic, and ultimately all competing businesses will have to make them. Nevertheless, before this stage is reached, a myriad of unfair competition behaviors can occur and GDPR complying businesses might have a business disadvantage for a limited period of time. The common tenor expresses the hope that this limited period of time will be not too long and that at the very end the compliance with GDPR by all business will provide a better competition and market environment for all stakeholders, including consumers.

6 Conclusions

The post-Lisbon EU and Europe 2020 are aware that data protection in general, and the related ICT expertise, are extremely important and at the same time ephemeral and moving targets, i.e. there is no ideal state in data protection, instead it is an ongoing learning process [20]. Since the single internal digital market cannot afford a fragmentation in this respect, the European Commission brought the Data Protection Reform Package, including the GDPR.

It cannot be overstated that the GDPR is not a mere directive, it is a regulation going not only for harmonization, but directly for unification and its provisions will generally apply from 2018. Hence, the EU made a strong move towards a mandatory framework regarding protection of personal data of natural persons and on free movement of this data. This ultimately leads to the situation that businesses will easily fit in the category of controllers or processors of personal data and hence will become subjects to many duties.

The results from the pioneering Czech pilot case study support the suggestions already presented in the academic press that the exact content of these duties is generally perceived as unclear and that businesses feel that, despite their efforts, they have a rather weak awareness of the very impact of the GDPR on their management and business conduct, including necessary changes of corporate administration. However, the Czech pilot case study brought forth new indices that businesses feel clearly that the GDPR poses new challenges to businesses. This is complemented by the academic findings that GDPR requirements demand substantial financial and human resources as well as training of a large part of the staff [22]. According to the Czech pilot case study, facing the risk of high fines, at least Czech businesses appear to not only consider internal changes and improvements due to the GDPR, but as well to be inclined to hire external experts from the field of IT and data protection law. Few businesses want to directly hire them and keep them on the exclusive basis, but the majority of businesses seem to be inclined to just use them as free-lance experts and knowing that they can perform similar businesses for other businesses. This seems to be a compromise solution, reducing the liability and requiring manageable costs and minimal efforts, which is critical vis-à-vis the real risk that some businesses, including competitors, will ignore or undermine the GDPR and temporarily could have an unfair competitive advantage. However, there is a belief that the GDPR will be effectively and efficiently enforced, at least in the mid-term and long-term time horizons, so the unfair competitive advantage will be only for a manageable time period. Boldly, the compliant businesses cannot spend too much on GDPR for too long while other businesses would skip these large costs for a long time period. It will be extremely beneficial to compare the indices generated by the Czech pilot case study with other studies, ideally involving similar questions and more respondents, both from the Czech Republic and other EU member states studies. Since currently there is an absence of such studies, the authors are considering performing them in the future and naturally present the outcome in the academic press.

There are no indices that the EU, namely the European Commission, has a clear plan how it will improve the awareness about the GDPR and how aggressively will enforce the compliance. However, the businesses seem to have already made their outsourcing choice while hoping that shortly this will be followed by the remaining businesses. Well, the near future will show whether this strategy and prediction will be met. Nevertheless already three statements are generally accepted. Firstly, the GDPR is a big unknown which is perceived as a challenge and perhaps even a threat by businesses. Secondly, there is clear potential for unfair competition caused by the fact that some businesses will spend time and efforts to comply with the GDPR while other will skip them and cross their fingers. Thirdly, businesses are resolving the

GDPR issues by cooperating with free-lance experts in a hope that this is more safe, cheaper and more flexible than employing them, and once the enforcement will truly kick in, they can adjust their strategy, e.g. to use less external experts and rather make their own staff to be better trained with respect to the GDPR and perhaps to have their own GDPR specialist and/or data protection officer. In sum, the GDPR can after all achieve its goals and also improve the European integration and competition on the single internal market and businesses are open to cooperate actively in this respect, provided one *conditio sine qua non* is met – the GDPR must be effectively and efficiently enforced. If not, then the dark unfair competition might prevail and become another large error of the European integration … an error which the post-Lisbon EU in the Brexit context could hardly afford.

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The Driving Forces of Business – Innovation, Success and Human Resources

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Abstract. To survive in an increasingly competitive business environment of the globalized world the primary task of businesses is to ensure and manage human resources to achieve economic growth, gain market share and remain successful. The success of business is made up of several factors. The most important factors are: innovation, motivation and the highest emphasis is put on human resources. Innovation, as a catalyst of progress is playing an increasingly important role to ensure competitiveness and maintain sustainable development. The main objective of the paper is to introduce and examine success, innovation and human resources on theoretical level as well as utilization of this knowledge in international practice, as they are applied in Central and Eastern European subsidiaries.

Keywords: Innovation, Human Resources, Management, Motivation.

1 Introduction

Shaping future processes has always been a desire of mankind. The primary task of businesses in increasingly competitive business environment is to ensure resources to gain economic growth, increase market share and achieve success. Different factors can determine the success of the business. Innovation, motivation and human resources play the most important role to maintain competitiveness. Innovation is a key to sustain development and considered to be an engine of progress [9].

The secret of success is explained in different ways. The basic elements of success are: learning, setting objectives, positive thinking, enthusiasm, strategy, relationships, reliability and flexibility. „Innovation” comes from the Latin word of „innovatus”, which refers to something new, but also means „to renew or change” something. Innovation in society is a process, when new ideas are born and transformed into values. There is a gap between the concept of innovation and the organization’s ability to create value. Nowadays, innovation plays an important role in providing prosperity, maintaining competitiveness and sustaining development [2, 6]. According to Schumpeter, innovation leads to development of new products and processes, requires the use of new resources, implementation of new organizational structures and entering new markets. Freeman differentiates four categories of innovation process: incremental innovations, radical innovations, production process changes and paradigm shifts. Nowadays successful enterprises appreciate not only knowledge and experience of their employees but also their willingness to cope with all difficult tasks [6]. The Oslo Manual is an international source of guidelines for the collection of data on innovation. The Frascati Manual is an essential tool which contains data collection guidelines and classifications for compiling R&D statistics. The Patent Statistics Manual provides guiding principles for the use of patent data. The Canberra Manual is intended to provide guidelines for the measurement of Human Resources devoted to Science and Technology and the analysis of such data. The OECD has made a great effort to clarify and harmonize the concepts related to innovation and the methods measuring innovation. Innovation incubators play an important role in regional levels of innovations [5, 12]. A new concept of responsible innovation was introduced. The social aspect of responsible innovation is complex. The most important feature of responsible innovation is the improved quality of life as a welfare indicator. The development of technology and increasing innovation can result in job losses, therefore other undesirable social consequences may appear [3].

2 Innovation and Human Resources

Nowadays money and assets can be quickly mobilized and rearranged, but it is more difficult to do it with the appropriate workforce. The accelerated processes have made the individual and human knowledge the most important indicator. The human resource will be the most important strategic resource for the organizations in the future. Societies and organizations can experience downturns and losses, but it is easier to survive if employees remain. Similar views are followed by managers. They think that dealing with people is a sensitive and responsible task.

We use the term of human resources for entire population of a country or nation. In the following chapters we will use the concept for individuals working for an organization. The company management should be careful with decision making and implementation of their decisions concerning the company employees [16]. Human resource management is primarily concerned with the management of people within an organization, recruitment of staff, training and development of employees in order to achieve organizational goals. It is essential to mutually consider the needs and objectives of employees and the organization, train and shape the attitude of the staff and develop mutual commitment of the partners. Several approaches deal with the problems of weightless economy and intellectual capital. According to different opinions, the new economy will not follow the rules of classical economics. Others argue that the economic law is outdated and extremes prevail, while some share an opinion that knowledge and knowledge capital are not considered to be part of economic processes. There is no doubt that knowledge has become a critical resource and competitive factor in the economy. Many industrial activities find knowledge capital more important than the intangible capital.

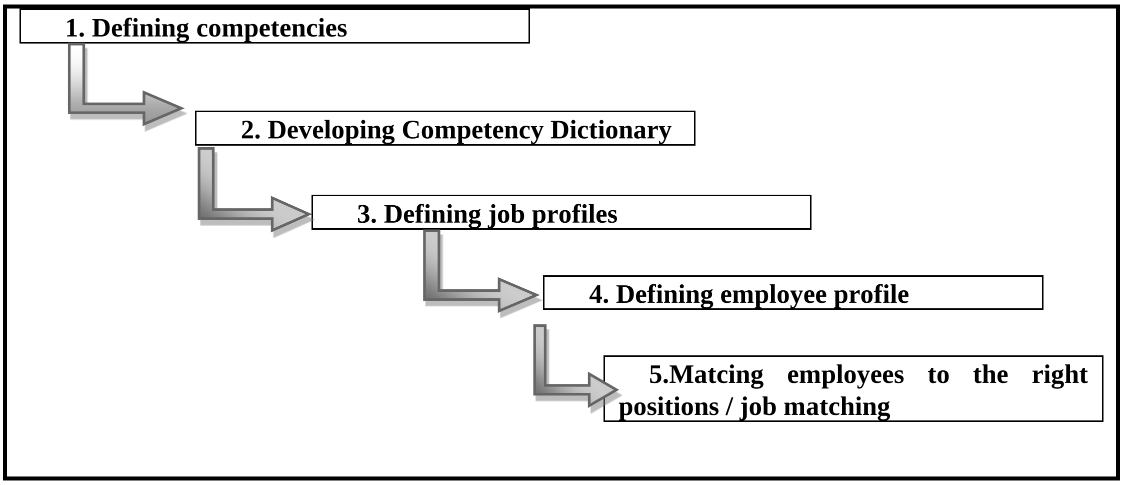
1. Defining competencies
2. Developing Competency Dictionary
3. Defining job profiles
4. Defining employee profile
5.Matcing employees to the right positions / job matching

Fig. 1.. The Competency Model and its Implementation, [9].

There is a debate between professionals about the relationship between the economic development and population growth. Optimists argue that competition is mainly determined by demographic indicators, while others argue that rapid population growth will have negative impact on the development of organizations and businesses.

Organizations going through change experience an increase or decrease of employees. If companies are expanding, they will increase the number of employees, while going through tougher periods will result in reduction of staff. The change of employee number is a complex problem for HR specialists, which can be a sign of implementation of new strategy, organizational development or change.

The intellectual capital should be utilized to build strength, abilities and competencies to maintain relevance and competitiveness. The unpredictability of the work environment, work possibilities and the labour migration should be considered.

HR specialists should help companies to gain a competitive edge and should spend more time on developing company strategy, technologies and getting to know their competitors and customer needs. Good strategies are needed to develop new methods and information should be gathered to forecast the change. It is important to apply modern technologies rationally and take into consideration the well-performing and weaker performing employees. It is important to shape the future, achieve high standards and reward excellent performance. The focus is on the individual, but more emphasis is placed on the responsibility of company's achievements. The future generation of HR specialists will be a hybrid [13, 14].

3 Research Objectives and Methodology

The main objective of this research is to introduce how theory is implemented in practice in the field of innovation, HR, motivation and success. We would like to focus on answers to the following hypothesis:

Innovation, as the main engine of the economy is understood, experienced and perceived positively by employees. Innovation will help employees and make their work easier. They support innovation and accept that there is no progress and development without it. Development secures the stability of jobs. The company values innovative efforts of its employees.

The company was founded in 1874 and headquartered in Lucerne, Switzerland. It has developed a lot since its establishment. Plants and production lines of the company can be found in more than 100 countries. In Europe, it is the biggest and worldwide the second biggest company in elevator production and distribution. The company is a world leader in production of escalators and moving walkways. The number of employees is over 56 000. The company has been operating on the Slovak market since 1995 decided on further expansion.

The main objective of our primary research is to find out and introduce how employees of the company are motivated and what role innovative solutions play in the company. We applied qualitative and quantitative methods in our research. The hypothesis we set is based on quantitative research results, so we do not deal with the results of qualitative research conducted. In selected subsidiaries we delivered questionnaires to 1500 e-mail addresses via internal communication system. 380 questionnaires were returned, but only 345 were evaluable which means 23% success rate. Deductive and inductive approach was applied to process theoretical information and research data.

A frequently asked question is why a person is different from other? It can be explained by instinctive behaviour and childhood experience. Based on these facts, people fall into different stereotypes; however the human personality is complex and diverse [10]. Nowadays companies face not only the problem of smoking and alcohol consumption of employees, but drug addiction as well. The control of this situation means extra burden for the company. According to Herzberg, the existence of hygiene factors reduces or eliminates employee dissatisfaction. It can increase the employee commitment and they are less likely to leave their job, but will not result in increased motivation and performance [4] only few companies pay attention to decrease workplace stress. Stressful work environment increases the number of workplace accidents by 30% [17]. 75% of employees can provide better performance on workplace if they experience positive feedback. 9,9% of the respondents rejected the possibility of motivation and refused to perform better even if there is any kind of reward for their performance. 15% of the employees considered it for extra performance. Employees show willingness to make an effort that benefit them and estimate the expected return before choosing the best option [1].

Different motivational tools were used, but we highlighted only those which were the most popular among respondents involved in our research.

For better transparency all answers received from respondents will be evaluated separately.

- Salary increase: „very good" option was chosen by 75%, „good" option by 13% and „less good" by 4.9% of the respondents.
- Workplace recognition: „very good" option was chosen by 44.4%, „good" option by 37% and „less good" option was chosen by 3.7% of the respondents.
- Job security: „very good" option was chosen by 50.6%, „good" option by 28.3% and „less good" option was chosen by 4.9% of the respondents.
- Chance of promotion: „very good" option was chosen by 44.4%, „good" option by 19.7% and „less good" option was chosen by 7.4% of the respondents.
- Working time: „very good" option was chosen by 38.2%, „good" option by 28.3% and „less good" by 3.7% of the respondents.
- Work environment: "very good" option was chosen by 28.3%, „good" option by 39.5% and „less good" option was chosen by 3.7% of the respondents.
- Income level: „very good" option was chosen by 45.6%, „good" option by 17.2% and „less good" option was chosen by 8.6% of the respondents.
- Benefits: „very good" option was chosen by 51.8%, „good" option by 14.8% and „less good" option by 9.8% of the respondents.

Motivating factors received positive evaluation. If we summarize the ratio of positive responses, less positive answers can be considered negligible. The most popular motivating factor is salary increase. Money can lose its motivating power in long run and will be replaced by other tools to maintain motivation. Our respondents marked money as the most motivating factor. Based on Herzberg's two factor theory of motivation both motivators and the hygiene factors are important for respondents.
„Herzberg found that:

- Satisfaction is not the opposite of dissatisfaction, but the absence of satisfaction. Job satisfaction depends on motivators;
- Dissatisfaction with the job is not the opposite of job satisfaction, it is the absence of job dissatisfaction – dissatisfaction depends on the physical and social environment, colleagues and managers [7].

Below we will focus on fringe benefits motivating the employees of the company.

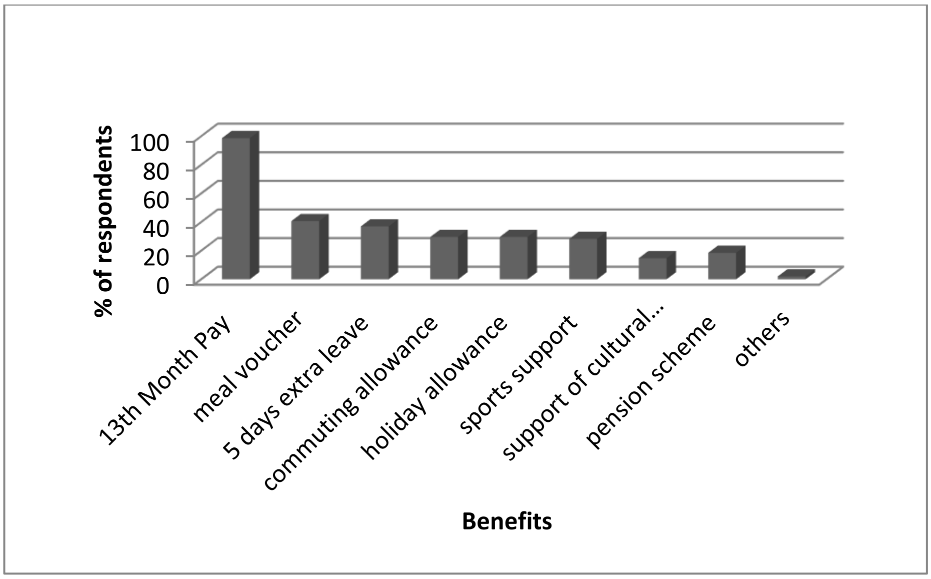

Fig. 2. Fringe benefits

98.7% of the respondents find 13th Month Pay the most motivating factor, 40.7% voted for meal voucher, commuting allowance is attractive for 29.6%, holiday allowance was chosen by 29.6% and sports support by 28.3% of the respondents. Support of cultural events got 14.8% of the votes, 5 days extra leave was attractive for 37% and pension scheme contribution by the company attracted 18.5% of the respondents. In category „Others" two entries were made.

The results show that financial benefit is still the most important motivating factor among the respondents. Other types of benefits were less attractive for employees. In category „Others" one of the respondents found all the listed types of benefits motivating, while other respondent would welcome a training allowance.

People spend less time working and get more money, therefore enjoy higher security and this trend is irreversible. The benefits are not considered to be as a reward for better performance but something granted for work done. Positive corporate culture contributes to employees' willingness to get involved in the enterprise goals, to strengthen initiative and quality of work, to support their loyalty and responsibility towards the enterprise and to make the communication within the enterprise more effective [8]. The response we received for question 26 clearly shows that innovative solutions make work easier for the employees. There are four possible answers for this question, but only one answer can be accepted. (yes, no, make it easier, make it difficult)

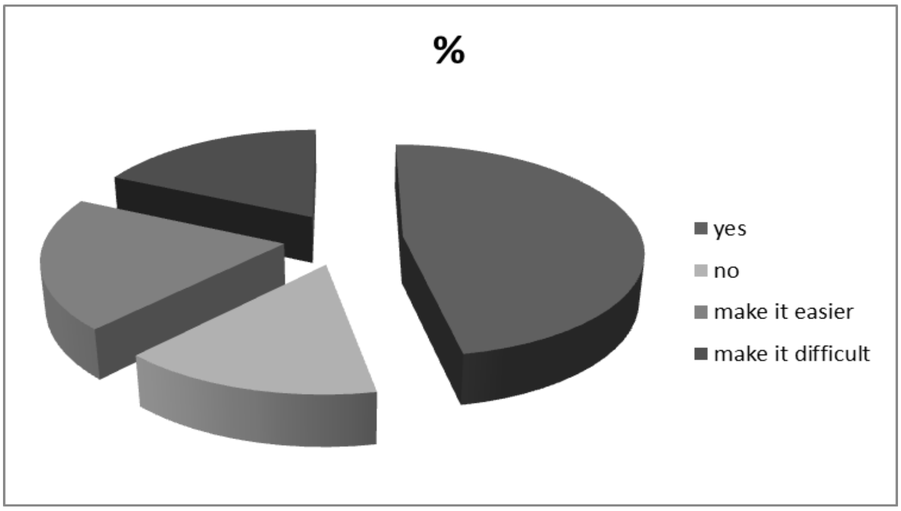

Fig. 3. Do innovative solutions help work?

The research results show the following answers: 16 respondents feel that innovative solutions help their work, while 12 respondents voted for „no” answer. 38 employees from all the respondents answered that innovative solutions make their work easier and 15 think, their work is more difficult.

Summarizing the data available we can declare, that 66.66% of the employees found innovative solutions helpful. It must also be said, that 33.33% of the respondents do not find innovative solutions helpful.

To obtain data it was important to work out the questionnaire. Data collected in our questionnaire research helped to support or reject our hypotheses. The studied phenomenon is interpreted in comparison to other variables. We applied statistical analysis to examine the relationship between the responses. Answers to questions are not expressed numerically, but provide quality values which reflect associative relationship.

We applied a contingency table to examine the relationships between the variables. We must consider, whether the chosen method meets the requirements of the analysis, e. g. the expected value in a cell cannot be less than 1.

The Chi-Square, Cramer and Chuprov’s coefficients of associations may have values between 0 and 1, where 0 indicates full independence and 1 indicates a function-like relationship between the variables.

Hypothesis: Innovation, as the main engine of the economy is perceived and understood positively by employees.

The evaluation of Hypothesis we start with the introduction of results obtained through qualitative research. The research and development is conducted in Switzerland, but innovative ideas are dealt with on local level as well. Financial reward and bonus is provided for innovators, whose ideas can be utilized by the company.

As the results of our quantitative research show, 66.66% of employees found innovation important. Finding new opportunities will ensure the continuity of production and the stability of workplaces.

Statistical method will be used to examine the possibility of correlation between the indicators.

Chi-Quadrat

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{\left(f_{ij} - f_{ij}^*\right)^2}{f_{ij}^*} \qquad (1)$$

Cramer’s contingency coefficient

$$C^2 = \frac{\chi^2}{N \min\{(r-1),(c-1)\}}, \quad \text{or} \quad C = \sqrt{C^2} \qquad (2)$$

Chi-Quadrat = 16,0655

C^2 = 0,198339506

C = 0,445353237

Chuprov’s contingency coefficient

$$T^2 = \frac{\chi^2}{N \cdot \sqrt{(r-1)(c-1)}}, \quad \text{or} \quad T = \sqrt{T^2} \qquad (3)$$

T2 = 0,114044497

T = 0,337704748

The Chi-square value in test of association reached the value of 16.0655. We can recognize a stochastic correlation between the role of innovation and help of innovative solutions. Close correlation is expressed by two coefficients: the value of Cramer’s contingency coefficient is 0.445353237, the Chuprov’s coefficient of contingency reached a value of 0.337704748. The above mentioned coefficients would show independence at 0 values. It is not fulfilled, because the values indicate correlation between the variables. Employees of the company are involved in certain stages of innovation process and some stages of the implementation process. Innovation contributes to better cooperation. Hypothesis **can be confirmed**, as we can see the results.

4 Discussion

In the 21st century, human resources have an indispensable role in the process of innovation and are a creative element in every organization, people design and produce goods, provide services, control quality, care for product marketing, allocate financial resources, and set the overall strategy and goals organizations. Human resources are the most valuable and, as a rule, the most expensive resource for a financial institution, which greatly contributes to its competitiveness, even though the future will probably be a human-like computer with a connection with imagination that leads to robotics.

Stimulating innovation in enterprises is an integral part of good governance and part of quality management approaches, innovations in practice. The economic, political and technological environment has changed significantly both at national and international level recently. Among the most important challenges that affect the development of the economic environment are globalization, talent management, professionalization of HR managers, knowledge management, performance management, creative approach and innovation management. All these new challenges also have implications for human resource management, which ultimately innovate outdated processes in human resource management, and therefore these challenges can also be described as innovative elements and elements in human resource management [15].

In the world of business, there is a constantly up to date question: "*How better than competing*"? Over the course of a decade, however, the answer to this question has changed. In the past, it was true that the one who provides the customer with a higher quality has greater chances for him her. Today, the high quality of its products and services is as high as many producers that quality as a competitive advantage has lost on its original. Recent research shows that a new factor is coming to the fore, which distinguishes successful companies from those less successful, that is, working

with people. Today, it is undisputed that the quality of human resources and their willingness to work and the good of the company is a basic sign that distinguishes successful firms from those of others as well as the upcoming era of robots.

5 Conclusion

It is important to recognize, that an enterprise is not a charity organization. The main objective of business is to make profit and accommodate to market conditions. Hiring the appropriate staff and motivate them to achieve common goals is an essential factor. Our objective is to explore those hidden aspects, which can be improved with administration, different types of motivation tools or simply by accepting facts. We compared the data of fluctuation from the perspectives of staff and the management. The management estimated the level of fluctuation at 5%, while the questionnaire survey shows that 11% of employees would leave their workplace. Employees do not receive regular feedback about their performance. The feedback of information does not work properly. If employees understand why they carry out tasks, they will better understand and accept decisions. Praise is one of the motivation tools which are not used appropriately by the managers. Our results show, that financial incentive is still the most attractive motivational tool among the employees. The phenomenon can be understood when we come to analysis of employee's age. About 70% of employees fall into the age group of 21-30, before or after establishing a family and find finances a motivating factor. This seems to be important information for the company and use this motivation tool properly, because employees receive annual or monthly bonus payments.

According to Fodor, motivation can be conscious, semi-conscious or unconscious, a need or desire that will affect our will and make us act [7]. Employees face innovation at work, but understanding the innovation process is not really successful. They marked the following factors as obstacles: lack of accurate information, unclear instructions, misunderstanding of objectives. It is necessary to explore the reasons of employee fluctuation. It does not require further investment and administration can help to explore the reason why employees leave the company? The company would benefit from more frequent use of „verbal praise" as a tool of motivation. The company should invest into training, where managers can learn about verbal praise and its importance on the workplace. Lack of communication was mentioned several times. Feedback about work, when and what kind of information is given to employees is essential. Factors affecting innovation are also connected with communication. It is important to provide accurate information, clear instructions and use appropriate communication channels. Finding solution for the mentioned problem does not require extra costs. It can increase the responsibility and transparency, as well as decrease workplace stress.

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