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FOREWORD

The Faculty of Informatics and Management, University of Hradec Králové, The Department of Economics organised on 4. - 5. 2. 2014 12th international conference Hradecké ekonomické dny 2014 (Hradec Economic Days, HED 2014).

The aim and intention of the conference are to present the results of scientific research activities in the fields of economics, business economics and management, creating a platform for regular encounters of experts of related fields, strengthening relationships and research, establishing personal contacts so important for submission of joint research projects and creation of space for presentation and publication of young teachers. The HED 2014 conference meets all these requirements.

Five parts of the reviewed HED 2014 conference proceedings include 184 papers in Czech, Slovak and Polish, another part of the proceedings presents 116 papers in English. Most papers were registered in the section of Business economics and management and of Economy and Management of Enterprises and Regions.

The papers were divided thematically and discussed in eight sections.

1. Latest issues in the banking and financial markets
2. Regional development macroeconomic context
3. Tourism economics
4. Business economics and management
5. Economy and management of enterprises and regions
6. Ekonomia i zarządzanie regionów i przedsiębiorstw
7. Mathematical models in economics
8. Modern trends in management

I would like to thank all those who contributed to the preparation of the conference, members of the scientific, organisational and programme committee. Many thanks go to the reviewers and editor for the preparation and publication of the proceedings.

I believe that the Hradec Economic Days conference contributed to the exchange of professional knowledge, establishing and strengthening collegial relationships.

Significant achievement and appreciation for the Department of Economics, Department of management and the entire team was the inclusion of the Hradecké ekonomické dny conference proceedings of the years 2005-2011 **in the CPCI database** (Conference Proceedings Citation Index) on the Web of - Science. We will also strive to implement the HED 2014 conference proceedings in this database.

Hradec Králové of 13. 1. 2014
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VISION, STRATEGY AND GOALS IN ICT STARTUPS

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Key words:

entrepreneurship – information technology – startup entrepreneurs – vision – goals – strategy

Abstract:

The article explores how leaders of technology startups understand the terms vision, goals and strategy. It further describes how they use these visions, goals and strategies to grow their companies. It also compares content of these terms with future ambitions of company owners. The article focuses on the field of ICT companies and startups in particular, as an important industry sector for maintaining competitiveness of the European Union.

Introduction

The owner-manager of a startup company is very important for its every day functioning. He makes important decisions and sets the strategy of the company. Managerial literature discusses the importance of different management concepts, such as visions, goals and strategies. But how the founders understand the underlying concepts? How they work with them? Do they understand the importance or are they using them just intuitively?

In our study we focused on ICT companies, because they are very important for economic growth. High growth ICT companies, the so-called gazelles are significant employment source. “In fact most firms don’t grow. Gazelles do. And that is only 3 % of all small companies” [5, 36].

What are the drivers of fast growth in those companies? There are many factors influencing new venture activity including factors related to the entrepreneur

himself/herself [7]. Also, the smaller the company, the higher the role of entrepreneur can be expected. We decided to take concepts of vision, strategy and goals that are the cornerstones of management literature and focus on how the ICT startup owner-managers perceive them. The goal is to explore understanding of those terms and how are they used in practice. If there is dissonance between academic research term understanding and practical use by founders, then there are possibilities for adapting academic knowledge to the actual market functioning, but also for better preparation of startup entrepreneurs.

1. Theoretical Background

Wilson defines vision as coherent and powerful statement of what the business can and should be years hence [10]. Vision represents a shared long-term goal to get all members of the organization working towards this intended goal. In the entrepreneurship and business literature, the importance of *vision* and its effects on organization level performance has been stressed in theoretical discussions and empirical research. Baum, Locke and Kirkpatrick confirmed the link between vision content, vision communication and venture growth [1]. Their study results confirmed the charismatic leadership theories that consider vision as a key element. This effect is supposed to be stronger in smaller companies where there are fewer hierarchical levels.

The goal setting theory states that there is a positive linear relationship between specific *goal* and task performance. The theory even explains that a specific high goal leads to even higher performance than urging people to do their best. Goal setting was widely empirically tested. It affects performance in laboratory, simulated and organizational setting. It was found valid in all levels of analysis from individual and group to organizational [6]. Important for our research is a notion of a direct link between goals and venture growth.

The internal explanation of venture growth is linked with entrepreneur and his role in *strategy* formulation [2]. In our research we used strategy defined as “a fundamental pattern of present and planned objectives, resource deployments, and interactions of an organization with markets, competitors, and other environmental forces” [5, 48].

2. Methods and sample

We conducted 20 semi-structured face-to-face interviews with ICT startup entrepreneurs focused on vision, strategy, goals and founder's ambition in autumn 2013. We constructed the sample using snowball technique, starting from personal recommendations in selected technological incubators in Prague. If the organization had multiple owners, we interviewed the one who had maximum or at least joint maximum decision-making authority and ownership. Our sample consisted of software development companies, e.g., online portal for flight tickets sale, b2b solution and mobile application developers for all platforms. The companies were based in Prague. The companies were on average 2,8 years old ($SD=1,5$). The average number of employees was 7,3 ($SD=6,2$).

We prepared questions for semi-structured interviews that were thematically grouped in several areas: general information, vision, goals, strategy, and ambition. Final question of the interview dealt with the founder's perception of success in business. Our goal was to capture detailed answers, so we can later analyze even the small nuances in content of these management concepts viewed from the entrepreneur's perspective. We used open-ended questions, e.g., "Do you have personal vision connected with entrepreneurship?" and "Does your company has a vision?" The answers were evaluated using content analysis techniques following the procedure established by Mayring [9]. We developed categories based on the questionnaire structure. We established initial coding rule for the company vision, based on the theoretical definition of Wilson [10]. Then we worked through the interview material and determined complementary categories, for example content of the vision. For each category we provided direct quotation as an example. From the second interviewee's answer, we added one more quotation where it was needed. In this manner we worked through all interviews, continuously revisiting the categories. We replicated the category coding rule process for the strategy, goals, ambition and perception of success categories. We also coded the interviews in a way that we can search for relations in the different categories. Finally we created 21 sub-categories thematically grouped under 6 categories (general information, vision, strategy, goals, ambition and perception of success). Exact coding rules are available by the first author.

3. Results

We found that all entrepreneurs from the sample have personal *vision* connected with entrepreneurship and were able to describe this vision. For example: “Be free to take decisions in my life.” or “Do something that I enjoy and provide enough money for my family.” In 11 cases the vision was connected with success of their business. Seven cases of personal visions were directly connected to the entrepreneur and his dreams. We also found that almost all companies from the sample have some kind of company vision. Only in one case the entrepreneur wasn’t able to formulate company vision. In relation to content, there were 15 cases describing the company vision as a future direction of the company. This is in accord with the theoretical definition. Only 6 companies had their vision written in any form of formal statement. In 12 cases the vision existed only in the form of an idea or mental image of the entrepreneur. It was shared in the form of conversations and sharing the image in personal communications. In majority of cases (16) the vision was communicated only sometimes. The entrepreneurs did not see any benefits in regular communication of the vision.

There was a significant overlap of personal and company vision in the sample (11 cases). This supports the entrepreneur’s importance for future company development. In all cases the entrepreneur or the entrepreneurial team was a sole creator of the vision. Though they sometimes acknowledged influence by their employees, advisors, investors or family, the final decision and the content of the vision was in their hands.

Seventeen companies from the sample were using *goals* in their every day functioning. When it comes to term understanding, in six cases they were not able to differentiate the term from company vision. In three cases they were mentioning shorter time frame when compared with a vision, but there was still significant overlap in the content. In 9 cases they understood goals as specific steps in short time period (up to 3 months). What is positive, twelve companies measured fulfilling the goals. It could be in the form of financial controls or regular meetings with milestone revisions.

Almost all companies in sample (18) had a *strategy*. They understood the term strategy as a process to reach their goals or vision. In 9 cases they had some kind of a written

formal document. The rest was in the form of steps decided by entrepreneur. He was the one making the decisions and forming the direction. In general, entrepreneurs stressed the importance of flexibility. Just one company was creating a strategy plan longer than 1 year.

4. Vision and success perception

There is a significant focus on personal and employee satisfaction both in the entrepreneur's vision and in his perception of successful venture. Entrepreneurs emphasized their ambition to improve living conditions of their customers and creation of meaningful services. As an example could serve this answer: "We want to make something meaningful for our customers. Something with a real value." In 14 cases they mentioned the importance of doing something they enjoy.

We further compared the company vision and entrepreneurs' perception of success. In 14 cases the understanding of success was connected to added value creation, improving lives and employee satisfaction. We can conclude that the sense of purpose is more important than the financial motivation. Financial aspects appeared only in 5 cases of vision and only in one case of success perception.

When it comes to ambition in terms of future job creation, the entrepreneurs were rather moderate in their expectations. In 10 cases they wanted to build a company with more than 20 employees. But only in 2 cases the entrepreneur was planning a company with more than 100 employees. In their answers they often stressed the importance of workplace atmosphere and the ability to quickly react on market changes.

Discussion and conclusion

This study is the first to analyze the perception of terms vision, goals and strategy in young ICT companies. Although the concept of vision is widely discussed in management literature, there was no research focused on the practical perception by startup entrepreneurs. According to Baum, Locke and Kirkpatrick, the communicated vision is quantitatively related to performance over a multiyear period [1]. The results of our study show that ICT startup entrepreneurs do not recognize the importance of

properly and regularly communicated vision and do not use the theoretical concepts according to management books. One reason could be lower level of management education that might be even stronger in the case of technical school graduates. Future education of high growth company founders may require better explanation how can well formulated vision, goals and strategies help them to grow.

Also, the number of highly ambitious founders was rather low. Is it because the founders of high growth companies are open to potential future opportunities, but the growth is not the goal per se? I.e., they do not plan to be big, but they are able to adapt? Or is it linked with the focus of entrepreneurs in our sample on purpose rather than financial results? They seemed to be satisfied to stay small as long as they do something meaningful. It would be interesting to test these questions empirically in terms of company performance. There is study showing that business planning at the initial stage of firm's operation lowers performance [3]. Overly planning and use of rigid strategy planning could hurt flexibility and fast reactions. This is in contrast with theories of planning [8]. The conflict of results in those lines of research would be worth testing empirically. Entrepreneurs in our study stressed the importance of flexible reactions. Is it just common knowledge about the environment or is the ICT landscape really changing so fast, that you don't get engaged in strategic planning? Maybe the startup companies do not need the plan in the initial phase, but will implement more rigorous planning when they grow past certain size.

The main limitation of our study is the number of 20 respondents that is low to run sophisticated statistical analysis. However, we were able to analyze underlying concepts and gain deeper empathy for the ICT entrepreneurs' understanding of visions, goals and strategies. Subsequent longitudinal and quantitative research design on a more representative sample would bring a lot of value in understanding how the use of vision, goals and strategies relates to growth and company success.

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AUDIT OF PERSONNEL MANAGEMENT AND ITS USAGE BY THE ENTERPRISES

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Key words:

personnel management – audit – small and middle sized enterprises – human capital

Abstract:

The organization's greatest asset is the staff and their knowledge. Companies valuing their employees are becoming more aware and therefore pay increased importance to the human resources field and the management system and their employees control the efficiency with which a human resources management system is set up. This article presents partial results of the research of the usage of audit of personnel management in small and medium-sized enterprises in the Slovak Republic and theoretical knowledge of this issue. This article was created within the project VEGA 1/0053/2012.

Introduction

To enable any enterprise to operate, it must have human resources. And much like the other resources, financial and intangible resources as well as the human resources, the enterprises must take care of them and develop them. The most effective usage of human resources is one of the most important goals of the department dealing with human resources. "Personnel work has not only a mediated impact, but also a direct impact on the economic performance of the enterprise, such as the size of the profits of the enterprise itself." [5, 75]

In the current literature is the personnel work defined as a element, which forms the part of the enterprise, which focuses on everything that concerns the human capital in the employment process, that means the acquisition, formation, operation, usage, its organization and linking its activities, results of its work, the work skills and professional conduct, relationship to the done work, organization, co-workers and other individuals, which are in connection with their work and also the personal satisfaction of accomplishment, their personal and social development.

Human resources management is the most important element of competitiveness of the enterprise. Therefore, several authors in recent literature state that personnel work in terms of human resource management can be considered as the most important area of management throughout the enterprise. "The basic role of human resources management in the organization is to contribute to the achievement of business objectives through HR processes of acquisition, stabilization, motivation, development and optimal use of human resources in enterprises. Achieving this objective is a common task and takes place in conjunction with the line managers and specialists in the field of personnel management."

Human resource management therefore represents the latest concept in the literature and is considered to be the most advanced concept of personnel work. Human Resources is strongly gaining its importance and its management becomes a core management of the enterprise, its most important ingredient. The importance of personnel management results mostly from the fact that it is currently perceived as a process that (like any other business process) has its content of inputs and outputs. In most cases of business analysis is the personnel management one of the key parts of the core processes.

1. Audit of personnel management

One of the basic characteristics of today is the emphasis on power and performance, and strong focus on success. These factors influence the behavior of different actors, individuals and enterprises. The rating of the enterprises is in reality of the commercial firms often factored into the assessment of the performance issues of that enterprise. Profitability is not the only phenomenon that we may be interested in the operation of the enterprise. Profit information does not represent all aspects of the functioning of the enterprise. Therefore, as mentioned in the recent literature, performance measurement system should also include many non-financial benchmarks to supplement the financial aspects and especially include the customer perspective and performance of internal processes. If we want to know the company, we can use a variety of tools.

The audit is currently one of the most used methods in the evaluation of the enterprises. It is a method that can be used to evaluate different areas and activities. The development of this method in the view of the authors is well illustrated by the fact that they appear ever different and new types of audits. Methods of audit can be used to

evaluate the functioning of areas in the field of personnel psychology and personnel marketing.

"Audit of personnel in marketing and personnel management is a fundamental tool of business management. Business management applies through it the methods and procedures to give objective and reliable information on the state of human resources in the company, their quality, structure, motivation and ability to adapt to new tasks and challenges, as well as information on how is their management and control in the direction of corporate goals and objectives." [8, 131]

Audit of personnel management is one of the types of audits. In broad terms the importance of the audit of personnel management lays in the control of the activities focused on human resources management in the enterprise. Its objective is to streamline the development and management of human resources. Audit of personnel management may also address the detection level of corporate culture and the overall climate in the enterprise and can examine personnel actions (area) and processes of personnel work. This is consistent with the concept of Wagner, who says that "the classic personnel audit focuses on mapping the quality of the key functions of the human resource activities in the enterprise."

In the strict sense we can understand the personnel management audit as the audit of staff. In this sense the audit examines and evaluates the professional competence of staff of the company. In accordance with the conception of different authors in the literature, that are describing the audit of personnel management as a process that assesses whether the organizational structure and competences of employees and managers are responsibly defined towards the needs, strategies and objectives of the enterprise. The result of such audit has to offer qualified look at the personnel and the structure and the usage of staff resources with respect to the strategy and goals of the company. Within such an audit we can usually assess qualification, expertise and management skills, professional experience and personal characteristics of the several team members. Furthermore it also compares the quality of team members with the new requirements, the aim is to obtain the information on each individual's potential and the potential of the group as a team. Due to the absence of laws that would have an unifying influence at the area of personnel audit, this area is highly fragmented and instigates systematic

untidy. Any company that has undergone the audit has their own idea of the content and methods of personnel management and audit approaches of suppliers may differ widely. The audit of personnel management is an important tool of business management. It gives us an objective and independent view of the level of human resource management in the enterprise and is in particular trying to find weaknesses in this area and to propose measures that will increase the current level and to correct deficiencies. This gives us the opportunity to increase productivity and also the competitiveness of the enterprise. At the same time, these changes should lead to increased satisfaction for the workers within the company as well as customers and other stakeholders (public, contractors, offices). Every personnel audit follows a series of targets. These objectives are related to the subject of the audit. If the aim of the audit is to reveal the causes of turnover and absenteeism, the result of the personnel audit may be the reduction of these factors as well as the identification of surplus or incompetent people, or disclosure of personnel reserves. The literature on the objectives of current audit says that their purpose is to provide confirmation if the task is being done correctly. The audit of personnel activities, by contrast, focuses on finding bottlenecks in personnel management. Its purpose is thus rather highlighting shortcomings. How often is the personnel audit in the enterprise implemented generally depends on the size of the enterprise, its needs and budget, because the human resources audit is very expensive. The implementation of a the personnel audit is very time consuming for staff in leadership positions and the members of the personnel department. Some degree or all employees across departments are likely going to experience increased stress and discomfort in response to the ongoing or planned audit.

"The audit thus enriches the existing knowledge of the management on the quality of human resources in the company by means of the external objective assessment. This objective evaluation includes the comparison of the quality of the personnel with the market situation not only in local and regional but even global scale." [2, 49]

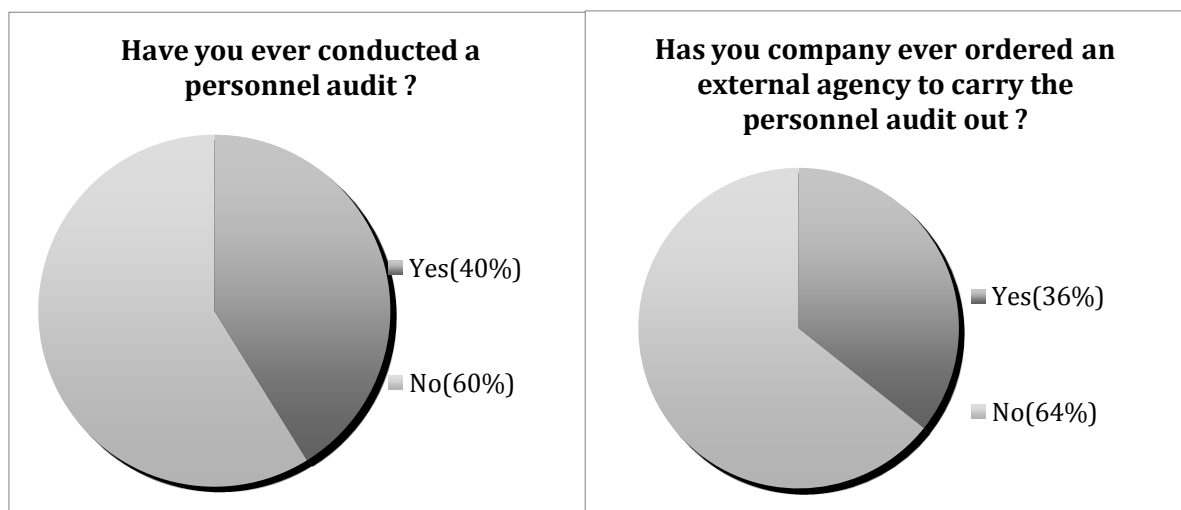
2. Partial results of the monitoring

The audit of personnel management, whether it is focused on human resources or management, or a combination, and is aimed at finding out the deviations from the established status in both planes, is considered an important tool of business management both in terms of presence as well as for the future. In the current literature

it is most often associated with large multinational enterprises implementing them regularly in order to obtain accurate information on the implementation of personnel policies by parent company in the subsidiaries.

Personnel audits are carried out sporadically in small and medium-sized enterprises. It draws on the notion that small and medium-sized enterprises not only have not sufficient funds for the costly audit of personnel management as well as all the staff is familiar with each other and therefore know their reserves, they know in which areas of HR activities they can find deviations from the established rules and standards. This can be observed to be to some extent a myth that connects the managements of small and medium-sized enterprises in general, and this has become the basis for monitoring, which was carried out in small and medium-sized enterprises operating in Slovakia. Sample respondents consisted of randomly selected managements of enterprises exclusively with the Slovak capital participation, which operate in the Slovak Republic. At the same time, these firms accounted for 1 % of the total registered Slovak small and medium enterprises operating in Slovakia. To obtain this information a questionnaire method was used with a complementary way of the structured telephone interview. To evaluate the information obtained, we used methods of content analysis, synthesis, generalization and statistical methods.

TAB. 1&2: Monitoring of the usage of personnel audit by the small and middle sized enterprises in Slovak Republic



Source: Authors creation

Conclusion

It is said that we are getting into the era of knowledge economy. This means, that the enterprise's greatest asset is the staff and their knowledge. In terms of enterprises, this is reflected in the shift from the designated name of "staff" to the term "human resources" and most recently the designation "human capital". The enterprises value their employees and are becoming more aware of this issue and thus pay more attention to the human resources field and the management system of their employees and control of the efficiency with which a human resources management system is set up. As shown by the results, personnel audit is not the domain of only foreign multinationals but there are also demonstrated efforts to acquire the knowledge from the audit even in small and medium-sized enterprises, which previously had the opportunity to benefit from the positive results of the audit of personnel management. Despite the financial burden that enterprises must undergo is audit of personnel management in small and medium-sized enterprises perspective, because the proper implementation of its results can influence the enterprises by having impact on improving enterprise processes and thereby improves its competitive edge in a difficult market in which individual enterprises operate.

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CROSS-BORDER FLOWS IN THE GERMAN-POLISH BORDER REGION

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Key words:

border region – crossborder flows – German-Polish borderland

Abstract:

The border area is a specific area due to the problems occurring on them. These areas are in fact peripheral areas with the result that their residents often seek satisfying their needs across the border. In this area we can also see very often differences in quality of life. It all makes a very important point is to answer the question: As the differences in quality of life influence the formation of cross-border flows? Such research was carried out within the project „Quality of life in the border area - the strengthening of cross-border flows for the common sustainable development and regional planning” financed by the European Union under the OP Poland - Saxony 2007-2013.

1. Crossborder flows

One of the causes of cross-border flows may be differences in the quality of life on both sides of the border. Particular area in which such phenomena may occur is a border region. Differences in quality of life can cause that people will move to the other side of the border in search of better jobs, make purchases, use of health services, cultural institutions, etc. Therefore, such an important issue is to determine the quality of life in the border area and an indication of how these differences may affect the formation of cross-border flows.

The observed differences in the quality of life on both sides of the border can be considered as determinants of the emergence of cross-border flows. Cross-border flows are defined as physical flows (people and goods), and institutional, which have their starting point or destination in the region of the test (borderline). For the purpose of research carried out under the project highlights 16 areas in which analyzed the formation of cross-border flows: housing, shopping, services, labor market, economy,

trade, finance, culture, religion, recreation, sport, tourism, education, communication and mobility, society, health and social security, public safety, prevention of crises, infrastructure, environment, politics and administration and the media. In each of these areas sought indicators with which is to possible to measure the magnitude and direction of flow. Proposals for examples of indicators in selected areas presents Table 1.

TAB. 1: Selected indicators for flow analysis

Areas of analyses	Possibles indicators
Residence	- Number of residences of foreigners from the neighbouring country - Removals close to the border
Reatil and services	- Flows of clients in retail - Flows of clients in services
Work	- Cross-border commuters
Economy, trade, finances	- Economics clusters - Branches of eneterprises in the neighbouring country - Cross-border trade flows
Culture	- Cross-boredr catchment areas of cultural facilities
Religion	- Cross-border attendances of services and pilgrimages
Recreation, sport, tourism	- Cross-border utilization of recreation, sport and touristic facilities
Education and qualification	- Pupils, students etc. From the neighbouring country - Native teachers from the neighbouring country
Transport and mobility	- Intensity of cross-border traffic

sources: R. Knippschild, Cross-border interrelations. A factor to enhance quality of life in border regions?, http://tu-dresden.de/die_tu_dresden/fakultaeten/fakultaet_forst_geo_und_hydrowissenschaften/fachricht_ung_geowissenschaften/ig/lehrstuehle/raumordnung/news/KNIPPSCHILD%20Cross-border%20interrelations.pdf

Each of the obtained data were subjected to multidimensional assessment. This evaluation consisted: availability of data, its timeliness, the time range and frequency of collection, the level of accessibility (province, district, commune), range (point or for the whole area), reliability, comparability between countries.

As part of these sought answers to questions that are cross-border flows, what is the source of their creation, and what are useful sources of gathering information about the flows. The rationale for such kind of research was the fact that these regions because of its border location are the peripheral regions. Their inhabitants may have trouble satisfying certain basic services due to occurrence the border. Cross-border ties can compensate for this disadvantage. It should be emphasized that the peripheral does not result only from the geographical position , but it is a process that has many causes (tab. 2).

TAB. 2: Surface formation process of peripheral

Field of action	Proseses of peripheralisation
Economy	- deficits in regional education and labour markets - disconnection of local and regional economy from dynamics of knowledge-based economies
Infrastructure	- disconnection from technical infrastructure - disconnection from social infrastructure
Politics	- dependency of municipalities on public transfers - dependency of municipalities on public decisions in capitals
Communication	- stigmatisation through negative public images - stigmatisation through negative self images

sources: R. Knippschild, Cross-border interrelations. A factor to enhance quality of life in border regions?, http://tu-dresden.de/die_tu_dresden/fakultaeten/fakultaet_forst_geo_und_hydrowissenschaften/fachricht_ung_geowissenschaften/ig/lehrstuehle/raumordnung/news/KNIPPSCHILD%20Cross-border%20interrelations.pdf

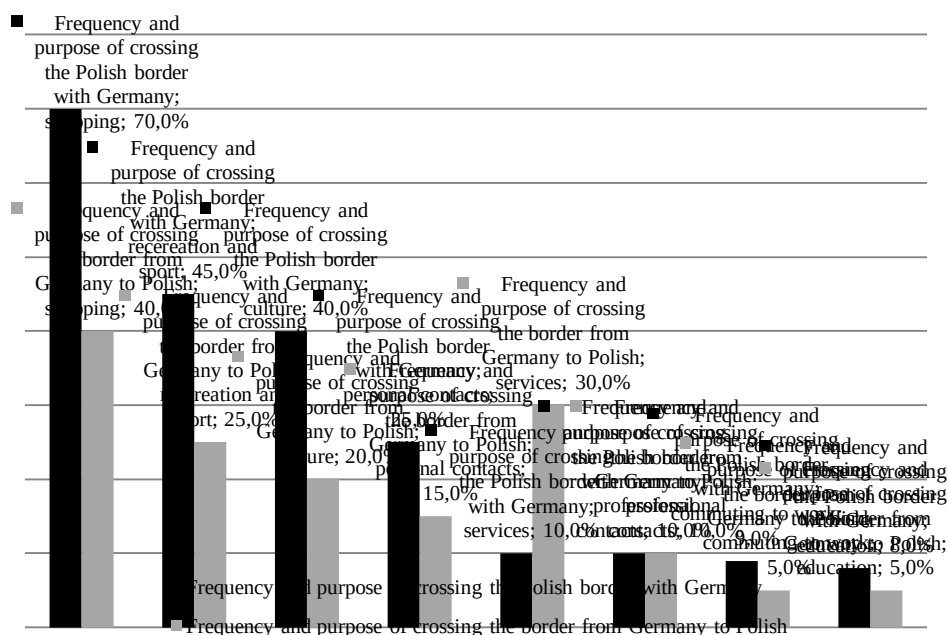
Increasing the flow formation is observed since the opening of the border. Freedom in the crossing causes the residents if their needs are not being met to an adequate level in the area where they live are looking to satisfy them on the other side of the border. It is therefore very important issue is to take the appropriate decision-making process, the best common by partners from both sides of the border to allow appropriate management of resources which in turn may lead to the elimination of disparities in quality of life. Determinant for the formation of cross-border flows are also differences in quality of life. You can bet the idea that the larger the differences in quality of life, the greater the flow and on more surface to such flows occur.

2. The results of studies on the Polish-German borderland

Research on cross-border flows was conducted using a survey conducted in the two districts, the analysis of available statistical data and based on expert interviews. Conducted research aims to not only identify the areas and the size of flows, but also to contribute to the records available sources of data on cross-border flows, evaluating the data from the point of view of their use in the examination flows. With the implementation of the project will be identified physical flows of "links" between the study districts and are to be identified obstacles to the formation of flow.

Survey conducted in the district of Zgorzelec and Görlitz has helped to identify the main areas of the formation of the flow between this two districts (graph. 1).

GRAPH 1: The main areas of the formation of cross-border flows.



source: own study based on the results of a questionnaire study, www.kzjis.ue.wroc.pl/plsn

The aim of the trip Polish respondents to Germany is the most frequently desire to go shopping, take advantage of the infrastructure of sports, recreational and cultural. German inhabitants of the border region also come to the Polish frequently to make purchases, use of recreational facilities and sports and use services.

Below as an example of the detailed results obtained will be presented cross-border flows identified in the area of tourism.

In the area of tourism on the basis of data published by the Central Statistical Office in the framework of the Local Data Bank¹ and the National Statistical Office in Kamenz² can present information showing the state of German tourism in the district of the Zgorzelec. For example:

- the number of German tourists using accommodation,
- participation of German tourists accommodated in the total number of accommodated,
- participation of German tourists accommodated in the total number of foreign tourists using accommodation,
- number of nights spent by German tourists,
- proportion of the number of nights spent by German tourists in the total number of nights,
- proportion of the number of nights spent by German tourists in the total number of overnight stays by foreign tourists.

The values for individual indicators from the years 2008-2012 for county Zgorzelec shows TAB 3.

The presented data show a downward trend both in terms of the number of German tourists using accommodation as well as in relation to the number of nights spent by German tourists. It is worth emphasizing the fact that German tourists benefit from short-term stays of area county Zgorzelec. Average for number of nights per tourist accommodation ranged from 1.3 in 2011 to 1.7 in 2012. Tourism occurring in the district of Zgorzelec is mainly tourism "Purchasing". Tourists "sojourn" crossing the border at the most popular border crossing in the district of Zgorzelec head for towns located outside the county (eg Wrocław - city tour, Swieradów Spa - spa guests, gondola, Jelenia Góra - sightseeing, Karpacz - mountaineering, church Wang).

¹ Local Data Bank, www.stat.gov.pl/bdl..

² Statistisches Landesamt Sachsen, <http://www.statistik.sachsen.de/>

TAB. 3: The values of selected indicators for county Zgorzelec.

questionnaire	2008	2009	2010	2011	2012
the number of German tourists using accommodation (person)	2773	2459	1877	2420	1739
participation of German tourists accommodated in the total number of accommodated (%)	4.20%	4.37%	3.62%	4.31%	3.73%
participation of German tourists accommodated in the total number of foreign tourists using accommodation (%)	10.97%	13.11%	10.59%	10.23%	9.14%
number of nights spent by German tourists (piece)	3526	3370	2632	3143	2906
proportion of the number of nights spent by German tourists in the total number of nights (%)	12.54%	15.77%	11.28%	10.50%	11.80%
proportion of the number of nights spent by German tourists in the total number of overnight stays by foreign tourists (piece)	3.48%	3.90%	3.13%	3.91%	4.30%

source: Own calculations based on the Local Data Bank, www.stat.gov.pl

Summary

The study showed that there is a need to study the cross-border flows. Identifying the sources and flow rates can allow for better resource management in the border area. You can also arise such needs, which can not be met on one side of the border due to lack of resources, such as certain, but you can use them after crossing the border. The cooperation of local authorities in the border area can cause the residents will be able to meet their needs across the border without having to meet them at any price in residence.

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THE IMPORTANCE OF CREATIVITY IN INNOVATIVE CLUSTERS

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Key words:

cluster – innovation – knowledge – technology – creativity – management – competitiveness

Abstract:

The article presents the significant role of creativity in development of innovative knowledge-based clusters. It has been emphasised that the ability to combine and use knowledge of various branches to create new, original solutions is an indispensable element of the decision making process within clusters. Basing on the results of theoretical studies, it has been assumed that innovative clusters create a great environment for human creativity.

Introduction

Innovative clusters with great level of intellectual capital of their members, they focus on searching new possibilities of elastic use of the innovative potential in creating and commercialisation of valuable ideas, making an effort to meet market needs. Professional management in this type of cluster should not only lead to solving current problems but also it has to be permanently focused on active identification and facing new challenges. As a result, it creates the need of great excellence in cluster management, development of creative management as well as shaping the climate favouring creativity.

The aim of the article is characteristics of the nature of an innovative cluster as well as the role of individual and team creativity in the process of developing this type of structure. The considerations, whose outline was presented in the article, have been made on the basis of theoretical studies.

1. Nature of an innovative cluster

Clusters as geographical centres of specialised economic entities, both cooperating as well as competing with each other, they have become a very attractive manner of development and improvement of competitiveness, thanks to an increased capability of creating, designing and permanent implementation of innovations. Moreover, clusters are treated as modern forms of organising production with high innovative potential, which allow efficient creation and use of knowledge resources. In theory and practice, there is no generally assumed and accepted definition of a cluster. Consequently, this notion has many meanings depending on the context of studies and analyses. The concept of cluster can be characterized by [7]:

- new paradigm competition (co-opetition),
- socioeconomic entity (organization);
- social community of different people and population of economic agents localized in close vicinity within a specific geographic region;
- collection of different types of complementary members and their interaction;
- regional economic activity located at all levels: community, geographic area, global;
- limitation to a specific industry;
- vertical relations as supplier-manufacture-dealer-customer value chain or horizontal production relations as in sectors of the same industry;
- companies having identical or interrelated business areas;
- firms in competition process but through high specialization contribute to the cluster development and growth;
- firms proximity constantly generates social relations based on trust;
- common infrastructure used in innovation by rapid transfer of formal and informal knowledge, and because of the support offered by universities, education organizations, research centres, business support institutions, capital providers (angel networks, venture capitalist, commercial banking institutions), public agencies.

M. Porter emphasizes, that many clusters include specialized firms, governmental and other institutions - such as schools, universities, standards-setting agencies, think tanks, vocational training providers and trade associations - that provide specialized training, education, information, research, and technical support. Moreover, he suggests, that clusters concentrating a significant number of firms and related organizations that

complement each other, stimulate competition and provide shared information, it is generally agreed, they generate efficiencies that help firms compete in local, national and international markets [21, 3]. P. Krugman argues that the clusters are not seen as fixed flows of goods and services, but rather as dynamic arrangements based on knowledge creation, increasing returns and innovation in a broad sense [19].

Among many kinds of clusters, particular attention is paid to innovative clusters, characterised with great intensity of research and development, high level of expenditures on R&D, high participation of qualified employees in employment as a whole. The aim of innovative clusters is mostly openness to innovativeness and seeking concept support in the sphere of research and development. Thus, these structures focus mainly on the entities oriented to innovations and functioning in the area of high technologies. It is worth emphasising that in the sector of advanced technologies, the products of investments in research and development, they “age” very fast, by means of which, this sector is featured by the high investment risk, putting additional pressure on increasing the expenditures on scientific activity and improvement of effectiveness. Moreover, the success in this knowledge absorbing sector, greatly depends on the interaction with the scientific sector.

Innovative clusters are a critical component of regional and national competitiveness because this kind of clusters is generally seen as organizational structures that enhance industrial productivity and innovation. Innovative clusters mean groupings of independent undertakings - innovative start-ups, small, medium and large undertakings as well as research organisations - operating in a particular sector and region and designed to stimulate innovative activity by promoting intensive interactions, sharing of facilities and exchange of knowledge and expertise and by contributing effectively to technology transfer, networking and information dissemination among the undertakings in the cluster [15]. The studies conclude that diffusion of technology goes faster when it is between the entities located in the vicinity, and at the same time, different due to technological scope. [20]. Also I. Bortagaray and S. Tiffin define the innovative cluster as groups of firms, research centres and investors that work together within a narrow physical proximity in order to create new products, technologies and enterprises. They work into invisible relationship networks within a complex social framework where the

collective industrial activity is based on learning and knowledge¹. An innovation cluster can then be defined as geographic grouping of institutions/firms which will catalyse and strengthen the innovation culture in the entire ecosystem. The focus is on creation of knowledge sharing mechanisms inside the cluster, use creativity, technology transfer and commercialization, innovation in products, processes, services and delivery which will in-turn enable growth and development [14]. The concept of innovative cluster refers to the role of partnership into formation the learning organization. Moreover understood as the structure built to increase the level of knowledge and the participants innovative capacity and to give the organizations the possibility of entering into relationships with other members and to support the learning of their employees [9]. Innovative clusters that are bound together by a network of shared advantages create virtuous cycles of innovation that succeed by emphasizing the key strengths of the local businesses, universities and other research and development institutions, and non-profit organizations [16].

We conclude that clusters favour systemic dynamics of learning and knowledge creation based on socially embedded vertical and horizontal linkages of co-locating firms and their interaction with key stakeholders [12]. Clusters provide proper conditions for efficient implementation of innovative processes, developing the entrepreneurial attitudes of their members, favouring permanence of knowledge, designing and implementation of innovations, meeting the needs of the market. Concurrently, functioning within the structure of the cluster favouring proper conditions for stable development, in which it is easier, safer and cheaper is to gain specialised resources, adjusted to specific needs or experiment with new ideas. Formally and informally, the relations of partners within the clusters, including cooperative relations, enforce greater efficiency, innovations and competitiveness, generate scale effects, limits the barriers of entering the foreign markets, create high added value, favouring reduction of costs connected with the activity within a given sector.

¹ The two authors consider the innovative clusters a category of industrial clusters that can be divided into three subcategories, in accordance with the intensity of innovation, i.e.: innovative industrial clusters (centered on incremental innovations as the authors suggest, improvement of products, processes and routines), proto innovative clusters (focused on the latest knowledge as competitive means at a medial level, that supports a limited growth of the knowledge based firms but which lack all the elements to guarantee medium-term development) and mature innovative clusters (developed inside the social community structure, which gather competitive international firms and path the rhythm and the direction of the world scientific and technological research) [9].

2. Creativity as the basis for development of an innovative cluster

One of the resources indispensable to design and implement innovative projects within a cluster is creativity of the members of this structure, both individual and team one. Creativity treated as a driving force is accompanied by the intellect enriched with differentiated professional experiences and views (opinions). Human creativity as a multidimensional category, is differently interpreted i.a. as [18, 22, 5]:

- function of three components: expertise, creative-thinking skills, and motivation;
- ability of watching new ideas and face to face problems that haven't an ability of deterring their existence;
- production of novel and useful ideas or solutions;
- conceptualization and development of original ideas, products, processes or procedures by individuals or a group of individuals working together;
- process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on; identifying the difficulty; searching for solutions, making guesses or formulating hypotheses about the deficiencies; testing and retesting them; and finally communicating the results;
- development of ideas about products, practices, services or procedures that are novel (unique) and potentially useful (having a direct or indirect value) to the organization.

Creativity is derived from an individual's accumulated creative thinking skills and expertise based on their formal educations and past experiences. Also considered to be a personal characteristic with features that include broad areas of interest and high energy levels [6]. Creative people use intelligence in a specific manner i.e. against the principles of traditional intelligence, they create various notions in surprising combinations, they think synthetically, they know how to see what is new and invisible for others. Moreover, they indicate total engagement in implementation of aims, along with intensive use of energy, which constitutes the sign of self-realisation. Creative thinking depends to some extent on personality characteristics related to independence, self-discipline, orientation toward risk-taking, tolerance for ambiguity, perseverance in the face of frustration, and a relative lack of concern for social approval². M. Wertheimer stresses that creative thinking involved breaking down and restructuring our knowledge about something in order to gain new insights into its nature. He

² Creativity skills can be increased by the systematic learning and practice of techniques to improve cognitive flexibility and intellectual independence [2].

considers that understanding our own cognitive model of reality may therefore be an important determinant of our ability to think creatively [5]. Creative thinking commonly regarded as passive investigation leading to seeking new manners of perceiving a given problem, whether the procedure is always pursuant to logics or not. However, it requires coordination in using two cerebral hemispheres, as it integrates linear thinking with lateral one. The creative attitude basing on fantasy, optimism, breaks barriers of routine, conventionalism, schematic and commonly binding paradigms.

Innovative clusters characterised with high ability to create and implement innovations, high potential of creativity of their members, constitute an example of creative organisation. The orientation to permanent seeking of new knowledge and organisational learning dominate in this kind of organisation. Creative organization as encompassing factors concerning the removal of barriers demonstrating managed innovation, idea evaluation procedures, motivational stimuli, communication procedures, development of idea sources, and evidence of the creative planning process [5]. In creative organisation, much depends on the potential of organisational creativity. R.W. Woodman defined the organizational creativity as the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system [24]. D.M. Harrington noticed that an understanding of organizational creativity will necessarily involve understanding: the creative process, the creative product, the creative person, the creative situation, and the way in which each of these components interacts with the others [13]. Organizational creativity in a cluster also depends on how leaders encourage and manage diversity in the organization, as well as develop an effective leadership structure that sustains the innovation process [1]. Clusters as a innovative organizations will need to act upon three imperatives to accelerate the development of creative capital [8]:

- uncover the key capabilities of the creative organization,
- unlock and catalyze the creative capabilities of leaders,
- unleash and scale organizational creativity.

Creative processes in innovative clusters are accompanied by informal and multi-dimensional communication, atmosphere of cooperation, openness and freedom, resulting from organisational culture, orientated to concrete problems of concrete people, allowing the members of the cluster to formulate problems on their own, select

proper methods and disclose and use their competences. Innovative clusters are perfect incubator of new original solutions, environment which favours activity of creative work. In creative environment of the cluster, there is accumulation of three kinds of resources [23]:

- firstly, there are great resources of information, which are easily transferred within the framework of certain space,
- secondly, there are available resources of knowledge gathered by the existing institutions of the sector of science and R&D,
- thirdly - the cluster is characterised by a valuable selection of specialist competences in defined areas of business activity.

G. Ekvall defined creative climate as the observed and recurring patterns of behaviour, attitudes, and feeling that characterize life in organization³. He proved that his approach to the climate measurement clearly differentiate the innovative and stagnated organizations. The creative climate encourages people to generate new ideas and helps the organization to grow and increase its efficiency and at the same time it enables members to generate and implement creative ideas more effectively [11]. At the same time, the important role of a cluster manager is providing proper conditions for permanent development of creative environment and creative organisational culture, promoting creative thinking and teamwork within this structure. Holistic understanding of cluster creativity, in particular those innovative ones, it proves the fact that the flexibility of thinking and creative activity by the people managing, the cluster as well as its members, depends a final level of cluster innovativeness.

Conclusion

The conception of innovative clusters is an integral element of modern model of innovative processes (systematic and interactive), in which the source of innovation is not knowledge itself but also complex connections between various entities having

³ Dimensions of the creative climate in organization: Challenge (How emotionally involved, and committed are employees to the work), Freedom (How free employees are to decide how to do their job), Idea time (The amount of time employees have to elaborate ideas), Trust and openness (Do employees feel safe speaking their minds and offering different points of view), Dynamism (The eventfulness of life in the organization), Playfulness (How relaxed is the workplace), Debates (To what degree do people engage in lively debates about the issues), Conflicts (To what degree do people engage in interpersonal conflicts), Risk-taking (The promptness of response to emerging opportunities and fear of failure), Idea support (Are there resources to give new ideas a try) [10, 4].

differentiated types of knowledge and indicated by the ability of creative thinking as well as organisational learning [17]. Innovation is an strategic part of competitiveness. Many researchers believe that today's innovative cluster is a complex system of tangible and intangible elements, focused on the learning and teaching process, having as its main organizations the companies, research-development units, consulting firms, and financial organizations, and as its main input, information and knowledge [9]. Without innovative clusters and innovative companies a local and national economy hardly becomes competitive. In knowledge-based economy, the development of creative competences including creativity of particular members of the cluster and their employees, it is transferred into the level of cluster innovativeness. However, it is worth remembering that creativity is not a sufficient condition for innovativeness. This is essential to realise creativity. Creativity within a cluster may be perceived both in an economic attitude as seeking new manners of development, new ideas which, thanks to commercialisation, will bring measurable benefits as well as in the psycho-social attitude as creativity is the process performed in human mind, within a given social context, determined by interpersonal interactions. Creativity in a cluster as a basis of innovativeness is still on a small extent studied at the individual employee level; despite the fact that is considered an important source of competitive advantage. Creativity and creative thinking are very important for the long-term survival of organizations because it enables organizations to remain innovative, competitive in a rapidly changing environment (turbulent environment) and to achieve a competitive advantage [6]. Creative attitude in a cluster towards certain problems favours development not only skills of flexible reacting to changes inside the cluster and its external environment as well as active creation of anticipating changes. Creativity in a cluster makes changes in the manner of thinking and action by means of which there is additional force for the managers and engaged members so as the structure may overcome any difficulties and recreate and strengthen in the changing conditions of environment. Real inclusion of creative members in clusters in the process of identification and solving problems decides on efficient organisational learning, reaching first common successes, which incites aspirations, strengthen full engagement and sense of commonly acknowledged values. As a result, in order to develop a cluster, it is indispensable to permanently shape a proper pro-innovative attitude, expressed in active participation in creating new

solutions, realise creative ideas and readiness to participate in responsibility for operationalisation and commercialisation of innovative projects.

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MONITORING AND IMPROVEMENT OF MANAGERIAL PROCESSES IN PROCESS CONTROLLING

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Key words:

process management – process controlling – managerial process – instruments of controlling

Abstract:

In the article the essence of process controlling was presented. The specifics of management processes as a reference area of process controlling were characterized. In particular authors note was focused on the monitoring of managerial processes and their improvement. At the paper the usefulness of the classic tools of the keeping under control the volatility and the effectiveness of management processes was discussed and the need to seek new solutions in this regard was pointed.

Introduction

The turn of the twentieth and twenty-first century is in the world of organization a time of intensive development of the concept of process-oriented organization. According to this concept, the company can be defined as "a set of operational processes and projects supported by other processes and auxiliary functions, contributing to the creation of the value for the customer" [4, 285]. Among the characteristics of such enterprises one can indicate, inter alia, focus on the process management and on outcomes of the processes, optimization of resource usage, customer orientation, as well as flattening the organizational structure and creating teams of relatively high degree of autonomy [4, 286]. Efficient management of such organizations requires not only shaping and mapping (identifying, structuring, documenting the course) of the processes in the organization, establishing the limits of freedom of processes designing and ensuring a proper intra-and inter-process coordination. It requires also effective monitoring, which, as a result, finally leads to improving processes that are defined in an organization.

While in relation to the essential (fundamental) and auxiliary processes monitoring and improvement are performed by the management system (management, regulatory processes), the supervision of the stability / variability of regulatory processes is undertaken relatively rare - both as to the potential useful instruments, and as to the substance of this issue. In that context the aim of this article is to present the essence of process controlling as a method of monitoring and improving regulatory processes and to discuss the possibility of using for this purpose already traditional instruments (including statistical tools), well proven in relation to the supervision of the variability of production process over time.

1. Managerial processes as a reference area of process controlling

The idea of process controlling is to give widely understood support to process management in an organization. It can be defined as "a method of process management support, which essence is a coordination, supervising and monitoring the implementation of the processes taking place in the organization, especially with regard to their planning, control and steering" [1, 36]. Process controlling therefore directs a way of managers thinking for certain economic aspects related to the widely understood process management, and becomes thus a tool for planning and evaluation of the implementation of activities in the field of process management, ensuring the achievement of its objectives in relation to the organization as a whole. It is an instrument through which managers can effectively plan and control the realization of process management activities, and in case there is (or that can be) deviations from the plan to make (or participate in the making) proper corrective (or preventive) action [2].

Process management narrowly defined - as a method of processes improving, or more holistically - as a method of improving the organization, that determines their efficiency [9, 159 - 160] applies to all processes in an organization. According to the proposal made by P. Grajewski they generally can be divided into processes:

- basic (operational, main, essential, fundamental) – that constitute the essence of the business and generate added value for the customer,

- auxiliary – supporting the implementation of fundamental processes, usually "unnoticed" by the customer and having an indirect impact on generating added value, and
- managerial (regulatory) - directing the operation of the system, which is an organization, that is governing fundamental and auxiliary processes; even though they do not directly create added value, they have a strategic impact on their generation [5, 34 – 35].

Fundamental (basic) and auxiliary processes have usually relatively unchanged during the time, orderly course (laminar flow¹), fixed value of the end result, passive effect on the generation of the final parameters and low capacity for self-organization (are unintelligent). Managerial processes, however, in the context of the enormous rate of change of conditions in which are functioning modern organizations - are supposed to be characterized by intelligence and turbulent flow. Their structure - in search of prosperity and success of an organization - will be subjected to random changes resulting from the emerging market opportunities or changing customer expectations. Variability of purposes of so understood processes therefore raises the questions about the utility of the classical tools used for controlling the course and efficiency of managerial processes and the need to seek new solutions in this regard.

The essence of managerial processes, apart from setting the rules of the entire organization functioning, is "... monitoring the effectiveness of the processes [basic (fundamental) and auxiliary - ed. A.B. and AZ-K.], determination of their boundaries, the principles of their improvement, the prerogatives of the owners of processes and methods of documenting" [5, 35]. By definition, a similar task in relation to the regulatory process will be performed by process controlling. It can therefore be understood as a kind of "metamanagement" (ie "management of the management") [3,

¹ Classification of the processes can be made according to different criteria. P. Grajewski taking into account the structure of the process distinguishes processes: laminar (ordered, flat, stable, relatively unchanging over time) and turbulent (whose structures are supposed to be subjected to random changes resulting from changing expectations of customers), while in the context of a way of processes self-organization acting as the determinant of the ability of the process to respond to external impulses divides processes into: intelligent (which have built into the structure the system of their own knowledge usage to optimize the flow of individual operations from the perspective of the estimated each time results) and unintelligent (that realize the output effects without their own contribution to the organization) [5, p. 58 – 59].

21 - 28]. In the context of the specific nature of the controlling the object of interest of process controlling is not only the organization as a whole, but also its separate smaller fragments called responsibility centers [11, 11], so coordination, supervision, monitoring and - if necessary - participatory processes of planning, control and steering will refer to both the entire organization and individual responsibility centers as well. Managerial processes at the organizational level and at the level of responsibility centers are characterized by varying degrees of strategic orientation and varying degrees of volatility. It can therefore be assumed that with their strategic orientation increasing should also increase intelligence and turbulence of these processes. This will not be without influence on the choice of instruments useful to their progress monitoring and assessing their effectiveness.

This article does not refer to all distinguished functions of process controlling, but focuses on the managerial processes monitoring associated with the process of their improvement – that is as a consequence of identified in the field of steering actual and / or of anticipated deviations from the planned state.

2. Monitoring of managerial processes in process controlling

The concept of monitoring is used with refer to various types of human activities (actions) of. In general, the most commonly is understood as a constant, methodical observation of some phenomena or processes. It can also refer to the phenomena and processes taking place on the grounds of the company. "Monitoring is then treated as a systematic, methodical tracking and recording changes in the company" [13, 205]. In this context, the monitoring of the managerial processes can be understood as a continuous, generally systematic and long-term observation and recording of managerial processes course for the purpose of diagnosis, control and prediction of the situation. It has to allow supervision of variability of the managerial processes and be the basis for their improvement. The results of monitoring of managerial processes should therefore provide the information necessary for making optimal decisions concerning regulatory processes improvement in the enterprise, and thereby improving the efficiency of organization's functioning.

The starting point for the monitoring managerial processes is, first of all, the identification and modeling (designing) the structure of the process "specifying what types of operations constitute the process, providing a logical sequence of these activities; optimizing the duration of individual operations; determining the costs of the process, defining effect which the process is to generate" [5, 35]. Such a flow of the process, called standard, is a reference point in the monitoring. In subsequent steps, it is necessary to identify the relevant parameters for the managerial process and define the measures (categories / criteria) of process, by means of which the final effect of the process will be evaluated and which are the subject of monitoring, then to design of the expected values of these measures and acceptable deviations (boundary parameters of the process), which also determines the freedom of action of the process implementers [5, 63]. It is also requisite to develop tools appropriate for control of the course and the effectiveness of managerial processes, procedures for monitoring them and defining the role in this regard both the process owners and process controllers.

The parameters of the managerial processes evaluation should describe the ability of managerial processes to generate the effect expected of both the organization's stakeholders and internal customers within the organization. Usually such parameters are: duration of the process, the timeliness of the process realization, process quality, customer satisfaction (including internal customer), the flexibility of the process, public approval for the method of the process realization, the importance of the process for the customer and for the organization and process costs [5, 52 – 53]. Their combination allows for the construction of measures to assess the effectiveness of managerial processes, both at the level of the entire organization (eg in the form of various systems of evaluation of performance, ie scorecard or performance prism), and at the level of individual responsibility centers. It should be emphasized that this efficiency should always be determined from the point of view of the recipient of the process, which ultimately will always be external customer, or more broadly - a group of organization stakeholders (the ability to meet their needs "sets the organization's ability to gain competitive position in the market" [5, 36]). However, you can also talk about meeting the needs of internal customers, which in this case will be the managers (owners) of

basic (fundamental) and auxiliary processes and / or managers of responsibility centers². While the needs of internal clients can be characterized by relative stability, dynamically changing expectations of internal customers require rapid response. This determines the necessity of incorporating in the structure of managerial processes "operation and the competence to identify customer needs and mechanisms that significantly accelerate the procedure of the structure and process flow changing" [5, 62]. Large – from the assumptions - need to make changes in managerial processes makes the classic instruments of processes monitoring – tending to minimize any deviations and eliminate all possible causes of their formation (ie, Six Sigma or SPC), to be useful mainly in periods when managerial processes have - in selected conditions - the laminar course. Signals of dysregulation of these processes should be a contribution to the discussion on the analysis of the events causing volatility and the need for reconstruction (reorganization) managerial processes.

Very important instruments for identifying deviations in managerial processes are well - regarded today as a classic: internal audit, self-assessment and management system review. Audit understood as "all activities involving independent study of the management system and control in units (...) and consultancy activities aimed at improving the functioning of the unit" [15, 215] is to support the organization in achieving its objectives affecting the improvement of efficiency of management systems. Self-assessment of the company is "a systematic and comprehensive overview of the organization and its performance due to the criteria of the model, which aims to identify the organization's strengths and areas for improvement, giving the opportunity to prioritize follow-up activities that can be regularly monitored" [12 for: 6, 193]. Usually it is implemented basing on the adopted model of business excellence, and aims to estimate the progress of the company on the road to achieving organizational excellence. However, it can also serve as a tool to support the process of integrating the management system and incorporating organizational excellence in everyday business practices [6, 192 - 193]. Overview of management system can be understood as a formal (made by managers) evaluation of the effectiveness of the management system and its adequacy in the context of achieving the organization's goals in the changing

² For more on the relationship process managers - managers of responsibility centers read in a paper [2].

circumstances of its operation. All this instruments provide important information useful for improving managerial processes.

3. Improving managerial processes in process controlling

A natural consequence of the monitoring managerial processes is to take, within the framework of steering in terms of process controlling, actions in response to the previously identified deviations from the planned value. Reliable information resulting from the monitoring of managerial processes and effectiveness of achieving the objectives assigned to them are the basis for determining the reasonable directions of improvement. Therefore, the first step in improving processes in the broad sense appears to be an analysis of the monitoring results, with particular emphasis on the identified (real or of anticipated) deviations. The above analysis should primarily lead to a determination of the cause of deviations and indicate whether they lie in the areas of planning or implementation.

Improving managerial processes in the strict sense, means making specific projects (focused on increasing capacity to meet the requirements for these processes) across the whole organization in order to improve the efficiency and effectiveness of managerial processes, as well as to obtain additional benefits for the entire organization and its customers. Such understood improvement is an integral part of the steering. B. R. Kuc distinguishes the feedback and feedforward steering [10, 61]. By analogy one can therefore talk about *ex post* and *ex ante* improvement. While the first of these means the restoration of managerial processes stability in the organization, the second one aims at optimizing the solutions adopted.

The *ex post* improvement appears as a result of real deviations occurring and indicate the specific irregularities relating to the managerial processes to be corrected. The essence of this kind of improvement determines the feedback. It seems that the most useful tools for such kind of improvements are reengineering and benchmarking. BPR is, according to M. Hammer and J. Champy, the fundamental rethinking and radical new redesign of the organization, leading to crucial improvement of the organizational performance [7]. Benchmarking in turn, in case of deviations detection allows to find

the real causes of abnormalities, as well as to develop - based on the analysis of specific patterns - effective corrective actions.

The *ex ante* improvement appears as a result of identifying the potential deviations which could threaten of previously established, relating to managerial processes objectives achievement. The aim of *ex ante* improvement is to develop and implement preventive actions and, therefore, acting under conditions of feed-forward. One can say that the *ex ante* improvement has a signs of continuous improvement or even optimization. Continuous improvement or optimization are a permanent search by all involved employees of a ways and means to improve their own work and the best way to meet the needs and expectations of customers. In relation to managerial processes in particular way there are applicable here tools such as benchmarking, Kaizen or Six Sigma. Benchmarking - strongly oriented towards the future and improvement - allows, by comparing with so-called reference standards, to find potential risks in the managerial processes in the organization. Kaizen involves continuous and constant observation and search for potential problems, their analysis and definition, the search for causes, preparation of solutions, try out in practice, implementation and monitoring of performance and standardization. In this perspective, Kaizen is useful especially in the daily *ex ante* improvement of managerial processes in the organization. Six Sigma in turn, according to Smith, Blakeslee and Koonce [14, for: 8], can help, among others, in the formulation, integration and implementation of new (or existing) strategy and mission; combination of changes in the organization with customer expectations, accelerating activities related to the integration of the various responsibility centers, innovation increasing and risk management as well.

Conclusion

Finally it should be emphasized that the disclosure in the monitoring process of unfavorable trends or identifying deviations from the assumptions creates an opportunity for an early reaction - impact on managerial processes (improvement of these processes) in order to maintain their course at predetermined limits, or to make the appropriate changes to achieve their sustainable improvement. Managerial processes improvement requires also a constant analysis of the interdependencies among

processes. Action, taken as a result of it, should take into account the fact that the optimization within a single process usually entails a change in the other processes.

It should also be noted that in the concept of process controlling the process controller specialists monitor managerial processes flow, as well as participate in the both the *ex post* and the *ex ante* development: analyze deviations, generate proposals of corrective and / or preventative actions and coordinate the implementation of these activities in the organization. The decisions in this regard, however, take managers.

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FUZZY MULTI-CRITERIA EVALUATION PROCEDURE FOR THE INVESTMENT DECISION MAKING UNDER UNCERTAINTY

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Key words:

membership function – triangular fuzzy number – uncertainty – vague preferences

Abstract:

The article deals with a new proposed fuzzy multiple criteria evaluation method. This approach enables to include some uncertainties in a decision making process. The criteria values and weights of criteria may be expressed in a vague, uncertain form. A decision maker sets an importance of criteria linguistically. The criteria values can be expressed as the triangular fuzzy numbers, the criteria weights as well, which are transformed to the strict form. The algorithm is computationally namely based on the preference relations among alternatives and also the differences in the (non)fuzzy evaluations of alternatives. The proposed method is able to choose primarily one effective alternative. Finally, the approach is clearly applied in the investment decision making process in the capital market with the open shares funds.

Introduction

When we want to choose some alternative from the set, some multiple criteria evaluation method can be applied. There are many methods which offer a full ranking of alternatives and mostly are not able to involve some uncertain, vague input information. But we are trying to choose only one effective alternative and mainly take into account uncertainties in the decision making process.

The proposed fuzzy method uses the basic concepts of the fuzzy set theory in order to express the uncertainties quantitatively. It evaluates the alternatives on the basis of the fuzzy preference relations and also makes provision for the differences in the criteria values, so the distance from the ideal alternative is computed.

The reason of the proposal of the fuzzy multi-criteria evaluation method is the particular decision making situation. It is a choice of one open shares fund from each set in the capital market. For this purpose, we projected the method which could include the stochastic elements and vague information from the decision maker. Further, we focused on its computation complexity to be able to apply it in practice without bigger obstructions.

1. Fuzzy multiple criteria evaluation method

The proposed method uses the fuzzy numbers in order to express the uncertainties. The approach evaluates the alternatives by means of the preference relations and also takes into account the differences in the criteria values. The McCahone's approach is employed for a ranking of fuzzy valuations and the concept of the Hamming distance is applied to compute the distance between fuzzy numbers. The introduced method does not offer a full ranking of all alternatives, but chooses only one effective. The fuzzy method will be described in terms of the several following steps.

Step 1: Give the matrix $Y = (y_{ij})$, where y_{ij} ($i = 1, 2, \dots, p; j = 1, 2, \dots, k$) represents a valuation of the i -th alternative by the j -th criterion. Some of them can be stochastic, random variable, the time series of their values are available, respectively. Then the vague valuation is expressed as a triangular fuzzy number (see more [6], [7], or [8]), or a fuzzy number with a triangular membership function as follows

$$\tilde{F}_X = (x_{\min}, \bar{x}, x_{\max}),$$

where $\bar{x}$ is a mean and $x_{\min}$, or $x_{\max}$ denotes a minimum, or maximum of all values of a random variable X . An importance of the particular criteria is stated linguistically. These linguistic expressions are transformed to the triangular fuzzy numbers of the set scale. The strict weights are formulated via the optimization model based on the maximin principle (see more [1], [3], [4]).

Step 2: In the second step, we must find out a definite ranking for all alternatives according to each criterion. This is a little problem in the case of the fuzzy numbers. For this procedure, the McCahone's approach is applied¹.

¹ In order to eliminate the shortcomings of this concept, the modified McCahone's approach is proposed in [2].

McCahone's approach

This approach compares the fuzzy numbers via the fuzzy maximum and fuzzy minimum [9]. Given n fuzzy numbers $F_1, F_2, \dots, F_n$. The fuzzy max, or the membership function of the fuzzy max can be formulated as

$$\mu_{\max}(x) = \sup_{x=x_1 \vee x_2 \vee \dots \vee x_n} [\mu_{F_1}(x_1) \wedge \mu_{F_2}(x_2) \wedge \dots \wedge \mu_{F_n}(x_n)] \quad \forall x, x_1, x_2, \dots, x_n,$$

where $\mu_{F_1}(x_1), \mu_{F_2}(x_2), \dots, \mu_{F_n}(x_n)$ are the membership functions of the fuzzy numbers $F_1, F_2, \dots, F_n$. We can analogously specify the fuzzy min as

$$\mu_{\min}(x) = \sup_{x=x_1 \wedge x_2 \wedge \dots \wedge x_n} [\mu_{F_1}(x_1) \wedge \mu_{F_2}(x_2) \wedge \dots \wedge \mu_{F_n}(x_n)] \quad \forall x, x_1, x_2, \dots, x_n.$$

Now we compute the contribution of the fuzzy number F_i ($i=1, 2, \dots, n$) toward the fuzzy max, or fuzzy min by the following formulae

$$P(F_i) = \frac{\int_{S(F_i)} [\mu_{\max}(x) \wedge \mu_{F_i}(x)] dx}{\int_{S(F_i)} \mu_{F_i}(x) dx}, \quad N(F_i) = \frac{\int_{S(F_i)} [\mu_{\min}(x) \wedge \mu_{F_i}(x)] dx}{\int_{S(F_i)} \mu_{F_i}(x) dx}$$

where $S(F_i)$ is the definition scope of the fuzzy number F_i .

In the next step, we rank the fuzzy numbers according to $P(F_i)$ descending and $N(F_i)$ upwardly. Two rankings are compared. If both ranking orders are identical, the algorithm stops. If not, we will pick the fuzzy numbers sharing the same positions and perform pairwise comparison via the rules described in the following section.

We calculate the composite index

$$CP(F_i) = \frac{P(F_i)}{P(F_i) + N(F_i)}.$$

And now all fuzzy numbers sharing the same position are ranked descending according to this indicator. If the index is identical for more fuzzy numbers, it is not possible to distinguish them. Then we use the second rule, thus we compare the absolute sum of $P(F_i)$ and $N(F_i)$. One of the following relations must hold

$$\text{if } P(F_k) + N(F_k) > P(F_l) + N(F_l), \text{ then } F_k > F_l,$$

$$\text{if } P(F_k) + N(F_k) < P(F_l) + N(F_l), \text{ then } F_k < F_l,$$

$$\text{if } P(F_k) + N(F_k) = P(F_l) + N(F_l), \text{ then } F_k = F_l.$$

Step 3: And now we specify the set $I_{iRj} = \{r \mid y_{ir} \geq y_{jr}; i, j = 1, 2, \dots, p; i \neq j\}$ containing the indices of criteria r according to which the alternative i is evaluated better or equally than the alternative j . Then we can formulate the matrix $S = (s_{ij})$, where

$$s_{ij} = \sum_{q \in I_{iRj}} v_q \quad i, j = 1, 2, \dots, p, i \neq j,$$

$$s_{ij} = - \quad i, j = 1, 2, \dots, p, i = j.$$

The element of the matrix s_{ij} may be interpreted as a volume of the preference of the i -th alternative against the j -th alternative. For each i -th alternative the average preference relation is calculated as follows

$$s_i^{average} = \frac{\sum_{\substack{j=1 \\ i \neq j}}^p s_{ij}}{p-1}.$$

Finally, the threshold value is computed by the following formula

$$s = \frac{\sum_{\substack{j=1 \\ i \neq j}}^p s_{ij}}{p(p-1)} = \frac{\sum_{i=1}^p s_i^{average}}{p}.$$

Step 4: Firstly, we choose the alternatives which satisfy the following formula

$$s_i^{average} \geq s.$$

Secondly, the distance from the ideal alternative is computed for the choice alternatives. In the case of a nonfuzzy valuation y_{ij} ($i = 1, 2, \dots, p; j = 1, 2, \dots, k$), the distance from the best value by the j -th criterion is as follows

$$d_{ij}^{nonfuzzy} = H_j^{nonfuzzy} - y_{ij}^{nonfuzzy},$$

where $H_j^{nonfuzzy} = \max_i(y_{ij}^{nonfuzzy})$ is the best valuation according to the j -th criterion. If the criteria values are fuzzy numbers, then we use the concept of the Hamming distance. The Hamming distance between two fuzzy number F_i and F_j is defined as [8]

$$d(F_i, F_j) = \int_{-\infty}^{+\infty} |\mu_{F_i}(x) - \mu_{F_j}(x)| dx.^2$$

² In order to weaken the shortcomings of this approach, the modified concept of the Hamming distance is proposed in [2].

Then the distance of the i -th valuation from the best value by the j -th criterion is marked as d_{ij}^{fuzzy} .

Finally, the general distance from the ideal alternative for i -th chosen alternative is computed as

$$d_i = \sum_{j=1}^k \left[\frac{d_{ij}^{nonfuzzy}}{\max_i(d_{ij}^{nonfuzzy})} + \frac{d_{ij}^{fuzzy}}{\max_i(d_{ij}^{fuzzy})} \right].$$

The partial distance by each criterion j is standardized with the view of their comparability. The alternative with least distance from the ideal one is chosen as effective.

2. Open shares fund selection

A potential investor decided to invest some money in the open shares funds offered and managed by Česká spořitelna investment company. There are three groups of the shares funds – mixed, bond and stock funds. For illustrative instance, a group of the bond funds is analysed. Thus we have five bond open shares funds – Sporoinvest, Sporobond, Trendbond, Korporátní dluhopisový and High Yield dluhopisový. The investor evaluates the investment alternatives according to three main criteria – return, risk and costs.

We have 6-year time series of monthly returns of each open shares fund. Then the return is expressed as a triangular fuzzy number. The risk is set as a standard deviation of monthly returns in last six years. The costs are represented by entry fee and TER (total expense ratio) containing (e. g.) management or license fee.

The preferences about criteria importance is described linguistically by the investor. The risk is “very important”, the return is “important” and the costs are “little important”. All linguistic expressions are transformed to the fuzzy numbers and then their strict form is computed via optimization model. All necessary data is in the following table (TAB. 1).

TAB. 1: Data about bond open shares funds

Shares fund	Return	Risk	Costs
Sporoinvest	(-1.17, 0.06, 1.29)	0.41	1.07
Sporobond	(-3.7, 0.3, 4.30)	1.33	2.10
Trendbond	(-6.02, 0.18, 6.38)	2.07	2.74
Korporátní dluhopisový	(-9.63, 0.38, 10.38)	3.34	2.74
High Yield dluhopisový	(-13.15, 0.33, 13.81)	4.49	2.56
Weight	<i>0.3</i>	<i>0.55</i>	<i>0.15</i>

Zdroj: Česká spořitelna³ and self-calculation.

The shares fund Sporoinvest is the best in the criteria risk and costs. According to the McCahone's approach, Sporobond is the best in return. To choose one effective alternative, the proposed fuzzy method is employed. Before the measuring distance from ideal alternative, two funds are chosen – Sporoinvest, Sporobond. Sporoinvest has the shortest distance from the ideal alternative, so it is the effective alternative according to applied introduced fuzzy method. Anyway, it was quite expectable, because it dominates in the most important criterion.

Conclusion

The main contribution of this paper is a new fuzzy multiple criteria evaluation method which is able to contain some uncertain, vague information in the decision making process. The proposed approach makes use of the fuzzy set theory to quantify the uncertain elements, concretely the triangular fuzzy numbers. Then the stochastic criteria values or vague information about an importance of criteria may be included. This approach takes into account the differences in the criterial values and also computes the preference relations between alternatives. The method chooses one effective alternative.

The method algorithm could be modified in order to make a full ranking of alternatives. Some shortcomings of the McCahone's approach and the concept of the Hamming distance can be eliminated as in [2].

³ http://www.csas.cz/banka/content/inet/internet/cs/RR_SK.VIII.xml (15. 7. 2013)

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APPLICATION OF INTERNATIONAL FINANCIAL REPORTING STANDARDS BY CZECH COMPANIES

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Key words:

Czech accounting legislation – IFRS – legal form – ownership of a company

Abstract:

International Financial Reporting Standards (IFRS)¹ as a single set of understandable and enforceable accounting standards represents an important presumption for effective functioning of financial markets. This article analyses the use of IFRS by companies located in the Czech Republic. Firstly, the legal requirements for preparation of financial statements in the Czech Republic are summarized. A special emphasis is laid on the use of IFRS by companies in the Czech Republic. The analytical part of this article deals with the relationship between the use of IFRS and the size of a company, its legal form and its ownership. The data for this analysis were obtained with the help of a survey which took place in January and February 2013.

Introduction

In today's global world when the markets are more connected than ever before the information about the financial position and performance of companies is becoming more important. Therefore, the contemporary financial position and performance of selected companies has to be carefully analysed. As an important tool for this analysis Enterprise Resource Planning (ERP) systems are used. These systems enable more efficient use of resources, including the subsequent decrease of costs and increase of corporate profitability. The use of these systems in the Czech Republic is closely related

¹ The whole system of IFRS contains the Preface, the Conceptual framework, individual IFRSs and IASs (International Accounting Standards issued before the year 2002) and Interpretations of both IFRSs and IASs.

to the ownership of a company or to the participation in particular supply chains.
[3,772]

Because the investors could place their capital into companies from different countries, it is necessary to ensure the comparability of information contained in financial statements of these companies. Therefore, a single set of understandable and enforceable global accounting standards such as for example IFRS should be used globally. These standards are created especially for listed companies and their use constitutes an important presumption for effective functioning of financial markets.
[4, 85]

The analytical part of this article is, therefore, focused on the characteristics of the companies which use IFRS when preparing their financial statements. Especially the relationship between the use of IFRS and the size of a company, its legal form and its ownership is examined.

1. Methodology

The methodology of the paper is based on the thorough studying of relevant research books and papers published in scientific journals. To obtain real data an electronic questionnaire survey was realized in January and February 2013. The vast majority of analyzed companies were located in the Central and North-East part of Bohemia. From this survey one hundred of completed questionnaires were received.

The survey contained 44 questions and was divided into three main parts. The aim of the first part was to obtain basic information about business entities. The second one was focused on the usage of Enterprise Resource Planning systems in these companies. The final part analyzed financial management of these companies and it also contains questions related to financial accounting of these companies.

The data received from the survey were processed with the help of spreadsheet application MS Excel. The obtained results had a form of a percentage share of particular responses of the total amount of analyzed companies. Each individual result was further analysed to find out detailed information or even general relationships.

2. Use of IFRS in the Czech Republic

The Czech accounting legislation represents a national accounting system, which is based on rules that are set directly by Czech state offices or indirectly through the

implementation of EU directives. [7, 119] General rules are set by the Accounting act No. 563/1991, which specifies general requirements for financial accounting. More detailed requirements are further stated by ministerial regulations and that are related to specific groups of accounting entities. Therefore, the business entities have to obey the Regulation No. 500/2002 and Czech accounting standards designed for these entities. The Czech accounting legislation is also strongly influenced by the tax law because gross profit determined according to the accounting rules is subsequently used as a basis for calculation of the income tax. [1, 110]

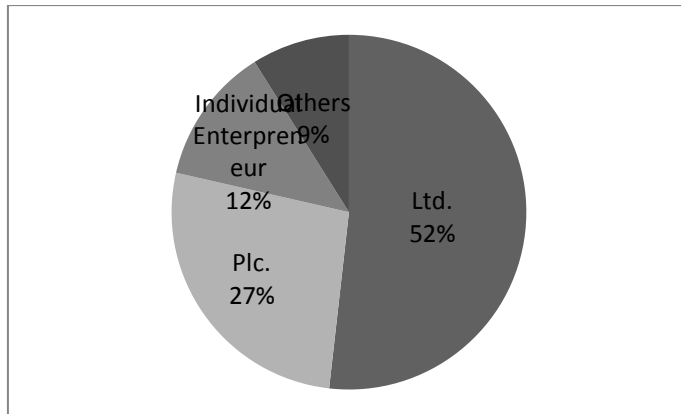
From the year 2005, IFRS were introduced into the Czech accounting legislation as a basis for financial reporting of listed companies. This requirement is applicable to both individual and group listed companies. Despite this measure there still exist differences between the Czech accounting legislation and the IFRS in many areas: different requirements of disclosure and presentation of financial information, various methods of recognition, measurement and presentation of similar items of financial statements. [6, 253] This causes differences by recognition and measurement of some items according to the Czech legislation and IFRS because some items that are named in Czech ministerial regulation don't meet the requirements that are requested by IFRS. It is for example the case of some assets, liabilities, expenses and revenues that will be either different recognised or at least other measured. [5, 155]

The inconsistency of these two accounting systems flows mainly from their legal status. A strong difference exists between the continental European model which is based on the Roman law and the Anglo-Saxon approach, which applies the common law. This issue is closely interconnected with different ways of financing and taxation of companies in both approaches. [2, 332]

3. Results of the survey

The results of the survey confirmed the general presumption that the prevailing type of a company in the Czech Republic is the limited company (Ltd.). Their share was about 52.00 % of the research sample. Nearly 27.00 % of the analyzed companies were public limited companies (Plc.). The third most prevalent type of a company with the share of 13.00 % were individual entrepreneurs. The rest of the analysed companies were cooperatives and other legal forms of business that can do business in the Czech Republic. This information is presented in figure 1.

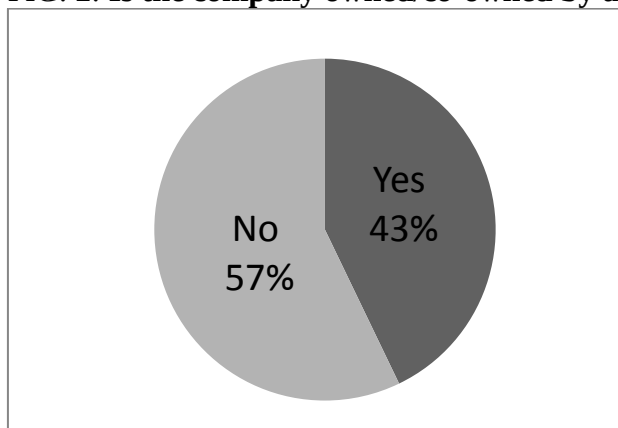
FIG. 1: The legal form of business of the analyzed companies



Source: own elaboration

Another important issue deals with the ownership structure of the questioned companies. As it is shown in figure 2, about 43 % are owned or co-owned by a foreign company. Most of these companies are either limited companies (nearly 54 %) or public limited companies (37,5 %). Also the size of these companies plays an important role. In accordance with the EU legislation, 62,5% of these companies are large, almost 17% are medium-sized and the rest are small companies.

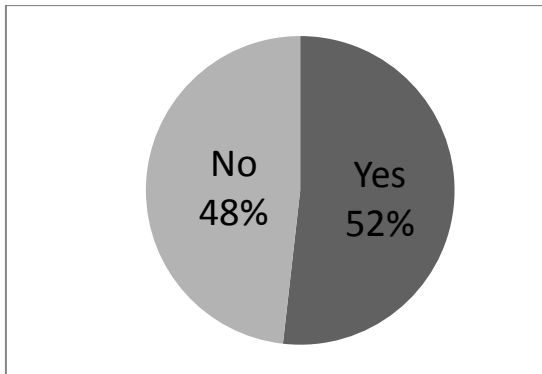
FIG. 2: Is the company owned/co-owned by a foreign company?



Source: own elaboration

The key question of the section related to the accounting issues dealt with the application of IFRS by the questioned companies. Almost 52% of them use IFRS when preparing their financial statements (see figure 3). About three quarters of them are owned or co-owned by a foreign company. Most of the companies which use IFRS are the large ones (about 62%), slightly over 17% are medium-sized companies and the rest are the small ones. With regard to the legal form, almost 59 % of the companies which use IFRS are limited companies and nearly 38 % are public limited companies.

FIG. 3: Does the company use IFRS for preparation of its financial statements?



Source: own elaboration

Conclusion

The results of this research confirmed that the use of IFRS by companies in the Czech Republic is closely associated with the size of a company, its legal form and its ownership. Most of the questioned companies which use IFRS when preparing their financial statements were large companies such as limited companies or public limited companies and three quarters of them were owned or co-owned by a foreign company. The finding is consistent with the purpose of IFRS that are primarily used for companies listed on financial markets. Moreover, it was confirmed that the use of IFRS is required by parent companies of their Czech subsidiaries which are located in foreign countries. The above mentioned requirement could also result from a membership in special supply chains or the questioned companies operate in a particular industry where financial reporting according to the IFRS is required. The vast majority of the questioned companies operated in mechanical engineering, especially automotive, textile industry or financial services.

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ECONOMIC AWARENESS AND DECISIONS OF GOVERNMENTS AND REGULATORS: THE GREAT DEPRESSION AND THE CURRENT ECONOMIC CRISIS

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Key words:

economy - government - crisis – regulations

Abstract:

World economic crises can be perceived as times of test for the widely held concepts on the laws governing the economy. They are also an occasion when the main weakness of the political system is exposed, namely the subjectivity of decision-making. Careful analysis of downturns reveals that distortions phenomena taking in the economy are mainly caused and perpetuated by the human factor, id est emotions, beliefs and private interests.

Introduction

The aim of this article is to present the underlying causes of the Great Depression in the 1930s and the ongoing Great Recession, and their history in terms of responses of institutions supervising various branches of the economy. Although the current downturn is not over, and its continuation as the crisis of public finances may have not yet reached its climax, many economists are already attempting to outline factors that have led to the present situation. Similar to the Great Depression, there exists no widely accepted and unambiguous diagnosis, and the emphasis is put, alternately, on the greed of financiers, errors of market regulators and the total failure of capitalism. Most astute observers have no doubt as to the role of banks, rating agencies, Wall Street, financial regulators and the government. Similarly, the author of this paper assumes that those institutions had had sufficient knowledge on the intricacies of laws governing the economy to have taken more successful preventive actions against the adverse effects of

the Recession, while the actions of governments have been based mainly on political rather than economic considerations.

1. Description and analysis of the problem.

It is impossible to directly compare the current Recession and the Great Depression, as the mechanisms of their origin and complexity of the related phenomena have been different in scale and character. However, both crises have been accompanied by irrational decisions of governments.

The inadequacy of government policies during the current downturn is not a new phenomenon. Most economists agree that the recession in the 1930s became the 'Great Depression' due to poor response from governments. One of the most spectacular signs of economic ignorance was the Smoot-Hawley Tariff Act during the presidency of Herbert Hoover [1]. The level of economic knowledge at the time was obviously sufficient for every astute observer of the market to be aware of the irrationality of protectionist policies during the crisis. However, the introduction of trade barriers supposed to protect American jobs did seem a good solution from a political point of view.

Although obviously the Great Depression was caused by a number of purely economic factors, in a hindsight one can also see a considerable role of the government [2]. The most popular slogans in 1919 were "get rich quick" and "buy as much as you can", followed by "two cars in a garage." This Republican vision of growth led to a situation that in 1928 up two thirds of cars produced in the States was sold in installment plans. Eventually, American economic isolationism, maximally inflated boom period of the economic cycle, enormous overproduction and speculation led to the transformation of the downturn into a catastrophic depression.

Of course, not all decisions taken by the American government or on its own initiative are always wrong. The existing system of financing the U.S. real estate market has its roots in the New Deal policies [3], when the Federal National Mortgage Association was created on the initiative of the Cabinet of President Franklin Delano Roosevelt. The purpose of this agency, popularly known as Fannie Mae, was to buy up mortgage claims

from commercial banks, and, based on government guarantees, create bonds from these claims and subsequently sell them on the stock exchange. This mechanism of securitization allowed cheap refinancing of loans. However, in 1999 the situation in this field started to become complicated, when Fannie Mae and its twin 'brother' Freddie Mac (Federal Home Loan Mortgage Corporation) became tools in the political game of the Clinton administration. Through the abolition of the Glass and Steagall Act [4], direct pressure on Fannie Mae and Freddie Mac, as well as significant subsidies from the government, credit assessment criteria were eased with regard to securitization.

TAB. 1: M3 money supply in the U.S. as a percentage of GDP in the years 2000-2009

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
M3	70.95	59.11	59.95	60.37	61.13	62.73	64.86	67.75	70.17	73.05

Source: own elaboration based on the World Bank data

Yet another element of the crisis puzzle was the policy of the Federal Reserve on interest rates. In order to stimulate the economy, whose growth was stunted as a result of the dot-com bubble burst, the then head of the Fed, Alan Greenspan, began cutting interest rates. As a result, in 2001-2004 the rates fell from 6.5% to 1%, almost reaching the lowest level in history. For the U.S. this meant the period of record cheap money.

TAB. 2: Interest rates in the United States for the years 1919-2004

Year	1919 I	1919 XII	1920 I	1920 VI	2000 XII	2001 I	2002 I	2003 I	2004 I
Interest rate	4.75	5.00	6.00	7.00	6.40	5.98	1.73	1.24	1.00

Source: own elaboration based on www.federalreserve.gov

According to statistics, in less than four years the M3 supply increased by almost 30%. The scale of surprise of the Fed by this situation is shown by the fact that in 2006 it even ceased to publish this index. According to various calculations, in the following period between March 2006 and September 2008, M3 supply may have had risen by up to a record 45% [5].

TAB. 3: S&P/Case-Shiller 20-City Composite Home Price Index 2000-2006

Year	2000	2001	2002	2003	2004	2005	2006
	I	I	I	I	I	I	VII
The level of the index	100	112.39	120.64	135.64	151.69	176.44	206.52

Source: own elaboration based on www.eu.spindices.com

Low government bond yields resulted in a search for investment that would at least protect one's own capital, and for ordinary citizens this usually meant investing in property. For banks these were sub-prime loans. The abolition of Glass and Steagall Act allowed banks to securitize potentially risky portfolio by issuing their own securities created on the basis of mortgage debts and selling them on the Wall Street. A prime example of the activities of that time became a Carlyle Capital Corporation fund, which, with own assets of \$670 million used leveraging to purchase mortgage-backed securities for about \$22 billion [6]. In this way the financial industry significantly contributed to the real estate bubble; however, not to justify the actions of bankers, it was made possible by the short-sighted policy of the government [7].

TAB. 4: New residential construction in the United States from 2000 to 2007

Year	2000	2001	2002	2003	2004	2005	2006	2007
Total housing starts (in thousands)	34 783	35 614	37 879	41 285	43 037	45 540	39 131	29 827

Source: own calculations based on www.census.gov

The values take into account the completed building, construction started and given a building permit.

The investors' interest in the American housing market was immense. Americans used cheap credits to make a growing number of purchases. In 2000-2007, American households mortgage loans increased from \$ 4,821 billion to \$ 10,540 billion [8]. This demand significantly contributed to an increase in real estate prices. The year 2005 brought record growth, when in many states, house prices grew 25% year on year. The boom was reflected in the S&P/Case-Shiller index of housing prices in 20 major cities. From 2000 to 2006, it increased by more than 100% [9]. Another factor stimulating the real estate market was politics, this time the policies of George Walker Bush who continued the populist policies of Clinton. In 2003 G.W. Bush launched a program

known as the American Dream Downpayment Act, intended to subsidize poor Americans in the purchase of their first house [10]. From an economic point of view, these actions may have seemed quite rational as the United States real estate investing amounts to about 14% of gross domestic product annually [11]. In this particular case, however, no-one had allowed for the irrational behavior of the market and the massive overvaluation of investments in this sector.

An interest rate increase by the Fed launched in 2004 in a simple way resulted in higher interest rate of loans. This in turn caused a decrease in the profitability of buying property for sale with the participation of external financing and an increase in the number of households with serious problems handling their mortgage debt. A growing number of delinquent loans, property take-over's by the banks, ever-increasing supply of houses and dramatically decreasing demand resulted in a further decline in real estate value, which was no longer an adequate security for loans. This resulted in further evictions, which in turn contributed to a further decline in prices. As a result of the mechanism, in 2007, U.S. banks became the owners of hundreds of thousands of houses and flats whose real value did not correspond to the value of loans granted to buy them. The need for maintaining appropriate reserves started to gradually appear as huge losses in financial reports [12]. In addition to banks, market problems were very quickly felt by the stock exchange investors. Due to the inability to recover debts, holders of mortgage-backed securities of junk values. Those who purchased credit default swaps were forced by banks to pay compensation for the loans that were secured by the swaps [13].

During the formation of the bubble many American economists warned that real estate prices could not grow forever. A lemming-like rush, mass scale of investment, prestige of market participants and, finally, political propaganda meant that sober calculation became very rare [14]. As it turned out later, it was also absent in decision-making after the outbreak of the crisis. One distinct example are the actions of Henry Paulson, Secretary of the Treasury in the administration of George W. Bush, who, as late as summer 2007, downplayed the danger of collapse associated with subprime loans: "I don't see (subprime mortgage market troubles) imposing a serious problem"[15]. In the face of the collapse he first decided to finance some investment banks, then refused to support Lehman Brothers, but when it was on the brink of bankruptcy, he once again

make considerable rescue efforts. Unfortunately, he did not take into account the requirements of international regulators, who ultimately did not allow the Paulson's plan. The apogee of his mistakes was the a rescue program known as the Emergency Economic Stabilization Act of 2008 with an almost \$ 1 trillion worth of help for the financial sector. The vast bailout of banks was used to restore liquidity and unfreeze the credit market. Bailout funding was to be received by all the giants of the financial sector, also including those who did not really need it. The move, meant to protect the banks with bad financial condition against further stigmatization and isolation in the market, resulted in a situation where only a small part of the aforementioned amount was spent on credit growth, while 2008 saw record high bonuses paid on Wall Street [16].

Conclusion

Studies on the problems presented in this article, historical data and its analysis allow to come up with two main conclusions:

1. Governments have always considered themselves capable of solving various economic problems. However, although the role of the state in legislation, security, etc., is indisputable, the economic reality clearly shows that economies do better when the interference of political leaders in the free market is low.
2. It seems natural that governments and several international institutions have pledged to create new regulations so that a similar crisis does not happen again. Yet some of such proposed rules had already existed in the past; they were subsequently annulled as a resulted of vested political interests.

As mentioned at the beginning of this paper, the current crisis is not over yet, and although its origins are publicly known, the steps of policymakers only seem to confirm the theses presented in this paper. Still worse, they are accepted by the citizens. The summary of my argument should be a quote from one of the U.S. presidents, Ronald Reagan: "Government is not the solution to our problem; government is the problem."

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CULTURE AND ORGANIZATIONS: THEORETICAL FRAMEWORKS AND RELEVANT FINDINGS RELATED TO INTERCULTURAL COMMUNICATION COMPETENCE AND MANAGEMENT PRACTICES

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Abstract:

Cultural differences that are relevant for intercultural communicative competence and management practices have become the object of study within a growing interdisciplinary field and various models have been elaborated in order to elucidate these issues. The first framework draws upon the work of Geert Hofstede, an organizational psychologist whose research was based on a large, questionnaire survey of IBM employees and managers in forty different countries. The second framework utilizes research by Fons Trompenaars and Charles Hampden-Turner who identified several elementary dimensions according to which different cultures can be measured. The third powerful framework relevant for studies of cultural values and multicultural environment has been elaborated by Edward Hall.

Introduction

Within increasingly interdependent economies and societies, management practices are highly correlated with intercultural competence (IC); intercultural competence is a developmental process with traits and dimensions that demonstrate the ability to effectively deal with cultural differences in order to develop successful cooperation with others. It involves a complex set of abilities needed to perform appropriately when interacting with others who are linguistically and culturally different from oneself.

A recent national survey of the Organization for Economic Cooperation and Development (OECD) to which the EU Commission and Czech Republic are members, recommended that Czech Republic increase its labor market flexibility by strengthening its education system. Employers' reports, statistics on secondary school graduates' employment rate and recent research studies, support the OECD's recommendation with the finding that domestic and international companies operating in Czech Republic are currently demanding certain intercultural communication competences (ICC) from their employees.

Fresh Minds Limited survey of 500 European business leaders identified the skills young people should possess and revealed a lack of 'soft skills' such as confidence, teamwork, self-motivation and presentation. Two-thirds of the respondents believe that their countries' education systems do not successfully instill these skills. A similar study surveyed over 2,000 companies in the Moravian-Silesian region and identified 14 competencies of skills, attitudes, knowledge and behaviors necessary for success at work, highlighting teamwork and communication. The report concluded ICC have been implemented with limited success in Czech Republic schools and cited social capital as deficient in this area.

Intercultural competence is understood as involving multiple modes of communication, (i.e., verbal, non-verbal, gestural, representational, etc.) through which individuals who inhabit certain cultures live their values. As assessing IC is best conducted through a mixed method approach to quantitative and qualitative measures, there have been selected interdisciplinary frameworks in order to measure ICC's strengths and weaknesses in organizations [4, 48].

The aim of the paper is to elucidate three theoretical frameworks and to present current issues concerning development of intercultural communication competence relevant for management practices.

1. Importance of Hofstede's Dimensions of High&Low Power Distance, and Collectivism&Individualism for Development of ICC

(1) The first framework draws upon the work of Geert Hofstede, an organizational psychologist whose research was based on a large, questionnaire survey of IBM employees and managers in forty different countries [3, 13]. Hofstede identifies cultural values along the dimensions of power distance, uncertainty avoidance, individualism and masculinity.

Example: High Power Distance& Low Power Distance

A) These behaviors are more commonly associated with high power distance cultures. 1. People are less likely to question the boss. (There is more fear of displeasing the boss in high power distance cultures). 2. Elitism is the norm. (Emphasizing distinctions between boss and subordinates is the norm). 3. Those of power have special privileges. (Rank has its privileges in these cultures). 4. There are greater wage differences between managers and subordinates. (Again, to emphasize the distance). 5. Workers prefer precise instructions from superiors. (Close supervision, the visible exercise of power, is common to these cultures).

B) These behaviors are more commonly associated with low power distance forces. 1. Students question teachers. (Because superiors do not have to be deferred to). 2. Freedom of thought is encouraged. (No one is threatened by independence of thinking for oneself). 3. The chain of command is mainly for convenience. (Power differences are not emphasized). 4. Interaction between boss and subordinate is more informal. (Because the distance is minimized). 5. Subordinates and bosses are independent. (We are all equal here so we all depend on each other).

CHART 1: **Power Distance Index in Selected Countries of European Union**

Belgium								65	
Czech R.							57		
Denmark		18							
Finland				33					
Italy					50				
France								68	
Portugal								63	
Greece								60	
UK				35					
	10	20	30	40	50	60	70	80	

Source: [7], Original Calculation

Example: Individualism&Collectivism

1. Managers should be hired from within the organization, based mainly on their seniority (**Collectivism**). Managers should be hired on the basis of the skills they have and previous experience in similar jobs (**Individualism**).
2. It takes a long time to make a new friend (**Collectivism**). Friends can be made relatively quickly (**Individualism**).
3. If I took a job with a new company, I would expect my old employer to wish me well (**Individualism**). If I took a job with a new company, I would be afraid that my employer might lose face (**Collectivism**).
4. I expect people to judge me by my achievements (**Individualism**). I expect people to judge me by my affiliations (**Collectivism**).
5. Before making a decision, it is best to make sure everyone agrees with it (**Collectivism**). Before making a decision, you should get at least half of the people to agree with it (**Individualism**).

CHART 2: **Individualism Index in Selected Countries of European Union**

Belgium								75	
Czech R.						58			
Denmark								74	
Finland							63		
Italy								76	
France								71	
Portugal			27						
Greece				35					
UK									89
	10	20	30	40	50	60	70	80	90

Source: [7], Original Calculation

Along the power distance dimension, the Czech society exhibits high power distance, similarly as French and Belgian societies. People tend to accept and expect a hierarchical/unequal distribution of power. According to the uncertainty avoidance dimension, the Czech society (similarly as German) tends to avoid risk. This dimension measures the degree to which members of a given society deal with uncertainty and risk of everyday life, and prefer working with long-term acquaintances and friends rather than strangers [6, 67].

The individualism dimension measures the degree to which individuals perceive themselves as separate from others or free from group pressure to conform. Individualism in the Czech society comes out in the middle. Despite the fact that Hofstede ignores intergenerational differences and distinctions among members of the same nation or ethnic group, his dimensions are particularly useful for understanding conflicts among various groups from different cultural backgrounds that could be important for management practices.

2. Importance of Fons Trompenaars' Dimensions of Particularism&Universalism and Ascription&Achievement for Development of ICC

(2) The second framework utilizes research by Fons Trompenaars and Charles Hampden-Turner who identified several elementary dimensions according to which different cultures can be measured [4,1]. According to the first one (universalism vs. particularism) Czech society is more similar to Mediterranean societies, which are more particularistic. Universalistic societies place more emphasis on, and expect others to follow, given rules, while particularistic ones stress personal and contextual aspects in interpreting rules.

Example: Universalism&Particularism:

1. a .In society, we should help those who are the neediest **(Universalism)**. 1. b. In society, we should help the neediest of those who depend on us. **(Particularism)**.

2. a. There are no absolutes in life, you always have to look at the particular situation **(Particularism)**. 2. b. There are certain absolutes which apply across the board **(Universalism)**.

3. a. The courts should mediate conflicts **(Universalism)**. 3. b. People should solve their own conflicts; it's embarrassing if it has to go to court **(Particularism)**.

4. a. In general, people can be trusted **(Universalism)**. 4. b. My closest associates can be trusted absolutely; everyone else is automatically suspect **(Particularism)**.

5. a. In hiring someone, I want to know about their technical skills and their educational/professional background **(Universalism)**. 5. b. In hiring, I want to know who the person's family and friends are, who will vouch for this person **(Particularism)**.

According to the second dimension (display of emotions in communication), Czechs are also in the middle compared to inhabitants of Mediterranean cultures, who speak quickly, raise their voice and show their enthusiasm or sadness, while in Scandinavian countries expression of emotions is considered to be a professional deficiency or uneasiness. According to the third dimension (specificity) Czech culture is more diffuse than specific. This dimension measures whether life is considered to be composed of many components which are not interchangeable and therefore deems it is necessary to divide work and private matters and activities or whether there is an assumption that all elements are part of the whole and mutually related.

According to the fourth dimension success, Czech can also be placed in the middle of the scale. This dimension measures whether an individual has achieved success on the basis of his or her efforts or work (North American culture) or whether status is more ascribed by means of a combination of personality of the individual as well as his or her social origins, education, employment and membership of this or that group [6, 61]

3. Importance of Edward Hall's Concept of High Context&Low Context Communication and Monochronic&Polychronic Understanding of Time for Development of ICC

(3) The third powerful framework relevant for studies of cultural values and multicultural environment has been elaborated by Edward Hall, who has spent more than forty years developing and writing about a four-dimensional classification system which basically focuses on the communication patterns found within various cultural environments and emphasizes four dimensions along which societies can be compared [1, 20].

The first dimension (high and low context) measures communication context or the amount of information that must be explicitly stated if a message or communication is to be successful. The Czech society has been placed around average; for example, the Japanese have been determined to use high context communication on the one hand, and the Americans low context communication on the other one.

Examples of Directness

I don't think that's such a good idea. That's not the point. I think we should...What do you think, Mr. Cato? Those figures are not accurate. You are doing that wrong. I don't agree.

Examples of Indirectness

That is very interesting point. This proposal deserves further consideration. I know very little about this, but...We understand your proposal very well. We will try our best. I heard another story about that project. Can we move on to the next topic?

According to the second dimension (ways of communicating through specific handling of personal space), the Czechs are also placed in the middle along this scale, between Scandinavians on one extreme, who tend to keep more place between them than do Mediterranean cultures, at the other extreme.

According to the third dimension (concept of time), Czechs also tend to be in the middle between German monochronic understanding of time (preference for scheduling and completing one activity at a time) and Mediterranean polychronic conception (not distinguishing between activities and completing them simultaneously).

According to the fourth dimension (speed and structure of messages between individuals or organizations), the Czech society has been placed between North American and South American styles. In North American, speed and structure of messages between individuals or organizations has been noted as significantly higher than in South America or in developing countries.

Example: Monochronic&Polychronic:

1. a. People should stand in line so they can be waited on one at a time (**Monochronic**).
1. b. There's no need to stand in line, as people will be waited on as they are ready for service (**Polychronic**).
2. a. Interruptions usually cannot be avoided and are often quite beneficial (**Polychronic**).
2. b. Interruptions should be avoided wherever possible (**Monochronic**).
3. a. It's more efficient if you do one thing at a time (**Monochronic**).
3. b. I can get as much done if I work on two or three things at the same time (**Polychronic**).
4. a. It's more important to complete the transaction (**Polychronic**).
4. b. It's more important to stick to the schedule (**Monochronic**).
5. a. Unanticipated events are hard to accommodate and should be avoided where possible (**Monochronic**).
5. b. Unexpected things happen all the time, that's life (**Polychronic**).

Conclusion: Specific Issues to Advance Knowledge in the Field

In the Czech Republic ICC has been recently evaluated as inadequate due to deficiencies related to labour market structures as well as other variables. Cultural values, coupled with cultural awareness, are known to have a primary role in the development of tolerance and acceptance of cultural differences, reduction of cultural bias and minimization of related social conflicts at workplace [5, 36]. While national

cultures have been identified across Europe according to their value dimensions and differences, the development of intercultural competence in relationship to local cultural values has not been studied.

Theories in the ICC field have been criticized for being biased towards the individualistic, the western way of managing communication; thus, Czech companies and society need to be studied within its local cultural values and their variables.

Although articulated theoretically, ICC research lacks specific data across cultural and situational contexts. ICC may be measured through domains, dimensions, proficiencies, and developmental levels affecting relationships, communication, and collaboration. Lacking consensus of ICC's unifying features and with a diversity of instruments to measure it, ICC is continually evolving. Areas that need more study include the study of language, the role of intergroup perceptions to communication between ethnic and cultural groups, how cultural perspectives and misunderstanding contribute to intercultural conflicts in the local context, and the impact of ICC training and skills development with coaches/teachers. Speakers of multiple languages have options of language rituals, conversation strategies, visual means of communication, body language, space, and other means at their disposal when communicating with members of other cultures. Given above mentioned frameworks and findings, further research concerning cultural differences that could be relevant for management strategies should focus on the following issues.

Behavior of managers in various countries of European Union as well as elsewhere differs in their acceptance of power or superior-subordinate relationships. In what specific ways do educational institutions and companies prepare managers to accept various types of communication structures?

Rituals of politeness (such as in greeting, complementing, requesting, inquiring, etc.) are negotiated within the cultural values of the company. Does the majority language alone establish the protocols? What role does the company management assume in the negotiation?

Language ideology (having a status of a national, official, vernacular, standard or local language) affects one's willingness to engage in ICC. In what specific ways are speakers' attitudes reflected in ICC relevant for management practices? Language proficiency affects ICC and modes of cooperation including management practices. What is the participants' proficiency in Czech companies' majority and minority language(s)?

Risk avoidance is related to unequal representation in the companies. Do differences between cultural identities of managers and employees in the companies influence overall risk avoidance level displayed in the company?

What are the discrepancies between stated belief and practice (despite managers claiming to be open-minded and tolerant)? Are the factors of language prestige, ideology and proficiency underestimated in their effect on one's status and self-perception?

In what specific ways does the company environment encourage the development of ICC competence (by means of regular and systematic training) and interaction with diverse groups, and promote tolerant understanding of cultural differences? Do companies reflect diversity in the use of space, choice between individualist or collective learning styles, and verbal or non-verbal communication strategies?

What is the level of intercultural sensitivity and awareness of the participants in the company environment? How does the level of cultural sensitivity and awareness impact interpersonal interactions, working environments, company policies and practices?

In what ways do company environments differ in enforcing rules and handling individual preferences? What differences exist between managers and ordinary employees who work in Czech and international companies?

What differences exist in managers' orientation towards the individual and the group? Are managers from individualist cultures positive about learning new topics and

speaking up at the workplace? Do those from collectivist cultures tend to speak up only when called on and avoid challenging the superior?

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A NOTE ON INVERSE OPTIMIZATION: TWO APPLICATIONS OF THE BINARY SEARCH TECHNIQUE

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Key words:

optimization – operations research – interval optimization – inverse optimization

Abstract:

We give a general formulation of the inverse optimization problem, applicable both for linear and nonlinear setup. We formulate some general questions deserving attention: in particular, we ask under which conditions the inverse optimization problem can be solved by the Binary Search technique. A partial solution to this problem is shown in case of linear programming with interval coefficients. We also illustrate the applicability of the method by two examples: designing a network and designing a payoff matrix for a matrix game.

1. Introduction, notation and problem statement

Let a set $\Theta \subseteq \mathbf{R}^k$, called *admissible space*, be given. We consider the family of optimization problems

$$\min f(x, \theta) \text{ s.t. } g(x, \theta) \leq 0, x \in \mathbf{R}^n$$

parametrized by $\theta \in \Theta$. Here f is an objective function, x is a vector of variables, θ is a vector of parameters and g is a vector-valued constraint function (i.e., the constraints $g(x, \theta) \leq 0$ can be written as $g_1(x, \theta) \leq 0, \dots, g_m(x, \theta) \leq 0$).

The *inverse optimization problem* asks: given $f, g, \Theta, f_0 \in \mathbf{R}$, find $\theta_0 \in \Theta$ such that $\min\{f(x, \theta_0) : g(x, \theta_0) \leq 0, x \in \mathbf{R}^n\} = f_0$ or assert that none exists.

Interpretation. In fact, the task is to find data of an optimization problem such that its optimal value equals to the prescribed level f_0 , when the data can be selected from the admissible region Θ .

A particular value $\theta^* \in \Theta$ is called *scenario*. Also the optimization problem $\min f(x, \theta^*)$ s.t. $g(x, \theta^*) \leq 0, x \in \mathbf{R}^n$ is called *scenario*.

Optimal value function. The function $V(\theta) = \inf\{f(x, \theta) : g(x, \theta) \leq 0, x \in \mathbf{R}^n\}$ is called *optimal value function*. We admit that V attains $\pm\infty$. This means in particular that the scenario θ^* is infeasible when $V(\theta^*) = \infty$ and that the scenario θ^* is unbounded when $V(\theta^*) = -\infty$.

2. Binary Search

Assume that V can be evaluated efficiently, say in polynomial time. This holds true for linear programming, semidefinite programming, general convex programming under some additional assumptions on Lipschitz-boundedness of f and many more optimization problems; see [6] for details.

Here we state a general theorem giving us a method for solving the inverse optimization problem.

Theorem 1. Let Θ be a convex set, let $\underline{\theta} \in \Theta$ and $\bar{\theta} \in \Theta$ satisfy

$$-\infty < V(\underline{\theta}) \leq f_0 \leq V(\bar{\theta}) < \infty \quad (1)$$

and let V be continuous on Θ . Then, for any $\varepsilon > 0$ Binary Search finds a scenario $\theta_0 \in \Theta$ such that $|V(\theta_0) - f_0| < \varepsilon$.

Proof of Theorem 1. By convexity of Θ , for each $\lambda \in [0, 1]$ we have $\theta_\lambda := (1 - \lambda)\underline{\theta} + \lambda\bar{\theta} \in \Theta$. By continuity, the function $v(\lambda) := V(\theta_\lambda)$ attains the value f_0 for some $\lambda_0 \in [0, 1]$ (using Bolzano's Intermediate Value Theorem) and it can be found up to an arbitrarily small error using Binary Search over $\lambda \in [0, 1]$. Q.E.D.

Remark. Recall that Binary Search is the following procedure. Start with $\underline{\lambda} = 0$ and $\bar{\lambda} = 1$. Given $\underline{\lambda}$ and $\bar{\lambda}$ such that $v(\underline{\lambda}) < f_0 < v(\bar{\lambda})$, set $\lambda^* = \frac{1}{2}(\underline{\lambda} + \bar{\lambda})$ and evaluate $v(\lambda^*)$. If $|v(\lambda^*) - f_0| < \varepsilon$, terminate. If $v(\lambda^*) < f_0$, set $\underline{\lambda} := \lambda^*$; otherwise set $\bar{\lambda} := \lambda^*$ and iterate.

3. General questions

It is hard to give a general bound on computational efficiency of the method of Theorem 1, since we would need further assumptions on V (like monotonicity,

Lipschitz-boundedness or other similar properties). Another problem is whether the assumptions of Theorem 1 are satisfied in a particular case – for example, in case of Linear Programming (which is the case when f and g are linear functions both in x and θ) it is easy to find an example when V is not continuous. Moreover, it can happen that even finding $\underline{\theta}, \bar{\theta}$ such that (1) holds is a complicated problem (say, **NP**-hard). More generally, it can happen that finding the bounds $\bar{V} = \sup\{V(\theta) : \theta \in \Theta\}$ and $\underline{V} = \inf\{V(\theta) : \theta \in \Theta\}$ is a computationally hard problem, showing that even the natural question whether $\underline{V} \leq f_0 \leq \bar{V}$ holds need not be easy-to-answer.

4. Linear programming with interval coefficients

Here we restrict ourselves to the case of inverse Linear Programming. The general problem can be formulated as follows: given f_0 and $\Theta \subseteq \mathbf{R}^{m \times n} \times \mathbf{R}^m \times \mathbf{R}^n$, find a scenario $(A, b, c) \in \Theta$ such that $\min\{c^T x : Ax = b, x \geq 0\} = f_0$ or assert that none exists. Moreover, we restrict ourselves to the case of *interval coefficients*, which is the case when $\Theta = \mathbf{A} \times \mathbf{b} \times \mathbf{c}$, where $\mathbf{A} = [\underline{A}, \bar{A}] = \{A \in \mathbf{R}^{m \times n} : \underline{A} \leq A \leq \bar{A}\}$ is a given *interval matrix* and $\mathbf{b} = [\underline{b}, \bar{b}] = \{b \in \mathbf{R}^m : \underline{b} \leq b \leq \bar{b}\}$ and $\mathbf{c} = [\underline{c}, \bar{c}] = \{c \in \mathbf{R}^n : \underline{c} \leq c \leq \bar{c}\}$ are given *interval vectors*. (Any inequality between vectors/matrices is understood entrywise.) For this case we have an interesting theorem on continuity of V .

Theorem 2 [4, 7]. (a) If $\underline{A} = \bar{A}$ and $-\infty < \underline{V} \leq \bar{V} < \infty$, then V is continuous.

(b) If every scenario $(A, b, c) \in \mathbf{A} \times \mathbf{b} \times \mathbf{c}$ satisfies

$$\{x \in \mathbf{R}^n : Ax = 0, x \geq 0, c^T x \leq 0\} = \{0\} \text{ and } \{y \in \mathbf{R}^m : A^T y \leq 0, b^T y \geq 0\} = \{0\}, \quad (2)$$

then $-\infty < \underline{V} \leq \bar{V} < \infty$ and V is continuous.

Remark. In (a) we assume that $-\infty < \underline{V} \leq \bar{V} < \infty$; that is, we assume that every scenario $(A, b, c) \in \mathbf{A} \times \mathbf{b} \times \mathbf{c}$ is feasible and bounded. Though in general it is not easy to test whether this assumption holds true, in many applications we can infer that this is the case from the economic meaning of the problem under consideration. We will show some examples.

Remark. Observe that in the Linear Programming case, the optimal value function is computable in polynomial time. This shows that each iteration of Binary Search of Theorem 1 is a computationally tractable procedure.

5. Two applications of Theorems 1 and 2

Application 1: Designing a network. Let a network (V, E, S, T) be given, where V is the set of vertices, E is the set of edges, S is the source vertex and T is the sink. Assume that for each edge e we are given a pair of nonnegative numbers $\underline{k}_e \leq \bar{k}_e$. Our task is to select capacities of edges such that the maximum flow through the network is f_0 .

It is well-known that the problem can be formulated as a linear programming problem. We add an artificial edge (T, S) to the graph G with unbounded capacity. Given a vector k of capacities of edges, we can easily solve the linear programming problem

$$\max\{x_{TS} : (\forall e \in E - \{(T, S)\}) 0 \leq x_e \leq k_e, C^T x = 0\}, \quad (3)$$

where C is the incidence matrix of G .

The inverse problem asks to select $k \in [\underline{k}, \bar{k}]$ such that

$$\max\{x_{TS} : (\forall e \in E - \{(T, S)\}) 0 \leq x_e \leq k_e, C^T x = 0\} = f_0.$$

Clearly we have

$$\begin{aligned} \underline{V} &= \max\{x_{TS} : (\forall e \in E - \{(T, S)\}) 0 \leq x_e \leq \underline{k}_e, C^T x = 0\}, \\ \bar{V} &= \max\{x_{TS} : (\forall e \in E - \{(T, S)\}) 0 \leq x_e \leq \bar{k}_e, C^T x = 0\} \end{aligned}$$

since an increase in capacities cannot decrease the size of a maximum flow. It follows that it is easy to test whether $\underline{V} \leq f_0 \leq \bar{V}$. Clearly, we have $0 \leq \underline{V} \leq \bar{V} < \infty$ by the nature of the problem. So, Theorem 2(a) tells us that the optimal value function $V(k)$ is continuous on $[\underline{k}, \bar{k}]$ since the capacities appear only in the right-hand sides of (3) and we can use Theorem 1 for finding a solution.

Application 2: Designing a matrix game [4]. Recall that a finding a mixed Nash strategy for Player I in a matrix game with payoff A can be found by solving the linear programming problem

$$\max\{\gamma : Ax \geq \gamma e, e^T x = 1, x \geq 0\}, \quad (4)$$

where e is all-one vector. Recall also that the optimal value equals to the value of the game.

Let $\underline{A} \leq \bar{A}$ and f_0 be given. In [4] it is shown that (4) satisfies the assumptions of Theorem 2(b). Clearly

$$\begin{aligned}\underline{V} &= \max\{\gamma : \underline{A}x \geq \gamma e, e^T x = 1, x \geq 0\}, \\ \bar{V} &= \max\{\gamma : \bar{A}x \geq \gamma e, e^T x = 1, x \geq 0\},\end{aligned}$$

since an increase in payoff cannot decrease the value of the game. It follows that we can efficiently test whether $\underline{V} \leq f_0 \leq \bar{V}$ and if so, we can use Theorem 1 for finding a payoff matrix $A \in [\underline{A}, \bar{A}]$ such that the value of the game is f_0 .

6. Conclusions

The results on inverse linear programming look appealing. However, there are many issues still to be resolved. For example, the conditions (2) are sufficient, but not necessary. Indeed, it is possible to construct a linear programming problem with a continuous objective value function such that at least one of the conditions (2) is not satisfied. So it would be desirable to re-prove Theorem 2 with a weaker assumption. Next, while testing the first condition of (2) can be done by a polynomial-time algorithm, testing the second condition of (2) seems to be **NP**-hard in general. So it would be desirable to construct a different, poly-time testable sufficient condition for continuity of the optimal value function.

Of course, many natural questions remain open for nonlinear programming problems. For example, for which classes of nonlinear programming problems it holds that $\underline{V}$ and/or $\bar{V}$ can be determined in polynomial time? Another example: for which nonlinear programming problems can we prove an analogy of Theorem 2(b)?

Acknowledgment:

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FOREIGN EXCHANGE RATE – CASE STUDY

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Key words:

financial derivatives – foreign exchange risk – forward – hedge – options

Abstract:

The contribution deals with the use of financial derivatives by export company to hedge foreign exchange risk. One case study that monitors ways of financial derivative use in a company was created, gained results and findings are evaluated. The paper uses real data from the years 2011 to 2013 and works with the Company's financial statements. The objective of the work is an analysis of the use of financial derivatives to hedge exchange rate risk of an export company. Worked out data are real data which were provided by the company from its financial statements from the years 2011 to 2013. Analyses are carried out taking into account the actual spot rate of the given periods, mostly obtained from the Czech National Bank sites or from other institutions.

Introduction - forward

One type of forward is an agreement on the exchange of pre-agreed amount of money in one currency for an agreed amount in another currency at a future date. So founders bet on the future spot rate between the two currencies. [3]

The exchange rate is the ratio of the mutual exchange of two currencies. It is given mostly in direct quotations, which means that the fraction is the ratio of base currency (i.e. the one which the trader sells or buys) and the contractual currency. In value terms, the ratio is reversed.

For example, a euro-crown couple expressed in direct quotations makes 25,630 CZK/EUR. [4] Euro in this case is the base currency and Czech crown is the contractual one. In the case of indirect quotation ratio would be reversed, i.e. 0.039 EUR/CZK. [1] Qualitative research will be used for the examination. Case study that characterizes company conditions is worked out. [2]

The company exclusively uses financial derivatives such as forwards for hedging of future cash flows. An important finding is the fact that these foreign exchange forward contracts aren't concluded strictly for specific contracts with purchasers of products, but are gradually fluently concluded with the partner bank. This way the company ensures a steady cash flow of foreign currency needed for production. When the contract is concluded, the company has at any moment financial reserves and is ready to produce immediately. Income from paid deliveries is also used to offset amounts of money back to the bank. Such procedure is typical for a manufacturing company, as stated in one of the interviews. [6]

Conclusion of forward agreements is in the company quite often performed on intuitive base; and according to the company's management a system or guidance for decision-making should be applied in the future.

Company trades with international partners mainly in euros. They have accounts in euros, U.S. dollars and Czech crowns in the financing bank; recalculation rate is used for accounting purposes.

Individual case study will be elaborated with its business partners.

1. Case study

The case study deals with delivery of separators in Belarus. The value of equipment was estimated at more than seven million. The production order was issued on 14 July 2011. Offer can be seen in the following table.

TAB. 1: General overview of calculation of the offer

Recapitulation (for EPASS)	(CZK)	
Material consumption limit (CZK)	3 870 000,0	
Other direct costs (CZK)	704 000,0	
Direct personnel costs (CZK)	774 400,0	
Total direct costs (CZK)	5 348 400,0	(CZK/USD)
The offer price (CZK)	7 258 000,0	
Total contribution margin (CZK)	1 936 600,0	26,6%
Contribution Margin per man-hour (CZK)	583,8	
Contribution Margin (CZK)	2 711 000,0	37,2%

Total amount of man-hours – manufacturing	3 320,0	KP
Total amount of man-hours – constructional	200,0	PN total
Total weight (kg)	61 340,0	
The total number of units (pieces)	2	

Source: Accounting statements of the analyzed company 2011 - 2013

The quotation was calculated at a rate of 23.5 crowns per euro. Hedging the currency can be seen from the table of company hedging cases. The table shows the cases of forwards that **hadn't been settled at 29 June 2012**. It can be noticed that the company in this period ensured greater amount of money due to other on-going contracts. Forward rate offered by bank **was agreed at 24.35** crowns per euro. Compared to the submitted offer there is an increase in profit by 85 cents per euro. Hedging with the due date on 30th March 2012 is closest to the due date of this study. Other cases with a later maturity date, however, have the same offered rate.

TAB. 2: Forwards of the analyzed company payable before 30 December 2011

Number of trade GID	Trade date	Due-date	The first currency	The volume of trade	The other currency	Exchange rate
50706167	13.9.2011	31.1.2012	EUR	150000	CZK	24,35
50746085	21.9.2011	31.1.2012	EUR	600000	CZK	24,66
50708170	13.9.2011	29.2.2012	EUR	150000	CZK	24,35
50741533	20.9.2011	29.2.2012	EUR	150000	CZK	24,60
50872333	21.10.2011	29.2.2012	EUR	2300000	CZK	24,85
50406172	13.9.2011	30.3.2012	EUR	150000	CZK	24,35
50741535	20.9.2011	30.3.2012	EUR	150000	CZK	24,60
50938842	9.11.2011	30.3.2012	EUR	800000	CZK	25,19
50748088	21.9.2011	27.4.2012	EUR	600000	CZK	24,66
50706175	13.9.2011	30.4.2012	EUR	150000	CZK	24,35

50741537	20.9.2011	30.4.2012	EUR	150000	CZK	24,60
50706177	13.9.2011	31.5.2012	EUR	150000	CZK	24,35
50741538	20.9.2011	31.5.2012	EUR	150000	CZK	24,60
50706184	13.9.2011	29.6.2012	EUR	150000	CZK	24,35
50741539	20.9.2011	29.6.2012	EUR	150000	CZK	24,60
50706191	13.9.2011	31.7.2012	EUR	150000	CZK	24,35
50746055	21.9.2011	31.7.2012	EUR	150000	CZK	24,66
50746090	21.9.2011	31.7.2012	EUR	600000	CZK	24,66
50605195	13.9.2011	31.8.2012	EUR	150000	CZK	24,35
50746058	21.9.2011	31.8.2012	EUR	150000	CZK	24,66
50706197	13.9.2011	27.9.2012	EUR	150000	CZK	24,35
50746063	21.9.2011	27.9.2012	EUR	150000	CZK	24,66
50706200	13.9.2011	31.10.2012	EUR	150000	CZK	24,35

Source: Accounting statements of the analyzed company 2011 - 2013

The invoice for the case was issued by the company on the 26th March 2012. The maturity was determined for 11 May 2012. At the time of maturity, the value of the course was 24.725 crowns per euro by the CNB. The payment was made later on 23 May 2012, when the value gained 25.505 CZK / EUR. The gradual growth would mean for the company a gradual appreciation of the contract in terms of euros. The calculation is shown in the following table.

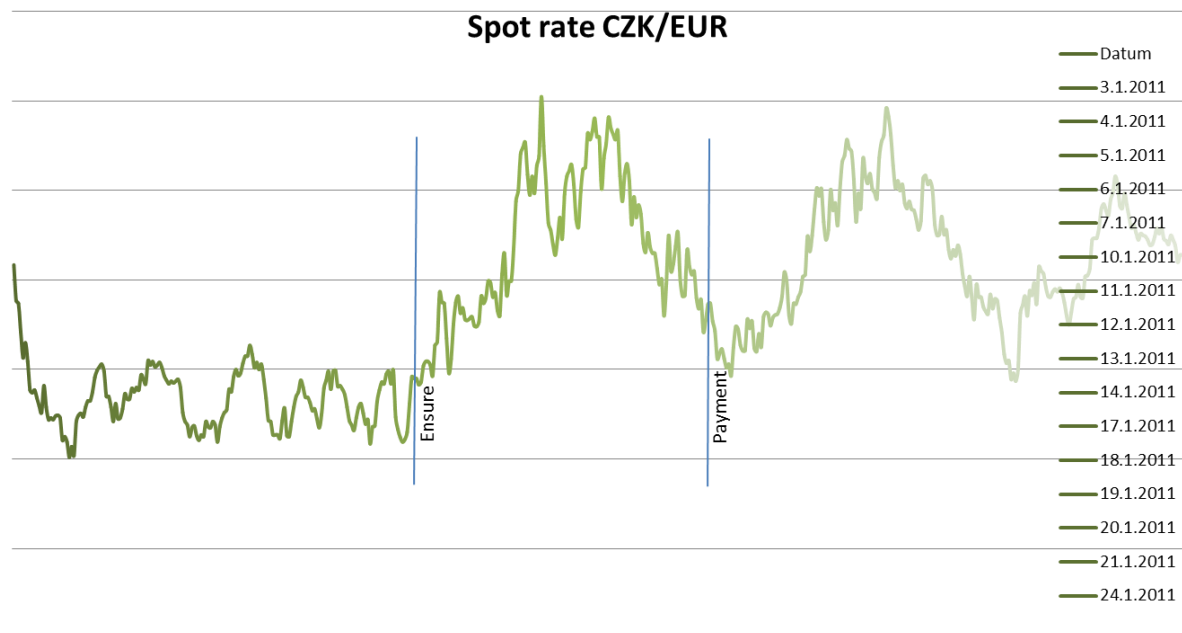
TAB. 3: Detailed calculation using forward in the case study

Date	Income (USD)	Forward (hedged)	Spot rate	Balance (CZK)
23.5.2012	310000	24,35	25,505	- 358 050
				Total - 358 050

Source: own processing

The progress of the case can be seen in the following graph which illustrates the development of the exchange rate CZK / EUR in 2011 and 2012 by the Czech National Bank.

FIG. 1: Spot rate CZK / EUR by CNB with marked dates in the case study



Source: Exchange rates Czech national bank (online), own processing

2. Utilization of options in the study

Now we are going to analyze the example from the case study, where options would be used instead of forward. The option contract will be used for hedging. The company would get agreed with its business counterpart that our company will acquire rights to the contract for the current price.

The amount of € 310,000 was originally designed in the calculation of 23.5 crowns per euro.

The same assumption is used for the calculation, namely that the price of the option premium is approximately one percent of the base price of the instrument to which it relates. [7] In this case, the amount reaches 75,485 crowns. This amount represents also the maximum potential loss of our company and maximum profit of the business partner.

Current rate stood at 24.35 crowns per euro and that would be the rate to which the company would acquire the selling right by negotiating the option.

The rate increased during production and maturity of the contract, so that at the time of the sale amounted to 25,505 crowns. The following table shows the calculation.

TAB. 4: Calculation of the option utilization in the study

Amount (EUR)	Prepaid rate	Spot rate	Potential profit (CZK)
310 000	24,35	25,505	7 906 550
The option premium		– 75 485	
Total		7 831 065	

Source: own processing

The company could sell for 7,906,550 crowns if the rights arising from the option are applied, but in the case where the company committed by forward to selling at a lower rate, the profit reached only 7,548,500 crowns.

After deducting the option premium the profit obtained by applying the option is 282,565 crowns higher.

Conclusion

The case study present rather negative results for the application of the current model for hedge of the exchange rate risk of an export company. In the case, the company profited less than if derivatives such as forward hadn't been used at all or if it had applied other hedge tools.

The study describe contract of about 7,258,000 crowns. If there had been no hedge the company would have profited by 358,050 crowns more than actually occurred. This view is distorted, however, because we evaluate the situation now when we know how the market developed.

The study shows that hedging foreign exchange risk doesn't have to be always beneficial for the export company. Therefore there is a strategy for saving financial means, and it is the strategy of not providing hedging at all. Site knowledge of the conditions which happened at that time leads to such a conclusion.

Return on derivatives depends mostly on macroeconomic development of the entire market. Monitoring Czech national bank financial reports which analyze development

and bring predictions on the economic environment might be recommended as a useful strategy.

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PROCESSES EVALUATION OF SMALL AND MEDIUM-SIZED ENTERPRISES

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Key words:

evaluation – proces – human resource management – small and medium-sized enterprises

Abstract:

The aim of this paper is analyse and creating of a strategy for the area of human resource management, importance and evaluation of individual processes of small and medium-sized enterprises. Primary data was collected through questionnaire survey and interviews with managers and owners of small end medium-sized enterprises from South Bohemia during year 2013 within the grant project GAJU 039/2013/S entitled: Human resource management of small and medium-sized enterprises.

Introduction

Global competition in its essence is not a rivalry between states, but the rivalry between companies. Small and medium-sized enterprises are under a great pressure and therefore they are looking for ways to achieve the competitive advantage and attracting customers. The creating strategies [5], knowledge of processes in the SME, especially staff processes, their measurement and their evaluation is the basis of a successful management [9]. Monitoring is the systematic and routine collection of informations, that processes and experiences to be documented and used as a basis to steer decision-making [6]. In general, monitoring is an integral part of evaluation and it is used for the assurance that all operations and all elements are functioning properly [4]. Knápková [8] note: The first and the most important point of management and enterprise performance management is knowledge of staff in enterprises based on skills and capabilities of employees and managers [2]. Knowledge of processes and specialized

knowledge of processes related to personnel is the first prerequisite for a successful business [1] especially in the management of SME.

1. Methodology

Primary data were obtained through a questionnaire survey and interviews with the management and owners of 123 small and medium-sized enterprises with the seat in the South Bohemian Region. The questionnaire survey and interviews were carried out during 2013 and will continue in the coming year. The questionnaires and interviews were focused on the area of human resources management, corporate culture, corporate social responsibility, communication, and the indicators used in these enterprises. Due to incorrect filling in the questionnaire the sample of small and medium enterprises for 109 have been reduced.

For clarity of information about 109 small and medium-sized enterprises the first part of the paper is focused on the fundamental characteristics of a sample of small and medium-sized enterprises, which are categorized by splitting the sample by number of employees at small businesses up to 49 employees and medium-sized enterprises up to 249 employees. Furthermore, the distribution of businesses, where managers and owners responded to the choice of the franchise contract, holding clusters, chains (networks), an independent business, or a combination of several other options.

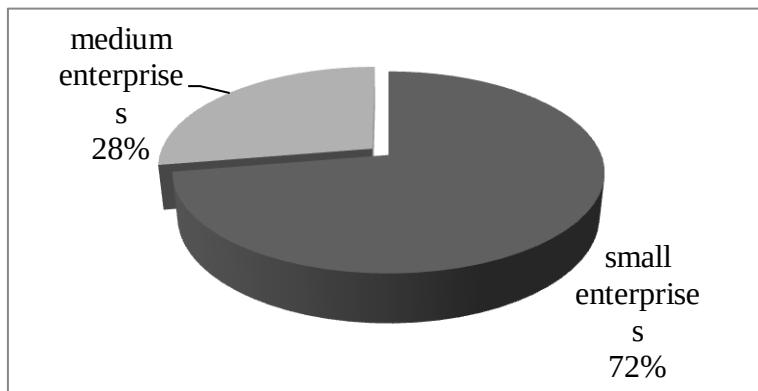
The second part of the paper deals with the creation of a strategy for human resources management, where managers and owners are told whether they make up the strategy and if it forms , whether it is recorded in written form.

The third and final part of the paper consists of evaluation of processes of the business and arrange them according to their importance for the company and assess the functioning of these processes. Enumeration of process is as follows: Marketing, Production and Service provision, Trading, Financial Management, Human Resource Management, Quality Management, Information internal processes, Corporate social responsibility and communication (media). Each process was evaluated on the level of 1 to 9, where 1 meant the most important process for the enterprise and 9 represents the least important process for the event. Evaluation of functionality of processes have been reported on the level of from 0 to 100%, where 100% represents the correctness of the process and 0% corresponds to the malfunction of the process.

2. Results

Questionnaires and interviews at the time of contribution participated in 123 small and medium-sized enterprises. This number was reduced to 109 because of the inaccuracy of the questionnaire.

FIG. 1: **Distribution of enterprises by number of employees**



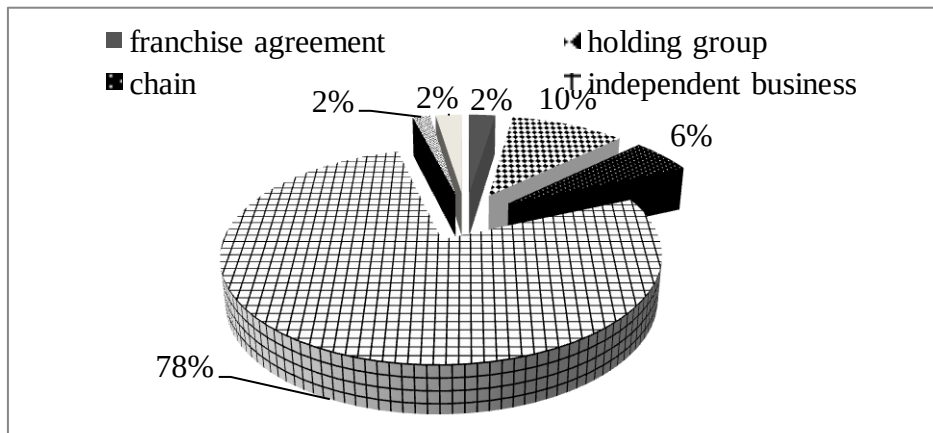
Source: own processing

A sample of 109 companies is divided, as is evident from Figure 1 into the predominant area small businesses employing up to 49 at 72.4% (79 companies) and medium-sized enterprises with up to 249 employees on the level of 27.5% (30 enterprises).

From Figure 2 it is clear that the most representative sample of 109 small and medium-sized enterprises is 75% (83 companies) an independent business, followed with 12% share holding groups. (13 companies) and 6% (7 companies) is part of a chain. Managers and owners of 109 small and medium-sized enterprises reported that three companies are part of the franchise agreement, three other groups of companies and enterprises a combination of business groups.

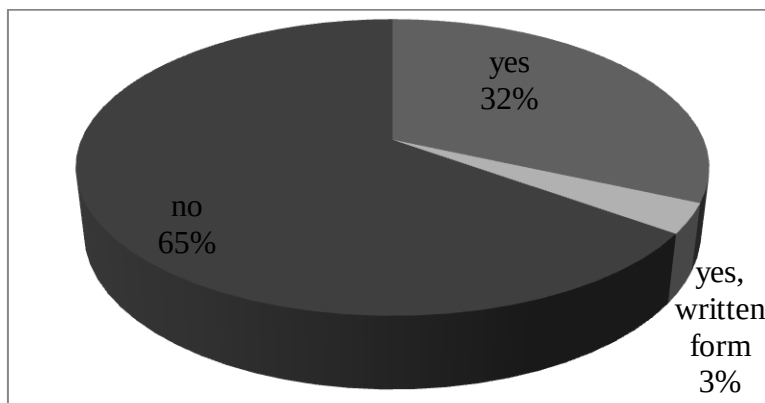
Many authors have reported that the management of human resources is one of the most important areas in the enterprise, the results are disturbing in Figure 3, where we can see that only 3% (4 companies) sample of companies creates written strategies for the management of human resources. 32% (39 companies) discusses strategies for human resources management, but recognizes her written form. 65% (80 companies) does not deal with the creation of a strategy for the management of human resources at all.

FIG. 2: Distribution of enterprises by number of employees



Source: own processing

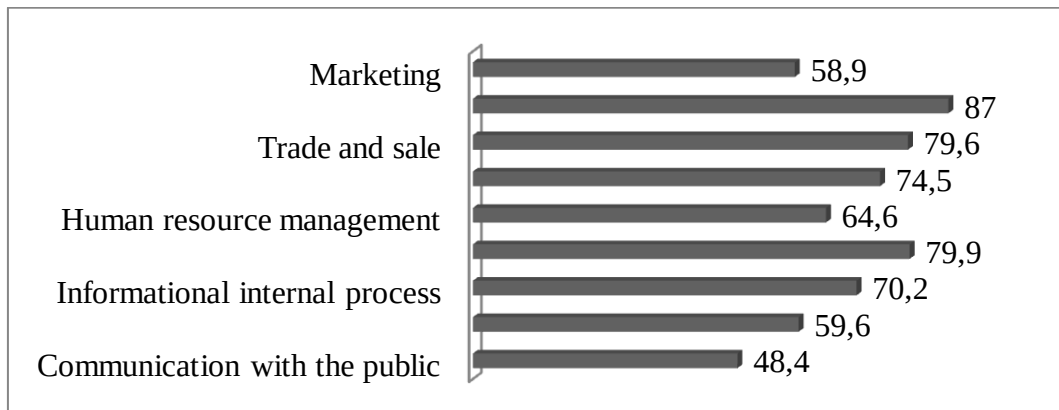
FIG. 3: Creating of a strategy for the management of human resources for SMEs



Source: own processing

Within the area of the importance of the process, each process was evaluated on the level of 1 to 9, where 1 meant the most important process for the enterprise and 9 represents the least important process for the enterprise, that is, the lower the value, the more important process for every business. According to the results of Figure 4 it shows that for 109 companies, the most important process is production of products and provision of services (2.5) and Trading (2.6) follows Quality Management (3.7) and Financial Management (4).

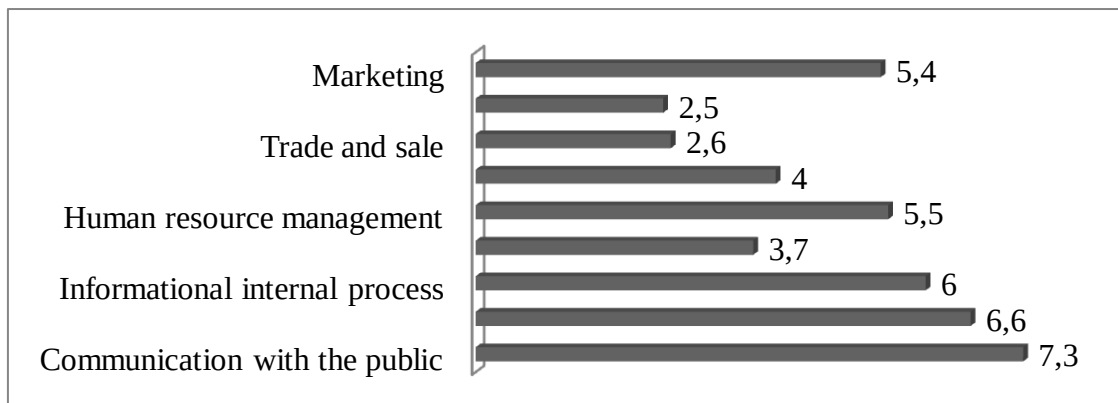
FIG. 4: The importance of the process of small and medium-sized enterprises



Source: own processing

After evaluation of the importance of the process followed evaluation of function of these processes in a given sample of small and medium-sized enterprises. Rating of functional processes was recorded on a level of from 0-100%, where 100% represents the correctness of the process, and 0% corresponds to the malfunction of the process.

FIG. 5: Evaluation of the functioning processes of small and medium-sized enterprises



Source: own processing

From Figure 5 it shows that the highest rate and also the most important process is the production of products and provision of services (87 %), followed by quality control processes (79.9 %), Trading (79.6 %) and Financial management (74.5 %).

3. Conclusion

With the help of the questionnaire survey of 123 small and medium sized enterprises there were used 109 /88,6 percent/ questionnaires, where three fourth of the samples were created by the small enterprises and independent enterprises also created similar representation in the frame of the entrepreneurial groups.

In the area of creation of strategy there were found dissatisfied results, when only 3 percent representation of the sample deal with this topic and also present written form and 32 percent without written form deal with this topic. 65 percent do not deal with this problem, the reason is unwillingness to deal with the research of competitive ring, competitive impact on small and medium sized enterprises, that is why it was suggested to increase interest in this area. It is probable that low rate of achieving profit leads many enterprises to the feeling of economic satisfaction concerning their results and they interrupt constant work over the strategy.

An interesting result coming out of the result is that managers consider production of the product and providing services the most important process - it is part of the secondary activity as well as the best evaluation of this process is operation. Disadvantage that have small and medium sized enterprises is lower number of employees and capital they have to their disposal to the development not only of this process but also to all others observed in the frame of questionnaire survey. Large shortcomings were found out in the evaluation of the operation in the area of communication with the public, in marketing and social responsibility of the firm. These areas are also necessary for function and competitiveness of the company that is why it was suggested to increase monitoring of these processes to the present sample of small and medium sized enterprises.

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NEW OPPORTUNITIES FOR EUROPEAN ENERGY COMPANIES – STRUCTURAL CHANGES IN THE VALUE CHAIN

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Key words:

energetics – deregulation – sustainability – differentiation

Abstract:

The European energy market is undergoing significant structural changes; the values of the stock markets trading traditional energetics are declining. A fully liberalised market development stage of end customers provides an increased margin potential. The key instrument for its implementation appears to be product differentiations aimed at meeting the expectations of customer insights. When supplementing interfaces with appropriate business fields, stability in terms of sustainability can be supported.

Introduction

The European energy market is undergoing profound structural changes. After the peak in 2008, major utility companies with a traditional business model have noted a slump on the stock markets to approximately half of their value. Among the main causes of this phenomenon are the political decision in the area of supporting renewable sources, a decline in consumption caused by the economic crisis, new deposits of shale gas in America, reduction of the coal prices and emission allowances and, last but not least, the decision on the shutdown of nuclear power plants in Germany [1].

The basic building blocks of the existing value chain of energy companies, i.e. production resources in which there have been large investments, very frequently become uncompetitive under new conditions. On the other hand, the retail market, which did not represent a relevant contribution margin, especially in regions undergoing

regulation or post-regulation (deregulation), constitutes a significant potential in liberalised markets. The Customer Insights and a long-term effective strategy in the field of B2C, which sees customers as a strategic asset in the context of sustainable development, are very relevant even for the competitive Czech end-user energy market.

Goals and methodology

The main goal of the case study in the energy supply was to develop a sustainable targeting tool. According to the trends in the B2C energy markets development from the global point of view as well as in the Czech Republic, we were able to formulate our new products, which respect the customer insight (measured by the loyalty marketing research, including NPS and the CATI methodology).

Based on a detailed description of brand positioning, an internal definition of both fitting and non-fitting product and communication lines has been developed. In combination with the customer insights, a long term direction of energy efficiency has been established. We went together with partners and conveniently connected the existing core business fields (appliance + commodity supply + sales channel + communication), to be able to bring new products to market in a relatively short period of time. As an additional activity, we introduced the collection of appropriate possible product ideas on the basis of a competition for the general public (within the E.ON Energy Globe Award ČR). Evaluating proceeds in view of the planned absolute margin (hard sales data), and with regard to brand influence (soft data from the Brand value market research).

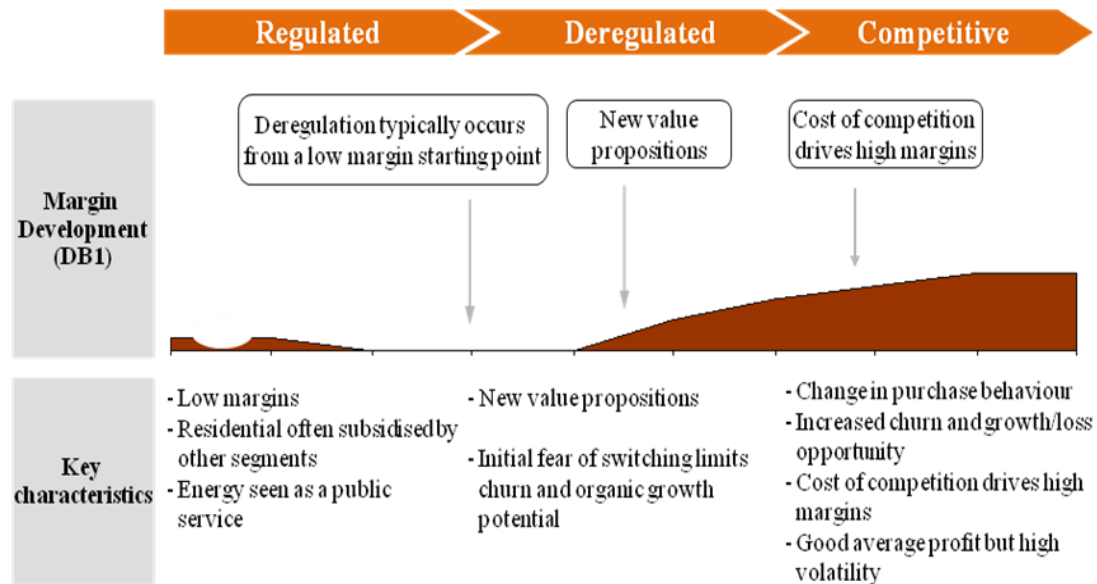
1. Developmental phases of the B2C energy market

European regions go through various developmental stages of the end-user energy market. From the perspective of liberalisation, or the level of regulation, three basic phases can be identified: “regulated”, “deregulated” and “competitive” phases.

Czech end-user energy is in the “competitive” phase. While the emphasis on building a Corporate Brand - in terms of key marketing concept [2, 15-19] - is characteristic for the “deregulated” phase, the subsequent “competitive” phase shows that the mere motif of a

branded commodity is not sufficient to motivate potential new customers to making any purchases.

GRAPH 1: Developmental phases of the B2C energy market



Source: Author, 2013

Therefore, there is a strong degree of defining even via product differentiation; or rather communication of specific benefits, and thus the increasing potential in the field of the gross margin is implemented in both acquisition and retention activities. When trying to maximize DB3, or DB5, it is necessary at the same time to improve the process, or rather the cost-effectiveness.

2. Current B2C Customer Insights on the Czech energy market

One of the key indicators of customer relationship is what is known as NPS (Net Promoter Score), i.e. willingness of the interviewee to recommend the energy supplier to friends, relatives or colleagues [3, 145]. In 2013 a statistically relevant sample of respondents indicated that the most important driver with the highest impact on potential recommendation of an energy supplier in the Czech Republic is “value perception” (37% impact on NPS). “Value perception” consists of “price perception” and “product and service offer”. The annual comparison between 2013 and 2012

implies that that there has been a significant increase (of 9%) in the degree of the influence of “value perception”.

The second most important driver is “image” (18% impact on NPS). In a detailed analysis of every single statistic variable in the importance of “image”, we observe that the most important factors are “acts responsibly” and “works on better energy solutions, so that the world of energy becomes cleaner and more efficient every day” [3, 10-15].

The impact of “image” on NPS significantly decreased between 2009 and 2013 (from 25% to 18%) to the benefit of “value perception”. This phenomenon corresponds with the accentuation of product differentiation in the “competitive” phase.

3. Practical examples of suitable targeting on B2C

When emphasising product differentiation as the key feature of the “competitive” stage of market development, and when pursuing a maximum focus on drivers with the highest impact on the NPS, it is advisable to upgrade the product portfolio with the following properties (in addition to establishing profitability):

- The promise of reduction/no increase in existing payments for the commodity (“price perception” driver).
- Developing product bundles in connection with another product or value added service (“value perception” driver).
- Supporting the above-mentioned products in communication, taking into account the significant factors of “acts responsibly” and “works on better energy solutions, so that the world of energy becomes cleaner and more efficient every day”. This only applies if the above factors saturate, respectively are not in conflict with the corporate brand positioning as such.

In such targeting, the effect of positive influence on the NPS of the target group of up to 55% can be achieved. Specific examples (with contribution by the author) of products implemented in this way on the Czech energy market include:

- Special offer of efficient natural gas boilers in combination with the product supply of natural gas at a fixed price for 2 years, i.e. a combination of energy company + manufacturer and boiler service as the primary sales channel.
- Offer of a unique “Benefit” product line, which actually motivates customers to save electric energy only in the Czech market. Its essence is the fact that annual savings of technical units (MWh) result in an automatic concession for the customer.
- Offer of a unique patented solution of switching on domestic appliances (in particular, washing machines and dryers) during the “low tariff” period of electricity, in combination with an electricity supply product at a fixed price for 2 years. In this way, energy costs can be significantly saved, even to the extent that, during the expected lifetime of the washing machine, such savings can be generated, compared to the standard tariff of electricity supply, which can cover the initial purchase price of the appliance.

In this case, the “image” driver was supported by the fact that the innovative idea was based on addressing the general public via an organised competition, which was relatively strongly communicated.

Conclusion

The ability to generate profitable product bundles, or an offer of stand-alone services with the potential of saturating the image is – according to its orientation and adjustment with regard to customer insight and any store-operating business channel – an appropriate instrument for the acquisition or a retention policy in the “competitive” market stage, which offers significantly higher margin potential in the segment detail than in the earlier stages of development.

Active customer insights and establishing appropriate interfaces with additional business fields contribute to greater long-term stability in the period of radical changes in the value chain of traditional European energy companies. In its heterogeneity,

sensitive awareness of individual subsystems and long-term perspective, combined with innovative drive, the essence of the principle of the Sustainability of enterprises is fulfilled [4, 44-52]. In principle, this involves the consistent and long-term increase of customer value by optimising the acquisition and retention cross-sell as well as up-sell instruments.

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THE SPATIAL AND FINANCIAL ASPECTS OF PROTECTED AREAS USING THE EXAMPLE OF THE BABIA GÓRA NATIONAL PARK

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Key words:

protected area – tourist function – managing space

Abstract:

The article is an attempt at highlighting the relation between the development of the tourist function and the complex management of legally protected space. It presents the national park not only as a type of space, but also as an active governance unit managing the real estate under its control. The empirical studies for the paper (2008-2012) are based on data from the financial-accounting records of the Babia Góra National Park (BNP) and the Central Statistical Office. The authoress has studied the degree of fulfilling the tourist functions by municipalities which share their territory with that of the BNP and characterised the BNP as a governance subject. The results of the studies indicate the need to acknowledge that activity within the BNP serves as a factor determining the directions for the development of the municipalities which share its territory.

1. Introduction

Through the activities of organisations such as the International Union for Conservation of Nature (IUCN) or the Europarc Federation, national parks are a category that is recognised all over the world. They exist in areas of unique natural value. This uniqueness is at the same time a source of attractiveness with regard to tourism. These areas foster the realisation of two functions: the natural protection function and the tourist function. Since tourism is related to anthropogenic impact on the environment it is crucial to properly manage tourist flow, steering it in a way which would guarantee that its negative influence is kept at a minimum.

The problems related to managing area-based natural protection forms need to be tackled with regard to the protected subject, the bodies and institutions performing the actions in question, as well as the tools used in the management of environmental protection [1]. Identifying national parks as nothing more but areas is an oversimplification -this form of natural protection is in fact an autonomous subject equipped with its own financial means and incomes, which manage the space under its control and the real estate and infrastructure related to tourist movement located therein. This requires the park's authorities to maintain a rational financial economy and serve the role of an employer, investor and - as a result - an active player on the economic market.

The main aim of the article is to present the national park as a space and governance unit with its own impact on the development of the tourist function in the territorially connected municipalities. Empirical studies have been undertaken based on data from the financial-accounting records of the Babia Góra National Park (BNP) and the Central Statistical Office. The executed 5-year research period made it possible to draw conclusions for the three types of organizational-legal forms which served as the basis for the activity of national parks, i.e. the state budgetary unit with its auxiliary enterprise, the state budgetary unit and the state legal person.

2. The Babia Góra National Park as space

The Babia Góra National Park (BNP) is located in the Lesser Poland voivodeship and shares its territory with three municipalities: Zawoja, Lipnica Wielka and Jabłonka. It has been founded by virtue of a Regulation of the Council of Ministers from October 30, 1954 regarding the creation of the Babia Góra National Park [2]. Initially the park's area equaled 1.637 ha. In 1997, by virtue of a Regulation of the Council of Ministers from August 8, 1997 regarding the Babia Góra National Park [3] its area has been increased to 3.391.55 ha. It is worth noting that a transition zone of 8.437 ha has also been established at that time. BNP data indicates that the park's current area equals 3.393.34 ha. The discrepancies between the areas indicated in the 1997 regulation and the current state result mostly from concurrent border delineation activities. The distribution of the BNP area in each municipality is represented in Table 1. Protected space is usually associated with the category of land property that is undeveloped and

unaltered by human actions. This omits the fact that there exist a number of infrastructure appliances aimed at developing tourist movement, including buildings. Managing BNP space – and thus also all of its components – Is strictly justified based on the provisions of the Act from April 16, 2004 regarding environmental protection [4]. The above document is complemented by a number of dispositions by the BNP director which make it possible to adapt each activity according to the traits of the territory in question. The 2004 Act clearly indicates that it is the priority of a national park to pursue environmental protection – making the area available to humans and fulfilling educational duties are secondary goals.

TAB. 1: The area of the Babia Góra National Park in each municipality (data from 2012).

Specification	Zawoja Municipality	Lipnica Wielka Municipality	Jablonka Municipality
	Sucha County	Nowy Targ County	
Area of municipality in ha	12.878	6.736	21.273
Area of the BNP in ha	2.554	826	14

Source: own elaboration using Central Statistical Office (Local Data Bank) data.

The unique inanimate nature found in the Babia Góra National Park (the Babia Góra Massif), already visible even at a significant distance, the diversity of the animate nature, the ecological education offered by the park (workshops, meetings on the trail, field practice etc.), the Babia Góra Plant Garden which recreates each vegetation level found in the area, or the Garden of the Senses, accessible for the disabled, are all examples of why the park is an unquestionable attraction for tourists. Other special real estate directly related to tourist flow within the park includes: the Markowe Szczawiny Mountain Hut, governed by the PTTK (Polish Tourist and Sightseeing Society), the Mountain Volunteer Search and Rescue post, as well as a Tourism Museum. The BNP area includes 55 km of tourist routes, nine educational routes and three ski-ways of 6 km of total length. It is worth noting that the ski-ways have been delineated with the environmental protection function in mind – they run at a height of 1.000 mamsl and omit areas considered most attractive for alpine skiing enthusiasts. The skiers often disregard the topmost priority of environmental protection

within the national park and enter areas under strict protection. This results in interventions by Park Rangers, the introduction of penalties and the spatial conflict between the environmental protection function and the tourist function becoming more apparent.

The number of tourists in the BNP is determined using the amount of sold entry tickets and an estimated number of people entering without valid tickets. Ticket sales are organised in two of the most popular BNP entry points, i.e. in the Polana Krowiarki Tourist and Environmental Information Centre located in the Lipnicka Pass, and in the Tourist and Environmental Information Centre in the Markowa Zawoja. In the past years the number of sold tickets revolved around 75 000. Observations from the year 2013 indicate that this number increased to over 80 000 tickets. According to BNP estimates, the number of people entering the park without tickets equals about 30% of the total number of sold tickets – which is why the actual amount of people visiting the BNP has been established at a level of ca. 100 000 people per year.

When compared to the popularity of the most known Polish national parks – visited yearly by over 2 million persons – i. e. the Karkonosze National Park and the Tatra National Park, the number of tourists in the BNP is unimpressive, yet it cannot be underestimated. In order to conduct a complex description of the BNP one has to take into account the scale on which the tourist function is realised by the municipalities which share their territory with the park. The degree of fulfilling the tourist function [5] in each municipality has been represented using the Charvat¹ and the Defert² indicators – the results have been included in tables 2 and 3 respectively.

¹ The Charvat indicator reflects the number of overnight vacancies per 1km². The calculations take into account the total number of overnight vacancies.

² The Defert indicator reflects the number of tourists with overnight accommodation per 1 km² of the total area of the municipality.

TAB. 2: The Charvat indicator for the Zawoja, Lipnica Wielka and Jablonka municipalities, as well as the Lesser Poland voivodeship between 2008-2012.

Specification	Year 2008	Year 2009	Year 2010	Year 2011	Year 2012
Zawoja Municipality	8.25	6.84	6.48	5.56	5.96
Lipnica Wielka Municipality	no data	no data	no data	no data	no data
Jablonka Municipality	0.79	0.74	0.75	0.79	0.70
Lesser Poland Voivodeship	4.53	4.53	4.61	4.83	5.58

Source: own elaboration using Central Statistical Office (Local Data Bank) data.

The calculations for the Charvat indicator take into account the total number of overnight vacancies. Due to a lack of statistical data for the number of overnight vacancies and the number of tourists with overnight accommodation, it is impossible to establish the indicators for the Lipnica Wielka municipality in each studied time period.

TAB. 3: The Defert indicator for the Zawoja, Lipnica Wielka and Jablonka municipalities, as well as the Lesser Poland voivodeship between 2008-2012.

Specification	Year 2008	Year 2009	Year 2010	Year 2011	Year 2012
Zawoja Municipality	162.20	134.15	130.93	117.91	100.67
Lipnica Wielka Municipality	no data	no data	no data	no data	no data
Jablonka Municipality	13.68	13.04	14.97	16.53	14.40
Lesser Poland Voivodeship	178.58	179.19	189.19	206.51	228.56

Source: own elaboration using Central Statistical Office (Local Data Bank) data.

When it comes to both the Charvat and the Defert indicator the Zawoja municipality outclasses the Jablonka municipality. The downward trend is alarming – the development of the tourist infrastructure is decreasing in both municipalities, yet the Zawoja municipality still achieves results that are higher than those observed for the Lesser Poland voivodeship. The results for the Defert indicator calculated for this municipality in each next research period were gradually worse – during the 5 years of

research the indicator decreased nearly by 40%. It is impossible to determine this sort of tendency regarding the Defert indicator for the Jabłonka municipality, as the number of tourists with overnight stays were subject to bidirectional changes.

3. The Babia Góra National Park as a subject

The Babia Góra National Park – just like any national park in Poland – is a subject that is economically, organisationally and legally distinguishable from its surroundings. The empirical analysis of the BNP has been performed with the goal of presenting the park as a governance unit. This included a characterisation of the structure and value of the assets at the park's disposal, an indication of the degree to which it fulfills its labour-creating function and an analysis of the selected types of costs directly related to developing protected space. Due to the various organisational-legal forms existing between 2008-2012, the empirical research (in all three above-mentioned domains) has been conducted in the following manner:

- between 2008-2010 – separately for the state budgetary unit (SBU) and the Babia Góra National Park auxiliary enterprise (AE),
- in 2011 – for the state budgetary unit (as of January 1, 2011 auxiliary enterprises have been claimed by their parent budgetary units),
- in 2012 – for the state legal person (SLP).

Arriving at valid conclusions required the summing up of the values related to the state budgetary unit and its auxiliary enterprise (between 2008-2010). Thus tables 4 and 5 include the phrase “as governed by the BNP” along with respective summary data.

TAB. 4. The net assets of the Babia Góra National Park and its Auxilliary Enterprise in the years 2008-2012 in PLN, as of December 31 of each year.

Specification	Year 2008		Year 2009		Year 2010		Year 2011	Year 2012
	BU	AE	BU	AE	BU	AE	BU	SLE
CAPITAL ASSETS	1 213 186	837 803	1 154 464	634 487	1 392 356	608 409	3 261 460	4 208 948
Fixed assets:	1 213 186	837 803	1 154 464	634 487	1 392 356	608 409	3 261 460	4 208 948
1. Tangible assets (net):	725 153	837 803	661 595	634 487	899 442	608 409	2 768 546	3 716 033
1.1. land value	0	0	0	0	0	0	0	176 177
1.2. buildings, locums and engineering object	472 075	398 218	445 474	375 517	515 816	463 786	1 779 683	2 642 759
1.3. other*	253 077	439 585	216 055	258 971	383 626	144 623	988 863	897 098
2. Tangible assets under construction	488 033	0	492 914	0	492 914	0	492 914	492 914
CURRENT ASSETS	78 948	643 833	211 404	692 788	126 555	87 037	195 060	994 720
Balance sheet total	1 292 134	1 481 635	1 365 868	1 327 275	1 518 912	695 446	3 456 520	5 203 668
As governed by the BNP	2 773 769		2 693 143		2 214 358		3 456 520	5 203 668

Source: own elaboration using BNP and BNP AE balance sheets.

Key: BU – Babia Góra National Park budgetary unit, AE – Babia Góra National Park Auxiliary Unit, SLE – the Babia Góra National Park state legal entity.

*item 1.3 includes the summary value of technical equipment and machines, means of transport and other tangible assets

The data presented in Table 4 indicates that the value of the assets (balance sheet total) at the disposal of the Babia Góra National Park has nearly doubled in the research period in question – this clearly shows an increase in the potential of the studied unit. The decrease of this value in 2010 was largely related to a decrease in the value of the current assets of the BNP AE, including unfinished stocks and finished products, as well as short-term receivables. Its financial funds equaled zero near the end of 2010, while by the end of 2009 they equaled 467.991.34 PLN. This does not imply that the unit found itself in a dire financial situation, but was rather due to the different indications for a rational financial economy formulated for the auxiliary enterprise and the state budgetary unit. The form of the auxiliary unit allowed to utilise the produced financial funds in the following business year, while the form of the budgetary unit, functioning as of 2011, brought about the obligation to immediately redistribute all AE funds to the National Budget revenue account. It thus seems rational that the park would utilise all of the financial funds of its AE in the year 2010.

The assets structure also indicates that tangible assets – an element of fixed assets – are a major component. It needs to be stressed that the “tangible assets under construction” item includes value related to works aimed at establishing the future Educational Centre in Zawoja. The commissioning of this real estate will play a significant role in realising the tourist function, especially with the number of tourists in the BNP being on the increase. The BNP fixed assets apparent in the analysed balance sheets are equal to the tangible assets, which does not mean that the BNP does not possess any non-material or legal values – the zero net value in the balance sheet is only there to inform that the total amount of non-material and legal values of the BNP have been subject to 100% amortisation. Due to the depreciation principles regarding non-material assets (50% in the first year of use and 50% in the second year of use) this does not mean that the BNP has been using outdated non-material and legal values. The zero land value in the BNP balance sheet has to do with the fact that it was impossible to fulfill the principle mentioned in the Act on accountancy [6] which made it mandatory to perform a plausible estimate of the value of all elements considered to be assets. The zero land value for the Babia Góra National Park is thus to be interpreted in the invaluableness category, and not as a lack of value of the protected areas.

In order to present the labour-creating function of the BNP, information regarding gross salaries has been included in Table 5. One must take into account that personal wages are related to statutory staff – the above-mentioned fees also include additional yearly salaries. Supplemental payrolls stem from civil-legal acts – the contract of mandate and the contract of specific work.

TAB. 5: Gross salaries in the Babia Góra National Park and its Auxiliary Enterprise between 2008-2012 in PLN, as of December 31 of each year.

Specification	Year 2008		Year 2009		Year 2010		Year 2011	Year 2012
	BU	AE	BU	AE	BU	AE	BU	SLE
Personal wages	1.120.165	947.864	1.170.789	838.568	1.175.074	847.329	2.166.268	2.194.896
Supplemental payrolls	600	27.732	0	24.350	0	50.500	24.992	219.497
TOTAL	1.120.765	975.596	1.170.789	862.918	1.175.074	897.829	2.191.260	2.414.393
As governed by the BNP	2.096.361		2.033.707		2.072.903		2.191.260	2.414.393

Source: own elaboration based on BNP and BNP AE trial balance according to analytical and control accounts. Key: See Table 4.

The total costs incurred by the BNP mostly stem from activities with direct impact on protected space which concurrently determine the possibility of realising the tourist function in its area – these have to do with making the area available to tourists, pursuing environmental education – teaching e.g. the principles of adventure tourism – as well as maintaining the continuity of the natural and cultural resources of the park. Data listed in Table 6 represents the scale of the activities in question.

TAB. 6: The costs related to the possible realisation of the tourist function incurred by the BNP between 2008-2012 in PLN.

Specification	Year 2008	Year 2009	Year 2010	Year 2011	Year 2012
	AE	AE	AE	BU	SLE
Protection of natural and cultural resources BPN	1.640.110	1.436.453	1.412.180	1.418.936	2.061.313
Available to tourists and monitoring	187.161	226.208	98.450	275.276	193.275
Scientific research activities and environmental education	212.089	253.293	298.849	245.644	399.578
SUMMARY	2.039.360	1.915.954	1.809.479	1.939.856	2.654.166

Source: own elaboration based on BNP and BNP AE trial balance according to analytical and control accounts.

Key: See Table 4.

Between 2008-2010 all statutory tasks related to the functioning of national parks have been executed by their auxiliary enterprises. Budget units served the purpose of governance and their financial-accounting records did not distinguish accounts under group 5. Because of this the information in Table 6 for the years 2008-2010 uses data from the BNP Auxiliary Enterprise exclusively.

Works conducted by the BNP in the research period include:

- ensuring the proper health of the wood stands (removing more than 19 thousand m³ of insect infested trees in the year 2008 is an example of the scale of this sort of activity),
- regularly renovating tourist route surfaces and modernising the tourist infrastructure (e.g. modernising the educational routes, building information tablets and benches, marking the area, creating campsites for tourists),

- regularly renovating forest roads, bridges and culverts (some important works included those aimed at removing the effects of the flood in 2010),
- creating a spatial information system,
- modernising the natural exposition and works related to the planned construction of the Educational Centre.

The activity described above shows that complexity is a characteristic trait of the BNP as the governor of the terrain under its jurisdiction. Infrastructure investments are complemented by activities related to ecological education – as a result, this ensures that the area maintains its natural value and, at the same time, remains attractive for tourists for a long period of time. It needs to be stressed that the municipalities which share their area with the park can not only utilise the effects of BNP activity – this at no cost – but also help co-create a mutual tourist product alongside the park.

4. Conclusion

Developing legally protected space influences the development processes present not only in the subject space but also in the municipalities related to it by their territory – it thus remains important for a wider spatial layout than the protected area itself. The indicators used to measure the fulfilling of the tourist function calculated for the municipalities sharing their territory with the park indicate the need to undertake decisive actions in the area of increasing tourist attractiveness. The decreasing Defert indicator for the Zawoja municipality is especially alarming. It is however optimistic that in recent years the BNP has been visited by an increasing number of tourists, which means that the environmental attractiveness of the area and the activities of the park as a unit governing protected space is appreciated by the consumers. Managing over 5 million PLN (in the year 2012), providing workspace for the staff – with the total sum of their yearly salaries exceeding 2 million PLN in the research period – as well as the expenditures incurred by the park reflect the scale of its activities. It is unquestionably an important actor on the local economic scene.

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Source material

The financial-accounting records of the Babia Góra National Park Auxilliary Unit.
Central Statistical Office (Local Data Bank) data.

LOCAL ECONOMIC IMPACT OF BIG CULTURAL EVENTS

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Key words:

local economic impact – big event – European capital of culture – assessment of attendance

Abstract:

The cultural activities have not only a key cultural and social value, but also an interesting economic impact. The cultural sector nowadays represents a productive economic sector which is growing in importance. The paper is focused on the evaluation of big cultural event. In the paper is presented case study which is providing evaluation of big cultural event organized in Košice European Capital of Culture in 2013 using methodology provided by the impact studies in two stages: first through estimating the attendance and second through calculating private spending generated by the event.

Introduction

Cultural economics represents very specific disciplinary field and economists pay attention to its issues. This topic is strongly discussed between European scientists and politician not only because of growing economic importance of creative industries but also in connection with impacts of title European Capital of Culture on hosted cities. The starting point of the recent history of the European Capitals of Culture was probably the designation of Glasgow in 1990, which used its nomination to change a city that was in industrial decline. That model has been copied and cited over again. (Herrero et al., 2006) Similar objectives of the city regeneration were presented by the nomination of Košice as European Capital of Culture 2013. For the following reasons organizers prepared set of very innovative cultural events, which have potential to attract a lot of people and mediate for them the cultural values connected with title

ECoC. One of the most popular cultural big event regularly organized in Košice since 2010 is White Night/Nuit Blanche. The paper is divided in two parts. In the first part are briefly mentioned the main aspects of impact studies methodology and its application to cultural events. In the second part is presented the case study focused on the estimation of the local economic impact achieved by event White Night in 2013.

1. The impact studies methodology

The economic impact studies are used to estimate the economic importance of big cultural or sport events and important infrastructure project. Effects of hosting big events are mainly evaluated in two fields. First is to focus on the short-term impacts which have wide diversity in the range of economic and intangible positive and negative effects on city and local community. Second is to concentrate on the long-term impacts which concern to legacy of facilities construction and infrastructure improvements. (Barghchi et al., 2009) The economic impact studies are quite new topic in Slovak and Czech economic research, several authors published some articles to this topic e.g. Šipikal et al (2010) and Sucháček, Sed'a (2011).

The aim of impact analyses is to quantify additional incomes of big events on local economy using traditional impact measuring methods (used by e.g. LIRC, 2001, Cherubini – Iasevoli, 2006). We provided our research according to often cited impact studies methodology developed by Crompton (2010).

According to Crompton (2010) *the economic impact of visitor spending is estimated by the formula: number of visitors * average spending per visitor * multiplier*. In our calculation we didn't used the multiplier because of lack of data on local level. The result of these analyses is estimation of number and structure of visitors of event and also of theirs average and total expenditures. This estimation allows quantifying gross direct, indirect and induced impacts of the event. The level of economic impact could easily have been overestimated if a carefully structured working methodology had not been used. There is a general consensus that whilst measures related to economic impact assessment are conceptually simple, the actual collection of such information is extremely difficult and time consuming. (Bond, 2008)

2. The estimation of local economic impact of the selected event

The event White night/ Nuit Blanche is special cultural project born in Paris and celebrated in Roma and other European capital cities, too. The event involves street performers and various artists which are presented their performances whole night.

According to the above mentioned base formula of local economic impact we provided our research in three steps:

1. estimate the number of visitors attracted to the event
2. estimate the average level of spending of visitors in the local area
3. calculate of total additional income for local economy.

The challenging task was the counting of attendees. At the ungated event all performances are free and people are moving throughout the city during the whole night, so counting of attendees was really labour intensive. We used modified methodology of “parade counts” described in the Guidelines (2007). We have supposed that our “parade” that is expected to attract “peak” attendance would be new reconstructed City Park, where the most beautiful light performances took place during the night. Reconstruction of the City Park was one of the main infrastructural projects realized within the Košice ECoC 2013 projects. City Park is surrounded by a fence with six entrances. Therefore there was a possibility to count people coming to the city park. According to our counting 18 373 visitors entered the City Park during the time between 07:00 p.m. and 00.00 a.m. We have abstracted from the multiple entrance of one visitor to the city park. At the same time we provided a questionnaire survey among the White night visitors (522 tally interviews were collected during the night in the city). One of the questions in the interviews was, whether the respondent already was - or plans to visit City Park during the night. Our estimation 21 615 White night attendees is derived from the combination of counting in City park and the information we captured in the tally questionnaire.

The questionnaire was designed to obtain basic information about the origin, socio-economic structure and expenditures of the visitors. Following chart shows our estimation about the visitors according to the geographical origin. As can be seen from the graphic, majority of visitors come from Košice, and nearly 20 % are tourists coming from Slovakia. Only 5% of visitors were originating abroad. Similar results were

achieved in impact study of White night in Roma (Cherubini, Iasevoli, 2006) with 6 % of foreign visitors.

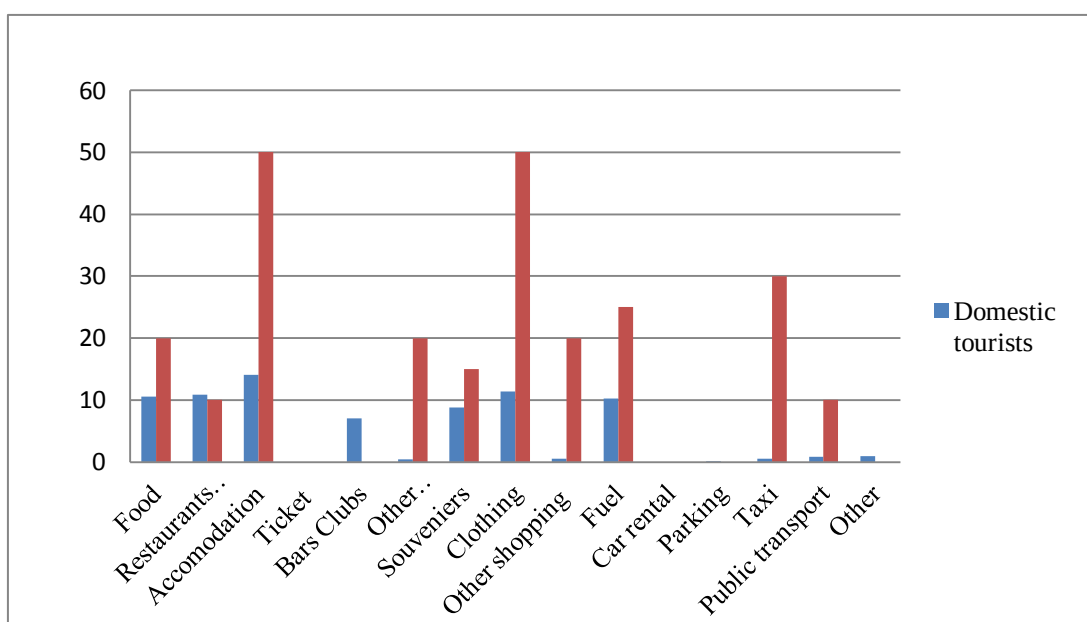
TAB. 1: Geographical origin of visitors

Local visitors (people living in Košice)	76 %
Slovak tourists	19 %
Foreign tourists	5 %

Source: own primary research

54 % of attendees were men, 46 % women. 50 % people were in the age from 21 to 40 years etc. Our objective was to estimate the average expenditures of different target groups of visitors and to calculate the impact on local economy. According to the survey approximately 70 % of local visitors did not spend any additional money due to the White Night. Chart n. 1 presents the average expenditures of visitors according to the basic groups of expenditures.

CHART 1: Average expenditures of visitors



Source: own primary research

The average was calculated only from visitors that have spent some money. The total average expenditures of local visitors were approximately 3,5 EUR per one visitor.

According to these estimation we assume, that local visitors spent additional 56 000 EUR in local economy during the White night event in 2013. Much higher were the expenditures of tourists because of accommodation and transport costs. The average expenditures of domestic tourist was approximately 32 EUR and of foreign tourist 225 EUR. The chart n.1 presents the average expenditures for each group in basic expenditure structure. As can be seen the main differences are in expenditures for accommodation, clothing, fuel and taxis. Based on these results we estimate that domestic tourists spent 128 000 EUR and foreign tourist 225 000 EUR. The direct economic impact of the event White night 2013 on the local economy in Košice city was approximately 353 000 eur.

Conclusion

As the range of cultural events has grown in EU regarding to project European Capital of Culture, their impacts have increasingly come under the investigation of funders, policy-makers and scientists. Various evaluations and studies have found that big events have a variety of potential impacts, including economic, social, cultural, political etc. One of the main important results of impact studies is information about real number of attendees which used to be overestimated by organizers (attendance hyperbole). The organizers in Košice stated, that the event attracted around 50 000 people. The qualified estimation based on our research is much less - around 21 000 attendees. Only 5% of the visitors were foreign tourists. Even so famous event like White night in combination with ECoC 2013 was not able to attract multitude foreign tourists into the Košice city. The economic impact is only one point of view, our further research would concentrate on wider socio-cultural impacts of selected big cultural event.

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DIFFERENCES IN TAILS OF STOCK MARKET RETURNS

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Key words:

fat tails – distribution – extremal index

Abstract:

This paper focuses on the extreme behavior of stock market returns. Statistical properties of the returns distributions are investigated due to investors' perception which leads to the assumption that the left tails are heavier than the right ones. Left tails associated with negative extremal returns have similar tail index to the right tails. Quite large differences between tails have been found in the clustering of extremes. The negative extreme returns are more dependent than the positive ones as a consequence of more violent evolution of crashes than booms on financial markets.

Introduction

Many literatures documented that financial time series do not follow a Gaussian distribution, and have much fatter tails than the latter. The earliest empirical studies come from Mandelbrot and Fama and date back to the 1960s. Fat tails mean large probability of extreme outcomes represented by profits and losses at the most positive or negative part of an asset or portfolio's returns distribution. From intuitive point of view it seems to be clear that left tail must be heavier than the right one. This is due to the fact that the growth trends are built over long time horizons and the crashes are more violent and price changes in absolute value are much larger than. For example, the DJIA index on Black Monday fell down by 22.6% and its biggest increase since early 1970s is merely just 11.08%. Even greater disparities in the biggest changes can be seen on the example of the Hang Seng Index, where the biggest in history daily loss is 33.33%, compared to 18.82% for the historical growth. There are studies indicating the presence of heavier left tails of distributions (e.g. [8, 1]). On the other hand, there are many

papers which have failed to demonstrate such asymmetry between the thickness of the left and right tails (e.g. [10, 6, 4]). If they are right and the left and right tail thickness is not distinguishable, there must exist some other difference between them from statistical point of view.

In this paper an attempt is made to verify the fact that the main distinction between tails is the higher dependence in extreme returns occurring in the left tail. The violence of the crashes is then reflected in clustering of extremes but not in the thickness of the tails. The tail behavior of returns for nine stock indices is compared.

The structure of this paper is as follows. In section one an estimator of tail thickness is presented, in the second section a brief description of extremal dependence is described. In the third section the test data is introduced, and in the final section the empirical results are discussed.

1. Fat tails

A random variable X follows a heavy-tailed distribution with index α if

$$\mathbf{P}(X > x) \sim L(x)x^{-\alpha}, \text{ as } x \rightarrow \infty, \quad (1)$$

where $L(\cdot)$ is a slowly varying function, and $\sim$ means that the ratio of both sides tends to 1, as $x \rightarrow \infty$. Estimating of tail index α is not an easy task. The most common estimator of α is Hill estimator, which is given by

$$\hat{\gamma} = \frac{1}{\hat{\alpha}} = \frac{1}{k \sum_{i=1}^k \left(\ln x_{(n-i+1)} - \ln x_{(n-k)} \right)}, \quad (2)$$

where $x_{(i)}$ are the order statistics for the series, $x_{(n)} < x_{(n-1)} < \dots < x_{(1)}$, n – sample size, k – number of observations in the tail. It is well known that if $k = k(n) \rightarrow \infty$, $\frac{k(n)}{n} \rightarrow 0$ the estimator is consistent, and asymptotically normal $\sqrt{k}(\hat{\alpha} - \alpha) \rightarrow \mathcal{N}(0, \alpha^2)$. The asymptotical bias and variance of Hill estimator follow function of k :

$$\mathbb{E}(\hat{\gamma}(k)) = \gamma + k^{\rho}, \quad (3)$$

$$\text{var}(\hat{\gamma}(k)) = \frac{\gamma^2}{k}, \quad (4)$$

where $\rho > 0$ is another parameter to estimate [9].

The Hill estimator is very sensitive to the choice of the tail fraction k . That choice is a classical trade-off between the bias and variation. Huisman et al. in [5] have shown a modified Hill estimator having improved properties in comparison to a traditional Hill estimator. They assumed a specific class of distributions, called the Hall class with parameter $\rho = 1$. Instead of selecting one optimal k to estimate the tail index, they propose to estimate regression line:

$$\hat{\gamma}(k) = \beta_0 + \beta_1 k + \varepsilon(k), \quad (5)$$

where $\hat{\gamma}(k)$ is a Hill estimator for different values of k . Term β_1 , in the above equation, estimates the bias and β_0 gives a bias corrected estimate of γ . This estimator is referred to as the OLS Hill estimator [5, 9].

2. Extremal dependence

The dependence effect in the short range behavior of extremes is measured by the extremal index θ . It is a key concept of extreme value theory for stationary processes [7]. Let $(X_n)_{n \in \mathbb{N}}$ be a strictly stationary sequence of random variables with a marginal distribution function F . It can be assumed that this sequence has an extremal index $\theta \in (0, 1]$, that is, for each $\tau > 0$, there exists a sequence of thresholds $(u_n(\tau))_{n \in \mathbb{N}}$ such that, as $n \rightarrow \infty$

$$n(1 - F(u_n(\tau))) \rightarrow \tau, \quad (6)$$

and

$$\mathbf{P}(M_n \leq u_n) \rightarrow \exp(-\theta\tau), \quad (7)$$

where $M_n = \max\{X_1, \dots, X_n\}$. The case of $\theta = 1$ is true for both independent and dependent process but the level of dependence is negligible at asymptotically high levels. The extremal index measures propensity of the process to cluster at extreme levels. It can be interpreted in a number of ways. The most common one being the reciprocal of the mean cluster size in the limiting point process of exceedance times over a high threshold. In this paper we focus on the block maxima model. It consists in dividing the n observations into non overlapping k blocks of a certain length m . In each block, the number of exceedances over a certain high threshold are counted, and the block estimator is then defined as the reciprocal of the average number of exceedances per block among blocks with at least one exceedance. Thus

$$\hat{\theta} = \frac{M}{N}, \quad (8)$$

where N – number of exceedance of threshold u_n , M – number of blocks with at least one exceedance of u_n [3].

3. The data

Our investigation is performed for daily closing prices of nine equity market indices obtained for the period between January 2000 and July 2013. The following region leading indices are chosen: S&P500, FTSE100, DAX, CAC40, Nikkei225, Hang Seng, Bovespa, WIG20 and PX. The calculations are based on the percentage logarithmic

returns $r_t = 100 \cdot \ln\left(\frac{p_t}{p_{t-1}}\right)$. The Table 1 presents some relevant summary statistics.

TAB. 1: **Descriptive statistics of the return series**

	SP500	FTSE100	DAX	CAC40	Nikkei	HS	Bovespa	WIG20	PX
Nobs	3393	3412	3455	3447	3318	3330	3339	3383	3387
Minimum	-9,47	-9,27	-8,88	-9,47	-12,11	13,58	-12,10	-8,44	-16,19
Maximum	10,96	9,38	10,80	10,59	13,23	13,41	13,68	8,15	12,36
Mean	0,00	0,00	0,01	-0,01	-0,01	0,01	0,03	0,01	0,02
Median	0,05	0,03	0,08	0,02	0,01	0,04	0,08	0,02	0,06
Variance	1,78	1,64	2,56	2,42	2,51	2,59	3,57	2,64	2,28
Stdev	1,33	1,28	1,60	1,56	1,58	1,61	1,89	1,63	1,51
Skewness	-0,17	-0,14	0,00	0,03	-0,43	-0,07	-0,11	-0,13	-0,45
Kurtosis	7,46	5,77	4,17	4,53	6,37	7,52	3,83	2,19	11,59

Source: own calculations

The highest values of spread between maximum and minimum is observed for Czech PX index. Likewise, skewness and excess kurtosis are the highest for that index indicating its strong dynamics. In all cases excess kurtosis shows too many realizations clustering at the tails of distributions relative to normal distribution. It is confirmed by the Jarque-Bera test which rejected normality for all indices. The lowest spread and

kurtosis is obtained for Polish WIG20. Surprisingly, it is the index listed on the market which is classified as an emerging market and thus characterized by a high extreme risk.

4. Empirical results

Fat tails of empirical distributions are the result of the occurrence of extreme returns in periods of high volatility. Many empirical studies on a financial time series indicate that the tail index is greater than two, confirming the existence of variance, and very seldom it exceeds five [3]. Note that, the smallest the value of α , the fatter the tail of distribution is. In Table 2 we present OLS estimates of the left and right tail indices. The results are consistent with the above mentioned. Values of tail index lie in the interval (2, 4). When we compare the tail thickness between left and right tails it is difficult to find some differences. The bold type means fatter tails but the differences between them are rather negligible.

TAB. 2: Tail indices and standard errors

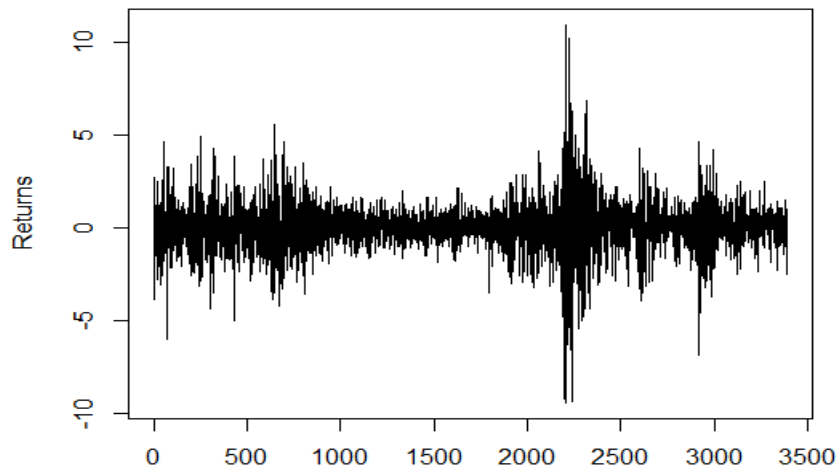
Index	Left tail	Right tail
SP500	2,879 (0,009)	2,825 (0,013)
FTSE100	2,983 (0,016)	2,961 (0,010)
DAX	3,311 (0,026)	3,063 (0,010)
CAC40	3,261 (0,021)	2,978 (0,007)
Nikkei	2,993 (0,006)	3,526 (0,008)
HS	3,014 (0,012)	3,069 (0,007)
Bovespa	3,342 (0,013)	3,485 (0,006)
Buenos	2,930 (0,016)	2,993 (0,013)
WIG20	3,349 (0,015)	3,791 (0,030)
PX	2,769 (0,008)	3,074 (0,007)

Source: own calculations

The biggest differences are visible in the case of Nikkei, WIG20 and PX and in all of these indices negative tails are heavier than the right ones. However, in general, we cannot state that negative extreme returns are more frequent than the positive ones, but their behavior is very similar. As an example see Figure 1 and Figure 2 for S&P500 index where asymmetry in the tails is not noticeable.

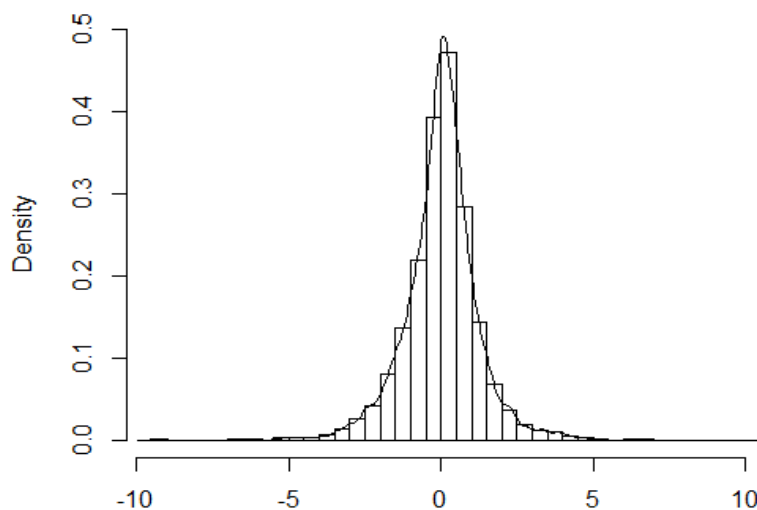
The final analysis concerns the issue of dependence in extreme returns. We verify a hypothesis that the perception of left tails being heavier than the right ones could be due to a more intense clustering of events in the left tail. Such hypothesis was negatively verified by Jondeau and Rockinger (2003) who stated that clustering of news cannot be the reason why investors consider left tails to be heavier than right tails [6].

FIG. 1: Log-returns for S&P500 Composite Index



Source: own calculations

FIG. 2: Histogram for S&P500 Composite Index



Source: own calculations

In this analysis, similarly to their work, one week blocks of returns to calculate extremal index are assumed. As it is known [2] the strength of dependence decreases as we move into the tail regions of distribution, even if the returns are highly dependent in the center of the distribution. For that purpose we estimate an extremal index for various levels of the threshold given as quantiles of the empirical distribution. The results are presented in Table 3. By the bold type those cases were marked where extremal index calculated for the left tail is higher than for the right one. It means that extremes in the right tail cluster more than in the left one. Such contingency occur only twice for Hang Seng index and for not very high order quantile. Besides, the differences in values of index are then negligible. Thus in all considered cases extremal dependence is higher in the left tail of distribution. Such property can be recognized general.

TAB. 3: Extremal index for various threshold levels

	SP500		FTSE100		DAX	
quantile	left tail	right tail	left tail	right tail	left tail	right tail
10%	0,725	0,778	0,726	0,761	0,717	0,757
9%	0,735	0,790	0,728	0,767	0,723	0,762
8%	0,745	0,793	0,749	0,764	0,726	0,765
7%	0,751	0,797	0,768	0,780	0,744	0,781
6%	0,744	0,816	0,768	0,802	0,760	0,808
5%	0,757	0,832	0,769	0,815	0,751	0,821
4%	0,777	0,856	0,755	0,842	0,784	0,849
3%	0,790	0,838	0,790	0,838	0,817	0,875
2%	0,761	0,873	0,803	0,831	0,814	0,914
1%	0,784	0,892	0,784	0,865	0,829	0,886
	CAC40		Nikkei		HS	
quantile	left tail	right tail	left tail	right tail	left tail	right tail
10%	0,723	0,784	0,785	0,802	0,739	0,739
9%	0,735	0,792	0,798	0,820	0,753	0,737
8%	0,755	0,806	0,807	0,835	0,757	0,749
7%	0,770	0,807	0,809	0,846	0,748	0,765
6%	0,794	0,813	0,822	0,860	0,755	0,775
5%	0,794	0,851	0,817	0,874	0,766	0,790
4%	0,829	0,871	0,824	0,866	0,754	0,806
3%	0,802	0,868	0,796	0,871	0,740	0,840
2%	0,831	0,887	0,814	0,870	0,761	0,896
1%	0,892	0,946	0,838	0,838	0,706	0,941

	Bovespa		WIG20		PX	
quantile	left tail	right tail	left tail	right tail	left tail	right tail
10%	0,740	0,820	0,709	0,794	0,680	0,751
9%	0,761	0,830	0,733	0,805	0,687	0,769
8%	0,779	0,845	0,762	0,821	0,689	0,791
7%	0,786	0,861	0,762	0,820	0,703	0,808
6%	0,795	0,859	0,771	0,834	0,718	0,816
5%	0,825	0,895	0,801	0,865	0,738	0,826
4%	0,841	0,899	0,775	0,891	0,732	0,826
3%	0,829	0,924	0,762	0,914	0,769	0,817
2%	0,831	0,944	0,789	0,930	0,757	0,843
1%	0,842	0,921	0,892	0,946	0,778	0,889

Source: own calculations

It is the more visible, the higher quantile (extremes) are taken into account. Especially evident asymmetry in clustering can be noticed for the PX, WIG20, and Hang Seng indices. Because no significant differences in the tail thickness for the Hang Seng case were found, it cannot be concluded that higher dependence in the left tail is the matter of a higher tail thickness.

Conclusion

Most investors believe, that left tails of the stock returns distribution are heavier than the right ones. It is a natural consequence of crashes perception as much more turbulent than the booms. Crashes develop in shorter time intervals than booms and changes of prices are significantly bigger. From statistical point of view such an argument is not acceptable. The fact which tail of the distribution is heavier depends on the considered market. Besides, differences in the tail thickness of both tails are mostly negligible. Differences in the behavior of extremes are rather the result of clustering extrema. Such phenomena are found in all nine considered in this paper stock market returns.

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DESIGN OF MULTI-OBJECTIVE SUPPLY CHAINS

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Key words:

supply chain – multiple objectives – De Novo optimization

Abstract:

In the paper multi-objective supply chains design problem is formulated and solved by De Novo approach. The suitability of supply chains can be measured by multiple objectives, such as economic, environmental, social, and others. Traditional concepts of optimality focus on valuation of already given systems. Multi-objective linear programming (MOLP) is a model of optimizing a given system by multiple objectives. In MOLP problems it is usually impossible to optimize all objectives together in a given system. As a methodology of optimal system design can be employed De Novo MOLP for reshaping feasible sets in linear systems. Innovations bring improvements to the desired objectives and the better utilization of available resources.

1. Introduction

Supply chain management has generated a substantial amount of interest both by managers and researchers (see Tayur et al., 2000). Supply chain is defined as a system of suppliers, manufacturers, distributors, retailers and customers where material, financial and information flows connect participants in both directions (see Fiala, 2005). The suitability of supply chains can be measured by multiple objectives, such as economic, environmental, social, technological, and others. Multi-objective supply chain design is formulated and solved by De Novo approach. Traditional concepts of optimality focus on valuation of already given systems. New concept of designing optimal systems was proposed (see Zeleny, 1990). Multi-objective linear programming (MOLP) is a model of optimizing a given system by multiple objectives. As a methodology of optimal system design can be employed De Novo programming for reshaping feasible sets in linear systems. The paper presents approaches for solving the

Multi-objective De Novo linear programming (MODNLP) problem for design of multi-objective supply chains. The approach is based on reformulation of MOLP problem by given prices of resources and the given budget. Searching for a better portfolio of resources leads to a continuous reconfiguration and reshaping of systems boundaries. Technological innovations bring improvements to the desired objectives and the better utilization of available resources. These changes can lead to beyond tradeoff-free solutions.

2. Multi-objective supply chains

In the next part a multi-objective supply chain design problem is formulated. The mathematical program determines the ideal locations for each facility and allocates the activity at each facility such that the multiple objectives are considered and the constraints of meeting the customer demand and the facility capacity are satisfied. The presented model of a supply chain consists of 4 layers with m suppliers, $S_1, S_2, \dots, S_m$, n potential producers, $P_1, P_2, \dots, P_n$, p potential distributors, $D_1, D_2, \dots, D_p$, and r customers, $C_1, C_2, \dots, C_r$. The following notation is used:

a_i = annual supply capacity of supplier i , b_j = annual potential capacity of producer j ,

w_k = annual potential capacity of distributor k , d_l = annual demand - customer l ,

f_j^P = fixed cost of potential producer j , f_k^D = fixed cost of potential distributor k ,

c_{ij}^S = unit transportation cost from S_i to P_j , c_{jk}^P = unit transportation cost from P_j to D_k ,

c_{kl}^D = unit transportation cost from D_k to C_l , e_{ij}^S = unit pollution from S_i to P_j ,

e_{jk}^P = unit pollution from P_j to D_k , e_{kl}^D = unit environmental pollution from D_k to C_l ,

x_{ij}^S = number of units transported from S_i to P_j , x_{jk}^P = number of units transported from

P_j to D_k , x_{kl}^D = number of units transported from D_k to C_l ,

y_j^P = bivalent variable for build-up of fixed capacity of producer j ,

y_k^D = bivalent variable for build-up of fixed capacity of producer k .

Using the above notations the problem can be formulated as follows:

The model has two objectives. The first one expresses minimizing of total costs. The second one expresses minimizing of total environmental pollution.

$$\text{Min } z_1 = \sum_{j=1}^n f_j^P y_j^P + \sum_{k=1}^p f_k^D y_k^D + \sum_{i=1}^m \sum_{j=1}^n c_{ij}^S x_{ij}^S + \sum_{j=1}^n \sum_{k=1}^p c_{jk}^P x_{jk}^P + \sum_{k=1}^p \sum_{l=1}^r c_{kl}^D x_{kl}^D$$

$$\text{Min } z_2 = \sum_{i=1}^m \sum_{j=1}^n e_{ij}^S x_{ij}^S + \sum_{j=1}^n \sum_{k=1}^p e_{jk}^P x_{jk}^P + \sum_{k=1}^p \sum_{l=1}^r e_{kl}^D x_{kl}^D$$

Subject to the following constraints:

- the amount sent from the supplier to producers cannot exceed the capacity

$$\sum_{j=1}^n x_{ij} \leq a_i, \quad i = 1, 2, \dots, m,$$

- the amount produced by the producer cannot exceed the producer capacity

$$\sum_{k=1}^p x_{jk} \leq b_j y_j, \quad j = 1, 2, \dots, n,$$

- the amount shipped from the distributor should not exceed the distributor capacity

$$\sum_{l=1}^r x_{kl} \leq w_k y_k, \quad k = 1, 2, \dots, p,$$

- the amount shipped to the customer must equal the customer demand

$$\sum_{k=1}^p x_{kl} = d_l, \quad l = 1, 2, \dots, r,$$

- the amount shipped out of producers cannot exceed units received from suppliers

$$\sum_{i=1}^m x_{ij} - \sum_{k=1}^p x_{jk} \geq 0, \quad j = 1, 2, \dots, n,$$

- the amount shipped out of distributors cannot exceed quantity received from producers

$$\sum_{j=1}^n x_{jk} - \sum_{l=1}^r x_{kl} \geq 0, \quad k = 1, 2, \dots, p,$$

- binary and non-negativity constraints

$$y_j, y_k \in \{0, 1\},$$

$$x_{ij}, x_{jk}, x_{kl} \geq 0, \quad i = 1, 2, \dots, m, \quad j = 1, 2, \dots, n, \quad k = 1, 2, \dots, p, \quad l = 1, 2, \dots, r.$$

The formulated model is a multi-objective linear programming problem (MOLP). The problem can be solved by some MOLP methods.

3. Optimizing given systems

Multi-objective linear programming (MOLP) is a model of optimizing a given system by multiple objectives. In MOLP problems it is usually impossible to optimize all objectives together in a given system. Trade-off means that one cannot increase the level of satisfaction for an objective without decreasing this for another objective. Multi-objective linear programming (MOLP) problem can be described as follows

$$\begin{aligned} \text{“Max”} \quad & z = Cx \\ \text{s.t.} \quad & Ax \leq b, \quad x \geq 0 \end{aligned} \quad (1)$$

where C is a (k, n) – matrix of objective coefficients, A is a (m, n) – matrix of structural coefficients, b is an m -vector of known resource restrictions, x is an n -vector of decision variables. In MOLP problems it is usually impossible to optimize all objectives in a given system. For multi-objective programming problems the concept of non-dominated solutions is used (see for example Steuer, 1986). A compromise solution is selected from the set of non-dominated solutions. There are proposed many methods. Most of the methods are based on trade-offs. The next part is devoted to the trade-off free approach.

4. Designing optimal systems

Multi-objective De Novo linear programming (MODNLP) is a problem for designing an optimal system by reshaping the feasible set. By given prices of resources and the given budget the MOLP problem (1) is reformulated in the MODNLP problem (2)

$$\begin{aligned} \text{“Max”} \quad & z = Cx \\ \text{s.t.} \quad & Ax - b \leq 0, \quad pb \leq B, \quad x \geq 0 \end{aligned} \quad (2)$$

where b is an m -vector of unknown resource restrictions, p is an m -vector of resource prices, and B is the given total available budget.

From (2) follows

$$pAx \leq pb \leq B.$$

Defining an n -vector of unit costs $v = pA$ we can rewrite the problem (2) as

$$\begin{aligned} \text{“Max”} \quad & z = Cx \\ \text{s.t.} \quad & vx \leq B, \quad x \geq 0 \end{aligned} \quad (3)$$

Solving single objective problems

$$\text{Max } z^i = c^i x \quad i = 1, 2, \dots, k$$

$$\text{s.t. } vx \leq B, x \geq 0 \quad (4)$$

z^* is a k – vector of objective values for the ideal system with respect to B .

The problems (4) are continuous “knapsack” problems, the solutions are

$$x_j^i = \begin{cases} 0, j \neq j_i \\ B/v_{j_i}, j = j_i \end{cases} \quad \text{where } j_i \in \{j \in (1, \dots, n) \mid \max_j (c_j^i / v_j)\}.$$

The meta-optimum problem can be formulated as follows

$$\begin{aligned} \text{Min } f &= vx \\ \text{s.t. } Cx &\geq z^*, x \geq 0 \end{aligned} \quad (5)$$

Solving the problem (5) provides solution: x^* , $B^* = vx^*$, $b^* = Ax^*$.

The value B^* identifies the minimum budget to achieve z^* through solutions x^* and b^* .

The given budget level $B \leq B^*$. The optimum–path ratio for achieving the best performance for a given budget B is defined as

$$r_1 = \frac{B}{B^*}$$

The optimum-path ratio provides an effective and fast tool for the efficient optimal redesign of large-scale linear systems. Optimal system design for the budget B :

$$x = r_1 x^*, b = r_1 b^*, z = r_1 z^*.$$

5. De Novo approach for multi-objective supply chains

The De Novo approach can be useful in the design of the multi-objective supply chain. Only a partial relaxation of constraints is adopted. Producer and distributor capacities are relaxed. Unit costs for capacity build-up are computed:

$$p_j^P = \frac{f_j^P}{b_j} = \text{cost of unit capacity of potential producer } j,$$

$$p_k^D = \frac{f_k^D}{w_k} = \text{cost of unit capacity of potential distributor } k.$$

Variables for build-up capacities are introduced:

$$u_j^P = \text{variable for flexible capacity of producer } j,$$

$$u_k^D = \text{variable for flexible capacity of producer } k.$$

The constraints for non-exceeding producer and distributor fixed capacities are replaced by the flexible capacity constraints and the budget constraint:

$$\begin{aligned} \sum_{k=1}^p x_{jk} - u_j^P &\leq 0, \quad j = 1, 2, \dots, n, \\ \sum_{l=1}^r x_{kl} - u_k^D &\leq 0, \quad k = 1, 2, \dots, p, \\ \sum_{j=1}^n p_j^P u_j^P + \sum_{k=1}^p p_k^D u_k^D &\leq B. \end{aligned}$$

The multi-objective optimization can be then seen as a dynamic process. Technological innovations bring improvements to the desired objectives and the better utilization of available resources. The technological innovation matrix $T = (t_{ij})$ is introduced. The elements in the structural matrix A should be reduced by a technological progress. The problem (2) is reformulated in to the innovation MODNLP problem (6)

$$\begin{aligned} \text{“Max”} \quad & z = Cx \\ \text{s.t.} \quad & TAx - b \leq 0, \quad pb \leq B, \quad x \geq 0 \end{aligned} \quad (6)$$

De Novo approach provides a better solution in both objectives and also with lower budget because of flexible capacity constraints. The capacity of supply chain members has been optimized with regard to flows in the supply chain and to budget.

6. Conclusions

De Novo approach was applied for multi-objective supply chain design problem and provides better solution than traditional approaches applied on fixed constraints. The design problem was formulated as MOLP problem. The economic and environmental objectives were used in the model but multiple objectives can be used in general. Technological innovations bring improvements to the desired objectives and the better utilization of available resources. These changes can lead to beyond tradeoff-free solutions. De Novo programming (DNP) approach is open for further extensions as fuzzy DNP, interval DNP, complex types of objective functions and continuous innovations.

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ANALYSIS OF THE FACTORS INCREASING THE COMPETITIVENESS OF THE FOOD INDUSTRY ENTERPRISES

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Key words:

competitiveness – innovation – food industry

Abstract:

The article presents a synthetic analysis of key factors influencing the competitiveness of enterprises of the food industry in Poland. Conclusions are the result of the study based on the analysis of enterprises functioning in the food industry in Poland. It was found that in the period 2006-2011 the most important process influencing business was growing competitiveness in the market, followed by implementation of innovation and Poland membership in the European Union.

Introduction

The purpose of this article was to present the research results aimed at identification and analysis of factors determining the formation of innovation in the food industry as an instrument to assist not only the competitiveness of firms, but also - in a broader sense - economic development of Poland. Food industry is one of the most important departments of business in our country, due to the fact that it supports nutrition and for international markets is a major exporter of drinks and foods [3]. The author wanted to examine the role of knowledge and innovation diffusion, as main factors influencing the development of small enterprises. The essence of so-posed thesis was to present the results of research on the market conditions and according to the development of food industry companies in terms of innovation-driven processes. The observations included analysis of businesses strategies for supporting the development of innovation in the years 2007 - 2012. The analysis was aimed at evaluation which innovations are random and how often they are implemented. Considering the strategic objectives of the enterprises of the food industry it should be noted that they are live, it is not the mission of the organization, but they are concretised and intentional kind of actions, undertaken

objectively, functionally and including efficiency, taking into account the external and internal conditions [1]. Each company, as a market participant must evaluate known factors affecting its competitiveness and monitor their own activities and innovation with respect to the firms achieving the best results [2]. For this reason, the test also included the influence of external factors and the company environment on innovation generation.

1. Facts, area and research methodology

Polish food industry after ten years of membership in European Union is counted among the major producers of food in the Europe Union, and its share in the production of the food sector of the EU-27 is 5 % in the current prices, and in comparable prices 8,3 %. Studies conducted by Institute of Agricultural and Food Economics, National Research Institute in Warsaw, have shown that in terms of value of production sold, we are in the 6th place, behind France, Italy, Great Britain and Spain, and far ahead of EU-12¹. Food industry, as a part of broadly defined agribusiness sector, is one of the most important elements of the economy, from the food security of population point of view, because the food in each country must be meant as a strategic commodity. According to EUROSTAT data from 2010, the share of food industry, calculated as foods and drinks turnover of the EU economy was 14.9 %, the value added of different sectors in the EU's GDP 12.9 % share, and in the employment 15 %. The food industry as one of the most important sectors of the EU economy is characterized by fragmentation (99.1% are small and medium corporations) and the declining share of world exports. Of particular note is the value of the Polish agrifood trade that in export in 2012 was 22 082.1 million \$ and in import 16 781.1 million \$, which contributed to the balance 5 301,0 million \$². It should be emphasized that during the crisis the food industry was characterized by exceptional durability and competitiveness, which definitely distinguished it from other branches of the economy.

¹ M. Bułkowska, M. Tereszczuk, R. Mroczek, *Miejsce polskiego przemysłu spożywczego w Unii Europejskiej* [Place of the Polish food industry in the European Union], Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej Państwowy Instytut Badawczy, Uniwersytet Ekonomiczny w Krakowie, Kraków 2013, s. 111-117.

² R. Grochowska, *Unijna polityka wsparcia sektora żywnościowego po 2013 roku* [EU food sector support policy after 2013]; J. Rowiński, *Strefa wolnego handlu UE-USA - potencjalny wpływ na polski handel produktami rolno - spożywczymi* [The free trade area of the EU-USA - the potential impact on the Polish trade in agricultural products - food] [w:] *Przemysł spożywczy...*, s 47-48, 55-56.

Sampling research included general food industry companies in Poland. In turn, the random research, which is a complete list of test units, included companies registered in REGON [CRO-Companies Registration Office number] on 30.10.2012, the day which, according to the Polish Classification of Economic Activities) (PKD 2007) were assigned to the Section C. Manufacturing, Chapter 10. Manufacture of food, Division 11. Manufacture of beverages and Chapter 12. Manufacture of tobacco products. In order to obtain representative sample, a probabilistic (random) sample selection technique was applied with questionnaires as a research tool. In the context of random sampling techniques, simple individual sampling (taken with feedback) was performed. The used sampling scheme and a sufficiently large sample size were to assure representativeness. In view of the conclusions drawn, the results can be applied to the entire population. Applying the formula for minimal sample size it was agreed that test must be performed on 267 companies (in a group of companies).

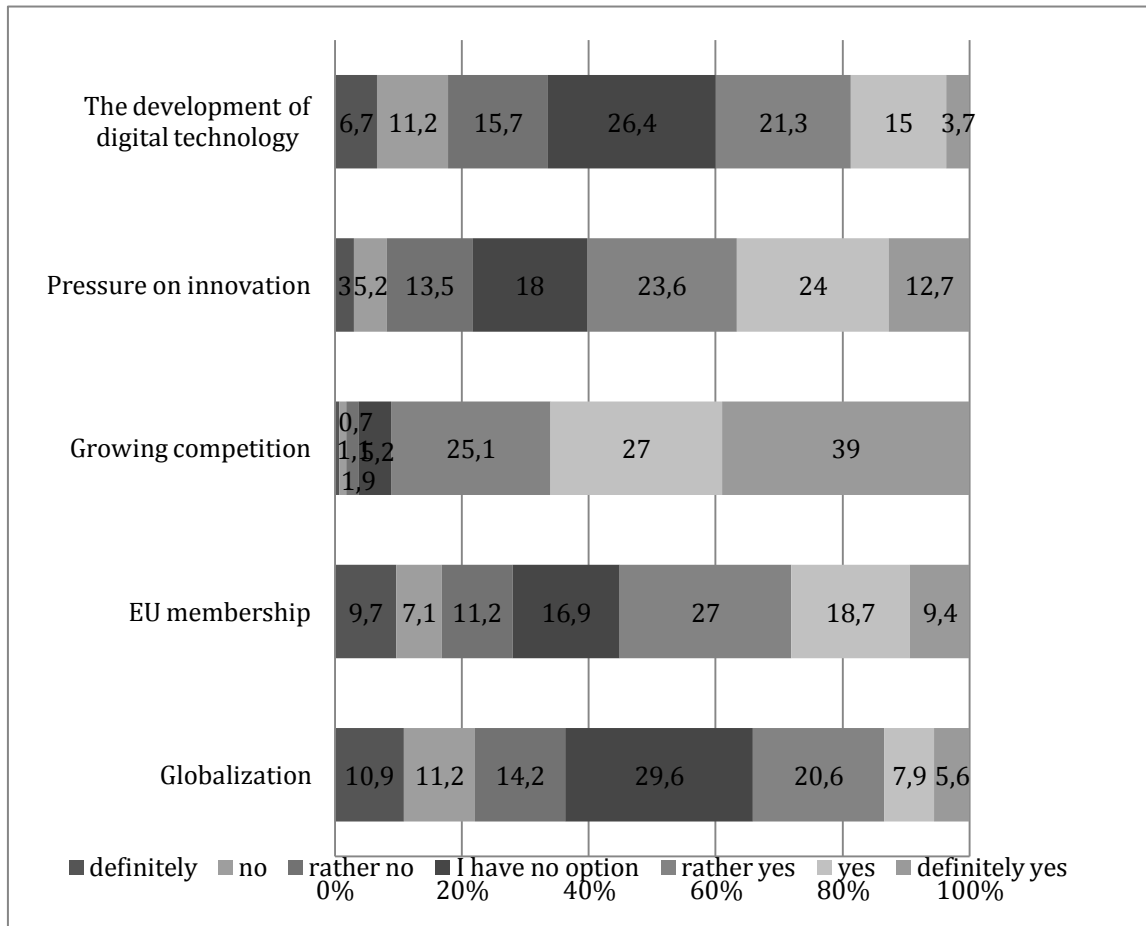
2. Test results

Based on the calculations made, examinations covered 330 enterprises of the food industry that were selected using probability sampling techniques. In the course of tests 267 correctly completed questionnaires were obtained, hence the results are based on 267 forms. The survey was done in the five month period from 1 November 2012 to 31 March 2013. At the outset examined the duration of life of the surveyed enterprises of the food industry, most of which (30.7 %) reported that they already are in the market at least 20 years or more, and the least of them determined the duration of the operation of the market for 5 years. 20.22 % of the respondents reported that the duration of the operation of their businesses in the market is between 11 - 15 years. Same number of traders pointed to the range of 16 - 20 years and 16.1% of the companies were operating in the market in the range of 6 to 10 years. The structure of the study group was also examined, according to the period of the companies on the market and found that for slightly more than 65 % of the companies' place of business is the city, and for almost 35 % of the country. According to the criterion of the population most companies (40.1 %) operate in towns of less than 5 thousand people and the least (3.0 %) in towns with more than 50 thousand people and less than 100 thousand people. Area of activity is usually province (29 %) or the whole Poland (22.1 %). For more than 35 % of the surveyed enterprises market is a municipality and district, and 13.9 % of them indicated

that they sell their products on international markets. Interesting was also the ownership structure of the companies investigated, which prevailed among companies belonging to the private sector (95.13 %), among which can be distinguished belonging to the domestic private sector - 87.64 % and the foreign private sector - 7.49 %. Least companies belonged to the Treasury (0.75 %). From the point of view of the organizational – legal aspects, the most numerous group consisted of companies registered as civil companies (22.47 %) or a limited liability company (22.47 %). The least popular form of organizational - legal person is a limited partnership - in this form of a function operated only 0.75 % of the surveyed companies. The form of a joint stock company peeled 14.98 % of companies, and 13.11% indicated a general partnership. Only 5.62 % of respondents conduct its activities in the form of cooperatives, and over 20 % of them in another form. The study involved companies included in many industries the food industry (Fig. 1). Most of them (23.97 %) come from the fruit and vegetable industry, then confectionary (20.22 %), meat (19.10 %), dairy (9.74 %), pastries (5.99 %) and bakery (4.12 %). In contrast, respondents pointed to a single industry such as tobacco, fish, coffee and tea processing, a spirit, cloth and feed. 13.86 % of respondents did not provide the industry in which the company operates by selecting the answer "other".

Food industry companies operate in environments that more or less impact their activities, including their effectiveness. Surrounding companies can be divided into: the further environment (macro-environment) and closer environment (microenvironment). Macro-environment of the company is an important element that affects both the current business situation and the situation of the future. The study attempts to identify the processes taking place in the economy that affect the food industry (Fig. 1).

FIG. 1. The degree of the impact of economic processes on the investigated enterprises of the food industry



Source: own research

According to respondents, a process that was most frequently indicated as affecting the activities of the company was the increasing competition in the market, which indicated 91.1 % of respondents. Subsequently, the company pointed emphasis on the implementation of innovations (60.3 %) and Polish membership in the European Union (55.1 %). In contrast, most respondents indicated that globalization (36.3 %) and the progressive development of information technology, telecommunications (33.6 %) does not affect or have rather any effect on their business.

Knowledge management is the collection of processes that enable the creation, dissemination and use of knowledge to achieve the objectives of the company. Among

the surveyed companies less than 27 % during the period have introduced considered modern management systems, and 38.2 % have a business development strategy in the form of a document.

In the years 2006 - 2011 the majority of the surveyed companies did not have food-related activities with elements of the implementation of knowledge management. Of those companies, which, however, pursue this type of project most (33.30 %) indicated assumption that organized training in knowledge management, and 21 % have joined knowledge management system to motivate employees. In addition, 19.90 % of the respondents declared that they benefited from advisory help / consulting with the implementation of knowledge management and 13.10 % indicated that their company has established a unit or created a job for the person responsible for the management of knowledge.

For calculations related to innovation activities of the food industry model developed by the OECD and Eurostat (the so-called Oslo Manual) can be successfully applied, according to which innovative activity is focused on scientific, technical, organizational, financial and commercial aspects, which have a direct impact on the introduction of new or significantly improved products to the market, as well as the use of new or improved processes. In this classification there are technological innovations in the nature and classified as a product and the process. The research found that during the analysed period the enterprises of the food industry implemented a total of 247 product innovations. The predominant majority of these innovations were implemented at the company level - 137 (i.e. 55.47 %). Then companies implement innovation at the local or regional level (31 companies, i.e. 12.55 %), 26 innovations have been implemented in the country, and 11 internationally. Among the surveyed companies, only 6 product innovations have national and international character. Product innovations were mostly purchasing machinery (73) and the purchase of transport (50). A small amount related to the modernization of buildings, land purchase and modernization of the equipment. In several cases, it included the purchase of licenses, new equipment, the construction or purchase of a building, and others. Total expenditures for product innovation in the surveyed enterprises in the years 2006 - 2011 amounted to 109 637 000 PLN. From

these calculations it can be shown that for the innovation at the firm level was allocated 60 675 800 PLN, for innovation in national and international scale, respectively 7 447 500 PLN and 7 610 000 PLN. Product innovation at national and international level cost a total of 3 520 000 PLN. Despite the relatively large number of innovations at local or regional level the cost did not exceed 2 293 700 PLN. Taking into account the type of expenditures incurred the greatest amount of funds was allocated for the purchase of equipment and construction of buildings - respectively 59 207 700 PLN 16 130 000 PLN. Third, the company expended money for the purchase of transport equipment (9 030 500 PLN), and a relatively high position accounted for the purchase of new equipment (6 572 000 PLN). The second form of innovation activity innovations are of an organizational nature, which 65 companies implemented, and they concerned in most of the activities at the firm level. Their reach in about 30 % was local and regional, and only 11 of them included national coverage. Unfortunately, neither one of the implemented innovations did not include coverage of the international market. Regarding the nature of the implemented process innovation, they were the most common new procedures for changing the organization of work, introducing new techniques and methods in the area of production, or the functioning of the company. New methods of cooperation with customers or suppliers were very popular. Often the procedures took care about the reorganization of work, and above all, their modernization. There have also been changes in the system of salaries and schedules performed. The overall amount for the period considered by companies in investing activities amounted to 2 117 380 PLN. The results confirmed that the majority of funds were allocated to innovation nationwide, followed by innovation at local or regional level, while the least innovation representing the new solution at the company level.

Summary and conclusions

The study and collected data and their analysis, allowed for the implementation of the objective in this study and to draw the following conclusions:

1. in the surveyed enterprises of the food industry the role of knowledge and the diffusion of innovation as the main factors influencing the development of enterprises do not always plays a leading role;

2. the most important process of the reacting on businesses was increasing competition in the market and only later focus on innovation and implementation and Polish membership in the European Union;
3. the study and analysis have shown that innovation processes are often random in nature and have the significant impact on the internal factors of the enterprise and do not affect its environment;
4. among the implemented actions innovations were proved to be dominant in terms of both numerical and basket -adjusted innovation at the firm level, with the expansion of their range which magnified expenditures.

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SOVEREIGN SPREAD AND ITS MEASUREMENT

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Key words:

risk – sovereign spread – financial crisis – yield spreads

Abstract:

We look into the traditional approaches to measure sovereign risk and use them to narrate the events how they were unfolding during the recent years of financial, economic and debt crisis. Providing empirical evidence we rationalise use of sovereign spreads and CDS spreads in different circumstances. Although we find both measures to be closely correlated, there are specific issues that need to remain in check. This article was created within the project VEGA 1/0053/2012.

Introduction

Up until 2009, sovereign debt of advanced economies was generally deemed safe asset to invest in. Advanced economies were enjoying high credit rating, based on which potential risks stemming from fiscal policies reaction to abrupt market conditions has been to larger extent neglected. Low risk and low interest rate levels were driving growth and improving economic outlook and there seem to be no reason for any correction in risk assessment. This has changed dramatically throughout the debt crisis evolving in the recent four years.

Origins of termination the risk neglect date back to August 2007, specifically to tensions in the inter-bank market, in which financial institutions lend to and borrow from one another. These tensions culminated in the collapse of Lehman Brothers in September 2008. With this event the tensions escalated and they developed into a global loss of confidence and to a deep recession in 2009.

In order to avoid witnessing a full scale crash of financial and economic systems, governments stepped into the game through various measures, as emergency loans,

open credit lines or fully fledged bail outs of systematically important institutions and/or corporations. Loss of confidence in 2009 spilled over to the real economy through squeezing provision of credit to non-financial sector in the time when it was the most vulnerable. Increased unemployment and consequent social costs and in addition attempts of governments to start up the economic activity weighted heavily on the public finances of many developed economies.

In 2010 some countries that were experiencing fiscal and structural problems even before the crisis became the subject of increased market scrutiny. The debt levels of these countries were increasing swiftly both due to large budget deficits and due to stagnant or shrinking economies. In 2011 tensions in sovereign debt markets spilled over to all other countries, that markets did not perceive to be perfectly fit.

Markets have started to price sovereign risk much more sensitively and much more individually than ever before in the history. The aim of this article is to: (i) show how sovereign risk data help story-telling of the debt crisis, (ii) discuss alternative tools to measure country risk and (iii) compare and rationalise their use in different circumstances.

1. Debt crisis narrated by data on government spreads

The narrative above suggests that approaches to pricing sovereign risk have been different in individual periods of time. On the TAB 1 we use the most common measure to picture sovereign risk - spread of long term (10 years maturity) government benchmark bond to the German bund of the same maturity. German bund is understood by markets as a risk-free asset against which risks of other sovereigns may be priced. Flagging the most remarkable events (accelerating tensions in the first part and calming down the tensions in the second) naturally split the picture into several following periods.

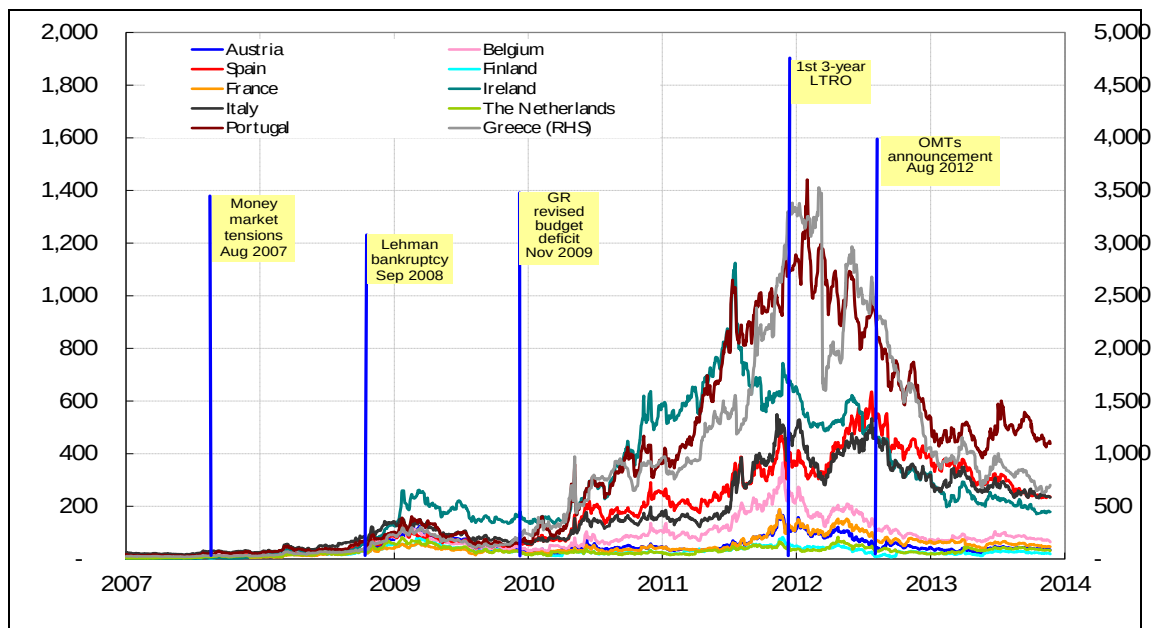
In the period until summer 2007, flat line near zero represents a general neglect of sovereign risks. Following early August 2007 tensions some volatility[4,240] has been present, and levels mildly picking up, but country risk premium was still considered very low. Both volatility and level of risk intensified after Lehman collapse in September 2008, but still relatively under control as states were active in correcting for the disruptions in both financial markets and real economy hit by severe recession.

While this process has been running and economy slowly recovering to the end of 2009, spreads have been slowly returning back from (for that time historically) elevated levels of 50 to 150 basis points to the moderate 30 to 60 basis points. To the end of 2009 however, negative news from fiscal in some countries have been penetrating the news. It has started with several revisions of Greek deficit figures, which have made markets uncertain about future sustainability of public finances. With spreads picking up, debt service of other countries was more and more constrained, new financing more complicated, which was adding further stress in the market.

The peak has been reached to the end of 2011 with actual risk of denomination and break up of euro area. Only fresh liquidity in the form of two 3-years long refinancing operations allotted in December 2011 and February 2012 by the Eurosystem has alleviated the markets and spreads slowly started to recede again. However, not even 1 billion of fresh liquidity in the system have not stabilise the system completely. As soon as in March 2012, when Greek private sector involvement has been negotiated, the additional burden to private sector holders in other peripheries has caused market spreads to rise again. Especially Italian and Spanish debt servicing has been increasing quickly, spreads to Germany peaking at more than 500bps in Italy and 600bps in Spain by summer 2012.

Only full-fledged promise of the ECB to stand by “whatever it takes” behind countries in the euro area and consequent announcement of the programme of Outright Monetary Transactions have managed to calm the markets and spreads have found their relatively stable, although moderate new level.

TAB. 1: Spreads on government bonds over time



Source: datastream

Although we may characterise current market conditions as stable, current level is still quite volatile and differentiated across countries. Compared to the pre-crisis period, it is clear that each country risk is being assessed individually and many other sources of risks, including its forward looking component is priced in. This is making overall stance more vulnerable, which may be viewed both negative and positive. It is negative in a sense that it makes countries debt service more expensive and limits their potential economic growth. It is however positive in a sense that breaking this vicious circle exercises more positive pressure on sovereigns in requiring them to undergo structural reforms to convince markets that their outlook may be bright and debt sustainable under different circumstances that may come in the future.

Calculated spread of the probability of default (CDS) of two underlying assets is therefore another measure that may well price a country risk. As a matter of fact, it is one of the most heavily used indicators of risk pricing in general.

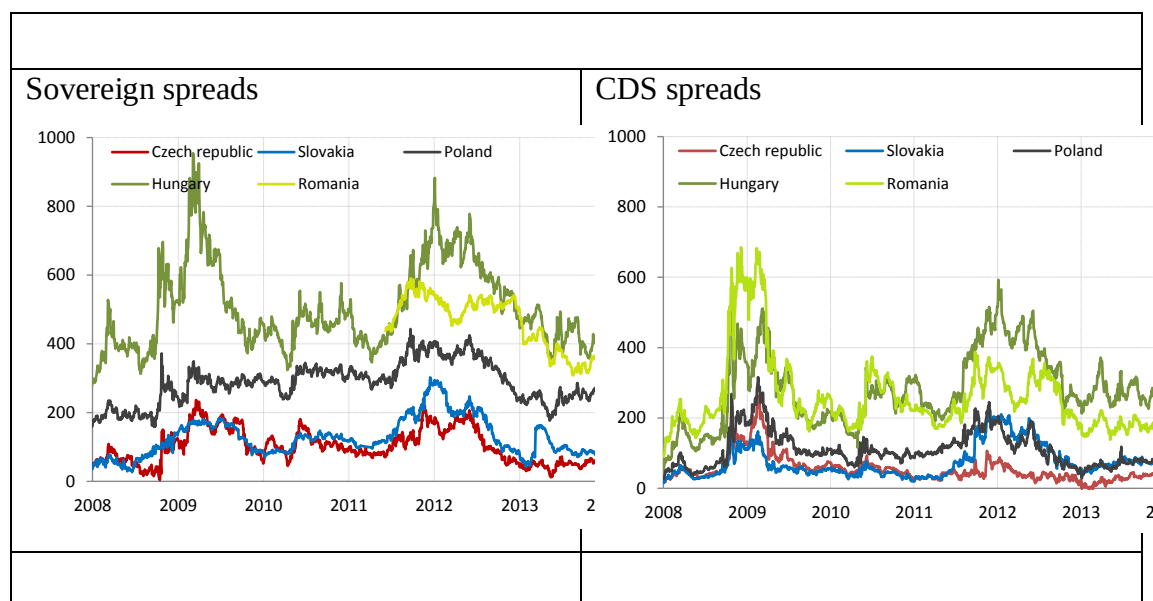
In fact CDS spreads and government bond spreads are quite closely correlated. This is due to the fact that sovereign bond is actually an underlying asset to the CDS and therefore their prices are directly interlinked. This is however not the rule, since swaps may be purchased without an underlying asset. This feature makes the CDS spread mildly deviate from the sovereign spread mostly in turbulent periods, when trade

volumes increase and market is being driving away from fundamental assets. Otherwise they are usually driven by underlying assets they are derived from.

2. Sovereign and CDS spread in central and eastern

When doing the same exercise for countries of central and eastern Europe, we see that the two measures of country risk do not align so well as in the case of other euro area countries. Sovereign spread to Germany has been trading at much higher number levels than the one measured by credit default swaps. This has not only been the case in periods with excessively high uncertainty, but also in times of relative stability. In 2010 for example sovereign spread for Slovakia and Czech Republic have been trading at around 100 basis points, while CDS spreads were only at 50 basis points in the same time.

TAB. 2: 10-year sovereign spreads and CDS spreads compared in CEE



Source: datastream

The reason for this deviation is to some extent liquidity, but to larger extent different denomination of debt.

CDS market has been barely liquid for these countries, while it has been very liquid for the advance countries of the euro area (except for periphery countries when driven out of the market by debt crisis and falling under the IMF/EC/ECB programme). Although correlation of sovereign spread and CDS market remained extremely tight, illiquid CDS

market makes prices to deviate more from their underlying assets. This is because markets where instruments are not being traded smoothly charge traditionally higher bid-ask spreads and also are more persistent.

Larger part of the difference in level of spread between CDS and sovereign spreads is due to different denomination. It also may be observed from the fact that Slovakia CDS spread and sovereign spread difference is the smallest of all CEE countries monitored on figure 3. Since sovereign bond is denominated in the non-euro currency, it is also attached to the monetary policy and interest rates of their own market. For instance key interest rate in Hungary was around 6% in the beginning of 2010, while one of the euro area was at 1%. Different level and slope of the yield curve cause completely different conditions for pricing 10-year sovereign bond of Hungary than the one of Slovakia. On the other hand, CDS price is generally denominated in US dollars and therefore it is expressed in relative terms, i.e. as a price of insurance paid to cover for the event of default of underlying asset. In other words, 300 basis points price of CDS of Hungary or Slovakia both mean that investor has to pay 3% of the underlying asset per annum to retrieve full amount of that asset in case it defaults. The difference in the level of CDS spread and sovereign spread is therefore in the yield curve of the monetary area they are attached to.

Using this example we have shown that country risk expressed in CDS spread may be an alternative to sovereign spread measuring only in the same currency area and only under special circumstances of relatively similar liquidity conditions and with caution during the periods of heightened uncertainty.

Conclusion

Level of country risk has been evolving rapidly in the recent several years and the methods to measure it can vary. Over last 5 years we have witnessed a period of underpricing country risk, reflecting in a flat line close to zero, moderately elevated risk in before the brink of the crisis as well as explosions of premia with its local peaks and troughs. Country risk assessment became much more individual reflecting various economic, political and budgetary issues.

Having these circumstances in mind, selection of proper indicators to measure the country risk should closely link with the purpose and interpretation. CDS market provides proper tools for measuring country risk in terms of probability of default,

however special attention has to be taken when international comparison is involved. For international comparison, sovereign spread to risk-free asset shall be used, which provides a universal tool to comparison irrelevant on the denomination or liquidity of the underlying asset.

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RISK ADJUSTED A DEPOSIT INSURANCE PREMIUM – AN EMPIRICAL ANALYSIS FOR POLISH BANKING SECTOR

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Key words:

deposit insurance – credit institution – banking system – risk-adjusted premium

Abstract:

Fair, individualized risk adjusted premium has a tremendous positive impact on the banks, the safety net institutions and indirectly, the whole economy. The direction of changes in European regulations regarding deposit guarantee indicates that differentiation of deposit premiums will be implemented in the EU law. The purpose of the article was to present the deposit guarantee schemes in selected countries, which provide risk-based contributions as well as models proposed by the European Commission as a basis for unification of guarantee schemes in the EU. Furthermore empirical findings on the differentiation of deposit premiums in the Polish banking sector were presented¹.

Introduction

Currently, in more than 80 banking systems in the world there is a direct protection of depositors of credit institutions and investment firms, with a formal system of deposit guarantees². Financial literature assigns following attributes to an ideal deposit protection system: a sufficient degree of formalization, transparency, wide range of competencies, counter cyclicity, minimum level of protection for average income depositors, access to additional financing sources and deposit premium calculation

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² According to the current state of knowledge differentiation of guarantee premiums is used in the banking systems of the following countries: Argentina, Belarus, Bulgaria, Chad, Ecuador, Finland, France, Gabon, Equatorial Guinea, Hong Kong, Cameroon, Canada, Colombia, Congo (Republic of), Korea, Costa Rica, Macedonia, Mexico, Micronesia, Germany, Nicaragua, Norway, Peru, Portugal, Central African Republic, Romania, El Salvador, United States, Sweden, Taiwan, Turkey, Uruguay, Marshall Islands, Italy, Hungary and further 3 countries (including India) declared a departure from the flat rate in the near future.

based on the real risk of bank assets[1]. In recent years, a growing number of deposit guaranteeing institutions in both developed and developing countries have switched to calculating insurance premiums, depending on the actual risk of the insured institution's assets. According to the database collected by A. Demirgüç-Kunt 33 guarantee funds worldwide (one third of total) have made such modifications.[2]

The primary objective of the present study is to systematize existing theoretical arguments for calculating risk-adjusted deposit premium and a critical analysis of the major algorithms, coupled with an attempt to assess their suitability for regulatory purposes and the presentation of their empirical research on the differentiation of deposit premiums in the Polish banking sector.

1. Rationale for the differentiation of deposit premiums according to the risk of bank

According to the arguments cited by J. Colantuoni [3] increasing tendency to differentiate the contributions to deposit guarantee schemes is primarily a function of three factors. The most important is the desire to avoid cross-subsidization, which negatively affects the efficiency and competitive position of the best banks in the financial system. An important argument is also a expansion of capital markets leading to increased liquidity and efficiency and as a consequence providing a wide range of financial instruments issued by banks, allowing for indirect assessment of their risk profile. Basle Capital Accord should also be mentioned in this context. Implementation of BCA regulations expanded reporting obligations and hence transparency of credit institutions allowing to obtain additional data on the quality of bank assets, the degree of concentration of credit portfolios and the ability to generate revenue. The regulations implementing the method of extended assessment of capital adequacy and forcing the application of advanced systems for estimating economic capital formed the basis for a quantitative bank risk measurement. International Association of Deposit Insurers (IADI) [4] formulated a set of Core Principles (rules) describing requirements for an "ideal" deposit insurance system, which underlined the importance of proper risk-adjustment in the context of the ability to reduce moral hazard. European Community law referred to the differentiation of guarantee fees in the revision of Directive 94/19/EC from March 2009 (Directive 2009/14/EC) [5] emphasizing the importance of the fair, individualized guarantee fee as desired extension and addition to existing

regulations. Thus, although not formally introduced as a rule it can be expected, that the differentiation of fees along with technical solutions will be implemented in EU law soon. Another issue raised in this context in the literature is a catalog of risks, which would become the basis for adjustment and the choice of practical implementation methods. In particular, the question refers to the inclusion of systemic risk, so that the fee charged expresses not only of the bankruptcy potential of an individual's bank but also its contribution to the overall risk of collapse of the system. Risk-adjustment may result in the introduction of additional elements of market discipline in the banking system, reduce the risk of moral hazard and improve the efficiency of the banking sector³. Central issue remains still the choice of the appropriate method of assessing the riskiness of financial institutions and calculating deposit insurance premium. An important issue is also the location of the system within the safety net. The introduction of a system based on the valuation of the bank's risk seems to make sense only if the collection of premiums is carried out in an ex-ante mode.

2. Empirical analysis of risk-adjusted deposit premiums in the Polish banking sector

In order to illustrate the abovementioned considerations, an empirical analysis has been carried out involving a calculation of the theoretical value of deposit premiums for a group of Polish banks listed on the Warsaw Stock Exchange. For the purpose of the analysis an option-based approach has been implemented assuming the existence of the direct relationship between the value of the deposit guarantee and the value of a European put option written on the assets of insured bank. The acquisition of deposit guarantee by a bank is equivalent to the acquisition of the right to 'sell' their assets portfolio to the safety net institution. The value of the put option (with respect to deposit level) is calculated using the formula:

$$g = N(-d_2) - \frac{Ve^{-rT}}{D} N(-d_1) \quad (1)$$

³ However, one can also point to the negative aspects of differentiation of premiums which include charging higher fees for the institutions in poor financial condition which may indirectly influence its further deterioration. It is also necessary to balance the benefits of increased transparency of the system and the danger of deterioration of economic and financial results of the bank.

where V is the market value of bank assets, D^4 deposit level, r – market risk-free rate, T – maturity of the option, e – Euler number and d_1 , d_2 auxiliary elements from Black-Scholes formula. The market value of the bank's assets V and its volatility σ_V are theoretical unobserved values, that need to be calculated based on bank share price data. It was assumed that the put option is exercised when $V < D$ (the market value of the bank's assets falls below the value of its liabilities). In order to find the two unknowns the standard option equation is employed (E_t – market capitalization in time t):

$$E_t = V_t N(d_1) - D N(d_2 - \sigma_V \sqrt{T-t}) \quad (2)$$

A single formula needs to be completed in order to find two unknowns. The literature suggests several alternative approaches which include inter alia Ronn-Verma [6] and Duan [7] methods. The former is the most popular tool for empirical studies of the theoretical value of the insurance premium in the various banking systems inter alia in the U.S. (Ronn and Verma), Japan (Oda) [8], Canada (Giammarino, Schwartz and Zechner) [9] and cross-sectionally in developed countries (Laeven) [10]. In this approach the standard equation is added - based on Ito's lemma - linking the volatility of equity and assets:

$$\sigma_E = \frac{V_t N(d_1)}{E_t} \sigma_V \quad (3)$$

with σ_E as volatility of market capitalization⁵.

Despite its popularity Ronn-Verma model has been widely criticized in the literature because of the numerous methodological shortcomings. The object of criticism was particularly non-compliance with the theoretical assumptions of the Black-Scholes-Merton model, which treats capitalization volatility as a continuous (stochastic) and not discrete variable. J.C. Duan created a method of estimating the value of V and σ based on maximum likelihood function, in which the volatility of equity is a stochastic⁶. This approach has become a "gold standard" in the valuation of the theoretical value of the

⁴ For simplicity as D are labeled total bank's liabilities and not just the deposit - this is due to the structure of liabilities in the banking system in Poland, which consist mainly of deposits.

⁵ the standard deviation of daily returns on bank capitalization

⁶ Merton algorithm does not say anything about the distribution values of obtained parameters. On the contrary Duan approach allows to carry out the appropriate interval estimation with confidence intervals, statistical significance, as well as testing of hypotheses and generating standard errors

deposit premium⁷. This model describes the value of bank assets in the form of log-normal process with expected value (defining trend) μ and volatility σ_v . Parameters of the logarithmic maximum likelihood function based on the observed values of the market capitalization are calculated according to the formula:

$$L_v(E_t, t=1, \dots, n, \mu, \sigma_v) = -\frac{n-1}{2} \ln(2\pi) - \frac{n-1}{2} \ln \sigma_v^2 - \sum_{t=2}^n \ln \hat{V}_t(\sigma_v) - \sum_{t=2}^n \ln(N(\hat{d}_t)) - \frac{1}{2\sigma_v^2} \sum_{t=2}^n \left[\ln\left(\frac{\hat{V}_t(\sigma_v)}{\hat{V}_{t-1}(\sigma_v)}\right) - \mu \right]^2 \quad (4)$$

where:

$\hat{V}_t(\sigma_v)$ is an approximation of V_t estimated from the sample, and $\hat{d}_t$ corresponds to the value of d_t .

The empirical analysis covers all the banks listed on the Warsaw Stock Exchange in the period 2000-2011, with sufficiently long time series of data: PKO BP SA, Pekao SA, BRE Bank SA, ING Bank Śląski SA, Getin Holding SA, Bank Zachodni WBK, Bank Millenium, Bank Handlowy, Kredyt Bank SA, Bank BPH SA, Nordea Bank PL, BNP Paribas PL, BOS Bank SA, DZ Bank SA (14 banks altogether)⁸. The results of estimation of Duan model based on market data and selected information from the financial statements of the surveyed banks in abovementioned years are presented in Table 1.

TAB. 1: Descriptive statistics of calculated values for the group of banks in Poland

Characteristics	Mean	Median	Min	Max
Total deposits D (mil \$)	10,167	6,593.3	74.5	53,111.5
Market value of assets V (mil \$)	13,414	9,356.3	149.9	72,904.7
Total leverage D/V (%)	0.79	0.80	0.28	1.17
SD of asset returns (%)	6.12	5.5	0.24	19.3
Risk-adjusted deposit insurance premium (%)	0.36	0.06	0.0000001	4.50

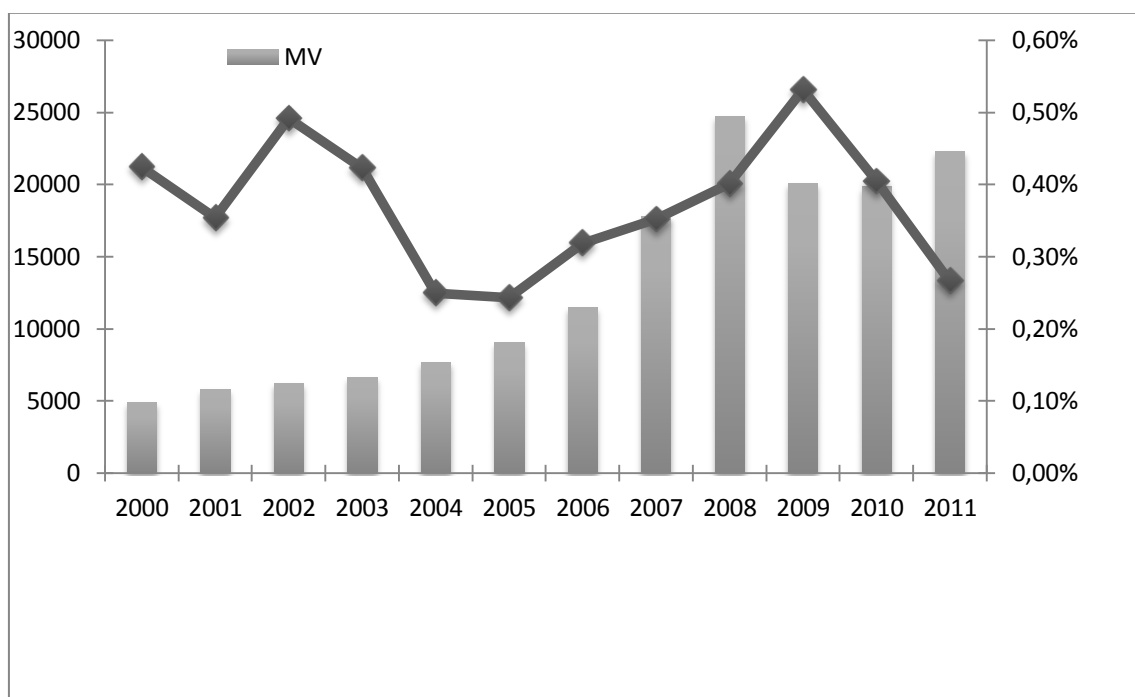
Source: own calculations

⁷ Alternative approaches include estimating the implied volatility of the capitalization using time series analysis such as different versions of the GARCH model

⁸ Banks with too short time series are excluded (Alior SA i BGŻ SA)

Calculated values are characterized by two main features: their trend is similar for all the analyzed institutions and banks with the highest level of deposit premiums, and thus exposed to the greatest risk are DZ Bank SA, Nordea Bank SA and Bank BPH. Correlation analysis indicates a strong and statistically significant relationship between market measures and accounting indicators illustrating the condition of selected commercial banks in Poland.

FIG. 1: Risk-adjusted deposit insurance premiums (right scale in %) and the market value of the assets (left scale in mil \$) of the surveyed banks



Source: Own calculations

Fig. 1 presents the values of deposit premiums and market value of assets of banks in the subsequent years. Assets values are characterized by a constant upward trend that collapsed in 2009-2010. Deposit premiums indicate a period of decline in banks' risk in 2000-2006, and its sharp increase in the period 2007/2008 due to the aftermath of the financial crisis.

Conclusions

Ideal deposit guarantee system should meet the requirements of efficiency, accuracy, simplicity, flexibility, ability to create positive incentives, fairness and objectivity [11]. As regards the condition of accuracy it is necessary to establish criteria explicitly

quantifying the level of risk of bank's assets. Banks with unfavorable risk profiles, showing a higher probability of bankruptcy should be charged a higher premium than the institutions with a stable financial standing. In addition, data used for assessing bank should have high accuracy, quality and frequency. The simplicity of the system means that the principle of its design should be accessible and understandable to both deposit guaranteeing institutions, as well as for financial institutions subject to insurance, so that they can determine their own position in the risk ranking and be based on measurable and objective criteria (quantitative). In addition, banks with comparable risk profiles should be charged with similar premium. The design of the system should also allow for modification of the assessment factors and adding new banks and force the bank's decision-making bodies to act reasonable, responsible and in the interests of the institution.

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THE EFFICIENCY OF BANKS IN THE SLOVAK REPUBLIC AND CZECH REPUBLIC

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Key words:

efficiency – efficiency score – banks – Slovak Republic – Czech Republic

Abstract:

The study focuses on the efficiency of banks in the Slovak Republic and in the Czech Republic in 2009-2011. It compares the efficiency scores of banks on the common Czech and Slovak market. Data envelopment analysis (DEA) was used in order to reflect the efficiency scores. Until the year 1993, the Slovak Republic and the Czech Republic were developing as a common state - Czechoslovakia. After the division of Czechoslovakia, two independent states were created. The Slovak Republic is a country with smaller area and population. Empirical results of the study are aimed to determine the statistical significance of the difference between the mean of efficiency scores of banks in the Slovak Republic and the mean of efficiency scores of banks in the Czech Republic.

Introduction

For a long period of time, the banking market in Slovakia and the Czech Republic was developing as a common banking market. After the division of the federal state of Czechoslovakia on 1.1.1993 two separate states were created. In both countries, the economy transformed from central to market economy. The rapid transition caused problems on both banking markets. Gradually, new banks were created, but many of them had a shortage of long-term funds. Over time, the banking sectors of both countries stabilized. The entry of both countries into the European Union in 2005 did not significantly distort the stability. Despite the common development, several

particularities are characteristic of each banking market. We are going to mention some of them.

The Czech banking market operates in about a twice larger area than the Slovak banking market and the population of the Czech Republic is twice the population of the Slovak Republic. Different size of the markets may also affect the interest of foreign investors to invest in the territories of both countries. The currency in both countries is not the same. Since 2009, Slovakia belongs to the Eurozone. The Czech Republic has not introduced the euro yet and the currency there is the Czech crown.

Our interest is to determine whether these specificities greatly affect the efficiency of Slovak and Czech banks. We focus on verifying whether there was a statistically significant difference in the mean of efficiency scores of Slovak banks and the mean of efficiency scores of Czech banks on the common Czech and Slovak banking market in the years 2009 to 2011. The aim of this paper is to determine whether there is a statistically significant difference between the mean of efficiency scores of Slovak banks and the mean of efficiency scores of Czech banks on the common Czech and Slovak banking market during the period from 2009 to 2011.

1. Methodology and Data

In Slovakia and the Czech Republic, the authorization to operate is given to the banks that have the residence on the territory of the state as well as it is given to the branches of foreign banks. In our analysis we focused on banks located on the territory of the particular state. We have analysed thirteen banks with residence on the territory of the Slovak Republic and sixteen banks in the Czech Republic. We used the annual reports of banks for analysis. Banks publish them on their web pages each year. We analysed indicators of banks in the period from 2009 to 2011.

We divided the indicators into two groups - inputs and outputs. Inputs meet minimization criterion. Outputs meet the maximization criterion. Greater value of the indicator is more favourable for the subject than a smaller value. The group of inputs included amounts owed to banks and customers, personnel expenses, property and equipment and intangible assets. The group of outputs included net interest income, loans and advances to banks and customers. [3] [4] [5]

The estimate of technical efficiency was performed using data envelopment analysis. DEA models analyse the efficiency of transformation of multiple inputs to multiple

outputs. They belong to the group of non-parametric models for evaluating efficiency. They are based on linear programming, which they use to construct non-parametric broken envelopment data. Analysed subjects are called decision making units (DMUs). DEA models estimate of efficiency score for each DMU. It is a relative measure because its value depends on the whole set of DMUs. [2, 74]

The efficiency score we expressed in the BBC models. [1, 1085] To estimate the efficiency score, the program A Data Envelopment Analysis Program - DEAP 2.1. was used. The program was written by Coelli. To characterize the efficiency scores of banks in Slovakia and the Czech Republic, we expressed the mean and variance in the program Statistica. The mean is an informative measure of the central tendency and the variance is the characteristic of variability.

The efficiency scores of banks in Slovakia and the efficiency scores of banks in the Czech Republic does not satisfy the requirement of normal distribution. Therefore, we conducted tests of statistical significance of the difference between the mean of efficiency scores of banks in Slovakia and the mean of efficiency scores of banks in the Czech Republic as well as testing the statistical significance of the difference between the mean efficiency scores of universal banks and the mean of efficiency scores of building societies and mortgage banks using the Mann Whitney U test. This is a nonparametric test for independent files that uses the sequence of all values to determine the value of the test statistics. Testing of null hypothesis was performed in the program Statistica.

2. Empirical Findings

The efficiency scores indicates that the number of technically efficient banks has been growing from 2009 to 2010. Out of the twenty-nine banks, there were fourteen technically efficient banks in 2009. Three of these banks were in Slovakia, which was 23.1% and eleven banks were in the Czech Republic, which was 68.8%. In 2010, eleven banks were technically efficient. Two of the banks were in Slovakia, which was 15.4% and nine banks were in the Czech Republic, which was 56.3%. In 2011, twelve banks were technically efficient. Three of these banks were in Slovakia, which was 23.1% and nine banks were in the Czech Republic, which was 56.3%. Eleven banks were technically efficient in all three years. They were banks based in the Slovak Republic - ČSOB stavebná sporiteľňa, a.s., Slovenská sporiteľňa, a.s.. They were banks based in

the Czech Republic – Česká spořitelna, a.s., Československá obchodní banka, a.s., Evropsko-ruská banka, a.s., GE Money Bank, a.s., Hypoteční banka, a.s., Komerční banka, a.s., Stavební spořitelna České spořitelny, a.s., UniCredit Bank Czech Republic, a.s., Wüstenrot hypoteční banka, a. s..

TAB. 1: Descriptive statistics of the efficiency scores of banks in Slovakia and the Czech Republic in the BCC model

Year	Number of banks	Number of technically efficient banks	Mean of the efficiency scores	Variance
2009	29	14	0.767	0.079
2010	29	11	0.725	0.068
2011	29	12	0.741	0.062

Sources: own processing of annual reports [3] [4] [5]

Descriptive statistics of the efficiency scores in all the three analysed years on the common market is in Table 1. In the analysed period, the variance of the efficiency scores was decreasing. While in 2009 the variance of the efficiency scores was 0.079, in 2011 it was 0.062. Reduction of the variance of the efficiency scores refers to reducing the variation of the efficiency scores in the period analysed. The variance of the efficiency scores of banks in Slovakia in the years 2009 and 2011 was more than the variance of the efficiency scores of banks in the Czech Republic. Descriptive statistics of the efficiency scores of banks in Slovakia is in Table 2. Descriptive statistics of the efficiency scores of banks in the Czech Republic is in Table 3.

The mean of the efficiency scores of banks in the Czech Republic in the years 2009-2011 was higher than the mean of the efficiency scores of banks in the Slovak Republic. The mean of the efficiency scores of banks in Slovakia and the mean of the efficiency scores of banks in the Czech Republic in the years 2009-2011 is in Figure 1.

The analysis shows that the proportion of technically efficient banks in the Slovak Republic in the entire analysed period was smaller than the proportion of technically efficient banks with residence in the Czech Republic.

TAB. 2: Descriptive statistics of the efficiency scores of banks in Slovakia in the BCC model

Year	Number of banks	Number of technically efficient banks	Mean of the efficiency scores	Variance
2009	13	3	0.642	0.080
2010	13	2	0.619	0.057
2011	13	3	0.665	0.062

Sources: own processing in the program Statistica of annual reports [3] [4] [5]

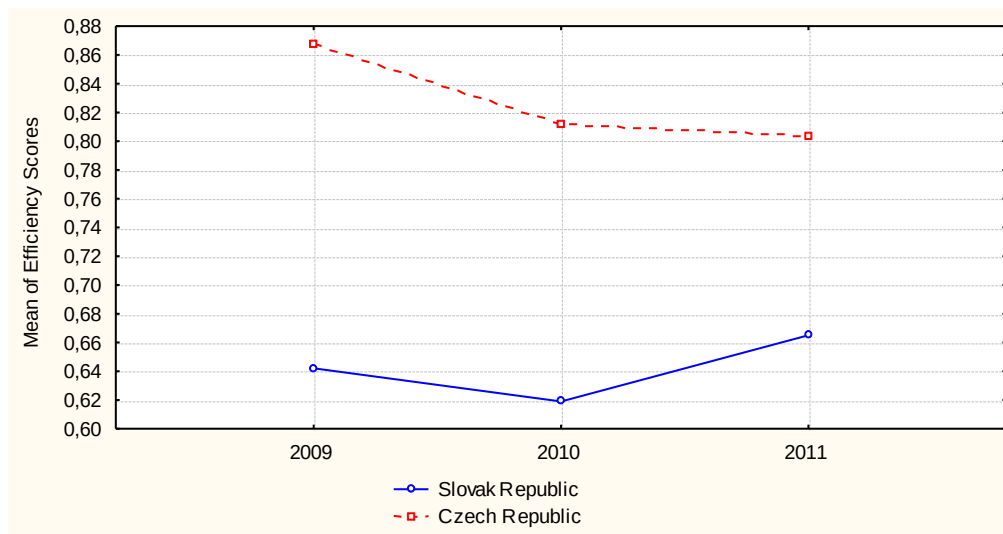
TAB. 3: Descriptive statistics of the efficiency scores of banks in the Czech Republic in the BCC model

Year	Number of banks	Number of technically efficient banks	Mean of the efficiency scores	Variance
2009	16	11	0.868	0.060
2010	16	9	0.812	0.064
2011	16	9	0.803	0.057

Sources: own processing in the program Statistica of annual reports [3] [4] [5]

With the help of the estimated values of the efficiency scores and analysis, we will find out using the Mann Whitney U test whether the difference between the mean of efficiency scores of Slovak banks and the mean of efficiency scores of Czech banks on the common Czech and Slovak banking market in the period from 2009 to 2011 was statistically significant. We will test the null hypothesis that the difference in the mean of efficiency scores of Slovak banks and the mean of efficiency scores of Czech banks on the common Slovak and Czech banking market is not statistically significant. Test results using the program Statistica are listed in Table 4.

FIG.1: Mean of the efficiency scores of banks in Slovakia and the mean of the efficiency scores of banks in the Czech Republic in the years 2009-2011



Sources: own processing

TAB. 4: Mann Whitney U test to test the statistical significance of the difference between the mean of efficiency scores of banks in Slovakia (Group 1) and the mean of efficiency scores of banks in the Czech Republic (Group 2)

Year	Order of group 1	Order of group 2	U	Z	p-level	Z modified	p-level modified
2009	145.5	289.5	54.5	2.171	0.030	2.304	0.021
2010	150.0	285.0	59.0	1.973	0.048	2.029	0.042
2011	159.0	276.0	68.0	1.579	0.114	1.638	0.101

Sources: own processing in the program Statistica

Expressed values of the p-level show that in the years 2009 and 2010 we reject the null hypothesis, with the significance level of 0.05. So we reject the assumption that the difference between the mean of efficiency scores of Slovak banks and the mean of efficiency scores of Czech banks in the common Slovak and Czech banking market is not statistically significant. In 2011, with the significance level of 0.05 we do not reject the null hypothesis. So, we do not reject the assumption that the difference between the mean of efficiency scores of Slovak banks and the mean of efficiency scores of Czech banks in the common Slovak and Czech banking market is not statistically significant.

Conclusions

Based on the results of application of mathematical and statistical methods, we can conclude that there was statistically significant difference in the mean of efficiency scores of banks in Slovakia and the mean of efficiency scores of banks in the Czech Republic in the period from 2009 to 2010. In the year 2011 there was no statistically significant difference in the mean of efficiency scores of banks in Slovakia and the mean of efficiency scores of banks in the Czech Republic. This shows the positive trend in the efficiency of Slovak banks.

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OKUN LAW: AN EMPIRICAL INVESTIGATION OF AN INCREMENTAL VERSION FOR THE CZECH REPUBLIC, 1997 - 2012

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Key words:

incremental version of Okun law – unemployment rate – real GDP growth rate

Abstract:

Okun law as a rule of thumb is often criticized because of the so-called jobless recoveries and its stability in a variable economic environment and its usefulness is questioned. The incremental version of Okun law applied on the annual and quarterly data in Czech Republic during the period of 1997 - 2012 is discussed in this paper. The negative relationship between unemployment rate and the real GDP growth rate in a simple linear regression model is estimated by using OLS method, but with low coefficients of determination.

Introduction

The negative correlation between the unemployment rate and GDP growth rate, known as the Okun law, was firstly estimated and modelled in 1960s [5] and since then it was proved by many authors [7] [2] [4]. This rule of thumb has become inaccurate mainly in the period just after the last three crises in the United States, when small GDP growth was not accompanied with a decreasing unemployment rate, especially after the financial and economic crisis of 2008-2009 [6] [3]. Nevertheless, for most countries the Okun law holds and the variance from it is small not lasting long time. The estimated Okun coefficient for Japan was equal to -0.15 expressing the loyalty to one firm and the tradition of one or few jobs during the whole life, for the USA -0.45 and for example for Spain it was equal to -0.85, indicating typical short temporary jobs in Spain [1].

This paper tries to estimate the incremental version of Okun law, resp. the negative relationship between the unemployment rate and the growth rate of real GDP, in a simple linear regression model using the method of ordinary least squares (OLS method). In the next section the aim of the paper is highlighted and the methodology used in this paper is described. Basic results of the regression analysis are presented afterwards and in the last section those results are discussed and compared to estimates from other authors which use longer data series.

1. Aim of the paper and methodology

An examination of the validity of the incremental version of Okun law in simple linear regression model using OLS method applied the Czech annual and quarterly data from the period of 1997-2012 is the aim of this paper. The core hypothesis of a regression analysis in this paper is a negative relationship between the first difference in the unemployment rate and the first difference in the real GDP growth rate.

The annual and quarterly time series of the unemployment rate, real gross domestic product (GDP) available for period 1997-2012 were extracted from the Czech Statistical Office database. The annual real GDP growth rate and quarterly growth rate in case of changes from previous quarter are calculated using the formula (1):

$$g = \frac{GDP_t - GDP_{t-1}}{GDP_{t-1}} * 100 \quad (1)$$

The quarterly growth rate of real GDP in case of changes from the same quarter of the previous year is processed using the formula (2):

$$g = \frac{GDP_t - GDP_{t-4}}{GDP_{t-4}} * 100. \quad (2)$$

The incremental version of Okun law is estimated in the form of linear regression model:

$$\Delta u_t = \beta_0 + \beta_1 \Delta g_t + u_t, \quad t = 1, \dots, T, \quad (3)$$

where Δu_t is the first difference of the rate of unemployment, Δg_t is the first difference of the growth rate of real GDP, β_0 constant, β_1 is Okun's coefficient and u_t is a random variable. Number of period T for annual data is 16 and for quarterly data T is equal to 64. The ratio β_0/β_1 gives a real output growth rate at a stable rate of unemployment, i.e. how the economy should grow to maintain a certain level of unemployment.

The main assumption about the Okun's coefficient is that it should be negative and less than 1.5 [5].

2. Results

The tables no. 1 and no. 2 includes some of the results from the regression analysis of the incremental version of the Okun law for annual and quarterly data of changes from the previous quarter and quarterly data of changes from the same quarter of the previous year. Okun's coefficient (β_1) indicates the negative relationship between the unemployment rate and the growth rate of real GDP both in first differences.

TAB. 1: The regression model results of Okun law, annual data 1997-2012, $R^2=0,0326$

Exogenous variable	coefficient β	t-value	p-value
constant	0.807247	2.6626	0.01857**
Δg	-0.072704	-3.1450	0.00716***

Source: Gretl output; *** the statistical significance of the estimate at the 99% probability level

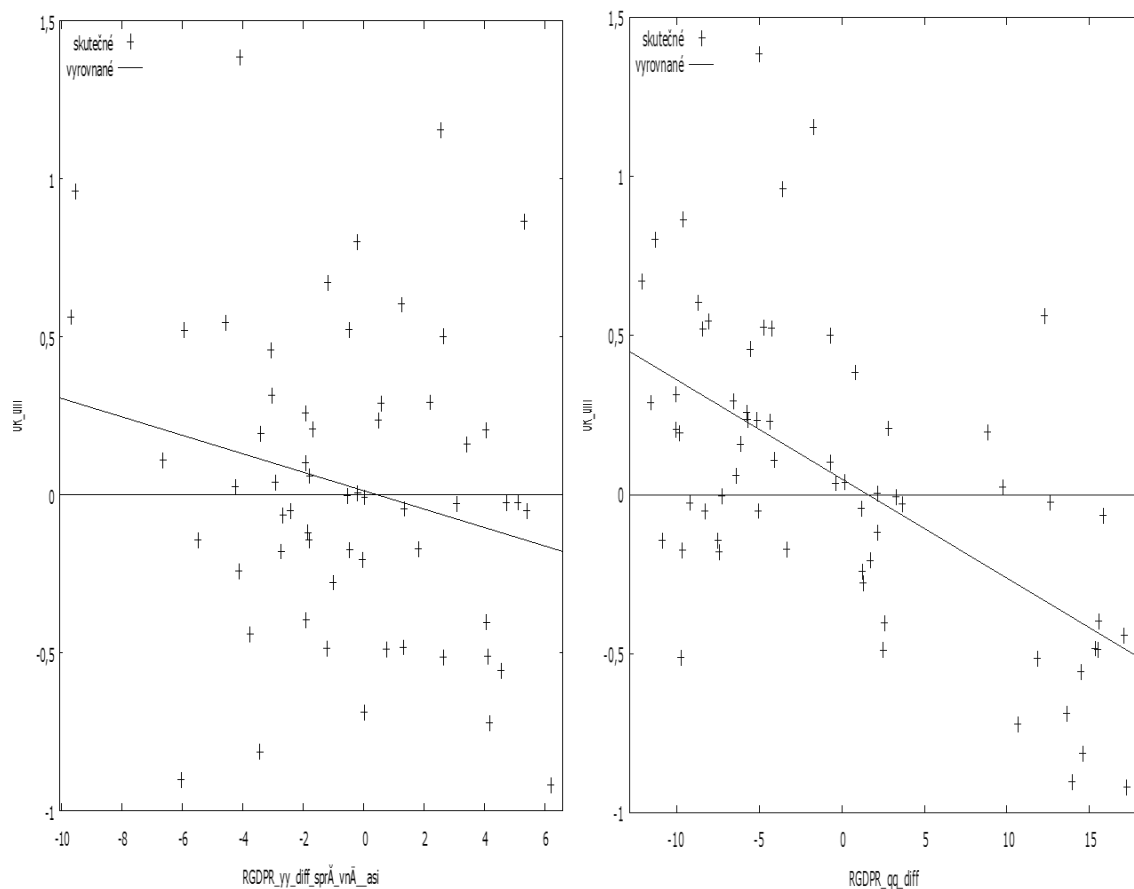
TAB. 2: The regression model results of Okun law, quarterly data 1997-2012, changes from the previous period (QoQ): $R^2=0,344$, changes from the same quarter of previous year (YoY): $R^2=0,047$

Exogenous variable	coefficient β	t-value	p-value
constant	0.0492899	1.0324	0.30577
Δg (case of QoQ)	-0.0311338	-5.7907	<0.00001***
constant	0.0127435	0.2017	0.84088
Δg (case of YoY)	-0.0291908	-1.6927	0.09588*

Source: Gretl output; * the statistical significance of the estimate at the 90 % probability level *** the statistical significance of the estimate at the 99 % probability level

The figure no. 1 demonstrates the result of negative slope of regression line between the first differences in the unemployment rate and in the real GDP growth rate. All results despite small coefficients of determination, are consistent with the hypothesis of this study.

FIG. 1: Linear regression curves of the incremental version of Okun law for quarterly data 1997Q1-2012Q4 (on the right the case of changes from the previous period (QQ) and on the left changes from the same quarter of previous year (YY))



Source: Gretl output

The interpretation of results

An increase in the first difference of real GDP growth rate by 1 percentage point a year is connected with a decrease of the first difference in the unemployment rate by 0.073 percentage points a year. A zero first difference in the real GDP growth rate is associated with an increase of the first difference in the unemployment rate by 0.81 percentage points. A zero first difference in the unemployment rate is connected with an

increase of the first difference in the real GDP growth rate by 11.1 percentage points (0.81/0.073).

Similarly, it is true for quarterly data. An increase in the first difference of real GDP growth rate by 1 percentage point from previous quarter is related to a decrease of the first difference in the unemployment rate by 0,031 a quarter. An increase in the first difference of real GDP growth rate by 1 percentage point from the same quarter of the previous year is connected with a decrease of the first difference in the unemployment rate by 0,029 a quarter.

These results are less than results by other others, e.g. smaller by 0.04 percentage points when compared to [5] and 0.02 less than results for Okun's coefficient in [4] that indicates less flexible labor market in the Czech Republic than in the USA.

Conclusion

The results of the regression analyses partly confirm the hypothesis of this study, i.e. the negative relationship between unemployment rate and the real GDP growth rate both in the form of first differences, despite very small coefficients of determination due to short time series and incompleteness of the whole regression model by omitting some important variables. The results on this paper gives to the Czech Republic with its less flexible labour market a rank between the Japan and the USA.

The irrelevance of the models estimated in this paper might be biased by the short time series or by the inclusion of the period of crisis and the recovery. An estimation of a general dynamic VAR model of the labour market and its impulse-response functions should be processed to receive a proper insight to the relationship between the mentioned variables.

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INTEGRATION OF MANAGEMENT SYSTEMS IN THE CONTEXT OF STRATEGIC THINKING IN ENTERPRISES IMPLEMENTING ORGANIZATIONAL ECOINNOVATIONS

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Key words:

organizational eco innovativeness – Environmental Management System (EMS) – ISO 14001 – integrated management system – the strategic thinking

Abstract:

The paper constitutes an element of broader personal research, conducted by the author. They comprise the issues of organizational ecoinnovations in a broad sense. So far their significance (in the context of building competitive advantage) has been underestimated and insufficiently investigated. The paper endeavors to answer the questions whether the introduction of organizational ecoinnovativeness in the form of the implementation of the Environmental Management System was connected with the introduction of a different management system; which management systems functioned in the enterprises with valid and certified EMS according to the requirements of ISO 14001 standard; whether the management systems were integrated; to what extent the decisions regarding the introduction/functioning of the management systems were the result of strategic thinking.

Introduction

In the view of the new European Union initiative – Horizon 2020, in the years 2014-2020 the role of innovativeness is going to be increased, among others, owing to the provision of adequate financial resources to the research and the implementation of initiatives, including ecoinnovations. Hence, the necessity to diagnose the current usage of the systemic ecoinnovative solutions, in the context of their understanding, programing and supporting. It is vital, not only from the perspective of the EU policy,

the interests of particular business entities, but also individual households. Such activities influence the standard of living of the present and the future inhabitants of the Earth. Enterprises (even the ones with very limited resources) can increase their competitive advantage through the implementation of organizational ecoinnovations. They are a consequence of applying a new organizational method in the adopted by the company principles of operation in organizing the workplace, and the relation with the environment [1]. The implementation, and subsequently the improvement of the proecological operational strategy is a component of a propaganda (especially during the crisis period) concept of Corporate Social Responsibility. The application of the organizational ecoinnovations can contribute to the emergence of ecoinnovative products, processes, as well as marketing. One of the commonly available, for all types of organizations, forms of organizational ecoinnovations is the implementation of the Environmental Management System basing on the formal requirements of the ISO 14001 standard. A system basing on international ISO 14001 standard is not very restrictive in its requirements. It can be the first stage of implementing more restrictive Eco-Management and Audit Scheme. ISO 14001 standard comprises the guidelines enabling the management of the significant environmental aspects in such a way that the undertaken actions becomes more eco-efficient, eco-effective and eco-successful. It is possible due to the fact that the key, from the viewpoint of an organization, areas of improvement will be identified and supervised within the framework of the adopted management system. Through the application of the system approach, the undertaken actions can be integrated, to a higher degree, with the processes carried out within the organization. It is particularly important in the context of strategic objectives fulfilment, which should take into consideration the triad of economic, ecological, and social benefits.

1. Organizational eco innovations as a sign of strategic thinking

In the countries of Eastern Europe seeking for benefits from the functioning of the formal EMS in organizations is very important. Due to the historical conditions, it is necessary to make the decision personnel aware of the significance of strategic thinking. It is reasonable in the context of seeking new and realizable, offensive and innovative strategies in the contest of organizations with the increasing competition on national, as

well as international markets. In the literature it is postulated that the implementation of organizational ecoinnovativeness should be the sing of the strategic approach, expressed, among others, in strategic thinking [5].

The significance of strategic thinking should be considered, among others, in relation to the recognition of the key stakeholders' intentions. It is crucial from the viewpoint of the gaining and maintaining the advantage over the competitors. The literature emphasizes that strategic thinking conduces to:

- better identification of the strategic priorities through critical verification and validation¹ of the binding and the planned regulations, practices, and strategies. It is possible through a constant diagnosis of the present situation and flexible systemic actions aiming to create the desirable reality (not only the short one, but in particular the sustained one) in the future, etc.;
- not only the acceptance of the changes, but also their conscious creation and proper management to achieve the strategic objectives. It results from the increased sensibility of the management and the personnel of the organization to the chances, challenges, barriers, relations and trends, which are present in micro-, meso-, and macroenvironment. Strategic thinking contribute to the creation of the conditions conducive to the innovativeness of the involved personnel who is characterized by a high level of readiness to the quick changes of the operation directions;
- focusing on the development of possibly most effective methods in the area of managing the limited resources of an enterprise, not only presently, but also in the future;
- the development of an organization and its duration through a long period due to proper risk management, and the development of the ability to envisage and visualize the cause and effect relationships (referring to the influence of the changes on the company position at present, and also in the future).

In order to determine whether the management systems integration in the context of strategic thinking occurs, in the enterprises implementing organizational ecoinnovations, 43 representatives of the management for the EMS, from the enterprises

¹ Verification should be understood as checking the authenticity, usefulness, or correctness (of sth), whereas, validation denotes all the activities aiming to scrutinize the adequacy, rightness or accuracy of sth.

in Podkarpackie voivodeship, which possessed valid certified EMS according to the ISO 14001 standard (purposive sampling, complete inquiries) were surveyed. As a result of the conducted direct in-depth interviews, it was concluded that the enterprises represented the following economic sectors: manufacturing (60,47%), construction (13,95%), electricity, gas, steam and air conditioning supply (11,63%), transportation and storage (4,65%), mining and quarrying (4,65%), wholesale and retail trade; repair of motor vehicles and motorcycles (2,33%), professional, scientific and technical activities (2,33%). 74,4% of the investigated enterprises operated in the country and abroad [4].

2. Environmental Management System and different management systems functioning in the examined enterprises

Referring to the fact that system management bases on the management of the processes proceeding in an organization, one should be aware that management evolution is strictly connected with constant improvement of the processes. There is still much to be done in this area if the enterprises investigated by the author want to achieve their strategic objectives. If EMS is “stuck” to the present management system in a company, there is a great risk of its negligence, and underestimation of the related problems (e.g. compared to the issues connected with the fulfillment of the requirements resulting from ISO 9001 standard). In this case lack of strategic thinking is clearly visible, and its features were characterized in the previous part of the paper. The research conducted by S. Enzler [2] depict that, despite the fact that 50,9% of the respondents possessed the integrated databases, processed and products planning is realized fundamentally separately – hence, they should not be considered really integrated systems.

In the case of the investigated enterprises from Podkarpacie Region, one should not even talk about integrated databases. Only 30,2% of the questioned stated that in their case, there is a functioning integrated management system. It integrates most frequently the issues of quality, environment and OSH. Referring to the other examined, it can be concluded that the majority of the management personnel from companies that possess certified EMS, do not think strategically, which will influence the effectiveness of the existing side-by side (frequently within the conflict of interests) decentralized and uncoordinated management systems.

In the context of analyzing the results of the personal research, it is interesting that 58,1% of the questioned from Podkarpacie Region [3] declared the simultaneous implementation of more than one management system.

Management systems integration is crucial from the viewpoint of strategic management. Properly conducted integration brings various benefits. The representatives of the investigated enterprises emphasized the following merits:

- system improvement, enabling more effective analysis of the business processes,
- better adjustment of the products and services to the clients' needs,
- improvement in the process of communication (especially in the speed of information flow),
- new quality in reference to data cohesion, which is crucial in the context of increasing the availability of up-to-date, reliable managing and controlling information, essential to the support of making strategic decisions as a consequence of the adopted vision.

The conclusion of the conducted research is as follows: in the vast majority of the entities, management systems function "side by side", frequently simply competing with each other for resources. This classic example of lacking the systemic approach to management in an organization, explains not only the conditions for many problems identified with the implementation of the solutions proposed in various standards, but also indicates the fundamental cause of low efficiency of implemented solutions. Lack of strategic thinking is clearly visible here. The problems emergence in the context of the absence of understanding the significance of a properly realized management system.

93% of the enterprises from Podkarpackie voivodeship, which possessed certified EMS, declared that they have Quality Management Systems (QMS) introduced on the basis of ISO 9001 standard. In this group nearly 23,3% of the questioned subjected themselves to additional certification, aiming to achieve an objective proof for the implementation of the requirements included in ISO/TS 16949 standard. This standard is dedicated to automotive industry and regards the usage of the advanced solutions in mass, and spare parts production. ISO/TS 16949 standard was created to eliminate multiple certification for the fulfilment of similar requirements of the companies operating in the supply chain for the automotive industry. It harmonized American (QS-9000), German (VDA6.1),

French (EAQF), and Italian (AVSQ) standards concerning systemic formation of the qualitative requirements in automotive branch, within the global automotive industry. In the literature it is stated that the condition for the implementation of ISO/TS 16949 standard is the prior certification of the Quality Management System ISO 9001, which is not always followed in practice. If a company fulfils the requirements of ISO/TS 16949 standard, it is obvious that it also fulfils the requirements of ISO 9001.

Alongside the EMS, in 35% of the questioned, functioned the system of managing occupational safety and health according to the requirements of OHSAS 18001 and/or PN-N-18001. One should bear in mind that PN-N-18001:2004 standard is the Polish, not the ISO standard. Owing to large divergence within the requirements of the regulations that determine the OSH issues in particular countries, successful solutions enclosed in one supranational standard have not been yet formulated.

Moreover, 32,6% of the respondents possessing valid, certified EMS, consistent with the requirements of ISO 14001 standard, proved that they have other systems implemented. Most frequent were:

- Internal Control System (ICS) according to PN-N-19001:2006 standard regarding trade turnover of strategic importance,
- AQAP types of systems (*Allied Quality Assurance Publication* are a complement of the series ISO 9000 standards for entities operating in the area of the countries that are the members of NATO),
- HACCP system based on ISO 22000 standard,
- system of certification of new special processes, among others, in the aviation industry *National Aerospace and Defense Contractors Accreditation Program* [6]. (In Podkarpacie Region there is a vigorously functioning *Aviation Valley Cluster*.)

Internal Control System determines the regulations of the international trade of goods, technologies and services of strategic significance for the state security, and also for the maintenance of international peace and safety, it determines the regulations of controlling and recording this trade, and the responsibility for trade of goods, technologies and services non-compliant with the regulations". According to Polish legal regulations, enterprises and military factories, which trade in products of strategic

significance with other countries, should obtain ICS certificate. It has to be stressed that it is an extension of the quality management system according to ISO 9001 standard [9]. “AQAP standardizing documents regulate the quality policy directed to full responsibility of each involved party, for the quality of a product, and which are obliged to supply safe, reliable and material-saving products for the needs of the army. They do not determine requirements for the production and the process. Being in possession of an AQAP certificate is required in enterprises to manufacture goods or provide services within the process of *Government Quality Assurance – GQA*” [8], [9], [10].

Generally speaking HACCP (*Hazard Analysis and Critical Control Point*) is a system, which has to be implemented obligatorily in all companies of the food sector since Poland acceded to the European Union. With this system there are partially connected activities within the confines of GMP (*Good Manufacturing Practice*).

Amidst the questioned (possessing valid, certified in compliance with the ISO 14001 EMS standard) 4,7% of the respondents were characterized by the application of solutions resulting from Good Manufacturing Practice. Owing to this practice, the production of food, and materials and articles destined for the contact with food, proceeds in a way ensuring safety of food, appropriately to its purpose.

Analyzing the adduced data, it is clearly visible that formal EMS functions most frequently in the vicinity of professional systems, systems required by law, or systems implemented voluntarily, however, enforced by specific requirements of international recipients/clients in the supply chain. To a group of the enterprises important is the so-called “paper”, i.e. a certificate confirming the implementation/functioning of particular systems, not the actual systems integration reflected in the desired results. In some entities one can clearly observe the deficit of knowledge concerning process management and the significance of management systems integration. It arouses suspicion that in a part of the investigated companies, there is lack of strategic thinking. It can result in e.g. the risk of losing reputation, lack of innovative solutions, cost intensity, the rise of bureaucracy and employees’ dissatisfaction with controversial usage of the resources, or accumulation of the disturbances in the communication process. Top management, as a result of such cursory activities, misses many opportunities to achieve valuable, compatible, up-to-date information necessary in the decisive process.

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THE OIL-MACROECONOMY RELATIONSHIP IN THE CZECH REPUBLIC

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Key words:

Oil – GDP – causality – Czech Republic

Abstract:

This article examines the influence of oil prices on the GDP in the various model and data specifications. The goal is to identify whether the oil prices exhibit significant influence on the selected macroeconomic indicators. Data show that oil prices are significant in the relation to the GDP growth. The differences between the various asymmetric or nonlinear oil price measures are not very profound. Furthermore, the data specification appears to be an important factor. Interannual data provide more stable estimation results and better explain the variance in the GDP growth than interperiod data. The oil-GDP relationship is mostly unidirectional from oil to GDP.

Introduction

The aim of this article is to investigate whether the oil (i.e. crude petroleum) price movements represent an important explanatory variable if estimated in the system with the main economic indicators (namely the inflation and GDP growth) in the Czech Republic, during the period 1996:01-2012:03.

The relationship between the development of energy prices and GDP is a topic that emerged in the economic spotlight and in the economic literature after the oil crises in the 1970s and 1980s.

In the literature it is common to find the expectation that high energy prices reduce the economic activity. Energy prices should therefore show negative relationship with economic activity and growth. This relationship should be especially observable in the case of oil (crude petroleum), being an input for many further activities not only in the energy industry, but also a commodity with no or very few substitutes in the transportation or the petrochemical industry (e.g. in the production of plastics, oils or

lubricants). The theory speaks for the argument that the increase of the price of widely used input with practically no options of substitution would be sooner or later reflected in the consumer prices and inflation. The seminal paper by Hamilton (1983), found such a significant and negative relationship between the oil price movements and the GDP growth for data of the United States. Some authors stress the distinction between the price increases and price decreases, proposing the expectation of the asymmetrical relationship. The first discussion of the asymmetry was provided by Mork (1989), arguing that while a positive price increase has negative effects on the economic growth, the downward price movements do not lead to faster GDP growth.

On the other hand, economic activities are the source of the derived demand for energy and energy commodities. The setback in economic activity would lead to lower derived demand and consequently to lower prices. Furthermore, there have been arguments related to the possible structural changes after the oil-crisis period. See e.g. Lee et al. (1995) or Hooker (1996), observing the relationship losing its statistical significance for the US data following the 1980s onwards. Hamilton (1996) further defended the theory by introducing one of the today's leading nonlinear measures, the so called net oil price increase (NOPI). The NOPI represents whether and by how much the price has risen compared to several previous time periods. Hamilton (1996) showed that the non-significant estimates with linear specification gain statistical significance with non-linear measure of NOPI. Even though it is possible that the instability of the estimated relationships is the consequence of the model's linearity misspecification (as discussed e.g. by Hamilton, 2003), several other factors may play a role. Such factors can be structural changes and policy changes, monetary policy reactions (advocated e.g. by Bernanke et al., 1997), endogeneity of the prices with only weak instruments, the chance of only marginal effect of the prices (see e.g. Rotemberg and Woodford, 1996) or the complexity of the channels by which the oil prices affect the economy.

Hence the answer on the impact of the increase or decrease in oil price is not as clear cut. E.g. Cuñado and Pérez de Gracia (2003) show the causality is not universal in all countries. Some studies, like Du, He and Wei (2010) even show somewhat surprising results, like the positive effect of an oil price increase on Chinese economic activity, even though the China is net oil importer with large share of energy intensive industrial sector. Multitude of the possible interactions and economy impacts is one of the reasons

why the research in this area is still thriving even decades after the first investigations have taken place.

1. Data and Methodology

The data source for most of the data was OECD Statistics (OECD.Stat Extracts), namely for the seasonally adjusted real GDP growth rate, observed both to previous period and to the same period of the previous year, the percentage change in the consumer price index (CPI), the percentage change in the domestic producer prices in manufacturing. (PPI) and seasonally adjusted index of the narrow money M1 (with the value of the year 2005=100). Data for the crude oil price comes from the World Bank Commodity Price Data (a.k.a. the Pink Sheet) and is in the current prices in USD per a barrel of crude petroleum.

The non-stationarity has been tested using the well established Augmented Dickey-Fuller (with optimal lag selection based on the Schwarz information criterion) and Phillips-Perron tests (with Bartlett kernel and Newey-West automatic bandwidth selection) for the individual series. Furthermore, recent development in the panel unit root testing indicates the joint test for multiple series may have higher power compared to performing a separate unit root test for each individual time series. While essentially designed for panel data environment (usually with the assumption of cross-section independence), this test can be viewed as an extension of ADF test to pooled multiple time series. The results of the Levin-Lin-Chu joint test therefore have also been implemented for all the models considered. Detailed test results are available on request from the author.

Given the aim of this article, the most substantial relationship to be examined is that between the GDP growth and oil price. While it would be interesting to also test the cointegration between the variables in levels, the current data availability restricts this analysis to VAR specification.

The selection of the additional endogenous variables (other than GDP) was carried out with the assumption that the narrow money aggregate (M1) would reflect a monetary policy reactions of the central bank and that CPI and PPI represent the inflation (either on the economy-wide consumer level (CPI), or more narrowly for the industrial

production, with the expectations of higher oil price sensitivity of the industrial manufacturers).

At least some of the data might exhibit non-stationarity in levels. To obtain stationary representations of the VAR systems (and due to limited availability of all the data in levels), the variables have been differenced (where appropriate) to obtain I(0) series. If there are levels of the variable presented, they are in natural logs, unless stated otherwise.

The estimation of unrestricted vector autoregression models are carried out in the common form, with p lags and M endogenous variables:

$$\begin{pmatrix} \Delta GDP_t \\ \Delta M1_t \\ \Delta CPI(or \Delta PPI)_t \\ \Delta OIL_t \end{pmatrix} = \begin{pmatrix} \alpha_1 \\ \alpha_2 \\ \alpha_3 \\ \alpha_4 \end{pmatrix} + \sum_{i=1}^p \begin{pmatrix} \phi_{1,1+M*(i-1)} & \phi_{1,2+M*(i-1)} & \phi_{1,3+M*(i-1)} & \phi_{1,4+M*(i-1)} \\ \phi_{2,1+M*(i-1)} & \phi_{2,2+M*(i-1)} & \phi_{2,3+M*(i-1)} & \phi_{2,4+M*(i-1)} \\ \phi_{3,1+M*(i-1)} & \phi_{3,2+M*(i-1)} & \phi_{3,3+M*(i-1)} & \phi_{3,4+M*(i-1)} \\ \phi_{4,1+M*(i-1)} & \phi_{4,2+M*(i-1)} & \phi_{4,3+M*(i-1)} & \phi_{4,4+M*(i-1)} \end{pmatrix} \begin{pmatrix} \Delta GDP_{t-i} \\ \Delta M1_{t-i} \\ \Delta CPI(or \Delta PPI)_{t-i} \\ \Delta OIL_{t-i} \end{pmatrix} + \begin{pmatrix} \varepsilon_{1,t} \\ \varepsilon_{2,t} \\ \varepsilon_{3,t} \\ \varepsilon_{4,t} \end{pmatrix}$$

Or in shorter notation (where P_t represents a vector of endogenous variables in time t , $\vec{\alpha}$ represents the vector of intercepts, Γ_i are $M \times M$ matrices, and $\vec{\varepsilon}_t$ is a M -dimensional vector of white noise terms):

$$\Delta \vec{P}_t = \vec{\alpha} + \sum_{i=1}^p \Gamma_i \Delta \vec{P}_{t-i} + \vec{\varepsilon}_t.$$

Several model specifications will be presented. The models differ mainly in the oil price measure employed. The models are further varied by replacing the CPI with PPI (denoted by A in the model name). The main specifications are therefore:

linear specification, without the oil prices (base model 0)

linear specification with the growth rate of oil price (Δoil) (model 1)

asymmetric linear specification (as advocated in Mork, 1989) (model 2)

non-linear asymmetric specification with the growth rate of oil price (Δoil) and Hamilton's (1996) NOPI (model 3);

Given the limited space of the article, a number of coefficients, tests and figures are omitted from presentation and are available on request from the author. All presented tables and figures are my own.

2. Results

The results of the formal block exogeneity tests (using the Wald test by restricting all the p lagged coefficients respective to the given variable) can be found below.

TAB 1: **Granger causality test results (significant at 10% level); oil-GDP relationships printed in bold**

	<i>Interperiod data</i>	<i>GDP equation adj. R- squared</i>	<i>Interannual data</i>	<i>GDP equation adj. R- squared</i>
Model0	CPI↔M1	0.455499	–	0.857850
Model1	CPI↔M1 OIL↔GDP	0.502264	OIL→GDP	0.873062
Model2	CPI↔M1 OIL↔GDP OILPLUS→OIL M1→OILPLUS CPI→OILPLUS	0.483266	OIL→GDP	0.875401
Model3	CPI↔M1 OIL↔GDP	0.497765	OIL→GDP CPI→OIL	0.874405
Model0A	PPI→GDP GDP→M1	0.493339	GDP→M1 PPI→M1	0.845960
Model1A	OIL↔GDP PPI→M1	0.504097	OIL→GDP GDP→M1 PPI→M1 OIL↔M1	0.863060
Model2A	GDP→M1 PPI→M1 GDP→OIL OILPLUS→OIL	0.485266	OIL→GDP PPI→M1 OIL↔M1 M1→OILPLUS	0.866044
Model3A	OIL↔GDP PPI→M1 NOPI_OIL→PPI	0.497388	OIL→GDP PPI→M1 OIL↔M1 M1→NOPI_OIL8 OIL→NOPI_OIL8	0.866040

Source: Author's calculations

The results yield several points worth mentioning. The interannual data provide better fit and generally speaking, exhibit more causal relationships. The causal relationships, especially regarding the GDP→M1 and CPI/PPI→M1 (which appear significant in almost all interannual specifications), also seem to be more stable across various

representations compared to interperiod results. Different specifications usually vary more in the way other endogenous variables interact with each other rather than with oil. The inflationary influence of oil and/or monetary policy effect of oil is found only in handful of specifications.

Nevertheless, the oil measures have proven significant in the relationship with GDP, even though the additional explanatory power of the oil is not very high (which indicates a similarity with the remarks of Rotemberg and Woodford (1996) on the relatively marginal effects of oil). The inclusion of oil or oil product price measure have proven to be jointly significant in the main examined relationship, i.e. with the GDP in most cases and provide better fit. This speaks against the criticism of the oil-GDP relationship (at least for the case of the Czech Republic) and for the Czech Republic the oil should not be overlooked in the macroeconomic policy.

However, it makes a difference whether we use PPI or CPI measures. While we can observe a bidirectional feedback interaction between the M1 and the CPI measures, the situations is different if PPI is used. In such case, the reactions of the central bank (in M1 changes) or GDP growth rate can be attributed to the unidirectional influence from the narrower, industry-oriented producer prices (PPI). CPI therefore seems to be more prone to being affected by M1 changes rather than PPI. This holds especially for the interperiod data.

Conclusion

The estimation results show several important findings. The probably most important one is that oil price changes represent significant explanatory factor (even though the additional explanatory power of the various oil measures is not very high), regardless of the model specification. This speaks against the criticism of the oil-GDP relationship (at least for the case of the Czech Republic).

While the various oil specifications provide slightly different results, the actual oil specification does not seem to be greatly influential for the direct GDP effects as long as it is present (in some form). The presumed inflationary influence of oil or direct monetary policy effect of oil is found only in handful of specifications (but can be often found in interannual specifications employing PPI). In general, the narrower, industry-

oriented producer prices (PPI) exhibit the unidirectional influence on the M1, while CPI measure usually represents bidirectional causality with M1.

Furthermore, it seems the interannual data provide more stable estimation results, and are also able to provide somewhat better understanding of the underlying behavior with more causal relationships.

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ENTREPRENEURSHIP VERSUS EMPLOYMENT CONTRACT – PILOT BASIC RESEARCH ON CONDITIONS FOR BUSINESS IN THE CZECH REPUBLIC

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Key words:

SME – Self-Employed Person – entrepreneur – business – business environment

Abstract:

This paper reviews a questionnaire survey focused on small entrepreneurs in the Czech Republic. The main objective was to analyze systematically the reasons why entrepreneurs choose this form of self-employment often connected with business activities of small scale. The survey covered 271 respondents doing business mainly in the form of the enterprise of an individual, i.e. a Self-Employed Person, with a different time length of doing business and a different branch specialization.

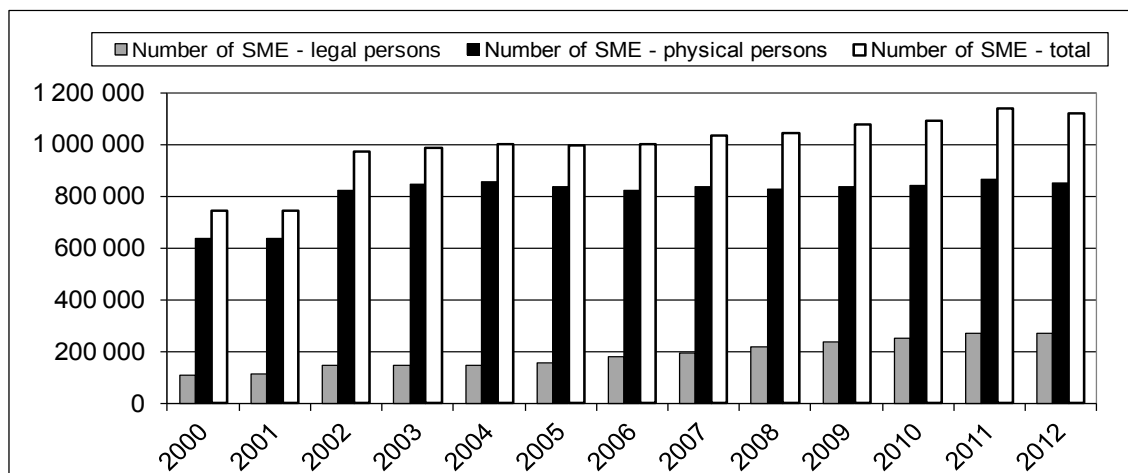
Introduction

Social and economic benefits of small and medium-sized enterprises are perceived as significant not only in the Czech economy but also at European and global level [4]. SMEs provide citizens - entrepreneurs with opportunities to use their potential freely, to achieve independent self-realization in their productive age [5]. In their own small businesses people learn to be responsible and to survive because any mistake might mean their own loss and fall. Small entrepreneurs themselves, who represent the local capital, local ownership relations and whose economic effects from business also stay in this region or country, create significant employment [4]. The sector of small and medium-sized enterprises often absorbs labour force released by big businesses and that is why the development and support of SMEs in regions becomes a considerable bearer of jobs [2].

As it is implied in the Report on the small and medium-sized enterprise and its support in 2012 published by the Ministry of Industry in 2012, 59.43% of the total number of

employees were employed by SMEs [3]. According to the data of Czech Statistical Office [1] totally 1,124 thousand of legal entities and physical persons showed their business activities till the end of 2012 in the Czech Republic. 1,122.5 thousand out this number represented small and medium-sized enterprises .

FIG. 1: Development of number of active small and medium-sized enterprise subjects in the Czech Republic in 2000 - 2012



Source: [1, 3], own processing

More than 75% of small and medium-sized enterprises has the legal form of physical persons, so called Self-employed Persons and 25% accounts for the other legal forms, most often Limited Liability Companies, alternatively General Commercial Partnerships or Limited Partnerships. This trend can be changed significantly in connection with the New Civil Code valid from 1st January 2014 as it will be possible to set up the very legal form of a small and medium-sized enterprise called Limited Liability Company without a mandatory basic deposit.

The above stated connections made the authors of this article look into the causes and detect reasons that are important for entrepreneurs while making their choice and subsequently deciding to employ themselves or opt for the employment contract instead of doing business. The decision of becoming an entrepreneur brings various business risks, financial risks, employment law, insolvency and other risks. In return an entrepreneur should be rewarded not only financially – higher profit (incomes) than in the employment contract but also receive non-financial rewards. Applying increased

creativity, ability to innovate and change things, realization of a certain idea and implementing a business plan, simply the fulfilment of personal prerequisites for a successful businessman.

The very success is then evaluated very subjectively by the entrepreneur. On one side the real quantitative value of profit or earnings is taken into account, on the other side there is the subjective feeling of satisfaction, such as flexibility, independence and self-realization.

1. Methodology and the procedure of survey evaluation

The survey was carried out by 3rd year students of the professional subject of Small business in May – June 2013. A unified questionnaire was filled in by the students themselves together with entrepreneurs. The students were instructed by the authors of the questionnaire in the content of individual questions, which was supposed to guarantee not only their high rate of return but also the completeness of the answered questions. The choice of respondents was determined by the students themselves who either approached the entrepreneurs from their surroundings or entirely unknown businessmen with the intention to identify the firm, the entrepreneur and his/her motivation as well as the determination to start a business.

The assessment and comparison of answers from two questionnaires enabled them to understand the decision of the businessman and the meaning of his/her choice between earning income from doing a job based on employment relations – employment contract or running their own business.

The questionnaires were collected from 271 respondents in total. They do business mainly in the form of an individual enterprise, i.e. Self-Employed Person, with a different time length (duration) of doing business and a different branch specialization. In particular there were 171 Self-Employed person respondents, 95 respondents doing business in the form of Limited Liability Company, 1 General Commercial Partnership, 1 Co-operative, 2 Joint Stock Companies and 1 Public-benefit Corporation. As far as the duration of conducting business is concerned 49 respondents have been doing business for less than 5 years, 24 respondents 5 – 10 years, 100 respondents belong to the category of 11 – 15 years of doing business, 53 respondents to the category of 16 – 20 years, 42 respondents have been doing business for 21 – 23 years, i.e. they started

doing business between years 1990 – 1992. Only 3 respondents did not fill in this category.

2. Entrepreneurship versus employment contract

While assessing the option of entrepreneurship and employment contract it was necessary to identify whether doing business is the main form of earning a living. Entrepreneurs answered the question of whether doing business is the main form of earning a living or if it is just a form of extra income.

TAB. 1: Overview of the number of respondents with the main form of income earned from entrepreneurship according to the duration of business activity

Duration of business activity	Main income from business activity	Business activity is just a form of extra income	Maternity leave	Retired person
up to 5 years	35	14	1	
5 – 1 years	22	2		
11 – 15 years	93	7	1	3
16 – 20 years	47	6		1
21 – 23 years	37	5		6
Total	234	34	2	10

Source: Own processing

It is evident from the table that the majority, i.e. 87% of entrepreneurs–respondents earn their main income from doing business. Moreover $\frac{3}{4}$ of the interviewed have been in business for more than 5 years. It can be assumed that the answers are related to how business satisfies entrepreneurs and in what they are relevant to create a real judgement about whether the business was a good option in entrepreneurs' lives within our sample of respondents.

Groups of questions:

1. Does the business bring enough money to me?
2. Is my income higher than that I would have as an employee?
3. Does the business give me more time flexibility?
4. As an entrepreneur am I self-contained and independent?
5. Can I achieve self–realization thanks to the business?

6. Is the business our family tradition?
7. Would I change the business for an employment contract?
8. I have no other choice.

In this part of the questionnaire orientated to the option of entrepreneurship or an employment contract the respondents were supposed to answer the question whether the business activity gives them satisfaction. Considering the results in Tab. n. 2. we can say that the majority of the entrepreneurs (80%) would not change their business activity for an employment contract, i.e. 215 respondents out of 268. If we assess the same fact in the category of entrepreneurs running their business for more than 5 years, 182 out of 219 (83%) would not change their status.

TAB. 2: Overview of the number of respondents according to the duration of business activity and criteria that they consider satisfying in business, i.e. „yes“ was used in the answers

Duration of business activity	Q .n. 1.	Q .n. 2.	Q .n. 3.	Q .n. 4.	Q .n. 5.	Q .n. 6.	Q .n. 7.	Q .n. 8.
up to 5 years	17	19	37	39	37	6	33	14
5 – 10 years	20	22	26	24	26	3	25	4
11 – 15 years	67	76	85	90	86	23	82	16
16 – 20 years	30	32	38	46	44	8	41	16
21 – 23 years	29	31	37	36	35	10	34	15
Total	163	180	223	235	228	50	215	65

Source: own processing

As far as the component answers are concerned we can say that more than a half of the entrepreneurs–respondents earn enough money from their business. 163 out of 268 interviewed businessmen gave a positive answer, i.e. 60.8%. Again, if we exclude the answers of those entrepreneurs with the duration of their business activity up to 5 years, 146 positive answers to question 1 are left there out of 219, i.e. 66.7%. 67% of respondents (180 out of 268) have a higher income from their business than they would have as employees. The same question for the entrepreneurs-respondents doing their business for more than 5 years (161 out of 219) indicates again that 73.5%, i.e. almost $\frac{3}{4}$ have the earnings from their business higher than they would have as employees. Time flexibility is assessed as an advantage by 83% of respondents (223 out of 268)

and by 85% of respondents (186 out of 219) doing their business for more than 5 years. Self-reliance and independence are considered as an advantage by 87.6% of respondents (235 out of 268) and even by 89.5% (196 out of 219) of those doing their business for more than 5 years. Self-realization seems to be equally important. It is seen as an advantage by 85% of respondents (228 out of 268) and by 87% of respondents (191 out of 219) who have been in business for more than 5 years. Question n. 6 was to find out how a family tradition can influence the decision about a business activity. Just under 1/5 of respondents is influenced by a family tradition in doing business (50 out of 268) and 20% (44 out of 219) of those doing their business for more than 5 years are influenced by the same factor. Answering question n. 8 24% (65 out of 268) of respondents determined their business activity as the only option and the source of income and 23% (51 out of 219) of those doing business for more than 5 years gave the same answer. For other respondents—entrepreneurs doing business is not the only option for their income and they do business „purely voluntarily“. There could be a question whether doing business due to a family tradition binds the entrepreneurs and does not create opportunities for free choice. Only 7 respondents doing business because of a family tradition answered that they have no other choice than entrepreneurship.

3. Entrepreneurship as future

The question of seeing entrepreneurs' business activity as their future is determinant for assessing success or failure of the entrepreneurs. By this they assess their decision to start the business, the success rate of their activity and give the answer to others who are doubtful about doing business. The following questions 'I see my future in doing business because:

- 9. independence and freedom help me develop;
- 10. independence and freedom suit me well;
- 11. independence and freedom suit me well but at the same time they decrease my performance as I cannot manage my time;
- 12. independence and freedom do not suit me;
- 13. doing business is a temporary matter for me, '

led the authors to the following conclusions as the Tab. n. 3 implies.

The option of doing business and seeing their future in it was chosen by almost 84% of respondents—entrepreneurs who see the possibility of their own development in independence and freedom connected with doing business. It is self—development that is the symbol of future for the entrepreneurs.

TAB. 3: Overview of respondent number and their positive reaction to their own future

Number of respondents	Yes answers given by				
	Q .n. 9.	Q. n. 10	Q. n. 11	Q. n. 12	Q. n. 13
271 interviewed	227	257	42	10	19
219 doing business for more than 5 years	184	209	34	9	17

Source: Own processing

95% of respondents—entrepreneurs assess independence and freedom connected with doing business as a condition that suits them perfectly well. This is also a very strong signal for those who are considering doing business but they are not able to make a decision.

Conclusion

Entrepreneurship is a long-term activity and most of entrepreneurs are well aware of this fact. Yet, whatever reason for doing business they had, most respondents—entrepreneurs in our survey are satisfied with their choice. Earnings played an important role in deciding whether to be an employee or an independent entrepreneur. This quantitative factor measurable via profit or income of an entrepreneur is mostly assessed as satisfactory. 60% of respondents—entrepreneurs mainly physical persons managing small businesses perceive their earnings as a sufficient income and 67% of respondents—entrepreneurs perceive their business income as even higher than they could earn as employees. Much more fundamental factors are the unquantifiable ones. Time flexibility, self—reliance, independence, self—realization and the desire to accomplish something are mostly the reasons for a positive evaluation of the entrepreneurial activity by the respondents of the questionnaire survey. Despite other circumstances, especially when they evaluate a business environment and express the opinion that entrepreneurship in the Czech Republic is not favourable for small

entrepreneurs, they see the future in their decision to do business. It is a positive conclusion considering a significant society-wide, economic and social importance of small and medium-sized businesses, although the authors realize that the sample of respondents–entrepreneurs is too small for generalization.

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COMPARISON OF THE MULTICRITERIA DECISION MAKING AND CLUSTER ANALYSIS IN RCBS MARKET

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Key words:

multicriteria decision making – bank – client – account

Abstract:

The paper is focused on retail core banking services in the Czech Republic. The fees for a bank account are one of the highest in the European Union and banks have non-transparent tariffs. There exists various projects, which are focused on comparison of costs of bank accounts – one of them is Calculator. Its purpose is to compare banking fees for different accounts based on demanded services and price. There is a client decision based on the multicriteria decision making. The weights are set using three different methods – Metffesel's allocation, method of order and pair-wise comparison. The weights are applied on basic clusters - the active client, average client and the passive client. For all these clusters the utility function is computed. The aim of this paper is the comparison of results of multicriteria decision making with cluster analysis.

1. Current situation on the banking market

Following table shows that by 31st of December 2012 there were 43 banks in the Czech Republic. The largest increase in entities was in 2009 - 2011, when a total of eight new entities were established. In 2012, on the other hand, one entity ceased to exist.

The three youngest bank in the Czech market, Equa Bank, Zuno Bank and Air Bank, which gradually entered the market in 2011, according to the survey implemented by Pravo newspaper, in January 2013 gained nearly 200,000 clients and deposits worth tens of billions Czech crowns. Their representatives reveal that they manage to gradually shift clients from larger, established banks. Together with other low-cost financial

institutions mBank and Fio bank, which had already entered market in 2007, or 2010, the banking newcomers have about 860,000 clients. [2]

TAB. 1: Number of banks by ownership (data as of the given date)

	2010	2011	2012	2013
Banks, total, as of	39	41	44	43
of which under conservatorship	0	0	0	0
Entities established in given period	3	2	3	0
Entities that ceased to exist in given period	1	0	0	1
Number of banks by ownership				
Czech-controlled banks - total	7	8	8	8
State-owned banks	2	2	2	2
Czech-controlled banks	5	6	6	6
Foreign-controlled banks - total	32	33	36	35
Foreign-controlled banks	14	14	15	15
Foreign bank branches	18	19	21	20
Banks under conservatorship	0	0	0	0

Source: [1]

There is therefore an outflow of clients primarily in the 4 largest banks in the Czech Republic: ČSOB, Česká spořitelna, Komerční banka and GE Money Bank. This trend is mainly due to the high fees for the services and products of individual banks. In the newly formed smaller banks, clients often have a free account. Czechs also have a thorough knowledge of modern IT resources to manage their accounts from anywhere and it is easy for them to change bank. Most banks also signed the Code of clients mobility that makes it for clients much easier to transfer to another bank. A client does not have to sort out anything with the old bank and the agenda is executed for them by workers from the new bank, including payment orders transfer, cards processing, etc. Other reasons to go to a new bank are transparent bank account, some banks offer higher interest of a simple account (e.g. Air bank gives bonus interest at the rate of 1.80 % p.a. for a simple account up to CZK 100,000 as well as for a savings account. [3]). New banks also invested heavily in advertising campaigns where they try to get clients by the benefits offered.

Although Czechs have saved over 80 billion crowns in the five new banks, from the whole market's point of view it is still a relatively small number. According to the

statistics of the Czech Banking Association, residents and businesses in the Czech Republic have more than three trillion CZK in deposits. [2]

For easier orientation in the market for banking products, several servers involved in the comparison of individual banks or companies current offers have been created. The examples of data obtained from the bank charges Calculator are available at URL: <http://www.bankovnipoplatky.com/kalkulator.html> the multicriteria decision making will be performed.

The bank charges Calculator [4] is used to compare actual monthly costs for each bank account in the Czech Republic banking market, according to the specified needs of the clients. A client can also obtain an overview of whether a new bank offers all the services required. A respondent can choose between two versions of questionnaires: a full version or a simplified version, which is suitable more for clients who do not use premium services and products. The methodology of the questionnaire is described in the paper.

Since 2010 the bank charges Calculator has so far been used by 81,417 respondents. By January 2013 the bank charges Calculator contains data for 15 banks operating in the local market and 52 different bank accounts which they offer. The authors have received all the data from [9], from which they carry out analyses. Cluster analysis necessary for multicriteria decision making is carried out in articles [5], [6] and [7].

2. Multicriteria decision making

Another way to solve the problem of the the Retail Core Banking Services Market is application of multicriteria decision making. Criteria will be described in articles [5], [6] and [7]. Three ways, how to use weights of these properties will be described in the following part.

2.1 Criteria description

In this multicriteria decision making will be used the same main 21 criteria as in previous chapters; all of these criteria are quantitative criteria.

The important condition is independence of all these criteria. This condition was proved using correlation matrices (all pair correlations are zero or close to zero) and therefore independence of all used criteria is assumed.

2.2 Three ways how to set criteria weights

In this chapter will be described three ways of the determination of the weights of criteria. At first Metfessel's allocation method, in which statistical data and histograms for all criteria were used, will be described. The second way, how to set the weights, is the method of order. The third method used in this paper will be the method of pair-wise comparisons (Fullers method), possible extension is usage of quantitative pair-wise comparison. All these methods will be described and compared in following chapters, at the will be described table with standardized weights for all these methods.

2.3 Metfessel's allocation method

The first way, how to set weights of criteria, is the Metfessel's allocation method. In this method statistical data and histograms for all criteria will be used. Histograms of all values and their frequency help us to determine the weights.

The weights have to be obviously standardized:

$$v_j \geq 0, j = 1, \dots, m, \sum_{j=1}^m v_j = 1$$

2.4 Method of order

The second way, how to set the weights, is method of order. Criteria have to be listed in order from most important to least important. We assume K criteria, the most important will be rated K and the least important 1.

The standardized weights will be set as follows:

$$v_i = \frac{b_i}{\sum_{i=1}^k b_i}$$

where b_i are weights of criteria before standardization.

2.5 Method of pair-wise comparisons

The third method, used in this paper, is method of pair-wise comparisons, also called Fullers method. In this method have to be constructed Fullers triangle and all criteria will be compared in pairs. Of each pair have to be selected the criterion, which is most important. The standardization is based on all comparisons; all weights have to be divided by this number of all comparisons.

The weights of the criteria for all three methods are described in following table 2:

TAB. 2: Weights of criteria by three described methods

criterion	weight 1	weight 2	weight 3
Domestic ATM withdrawal, own bank	0.12	0.091	0.091
Domestic ATM withdrawal, foreign bank	0.12	0.091	0.087
Abroad ATM withdrawal, own bank	0.02	0.035	0.035
Abroad ATM withdrawal, foreign bank	0.03	0.056	0.056
Incoming payment from foreign bank	0.10	0.082	0.082
Incoming payment from own bank	0.10	0.082	0.078
Direct payments to own bank at desk	0.02	0.035	0.030
Direct payments to own bank Internet	0.07	0.074	0.069
Direct payments to foreign bank at desk	0.02	0.035	0.026
Direct payments to foreign bank Internet	0.07	0.074	0.074
Standing orders to own bank at desk	0.02	0.035	0.022
Standing orders to own bank Internet	0.07	0.074	0.065
Standing orders to foreign bank at desk	0.02	0.035	0.017
Standing orders to foreign bank Internet	0.07	0.074	0.061
Encashment to own bank at desk	0.01	0.013	0.013
Encashment to own bank Internet	0.03	0.056	0.048
Encashment to foreign bank at desk	0.01	0.013	0.009
Encashment to foreign bank Internet	0.03	0.056	0.052
Cash deposit at desk	0.03	0.056	0.039
Cash withdrawal at desk	0.03	0.056	0.043
Cash back	0.01	0.013	0.004

Source: own research

2.6 Results for all methods for the mean client

In this chapter results for the average client using the statistic data will be described (average value of all data for all criteria was computed).

Overall evaluation of variant will be computed as follows:

$$u(x) = \sum_{j=1}^m v_j u_j(x)$$

where v_j are standardized weights of criteria and $u_j(x)$ are evaluations of partial objectives (in this case this value is an average value in criterion). This evaluation is related to one variant.

We get overall evaluation of variant for three computed weights of criteria.

For Metfessel's allocation method is overall evaluation of variant computed as follows:

$$u(x) = 0,12 * 2,61 + 0,12 * 0,76 + 0,02 * 0,16 + 0,03 * 0,16 + 0,10 * 2,16 + 0,10 * 1,13 + 0,02 * 0,17 + 0,07 * 1,67 + 0,02 * 0,21 + 0,07 * 2,82 + 0,02 * 0,17 + 0,07 * 0,97 + 0,02 * 0,30 + 0,07 * 2,03 + 0,01 * 0,09 + 0,03 * 0,40 + 0,01 * 0,14 + 0,03 * 0,89 + 0,03 * 0,44 + 0,03 * 0,26 + 0,01 * 0,15 = 1,346$$

For method of order is overall evaluation of variant computed as follows:

$$u(x) = 0,091 * 2,61 + 0,091 * 0,76 + 0,035 * 0,16 + 0,056 * 0,16 + 0,082 * 2,16 + 0,082 * 1,13 + 0,035 * 0,17 + 0,074 * 1,67 + 0,035 * 0,21 + 0,074 * 2,82 + 0,035 * 0,17 + 0,074 * 0,97 + 0,035 * 0,30 + 0,074 * 2,03 + 0,013 * 0,09 + 0,056 * 0,40 + 0,013 * 0,14 + 0,056 * 0,89 + 0,056 * 0,44 + 0,056 * 0,26 + 0,013 * 0,15 = 1,291$$

For method of pair-wise comparisons is overall evaluation of variant computed as follows:

$$u(x) = 0,091 * 2,61 + 0,087 * 0,76 + 0,035 * 0,16 + 0,056 * 0,16 + 0,082 * 2,16 + 0,078 * 1,13 + 0,030 * 0,17 + 0,069 * 1,67 + 0,026 * 0,21 + 0,074 * 2,82 + 0,022 * 0,17 + 0,065 * 0,97 + 0,017 * 0,30 + 0,061 * 2,03 + 0,013 * 0,09 + 0,048 * 0,40 + 0,009 * 0,14 + 0,052 * 0,89 + 0,039 * 0,44 + 0,043 * 0,26 + 0,004 * 0,15 = 1,210$$

For all these methods are computed results very similar, there are not significant differences between all used methods. So we can see that weights of all criteria were set correctly by all used methods.

Conclusion

The real capital power of new banks is still relatively small, but they have increased competition and brought exciting innovations to the market. "A fundamental change in the structure of the banking market did not occur, anyway the emergence of new banks is beneficial for a client, it pushes the innovations and quality of services," as stated by the former Governor of the CNB and current consultant of KPMG company Zdeněk Tůma for Právo newspapers. [2]

The multicriteria decision making was used in the second part of the article. At first the standardized weights of criteria were computed by using three different methods and then the multicriteria decision making was applied on the mean client. All of these methods yield similar results, so we can say that weights of all criteria were set correctly.

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EVALUATION OF CURRENT STATE AND IMPORTANCE OF SMALL AND MEDIUM-SIZED ENTERPRISES IN THE REGIONS OF THE SLOVAK REPUBLIC

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Key words:

small and medium-sized enterprises – region – national economy

Abstract:

Small and medium-sized enterprises (SMEs) constitute the dynamic part of our national economy. SMEs are specific by high flexibility, innovativeness and they also provide a high development potential of regions. They are irreplaceable for regional development as well as for the development and growth of the national economy. The aim of this paper is to evaluate the importance of small and medium-sized enterprises and numerous representation of the various forms of enterprises (categorized by size) in the regions of Slovakia.

Introduction

Private enterprise in small and medium-sized (SMEs) enterprises is specific, in our conditions, mainly by its flexibility and the possibilities of faster adjusting to turbulent conditions of the market environment in comparison with the big companies. This is the reason of the increase of the importance of small and medium companies in Slovakia, as well as in the other countries of the European Union.

Private enterprise in small and medium-sized enterprises is characteristic by a transparent organizational structure; it allows the realization of direct management and flow of information without a significant impact of negative aspects. Small and medium companies have a significant potential in national economies, where they fulfil several important functions (for example social, economic, export-import function, etc.). The

significance of these companies is, however, present not only on the national levels, but also on the supranational level.

1. Current state and importance of small and medium-sized enterprises in European Union

A specific feature of small and medium-sized enterprises is, apart from others, also the fact that they are much more closely related to the region, and they copy and often reflect in their activities the local particularities, and they are related to the area (from economic, social and other points of view) in which they conduct their business activities. Apart from the fact, that the company is localized in the particular region, its activity participates on the improvement of regional employment, and it means also non-economical benefits for the region, such as for example social benefits in the form of supporting charitable projects, cultural events, etc.

Within the national economies, small and medium-sized enterprises fulfil a number of important functions [3]. Small and medium-sized enterprises are an integral part of the business environment in every country [4], [5], [6], [8] and others. Within the structure of all companies, small and medium-sized enterprises are the majority. In Europe, more than 20 million of small and medium-sized enterprises are active, which is more than 99% of all companies in the European Union, as it is explained in the table 1 in more detail.

TAB. 1: Number of companies, the employed people and gross added value in the companies EU-27 (according to their size classification)

	Size categories of enterprises					
	Micro	Small	Medium	SMEs (total)	Large	Total
Enterprises						
Number of enterprises	19 143 521	1 357 533	226 573	20 727 627	43 654	20 771 281
In %	92.2	6.5	1.1	99.8	0.2	100.0
Employment						
Number of employees	38 395 819	26 771 287	22 310 205	87 477 311	42 318 854	129 796 165
In %	29.6	20.6	17.2	67.4	32.6	100.0
Gross value added						
in mil. eur	1 307 361	1 143 936	1 136 244	3 587 540	2 591 732	6 179 271
In %	21.2	18.5	18.4	57.1	41.9	100.0

Source: [2] European portal for the young entrepreneurs

2. Current state and importance of small and medium-sized enterprises in regions of the Slovak republic

It is not typical for small and medium businesses to be owned by foreign subjects. The companies of this type usually represent local capital, local ownership conditions, and from this point of view, they are irreplaceable both for national economies and the particular regions. The number of SMEs in Slovakia is currently more than 555 thousand. The complex structure is complemented by big companies, and currently almost 600 of them are being registered, as it is stated in the table 2.

TAB. 2: Distribution of business entrepreneurs and business companies in the regions of the Slovak Republic in 2011

Region	Entrepreneurs - physical persons			Enterprises			SMEs	Total
	free-lancers (self-employed)	Liberal professions	Self-employed farmers	Small (0-49)	Medium-sized (50-249)	Large (250 and over)		
Bratislavský	56 581	4 006	466	53 474	729	188	115 256	115 444
Trnavský	40 222	1 639	876	13 877	276	57	56 890	56 947
Trenčiansky	42 153	1 818	267	12 016	311	76	56 565	56 641
Nitriansky	46 120	2 365	1 451	15 037	358	54	65 331	65 385
Žilinský	58 612	1 919	1 011	13 676	317	64	75 535	75 599
Banskobystrický	39 656	2 163	1 342	12 982	251	46	56 394	56 440
Prešovský	55 132	2 382	1 030	13 879	257	56	72 680	72 736
Košický	37 246	2 777	1 091	15 581	262	57	56 957	57 014
Total	375 722	19 069	7 534	150 522	2 761	598	555 608	556 206

Source: [7] NADSME, 2012, Report on the conditions of small and medium business entrepreneurship in the Slovak Republic in 2011.

The majority of the companies are localized in Bratislava, Žilina and Prešov self-government regions – within the complex structure as well as in the category of small and medium companies. When assessing the percentage of the representation of small and medium-sized enterprises in the regions of Slovakia, the Bratislava region can be undoubtedly described as the region with the highest representation of small and medium-sized enterprises, whether based on the frequency of the occurrence of the localized companies - since more than one third of all small and medium-sized

enterprises are located in the Bratislava region - or from the point of view of the number of small and medium business, as Bratislava region is at the first place among all the regions in Slovakia. There are no significant differences in the number of small and medium-sized enterprises among other regions in the Slovak Republic. The highest number of free-lancers – physical persons – is currently registered in Žilina, Bratislava and Prešov regions. In Nitra region, there are currently the majority of the registered self-employed workers in agriculture.

Small and medium-sized enterprises represent in Slovakia a strong economical and developmental potential, and the state itself, as well as the European Union, are aware that the field of support of small and medium-sized entrepreneurship is currently one of the key questions of further development of our economy.

Currently, the most dynamic development can be seen, from the quantitative point of view, in the micro-companies, that means in the companies with a smaller number of employees (0-9 persons). Micro-companies, small and medium businesses can be regarded as the main power of national economies, as well as of the economy of the European Union, since they create favourable conditions for increasing employment, for the conducting of innovative processes, but they also create a beneficial social environment in the region. Their flexibility predetermines them to become not only a stabilizing, but also stimulating regional factor, even today, during the times of increasing pressures of competition and the world economic crisis. Because of these reasons, it is necessary to support the business entrepreneurship in small and medium businesses, whether financially, through mediation or through informative-advisory streaming of their further development.

Conclusion

One of the key factors of further dynamic development of small and medium-sized enterprises are the innovations and the implementation of the innovation processes. Any idea, the realization of which would bring the improved quality of products offered by small and medium business companies, improves the competition position of the company on the market. And achieving the competition advantage, or a good market position, or expanding to new markets is one of the basic aims of small and medium businesses. Increasing the ability to compete is, however, determined by the constant

need for the innovation. Using innovations and innovative processes determines not only the ability of a company to succeed in the competition, since it further determines the overall ability of competition of the region and it participates in the building of the competition ability of the whole country, but also the development of information and communication technologies, which became the determining element in the development of the countries. An important role in the implementation of innovations and information – communication technologies is played exactly by small and medium business companies, which set the direction and the speed of the development of economy. Innovations are the ways which bring new values to the companies, and the ecological innovations and the innovations in the environmental field are regarded to be very important innovations, which should be generated exactly by small and medium-sized enterprises. Presently, since the economic crisis has influenced all the fields of the economic life, it is not possible to think of the building of sustainable society without accepting and creating ecological innovations. And it is exactly in this field where small and medium-sized enterprises can become the most significant agents of the development of the society, stimulating not only economic, but also social development of regions and national economies.

Acknowledgements:

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DOES THE YIELD CURVE PREDICT FUTURE ECONOMIC ACTIVITY? THE CASE OF EU-28 AND USA

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Key words:

yield curve – spread – GDP – slope – economic activity prediction

Abstract:

In this paper the ability of the yield curve to predict GDP activity was examined in countries of EU-28 and United States of America. The dataset contains the spread between 10-year and 3-month sovereign bonds and real GDP of the countries between the years 2000 and 2013. The results showed that the prediction ability of the GDP growth or decrease was proven after year 2008 (the financial crisis) in Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Ireland, Luxembourg, Malta, Slovakia, Sweden and United Kingdom. These findings can be beneficial for investors and provide further evidence of the potential usefulness of the yield curve spreads as indicators of the future economic activity.

Introduction

The yield curve – specifically the spread between long term and short term interest rates is a valuable forecasting tool. It is simple to use and significantly outperforms other financial and macroeconomic indicators in predicting recessions two to six quarters ahead. The yield curve simply plots the yield of the bond against its time to maturity. Many market observers carefully track the yield curve's shape, which is typically upward sloping and convex. However when the yield curve becomes flat or slopes downward (the spread between 10-year and 3-month bond is negative) it may signal GDP decrease (recession).

This paper builds on a wide range of previous researches, but differs in some ways. [2] in their paper showed empirically on eight countries that the slope of the yield curve is a good predictor of the real economic activity. [1] examined 12 euro-area countries over the period of 1970-1998 and found that the term spread contains only limited information about future output growth. Their work is based on the previous theoretical researches of [6]. There was proven the evidence that the slope of the yield curve and the future GDP activity are related together. However it is necessary to say that this rule was true until the end of 20th century and it mostly disappeared at the beginning of 21st century and appeared again during the financial crisis (from 2008) and later on [5], [7] [4]. Most of the studies are focused on the relationship of the yield curve and GDP activity of United States of America.

The aim of this paper is to show if the yield spread possesses the predictive power of future economic activity in the countries of EU-28 and USA and to examine if this rule was weakened at the beginning of 21st century and appeared again during and after the financial crisis. Despite various researches, there is not any comprehensive theory that would prove the correlation between the yield spread and economic development of the country yet.

Almost perfect tool containing the relevant future data provides the yield spread of government bonds. The simplest interpretation of the yield spread is through monetary policy of the country. Based on this criterion - relatively low spread reflects the restrictive and tight monetary policy and vice versa - high spread reflects loose monetary policy. Based on the study of [3] spread has the greatest ability in predicting one-year horizon (four quarters ahead).

1. Methodology and data

A yield curve may be flat, up-sloping, down-sloping or humped. The standard solution uses a spread (difference between two rates). The problem is to choose the spread between the right terms. The most used spread is between 10-year and 3-month bonds. The problem is that there are rarely bonds which mature exactly in 10 years (or 3 months). In that case the best solution is to use the yield curve, which shows us the yield of each maturity.

The yield curves are constructed by Bloomberg, therefore the data for spreads were gained from Bloomberg. For the spread was chosen 10-year state bond rate minus 3-month state bond rate. The data used are on quarterly basis for the spreads because the data for the economic activity are taken on quarterly basis as well. The data for real GDP can be found at Eurostat, OECD statistics or Bloomberg. The selected countries are countries of EU-28 and USA – unfortunately data for Cyprus, Estonia, Latvia, Lithuania, Croatia and Romania were not found and the countries had to be excluded from the sample. The dataset for Malta contains only information of the period 1Q2007 – 3Q2016.

There is no previous research which would prove or reject the hypothesis of real GDP and bond spread dependence in Europe after the year 2000. As a measure of real growth four-quarter percent change in real GDP was used (thus the percent change of the quarter against the last year's same quarter was calculated, e.g. the change from 1Q2004 and 1Q2003 real GDP was used). The sample period starts from 1Q2000 and ends on 3Q2013. The basic model is designed to predict real GDP growth/decrease four quarters into the future based on the current yield spread.

This was accomplished by running of a series of regressions using real GDP activity and the spread between 10-year and 3-month bond yields lagged four quarters (e.g. the interest rate spread used for 3Q2001 is actually from 3Q2000). The last step is to find out if there is the change of behaviour of the spreads and GDP activity at the beginning of 21st century and after the year 2008. To generate the GDP predictions the regression using the whole sample was run, and later on two divided samples of real GDP and spreads of each selected country (the sample is divided in 4Q2007/1Q2008, because this year was the previous year of financial crisis and should show some changes in prediction of the yield curve spread) were run. The program software used for regression (ordinary least squares) was Gretl.

The following equation was estimated for each country:

$$Real\ GDP_{t+4} = \alpha + \beta * spread_t \quad (1)$$

Where:

$Real\ GDP_{t+4}$ is a prediction of the future real GDP in time $t+4$

$spread_t$ is spread between 10-year and 3-month state bonds in time t

2. Results

2.1 Results of regression for countries of EU-28 and USA – whole sample

The whole sample of dataset contains the real GDP from 1Q2000 to 2Q2013. A regression of the whole sample was run.

However it is necessary to say that we cannot contribute this model statistically significant for most of the countries (except of Finland, Greece, Malta and Sweden) because of very poor R^2 and very high p-value. Thus this model cannot be used as predictive model. It might be because of the different behaviour of the spread and GDP before and after the year 2008. This hypothesis will be tested later on.

2.2 Results of regression for countries of EU-28 and USA – divided samples

The research continued as follows – the whole sample was divided into two samples. The first one is from 1Q2000 to 4Q2007, the second one is from 1Q2008 to 2Q2013 in order to show if there is any dependency between the variables before or after the financial crisis. Regressions of the first sample and the second sample were run. The results for the period of 1Q2008 – 2Q2013 (second sample) are in TAB 1.

It is clearly visible, that the dividing of sample made a great difference in results. In the first period (2000 – 2007) only model for Greece, Bulgaria and USA were statistically significant and their p-value were below 1% and R^2 could explain more than 20 % of the sample. All the other models could not be used as predictive models because of their statistical insignificance (high p-values and low R^2).

TAB. 1: The results of all countries and sample of period 1Q2008 – 2Q2013

1Q08 – 3Q13	Constant	Spread	P – value (F –test)	R ²
Austria	-0,013113	1,23138	0,0005	0,443143
Belgium	-0,013606	0,745672	0,0317	0,201443
Czech Republic	-0,032186	1,30475	0,0014	0,516792
Denmark	-0,037617	2,17386	0,0008	0,439343
Finland	-0,041128	2,49529	0,0004	0,468630
France	-0,023337	1,16734	0,0008	0,420832
Germany	-0,033154	2,24637	0,0017	0,381225
Greece	-0,011570	-0,266766	0,0212	0,238074
Hungary	-0,006215	1,90879	0,0031	0,475489
Ireland	-0,037931	0,628057	0,0006	0,451275
Italy	-0,032885	0,657684	0,0852	0,134461
Luxembourg	0,000723	4,05401	0,0300	0,214314
Malta	-0,011342	1,24317	0,0470	0,201600
Netherlands	-0,011032	0,408083	0,4032	0,033503
Poland	0,051624	0,507359	0,1742	0,134957
Portugal	-0,018092	0,216830	0,3864	0,035918
Slovakia	-0,058657	3,496214	0,00006	0,694698
Slovenia	-0,022284	0,713097	0,2789	0,058326
Spain	-0,012979	0,102593	0,6894	0,007759
Sweden	-0,028987	2,95430	4,75e-07	0,726575
United Kingdom	-0,038164	1,61841	0,0160	0,246341
Bulgaria	-0,000876	0,498732	0,2683	0,058001
United States	-0,004990	0,632910	0,1475	0,097211

Source: Bloomberg, OECD statistics, Eurostat, author's calculations in Gretl

The second period (2008 – 2013) showed big difference. Models for Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Luxembourg, Malta, Slovakia, Sweden and United Kingdom can be used for future real GDP prediction.

The models for Austria, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Slovakia and Sweden have very low p-values (under 1%) and high R². The models are therefore usable for future prediction of GDP.

For example we can say that:

$$\text{Real GDP}_{\text{Austria } t+4} = -0,013113 + 1,23138 * \text{spread}_{\text{Austria } t}$$

If there would be a change of 1% up in the spread of Austria then the GDP would increase about 1,22% (-0,013113+1,23138*1%).

The findings of [5] were confirmed in Austria, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Slovakia and Sweden. The models should predict the future GDP well after 2008.

Conclusion

Does the yield curve accurately predict the real economic growth? Answering this seemingly simple question requires a surprising amount of preliminary work. The 10-year, 3-month spread has substantial predictive power and should provide good forecast of real growth four quarters into the future. Nevertheless from 2000 to 2008 the predictive power of the yield curve was lowered in all the countries except of Greece, Bulgaria and United States of America. The results presented above confirm that 10-year, 3-month yield spread has significant predictive power for real GDP growth after the year 2008 in Austria, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Slovakia and Sweden. This paper confirms the previous work of [5], who says there was a break in the time of financial crisis and the hypothesis that future growth of GDP can be explained by spread of bonds did not work properly at the beginning of 21st century, however it started to work after 2008 again. It also proves that this spread model works even in the countries of European Union after year 2000, as the previous researches were done only before the year 2000.

The simple yield curve growth forecast should not serve as a replacement for the predictions of companies, who deal with predicting of many economic indicators, it however does provide enough information to serve as a useful check on the more sophisticated forecasts.

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THE USE OF THE METHOD BALANCED SCORECARD

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Key words:

company – Balanced Scorecard – strategy – management tools

Abstract:

The article is dedicated to the use of strategic management system, *Balanced Scorecard*, developed by R. Kaplan and D. Norton in 1992. Formulation of the strategy and vision of the company in business plan has become necessary parts in today's competitive environment, but highly more important is the implementation of the strategy through the whole company. The implementation of the strategy can be achieved by the use of Balanced Scorecard. In the article is analyzed the use of Balanced Scorecard in the world compared to the use of the tool in Slovak's companies.

Introduction

Strategic management has become important part of companies in today's dynamic and competitive environment. Strategic management consists of three separate processes which are interconnected together and influence each other. These processes are – strategic planning, strategic implementation and strategic control. Researches in companies showed that the most important and the most underestimated part is strategic implementation.

Implementation of the strategy is a part of strategic management which success is conditioned by managers, employees, their organization, as well as by the transformation of company's culture. The main task of implementation of the strategy is to bring the strategy into the life as a part of everyday decision making process of the company. Strategic implementation was firstly introduced on scientific conference held on the University in Pittsburg in 1978.

Based on the literature review we can define factors which required the most attention while implementing the strategy, these factors are: *acceptance of the strategy by employees and implementers of the strategy, effective communication and coordination of company's activities.*

Management system that implements company's strategy can benefit from several methods. Their success depends on the accuracy and appropriateness of the method for the company emphasizing its specifics. In the article is further analyzed the method Balanced Scorecard and comparison of its use in the world and in Slovak's companies.

1. Balanced Scorecard

Strategic Management System *Balanced Scorecard* was developed by Kaplan & Norton in 1992 and was firstly introduced in the journal *Harvard Business Review*. In 1996 was published the first book devoted to this issue, entitled *Balanced Scorecard: Translating Strategy Into Action*. [4, 10]

Balanced Scorecard translates mission and strategy of the company into a comprehensive set of performance indicators that provide a framework for assessing company's strategy and management system. It represents a multidimensional system that is used to define and implement organizational and management strategies at all organizational levels of the company to maximize the process of value creation. Goals and indicators of Balanced Scorecard are based on the vision and strategy of the company and follow the performance of the company from four perspectives [7, 14]:

- customer perspective,
- internal perspective,
- learning and growth perspective,
- financial perspective.

Kaplan and Norton introduced that managing, measuring and investing in the intangible assets must be part of the organization for future financial success. For each perspective organizations objectives have to be set linked in cause – and – effect relationship. Right measurable objectives in learning and growth perspective lead to improved internal processes which enhance the value proposition delivered to targeted customer and

finally the result is increased revenues and higher shareholders value. This diagram was named „strategy maps” and describes how the organization creates value. Strategy map is the visual framework for integrating the organization’s objectives in the four perspectives of the Balanced Scorecard. [5, 55]

Although there are several methods and approaches used to implement company’s strategy there are several reasons to use the Balanced Scorecard. These reasons include for example orientation towards the learning organization, highlighting the status of human resources in the company and orientation to the future. [3, 18]

2. Comparison of the use of Balanced Scorecard

Balanced Scorecard since its development has become widely used management method. Firstly it was in companies in United States and then spread to the world. Nowadays is BSC used not only in companies but also in public sector and non – profit companies.

Bain & Company makes researches of the use of management tools through the companies in the world every year since 1993. The survey from 1993 to 2013 was made in 12 371 companies and in 2013 in 1 208 companies. These companies were mostly from North America (about 38%) and EMEA¹ (about 30%), from Asia – Pacific zone (about 18%) and Latin America (about 14%). This survey shows that in the year 2012² the Balanced Scorecard is on the *sixth* place in North America, on the *first* place in EMEA, on the *seventh* place in Asia – Pacific and on *sixteenth* place in Latin America from the most used management tools. In global is Balanced Scorecard on the fifth place.

If we focus on the strategy and strategic management we can compare Balanced Scorecard with other methods situated in the table of most 10 used management tools connected with this issue. These methods are Strategic Planning and Mission and Vision Statement. Comparison of these three tools and their place is in the table 1 and in the figure 1 is shown total usage, position and overall satisfaction of the tool Balanced

¹ EMEA – Europe, Middle East and Africa

² Survey was made in 2013 but results show usage of the year 2012.

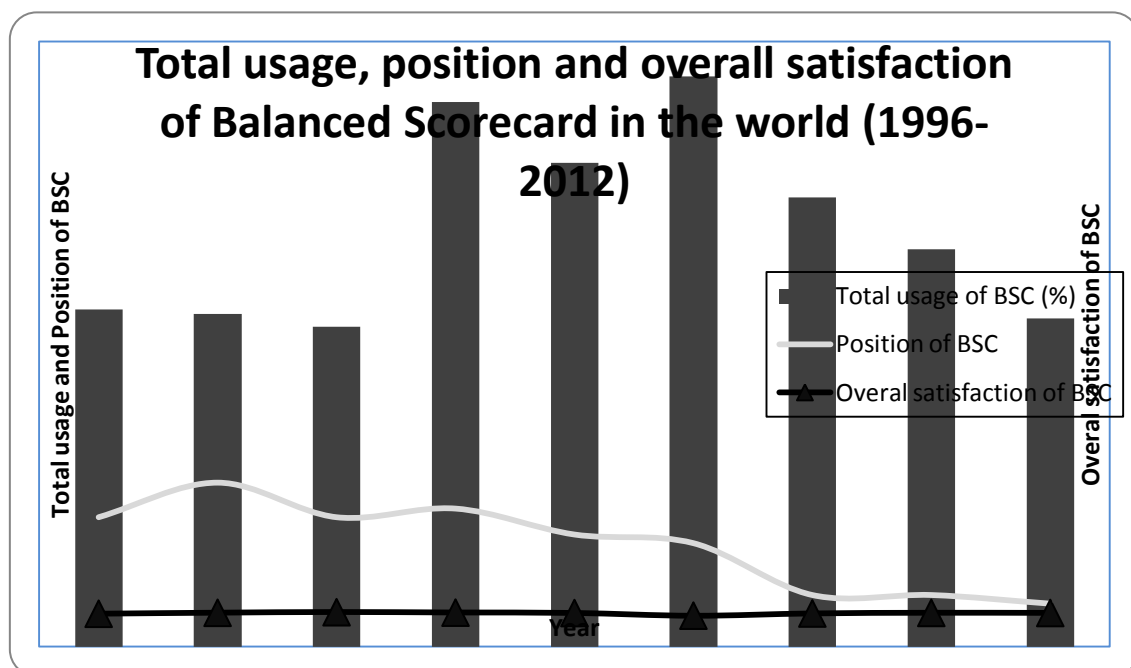
Scorecard in the world from 1996 to 2012 based on the surveys of the Bain & Company.

TAB. 1: Comparison of the three management tools related to strategy

Place of Management Tool/Year	2000	2006	2008	2010	2012
<i>Balanced Scorecard</i>	-	-	6	6	5
<i>Strategic Planning</i>	1	1	2	2	1
<i>Mission and Vision Statement</i>	2	5	3	3	10

Source: Bain & Company [2]

FIGURE 1: Total usage, position and overall satisfaction of Balanced Scorecard in the world (1996 – 2012)



Source: own processing based on the surveys of Bain & Company

From the table we can see that Strategic Planning is still one of the most important and used tool in management of the companies but on the other side another tool Mission and Vision Statement in the last comparison fall down from third place to tenth place. The use of Balanced Scorecard has risen in the last years and overall is on the fifth place, one place higher than in 2010 but until 2006 it wasn't in the top 10 Management Tools.

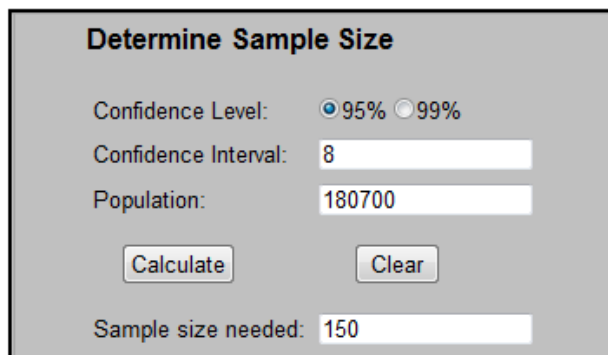
This research which is made on the companies through the whole world we can compare with the situation in Slovak's companies. In Slovakia were made few researches about Balanced Scorecard and its use. In 2010 Karabašová [6, 26] made research on the sample size of 110 companies and this research showed that only 8% of companies use Balanced Scorecard in the company. Another research in 2011 made by Bače [1, 72] on the sample size of 96 companies showed that 10% of companies use Balanced Scorecard. We can say that in Slovakia companies are slowly getting to know strategic management system and also they are trying to implement it in the company. These numbers of the use are low compare to the world but we have to say that 95% of companies are small with 19 or fewer employees and only 115 companies in Slovakia are large with more than 1000 employees. Strategic management system Balanced Scorecard is more valuable to use in medium or large companies based on the organization structure so this may be the reason why the percentage of usage is low in Slovak's companies.

Conclusion

The article summarized the use of the management tool Balanced Scorecard based on the researches made through the world's companies by the Bain & Company and this was compared to the researches made in Slovakia. Companies in Slovakia use Balanced Scorecard to measure their performance and also to implement their strategy through the four perspectives into the whole company.

This summary in the article will serve as the basis for the research of the use of Balanced Scorecard in Slovak's companies. This research will be made from the January 2014 to April 2014 by the use of questionnaire. The sample size needed is 150 companies determined by the number of companies in Slovakia – about 180 700, with the confidence level of 95% and confidence interval of 8. The determination of needed sample size is shown in figure 2.

FIGURE 2: Determination of needed sample size



Determine Sample Size

Confidence Level: ☒ 95% ☐ 99%

Confidence Interval:

Population:

Sample size needed:

Source: Sample size calculator. Available on line at: <http://www.surveysystem.com/sscalc.htm>

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PAYMENT CARDS – ON THE BORDER OF RETAIL BANKING AND MICRO ENTERPRISES

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Key words:

cashless payments – cashless turnover – micro-enterprises

Abstract:

Micro-enterprises use only basic instruments to settle their payments. More and more frequently, the micro-entrepreneurs use private accounts in settling their company payments. There are more companies which have technical capabilities to make cashless payments; however the use of these services is not becoming popular. The research was carried out using the computer aided personal interviews CAPI from July to November 2013, and it included a sample of N=600 micro-enterprises.

Introduction

It is a common opinion that Polish entrepreneurs widely prefer non-cash settlements [8]. Visa Europe estimates that the share of non-cash payments amounts to about 70 per cent in the enterprise sector, where close to 49 per cent of SME corporate payments are made using transfers in Internet banking, about 23 per cent are done with cards and about 29 per cent - in cash [7]. What is really interesting is how the issue of using payment cards is marginalized by micro-enterprises [10]. Another rather popular opinion is that micro and small enterprises use Internet banking and cards for their payments more and more often. More and more often, but it does not mean that use of company payment cards or Internet banking is widespread [2, 3].

However, owners of micro and small enterprises implement these solutions in everyday business activity relatively slowly. There are disproportions in standards and culture of using electronic payment services by companies in Poland. Micro enterprise sector is

also highly differentiated when it comes to willingness to use bank's offers, ranging from companies knowing and using a wide range of banking services to ones that know relatively little about banking products and use them to a small degree [5].

One need to ask a question then: on what scale are non-cash methods of executing payments used, such as company payment cards or orders in Internet banking or mobile banking? Another question is, what are key motivators and barriers among entrepreneurs in regard to using bank cards or Internet banking? Indices presented in this paper come from own recent research carried out in fourth quarter of 2013 on a national representative sample of micro, small and medium enterprises. The research covered micro, small and medium enterprises.

1. Usage of debit and credit cards in micro enterprise group

In 2013 in Poland there were 1,330 thousand company cards in circulation, out of which 900 thousand by Visa. In comparison to the total number of issued cards which amounted to 34.4 million at the end of second quarter of 2013 it is an insignificant number. On average, in the group of companies using company debit cards, there were 1.3 cards per a micro enterprise, 2.1 cards per a small enterprise and 4.1 cards per a medium enterprise. In case of credit cards these values amount to 1.4, 2.0 and 3.8 respectively.

Basing on the results of own recent research we can observe that in fourth quarter of 2013 60 per cent of managers/owners of micro enterprises declared that debit cards issued to the corporate account are used in their company and 17 per cent of micro entrepreneurs used credit cards actively. In comparison, in 2010 51 per cent of micro and 50 per cent of small enterprises declared using debit cards issued to the company account [5], and the share grew in three years by 9 and 5 percentage points respectively. In case of credit cards the changes have been in the opposite direction as during the last three years entrepreneurs were encouraged by the banks to give them up. In 2010 35 per cent of micro and 39 per cent of small companies used credit cards and in 2013 17 and 22 per cent respectively. In the opinion of micro enterprises credit cards are a much more advantageous solution than a normal working capital credit (used at that time by

18 per cent of micro enterprises), especially due to instant access to cash and possibility to finance current needs.

The past years undoubtedly meant recess in the development of the market of credit cards dedicated to micro and small enterprises. Micro enterprises gladly used company credit cards, noticing the advantages thereof. Change in banks' strategy and tightened criteria for credit card issue in years 2010-2013 caused a significant decrease in use of credit cards in current financing of micro enterprises' activities [4].

This phenomenon resulted from the failure to tailor bank offers to micro enterprises and from entrepreneurs' preferences in regard to finance management. Here we need to consider a micro enterprise as a both retail customer and a corporate customer of a bank. In this case three fourths of micro entrepreneurs actively use debit cards issued to their personal accounts and four in ten use company credit cards to execute payments related to company's operation as well as to the private needs of their households.

Generally, micro entrepreneurs are open to using bank cards and are mainly motivated by [5]: convenience (87 per cent), transaction security in comparison to cash transactions, control and reduction of employees' expenses (25 per cent). On the other hand, in the group of companies which do not use cards main reasons for the non-usage included no need to (62 per cent), fear of funds being stolen from the account (54 per cent) and lack of places where payments can be made in this way (46 per cent).

What is problematic in case of micro enterprises in Poland is not the questions whether to use a bank card or not but rather a question which card to use, i.e. the one issued to the corporate account or the one issued to the private account. There are several factors determining how popular it is to use debit cards issued to corporate accounts, including various external factors (binding legal regulations related to this matter, advancement of national economical development, condition of national payment infrastructure) and internal factors (organizational and legal from of the enterprise, its size, period, for which it has operated in the market, industry, motives, habits and attitudes of entrepreneurs towards financial institutions and openness to innovations). In case of

micro enterprises and some small enterprises, quite often company's finances and the company's owner's private finances are closely intertwined. Representatives of banking sector point it out, observing that the failure to delimit company's finance and household's finance are a significant obstacle for e.g. assessment of company's reliability and potential when it applies for a credit [5].

Increase in company debit cards' popularity in SME sector is supported by popularization of Internet banking. 80 per cent of SME use Internet banking. 70 per cent of respondents find it easy to use, 62 per cent think it is a modern way to conduct one's business and 53 per cent consider it a secure payment method. On the other hand, 67 per cent of MSE use company cards for payments. 50 per cent of MSE find payment cards easy to use, 47 per cent think they are a secure payment method and 46 per cent consider them a modern way to conduct one's business. Respondents perceive payment cards as more advantageous than Internet banking. 50 per cent MSE are of the opinion that payment cards facilitate differentiating corporate and household expenses, while 38 per cent think so of Internet banking [4].

Contrary to some expectations, package offers are considered optimum only by a part of corporate bank customers. It can be explained by varying advancement and need for banking services as well as by the fact that some entrepreneurs strongly want to be treated individually by banks [1]. It is commonly accepted that offers are differentiated in regard to company's revenues, in this case amounting or not to the value of 3.5 million zloty. In this light micro enterprise sector is often classified by banks as a homogenous group [9]. In fact, micro enterprise sector has its own rules, which considerably differ from the ones that apply to large, medium or even small enterprises.

2. Role of "company" bank account in popularization of payments with company cards

Numerous researches confirm that all entrepreneurs have opened a bank account. Three fourths of micro entrepreneurs having a one-man business and a half of entrepreneurs representing companies with turnovers exceeding 2 million euro annually use their private accounts for company settlements.

Keeping a bank account is imposed by Law on Economic Activity as of 19 December 1999, article 13 points 1-3 and the duty to register business transactions. The issue of keeping a bank account by companies is mentioned also in article 22 of Act of 2 July 2004 on Freedom of Economic Activity. Legal regulations do not prohibit conducting activity using a private account and this gives the entrepreneurs leeway to optimize their decisions when selecting particular functionalities of a corporate and private account. Fiscal regulations in force only oblige entrepreneurs to settle their taxes in form of a bank transfer using the account indicated prior to the revenue office. Payments related to the economic activity have to be performed or accepted via entrepreneur's bank account when: other entrepreneur is the other party involved or when a single transaction value exceeds the equivalent of 15 thousand euro.

Banking law has a different approach to the use of private account for economic activity purposes. However, as the legislators have not provided sanctions for using a private account for these purposes, many entrepreneurs use their private accounts for company's settlements for economic reasons.

However, using private bank account for professional purposes has not only advantages but also disadvantages resulting from revenues from interest and exchange rate differences being subject to taxation [6].

Considering the above, in the group of micro enterprises composed of one-man business there are three segments of entrepreneurs that become more and more fixed. The first and most numerous one consist of entrepreneurs who do not differentiate between their private and corporate settlements at all. The second one consists of entrepreneurs who keep two accounts (a company and a private one) but in one bank and the third segment includes micro entrepreneurs who keep private accounts and company accounts in different banks. Such distribution of current account usage significantly influences statistics related to using cards issued to company accounts or to other solutions related to payment execution, especially of non-cash payments. Very often finance management in micro enterprises is very similar to the management pattern in personal finance, with all positive and negative consequences thereof.

Main reasons for the existence of the abovementioned segments can be found in Visa Europe research which shows that entrepreneurs in MSE sector would use company accounts significantly more often if fees were reduced by 25 per cent (79 per cent of respondents definitely agreed and for as little as 16 per cent it would be of no importance). Similarly, about 80 per cent of respondents agreed that reduction of fees related to company payment cards would result in more frequent use of them. Offering additional benefits with the card would have similar effect, whereas the most respondents (almost 70 per cent) declared that they would use payment cards more often if they could have a part of expenses paid with the card paid back to them or would receive discounts for buying products of renowned brands.

Conclusion

Micro enterprises use only basic settlement instruments to make payments between them and their contractors. In regard to finance management and making payments, micro enterprises head in the direction of modern solutions.

However, it is a process and while the general direction of changes is advantageous in so far as it limits the role of cash in corporate payments, the very dynamics of the changes is very low. Share of payments performed with company payment cards in the total number of payments is very low.

Also steady market development and popularization of company payment cards are of key significance. In micro enterprise sector there are groups that are almost excluded or that exclude themselves not only from using company payment cards, but also from non-cash transactions. In this perspective, many barriers have to be taken down on the micro enterprises' part, barriers related to infrastructure and technology availability, as well as barriers on banks' part and directly related to the character of offers dedicated to micro enterprises. While the number of companies that are physically and technologically able to make non-cash payments including payments with company cards, increases these services have not become more widely used in the last three years.

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ANALYSIS OF METHODS FOR DERIVING PRIORITIES IN PAIRWISE COMPARISONS

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Key words:

analytic hierarchy process – optimization – goal programming

Abstract:

A crucial problem in the analytic hierarchy/network process deriving priorities form pairwise comparison matrices. The most popular methods for deriving priorities are eigenvector method proposed originally by T. Saaty, logarithmic least square method and least square method. The paper deals with other alternative approaches using goal programming methodology - one of them is based on minimization of sum of absolute or relative deviations and the other one on minimization of maximum deviation. The results of methods are compared on a set of randomly generated matrices of different sizes and consistency levels.

1. Introduction

The analytic hierarchy process (AHP) was introduced by T. Saaty in 1977 – more detailed information about it can be found e.g. in (Saaty, 1990) – and this method became one of the most popular tools for analysis of complex decision making problems. Even though the AHP was proposed many years ago it is still subject for research and applications – see e.g. (Jablonsky, 2012) or (Srdjevic, 2005). AHP organizes the decision problem as a hierarchical structure containing always several levels. The topmost level of the hierarchy defines the main goal of the decision problem and the lowest level usually describes the decision alternatives or scenarios. The levels in between can contain secondary goals, criteria and sub-criteria of the decision problem. The method itself is based on pairwise comparisons of elements on each level of hierarchy with respect to the elements of the preceding level. The comparisons are estimates of the preference between two elements of the lower level with respect to the element of the level above. They can be formed into pairwise comparison matrix $\mathbf{A} =$

$\{a_{ij} \mid a_{ji} = 1/a_{ij}, a_{ij} > 0, i, j = 1, 2, \dots, k\}$, where k is the number of elements of the lower level. Saaty (1990) proposes to use numerical scale from 1 to 9 to express preference of the decision maker, where 1 means that the i -th and the j -th element are equally important and 9 means that the i -th element is absolutely more important than the j -th element. By Saaty (1990) and later by other researches several methods for deriving priorities from pairwise comparison matrices were proposed. The aim of the paper is to compare some of them and suggest their modifications.

The paper is organized as follows. Section 2 presents a survey of most often used prioritization methods and discusses possibilities of their modifications. Section 3 contains information about computational experiments with randomly generated comparison matrices of different sizes and consistency levels. Some conclusions and directions for future research are given in the final section of the paper.

2. Prioritization methods in the AHP

Since formulation of principles of the AHP (and later ANP) several prioritization methods for deriving priorities from pairwise comparison matrices were proposed. The original Saaty's procedure computes the prioritization vector as the right eigenvector $\mathbf{w}$ belonging to the largest eigenvalue λ_{max} of the pairwise comparison matrix $\mathbf{A}$. This *eigenvector method* consists in solving the following linear problem:

$$\mathbf{A}\mathbf{w} = \lambda_{max}\mathbf{w} \quad (1)$$

The eigenvector $\mathbf{w}$ must be normalized, i.e. $\sum_{i=1}^n w_i = 1$. Due to computational problems

with solving of problem (1) some other prioritization methods were formulated by Saaty and later by other researchers. All of them are based on minimization of a metric (a deviation function) between elements of pairwise comparison matrices a_{ij} on one side and ratios of estimated priorities w_i/w_j on the other side.

Least square method (LSM) constructs the deviation function as the sum of squares of deviations between elements a_{ij} and ratios w_i/w_j , i.e. the model is as follows:

$$\text{Minimize} \quad \sum_{i=1}^n \sum_{j=1}^n \left(a_{ij} - \frac{w_i}{w_j} \right)^2 \quad (2)$$

$$\text{subject to} \quad \sum_{i=1}^n w_i = 1, \quad (3)$$

$$w_i \geq 0, i = 1, 2, \dots, n.$$

The problem (2)-(3) is a difficult non-linear problem with non unique solutions that are hardly computable. That is why the *LSM* cannot be used for practical purposes. A modification of the *LSM* is the *logarithmic least square method (LLSM)* that minimizes the objective function

$$\sum_{i=1}^n \sum_{j=1}^n \left(\ln a_{ij} - \ln \left(\frac{w_i}{w_j} \right) \right)^2 \quad (4)$$

with respect to constraints (3). The solution of the problem (3)-(4) can be simply given as the geometric mean of the elements of each row of matrix *A* that is normalized to unit sum. That is why this method (originally proposed by Saaty) is often called *geometric mean method*. Solution of this problem is identical to the eigenvector problem (1) in case the matrix **A** is fully consistent and it is close to this solution when the consistency measure is on a satisfactory level. More about measures of consistency can be found e.g. in (Saaty, 1990).

Because of computational problems with *LSM* method, its modification that minimizes the following metric was proposed

$$\sum_{i=1}^n \sum_{j=1}^n (a_{ij} w_j - v_i)^2 \quad (5)$$

The objective function (5) is not linear but it can be transformed into a system of linear equations – see e.g. (Bozoki, 2008) or (Gao et al., 2009). Let us denote this method as *modified LSM (MLSM)*:

Instead of minimization of the sum of squares it is possible to minimize the sum of positive and negative deviations or to minimize the maximum deviation. In both cases the deviations can be measured either as their absolute values or as relative deviations (in %). The optimization problem for minimization of the sum of relative deviations can be written as follows – let us denote this problem as *RSUM*:

$$\begin{aligned} &\text{Minimize} && \sum_{i=1}^n \sum_{j=1}^n \frac{d_{ij}^- + d_{ij}^+}{a_{ij}}, \\ &\text{subject to} && a_{ij} + d_{ij}^- - d_{ij}^+ = \frac{w_i}{w_j}, \quad i = 1, 2, \dots, n, j = 1, 2, \dots, n, \\ &&& \text{and constraints (3).} \end{aligned} \quad (6)$$

A solution that minimizes the maximum relative deviation can be given by solving the optimization problem – let us denote this problem as *RMAX*:

$$\begin{aligned}
&\text{Minimize} && D, \\
&\text{subject to} && a_{ij} + d_{ij}^- - d_{ij}^+ = \frac{w_i}{w_j}, \quad i = 1, 2, \dots, n, j = 1, 2, \dots, n, \\
&&& \frac{d_{ij}^- - d_{ij}^+}{a_{ij}} \leq D, \quad i = 1, 2, \dots, n, j = 1, 2, \dots, n,
\end{aligned} \tag{7}$$

and constraints (3).

Main group of constraints in both problems (6) and (7) are non-linear but their solution can be given quite simply by any non-linear solver, e.g. included in modeling and optimization system LINGO.

To avoid non-linearity in the models (6) and (7) their simplified version can be formulated and solved. The model for minimization of deviations is as follows:

$$\begin{aligned}
&\text{Minimize} && \sum_{i=1}^n \sum_{j=1}^n |a_{ij} w_j - w_i| \\
&&& \text{subject to constraints (3). The model that minimizes maximum deviation is}
\end{aligned} \tag{8}$$

$$\begin{aligned}
&\text{Minimize} && \max_{i,j} |a_{ij} w_j - w_i| \\
&&& \text{subject to constraints (3). The models (8) and (9) are not linear but it is possible to re-}
\end{aligned} \tag{9}$$

formulate them using deviational variables into linear models very easily. The solution of models (6) and (7) on one side and models (8) and (9) on the other side is identical only for consistent matrices.

Formulation of all models in this section assumes that all elements of matrix **A** are taken into account either in constraints or the objective function. Due to the reciprocal nature of the pairwise comparison matrix **A** it is questionable whether to consider all elements or the elements greater or equal 1 only, i.e. $a_{ij} \geq 1$. All the models presented in this section can be modified accordingly.

3. Computational experiments

The models for deriving priorities presented in the previous section were tested on randomly generated matrices of different sizes and different consistency levels. Due to the limited space for the paper we are going to present some results for pairwise

comparison matrices of four elements only. Consistency indices (*CI*) of generated matrices are from very small values (0.01) until values that indicate inconsistent matrices (more than 0.1; the largest value was approx. 0.2). Table 1 presents priorities derived by six methods – eigenvector method, *LLSM*, minimization of the sum of absolute and relative deviations (*ASUM* and *RSUM*) and minimization of the maximum deviation (absolute *AMAX* and relative *RMAX*) – for one of the almost consistent matrices (*CI* approx. 0.015).

TAB. 1: Results for an almost fully consistent matrix (*CI* = 0.015)

	<i>Eig.val.</i>	<i>LLSM</i>	<i>ASUM</i>	<i>RSUM</i>	<i>AMAX</i>	<i>RMAX</i>
w_1	0.5052	0.5047	0.4706	0.4706	0.4807	0.5068
w_2	0.3328	0.3322	0.3529	0.3529	0.3503	0.3245
w_3	0.1057	0.1061	0.1177	0.1177	0.1038	0.1039
w_4	0.0563	0.0570	0.0588	0.0588	0.0652	0.0648
<i>ASUM</i>	3.30	3.27	1.67	1.67	3.55	3.75
<i>RSUM</i> [%]	84.62	85.19	58.33	58.33	101.43	104.19
<i>AMAX</i>	0.97	0.87	1.00	1.00	0.63	0.99
<i>RMAX</i> [%]	24.08	24.02	33.33	33.33	31.39	21.92

Source: Own calculation

All the optimization problems are solved for elements of the generated matrix greater or equal 1 only. Each method is described in Table 1 by four characteristics: sum of absolute deviations of elements original elements a_{ij} and ratios w_i/w_j (*ASUM*), sum of relative deviations (*RSUM*), maximum absolute deviation (*AMAX*) and maximum relative deviation (*RMAX*). The results show that the original eigenvector procedure has average values of all four characteristics and is not the best in any of them. Differences in priorities are quite high regarding to low *CI* value and applying other methods than the first two can lead to quite different final results in evaluation of alternatives, scenarios, etc.

Table 2 contains the same information as Table 1 but for a matrix that is inconsistent and its *CI* slightly exceeds the recommended threshold 0.1. It is clear and understandable that all optimization criteria are much worse for matrices with higher *CI*. The derived priorities are very different for all of the methods except the first two ones.

It is quite surprising that eigenvector method and *LLSM* is worse in all four criteria than almost all other methods. Maximum difference in *LLSM* is nearly 7 and it is really extremely high value. This fact leads to question whether the standard methods are acceptable for inconsistent or nearly inconsistent matrices. This question is difficult to answer but all computational experiments show that the other methods are much better. On the other hand they are much computationally demanding and that is why their real applications depend on availability of appropriate powerful solvers.

TAB. 2: Results for an almost fully consistent matrix (CI = 0.015)

	<i>Eig.val.</i>	<i>LLSM</i>	<i>ASUM</i>	<i>RSUM</i>	<i>AMAX</i>	<i>RMAX</i>
w_1	0.5634	0.5604	0.4038	0.5526	0.4480	0.5085
w_2	0.2636	0.2721	0.4038	0.2763	0.3639	0.2832
w_3	0.1309	0.1271	0.1346	0.0921	0.1427	0.1587
w_4	0.0421	0.0404	0.0578	0.0790	0.0454	0.0496
<i>ASUM</i>	13.55	13.38	8.67	9.33	11.81	12.56
<i>RSUM</i> [%]	239.74	236.03	177.78	163.89	224.55	238.84
<i>AMAX</i>	6.37	6.87	3.67	4.83	2.86	3.26
<i>RMAX</i> [%]	90.98	98.19	66.67	80.56	58.97	46.61

Source: Own calculation

4. Conclusions

AHP (and its generalization analytic network process) belongs to one of the most popular methods for structuring and analysis of complex decision making problems. Both the methods are based on deriving priorities for the elements on each level of hierarchy by pairwise comparisons. The paper presents a survey of possible methods for deriving priorities. The standard methods as *eigenvector method* or *LLSM* are both computationally simple but they does not reach acceptable values of the optimization criteria as maximum deviation, sum of deviations, etc. The alternative procedures seem to be better with respect to all optimization criteria but they are computationally more demanding and their wider using is questionable for users without advanced background in optimization. Future research can be focused on analysis of rank reversals in case different prioritization methods are used or are combined in solving a decision problem.

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MANAGERS' EMOTIONS AS INSTRUMENTS OF DECISION-MAKING UNDER CONDITIONS OF UNCERTAINTY

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Key words:

emotions – manager – decisiveness – strategic decision – uncertainty

Abstract:

This article discusses the importance of emotions in the managerial decision making under conditions of uncertainty. Furthermore, it accounts for the role of emotions as regards the decision maker, and the way in which they should be interpreted, in order to support problem solving and increase the probability of making right decisions. It has been emphasized that developing emotional intelligence by the manager is profitable for their decisiveness. Reflections have been discussed mostly on the basis of research results concerning cognitive psychology.

Introduction

Managerial decision making is the basic process as for executing every task in an organization. Deciding is defined as a part of management, the most important ability of the manager, the main function of management, managerial role or acting identical with management. The importance of a decision increases together with the level within the management hierarchy, at which the decisions are made. Thus, strategic decisions which concern functioning of the whole organization or its key part, are defined to be of highest importance. To a large extent, strategic problems are new, complex and ambiguous (difficult to define). They are not clearly structured and require a creative approach. Information available for the manager is cross-sectional, collective (large-scale), qualitative, incomplete and imprecise. It is explicit or tacit (e.g. gossip, hearsay, weak signals), unprogrammable (e.g. derived from informal sources) and often contradictory. Information, knowledge, experience and methods that have been applied until now, do not appear to be sufficient for the decision maker, while solving problems under conditions of uncertainty. Thus, such a situation is called unmarked or vague. The

manager has difficulty in calculating probability of results of the decision-making variants in question. Furthermore, they do not know all the possibilities of solving a problem. The complexity of strategic problems is considerable, hence deciding under conditions of uncertainty causes cognitive difficulties and emotional responses among managers. Therefore, strategic decisions result both from the cognitive and emotional processes. The article discusses the latter.

The main objective of the article is to determine the way in which the manager should interpret their own emotions, in order to increase the probability of making right decisions. The main hypothesis has been formulated as follows: Manager's emotions as useful instruments of making strategic decision under conditions of uncertainty. Manager's emotional intelligence and the decisiveness should be improved through extending the knowledge in the subject matter.

1. Definition of emotion

An emotion is a subjective psychophysical state of a subject and arises as a result of interaction between different stimuli. An emotion arousing in a non-conscious way is defined as an automatic affective process. An emotion of a relatively small intensity, which is not directed to a particular object of cognition is referred to as mood; it is, therefore a general affective state dependable on external factors [7, 8]. Emotions that were already experienced are encoded in long-term memory together with the situational context in which they occurred. Re-experiencing analogical (or even slightly similar) stimuli by the subject, causes the automatic retrieval of past information on emotion that is remembered. It results in physical sensation of the affective state that is physiologically associated. This unconscious reaction of an organism often precedes the cognitive process – the conscious analysis of the situation – accelerating the subject's response. Cognitive control processes as well as automatic affective processes are considered independent on principle, which also relates to brain structures, where these two processes are carried out [6]. People are conscious of their emotions, however. They assess both their own and those of others as well as compare, categorize, and remember them. Furthermore, conscious recollection of emotions may evoke them [5]. A particular emotion is therefore an information packet, applicable to the current situation in which the manager is placed. The described mechanism has therefore

crucial importance as regards learning process and decision making. It results from the wide diversity of content, scale and the interaction strength of stimuli, which are processed on a daily basis by the manager. The decision maker behaves automatically under conditions unfavourable for reasoning, and uses cognitive schemas which proved profitable in the past. They apply these modules, when the thought process is made difficult or impossible due to: stress, time pressure, excessive information, great complexity of a problem, contradictive stimuli and other conditions causing the sensory overload.

Emotions experienced by the manager while making decisions can be considered both the risk and the profitable factor [3]. Therefore, many features of a particular emotion should be taken into account before recognizing it as an useful management tool.

2. Manager's approach to their own emotions while making a decision

Making strategic choices under conditions of uncertainty evokes many different emotions in the manager. Automatic affective processes should be considered a difficult-to-manipulate packet of useful information, thus dismissing psychosomatic signals would be a great waste. Emotions are the irrational component of management, therefore they should always be perceived as potential risk factors. Strong emotions, both positive and negative are particularly favourable to the occurrence of cognitive dysfunctions in the decision maker – namely heuristics, thought schemas, attributions, stereotypes, biases and inertias. It concerns both individual and collective way of making decisions. Nonetheless, emotions may also constitute a profitable factor for the decision maker, because they facilitate rapid, intuitive and almost effortless recognition of a decisive situation. Therefore, the decision maker should carefully observe their own emotions as well as those of others and apply the concept of mindfulness.

It is crucial to identify the emotions, namely their object that is entirely or not entirely aware. Relating an emotion to its real object enables separating the issues concerning a problem, from the rest and understanding a decisive situation in a broad context.

Emotional processes arise and remain in relation to the problematic content: interesting, new, rowdy, petrifying, wonderful – for instance incidents, conflicts, famous people etc.

(the novelty effect) and the content associated with the current object of cognition (the focusing effect) as well as often or recently analysed (the exposition effect). The decision maker is most emotionally sensitive to content, which: interacts briefly, randomly, disorderly, subliminally and is complex and interesting as well as in the situation when the decision maker's initial preferences are weak (strengthening of the exposition effect) [8]. The decision maker is least emotionally sensitive to content, which: interacts very often, orderly, long-lastingly and is simple and uninteresting (lessening of the exposition effect) [8].

Manager's emotions arise therefore and remain as a consequence of the external factors interaction – the problem and the decisive situation. If it is the decision maker, being the subject of cognition, that constitutes the content of emotions, then such emotions are also essential. Positive emotional assessment concerning “I, me, myself” of the decision maker has an impact on the improvement of their self-esteem, independence and self-sufficiency. Thus, the decision maker is self-directed (inner-directed); makes independent choices and has the sense of control over their life. Manager's positive thinking in relation to themselves themselves and the results of their work, causes the increase of self-discipline, simultaneity and resistance during the problem-solving process. The ability to regulate emotions indicates the substantial resistance. It takes place through the types and level selection of stimulation, which is optimal both for the decision maker and the tasks (needs) carried out by them. Upholding the resistance by the manager is a sign of their high emotional intelligence. Manager's emotional stability is favourable to making strategic decisions.

Manager should expertly distinguish positive (pleasant) emotions and moods from the negative ones (unpleasant). Positive emotions acknowledge the rightness of judgements in a particular situation and make the manager apt to uphold the decision or repeat it in a similar situation. Negative emotions caution against danger, encourage changes [7] and avoidance of future situations evoking them.

Decision makers expressing positive emotions, selectively direct attention to profitable information, which causes the modification of an access to the data storage, privilege of information favourable to attaining a goal, as well as ignoring or diminishing the

importance of the information on dangers [4]. Experiencing positive emotions results in the fact, that relatively little information is taken into consideration and is analysed in a cursory way. Manager's concentration on a task is weak [2], they overestimate their own cognitive capacities and their inclination towards self-criticism is slight. Conversely, the decision maker's attitude is different when they experience negative emotions. Therefore, it is considered essential for the manager to understand the impact of positive and negative emotions on the decision-making process and the choice itself. While making decisions under conditions of uncertainty, the manager can experience a state of ambivalence – emotions which are ambivalent, mixed and complex as regards content (object of feelings), valence (negative and positive feelings) and intensity (strength of stimuli interaction, namely a level of stimulation which is low or high, respectively). The ability to experience this state enables achieving the strategic objective of an organizations (fulfilling the mission) in an unconventional way, by means of: gaining high cognitive openness, metacognition, understanding the importance of the problem, increased interest in a decision problem and being engaged in solving it, an ability to deal with difficult situations (e.g. traumatic) in a relatively effective way, creative approach to the problem, as well as taking into account all the contradictory values and interests and an increase of empathy and respect for other people.

Furthermore, the manager should develop the ability to arouse sthenic emotions both in themselves as well as in others (e.g. emotions of interest, liveliness, concentration, spreading contagious enthusiasm). The emotions constitute a kind of motivational tension which raises the energy level of an organism and enables cognitive and affective activity in the decision making process. Reaching a decision under conditions of uncertainty facilitates the ability to response to stimuli of low intensity (low stimulative value), that is emotional oversensitivity. "It is better for the emotional system to be oversensitive, namely producing false signals (emotions experienced groundlessly), than to defer the reaction until it is delayed" [8]. Decision maker should always calculate the intensity of emotions, namely the level of their own arousal. Making decisions in a situation of both high (eustress or distress) and low level of stimulation has an impact on low efficacy of cognitive processes. The achievement of optimal

cognitive efficacy is possible by means of arousing the flow – a positive, rather high-intensity emotion, which can occur only under conditions of cognitive “adjustment” of the decision maker to the task, that is experiencing harmony in a perceptual field. Experiencing the flow, means that a problem (especially with the clearly determined objective) constitutes a challenge for the manager, but does not exceeds his cognitive capabilities, so that the decision maker exercises control over the decision making process [1]. Flow is an emotion, that facilitates overcoming barriers that the decision maker has encountered until now (e.g. intellectual barriers).

Conclusion

Emotions have an influence on manager’s decisions which evoke other emotions as well as determine the decision making process and accuracy of future decisions. Manager’s knowledge and mindfulness should enhance their decision-making ability. The decisiveness of the manager implies his fluency in making right decisions in various situations – notwithstanding, the subject of this article is restricted to the strategic choices under conditions of uncertainty, which from the cognitive viewpoint is the most difficult situation. Decisive manager has the ability of reaching daring decisions, feels comfortable about it and works expertly and relatively rapid. The decisiveness indicates character constancy, willingness to learn, considerable tolerance of ambiguity and high stress resistance. It is an attribute of the charismatic leader, which is also associated with following features: activity, commitment, conscientiousness and an ability to overcome the reluctance of subordinates as for changes. Furthermore, the decision-making ability is an asset derived from the manager’s personality. Moreover, it is an effect of their intellectual development, as a result of solving numerous, new and complex problems under conditions of uncertainty, namely in a situation of considerable information gap, obsolescence of information and information chaos. The ability that is being described is undoubtedly of considerable intellectual value as regards managers of the strategic management level.

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ON SELECTED LEGAL ASPECTS OF COLLECTIVE INVESTMENT IN THE LIGHT OF THE NEW ACT OF 2013

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Key words:

collective investment funds – joint stock company with variable capital – limited partnership with investment certificates – trust

Abstract:

The paper analyses selected issues from the new regulation of collective investment, valid since entry into force of the Law on Investment Companies and Investment Funds Act No. 240/2013 Coll., which replaced the former Act on Collective Investment. This new regulation has brought on the market for collective investment three new legal forms of collective investment - a joint stock company with variable capital (SICAV) a limited partnership investment Sheets and Trust Fund. The analysis is focused, among others, on the compatibility of these legal forms with the general regulation of the legal forms as ruled by the Business Corporations Act, effective from January 1, 2014.

Introduction

In August 2013 The Parliament of the Czech Republic approved a new Act on Investment Companies and Investment Funds („ZISIF” thereafter). ZISIF replaced the former Act on Collective Investment and will have a significant effect on a collective investment market in the Czech Republic.

ZISIF regulates investment funds and other entities that manage and administer investment funds or, as the case may be, that conduct other specific activities in respect of investment funds. Government issues implementing regulations setting rules on the investment policy and management techniques of investment funds that may be offered to the public and the provision of key information to investors. Complementary rules are set by decrees of the Czech National Bank. In addition, fund managers must comply

with directly applicable regulations issued by the EU Commission.¹ The complex regime for investment fund management is complemented by the 2013 Regulation of EP and EU Council on European Venture Capital Funds² and 2013 Regulation of EP and EU Council on European Social Entrepreneurship Funds³. In addition, there are a number of general guidelines of European Securities and Market Authority (ESMA) and recommendations issued by ESMA and CNB.⁴

ZISIF introduces several new items into the Czech law including the following

- New forms of investment funds: the Act allows for the existence of investment funds in forms other than a joint-stock company and a unit trust (these are the only two forms possible under the current legislation). According to the Act, investment funds will also be able to exist in the form of (i) a joint-stock company with variable capital (i.e. a SICAV); (ii) a trust; (iii) a limited liability partnership which includes a newly introduced variant of a limited liability partnership issuing investment certificates; (iv) a limited liability company; (v) *Societas Europaea*; and (vi) a co-operative.
- Division of the internal management activities of a fund: the activities of a fund's internal management will be divided between (i) an administrator who will maintain the administration of the fund (e.g. the accountancy, legal and tax issues); and (ii) a manager who will manage the portfolio and be responsible for risk management.
- More restrictive rules on the liability of a depository: the rules regarding the liability of a depository will be stricter
- A Czech National Bank's permit is not required for funds managing smaller portfolios: investment funds managing assets with a value of up to EUR 100,000,000 will not be subject to supervision by the Czech National Bank and will only be subject to a registration duty.

¹ E. g., Commission Regulation (EU) No. 447/2013, implementing the Directive of the European Parliament and of the Council No. 2011/61/EU, establishing the procedure for the AIFMs that choose to opt in under Directive 2011/61/EU

² Regulation of the European Parliament and of the Council (EU) No. 345/2013 of 17 April 2013 on European Venture Capital Funds

³ Regulation of the European Parliament and of the Council (EU) No. of 17 April 2013 on European Social Entrepreneurship Funds

⁴ Husták, Z.: New Framework for Investment Funds in the Czech Republic. Online, <http://www.bbh.cz/files/publikace/zisif-marketing-20131025-eng-final.pdf>

- New classification of qualified investor funds: qualified investor funds will no longer be classified as collective investment funds (under the current legislation qualified investor funds are a sub-category of special collective investment funds).

Innovation that might bring a slight confusion among investors is the new terminology. Whereas under the previous legislation collective investment funds were divided into investment funds and mutual funds, the new legislation divides investment funds into collective investment funds and funds of qualified investors. The collective investment funds are then further divided into standard funds and special funds.⁵

1. Aim of the paper, methodology

One of the most progressive innovations that contribute to the development of collective investment in the Czech Republic is the introduction of three new permissible legal forms of investment funds. While the former Act provided only for the use of a joint stock company and unit trust, the new Act introduced three additional legal forms inspired by experiences from other European countries. The paper brings a basic analysis of these legal forms in comparison with existing legal environment of the Czech corporative law. These changes go along with (and subject to) a substantial change of the Czech civil law brought by the new Civil Code, Act. No. 89/2012 Coll., effective from January 1, 2014

Therefore the analysis of the new legal forms for collective investment must focus on both codifications as the implementation of the corresponding part of the ZISIF started only after the new Civil Code became effective.

The consideration include also the evaluation of the scope of modifications brought along by the new rules of the Act in comparison with the fundamental features of a „classical“ joint stock company as ruled by the Business Corporations Act, Act. No 90/2013 Coll. and poses a question whether the joint-stock company with variable capital can still be subordinated under this type of business company.

⁵ Šovar, J.: What myths accompany the new legislation on the funds of qualified investors? (Jaké mýty provázejí novou právní úpravu fondů kvalifikovaných investorů?) Online <http://pravniradce.ihned.cz/c1-60126480-jake-myty-provazeji-novou-pravni-upravu-fondu-kvalifikovanych-investoru>

2. Joint-Stock Company with Variable Capital

Concept of the company, although inspired by the German open-ended collective investment scheme model, introduces a variant of an open-ended collective investment scheme that is common in entire Western Europe, known as SICAV (acronym for *société d'investissement à capital variable*).⁶ The primary aim of its introduction by the Act was to create a more attractive environment for investors in the Czech Republic. The SICAV includes some classical features of a Czech joint-stock company, mainly, the limits of a shareholder's liability. On the other side it provides new opportunities for the disposal of a company's variable capital without administrative, time and additional cost complications.

The required internal structure of a SICAV is simpler than the current structure required for a Czech joint-stock company. A SICAV does not need to establish a supervisory board. The only required corporate bodies of a SICAV will be a statutory director to manage the business of the SICAV, and an administrative committee to determine and oversee the implementation of the SICAV's management strategy.

A SICAV shall issue the following two types of shares:

- founder shares: the founders of a SICAV would primarily subscribe for founder shares. Typical shareholder rights attach to these shares, in particular, the right to attend and vote at a SICAV's general meeting.
- investment shares: the investors of a SICAV will subscribe for investment shares. The main purpose of such shares is the ability of a shareholder to request the SICAV to redeem the shares and pay the investor the redemption amount. In contrast to the owners of founder shares, owners of investment shares will not, in principle, have any influence on the administration or the business management of a SICAV.

A SICAV's share capital corresponds to its fund capital. The amount of the SICAV's share capital registered in the Czech commercial register will amount to the sum contributed by the founders for the founder shares.

⁶ SICAV is an open-ended collective investment scheme common in Western Europe, especially Luxembourg, Switzerland, Italy, Spain, Belgium, Malta, France

The SICAV's fund capital does not need to be registered in the Czech commercial register and will continually increase or decrease depending on whether investment shares are issued or redeemed.

The investment shares shall be issued for their actual value which was announced on the decisive date (determined in accordance with the SICAV's statute) and can be increased by an amount stated in the SICAV's statute. If an investor requests the redemption of the investor shares, the redemption amount shall equal the investment shares' actual value which was announced on the day of receipt of the investor's request and can be decreased by an amount stated in the SICAV's statute.

A SICAV may establish "sub-funds" which will, from an accountancy perspective, form a separate part of the SICAV's assets. The SICAV will issue investment shares in relation to each sub-fund. Each sub-fund will have its own investment strategy. The sub-funds do not have to be registered in the Czech commercial register.⁷

The main benefit should be the possibility of flexibly changing the amount of basic capital without such administrative and time demands as are required for a regular joint stock company. Thus, only "recorded" basic capital equal to the amount contributed through the subscription of founders' shares will be entered in the commercial register, while the amount of basic capital will be changed flexibly based on the subscription or buyback of participant (investment) shares to which the owner's right to request their buyback by the company is attached.

3. Trust

General legal regulation of the trust is to be found in the new Czech Civil Code, Act. No. 89/2012 Coll.(CivC) The trust is created by separation of property owned by the settlor, the management of that takes over an administrator called as trustee. The settlor defines in the Statute of the trust conditions for the administration and activities of the trust. He also determines the trustee and scope of beneficiaries to whom the trustee shall be required to provide benefits. The benefits may be distributed among the beneficiaries unequally. Any properties (money, movable or immovable property) may be allocated to the trust. An example may be the allocation of shares to the trust. Dividends on these shares will constitute income of the Trust, which shall be redistributed among the

⁷ The provisions ruling the joint stock company with variable capital are inspired by German law, while the treatment of sub-funds also reflects Luxembourg law.

beneficiaries. Another example may be is the allocation of real property where the benefits will be created by the income from the rents collected.

For the establishment of a trust, a contract (Statute) shall be drawn up. This is an important deed, to the preparation of which attention must be paid not only from the legal aspects, but also from the point of view of taxation and account- keeping. It contains basic rules on the trust - its name, scope of property when founded, purpose of the trust and identification of its beneficiaries. Of great significance is also a careful adjustment of the supervisory arrangements that shall prevent any disposal with the property against the will of the settlor. One of the supervisory arrangements can be the obligation to audit the accounts of the trust, which may the settlor rule in the Statute. The trust shall be founded at the time when the trustee accepts credentials to his administration⁸ the property of a trust must thus enjoy permanent protection and professional administration.

From the general regulation the CivC deviates the ZISIF is several issues. The trust under ZISIF can be founded only by a contract and can't be created by separation of assets of a collective investment fund. Trusts have no legal personality, they are established for a limited period of time and exclusively for the purpose of investing of the assets entrusted. Statute of the trust shall be governed by the regulations under ZISIF (not by the CivC) and as the trustee can be appointed only an investment company.

4. Partnership limited by investment certificates

For funds of corporate investments, a special regulation of a partnership limited by investment certificates under ZISIF shall be applied. The rules for the partnership limited by investment certificates make it possible, among other, to incorporate the shares of limited partners to share security, it provides also for looser conditions for limited partner leaving the company. In the event of termination of the participation of key partners it also provides a stronger protection should an enforcement order for share of the partner be issued.

Partnership limited by investment certificates is also intended only for qualified investors funds and is the most suitable form for private equity funds and venture

⁸ Bednaříková, B.: Trust Funds. Institute for the storage and transfer of family assets (Svěřenský fond. Institut pro uchování a převody rodinného majetku. Wolters Kluwer ČR, 2012.196 pp.)

capital funds. This partnership will have only one partner with unlimited liability for the debts of the company (general partner) and shares of limited partners whose liability for the debts of the company shall be limited by the investment certificates. Investment certificate is physical security to the order with limited transferability to the extent to which the transferability of limited partner share is limited in accordance with general legal regulation. Its public (stock) market trading shall be prohibited. In contrast to the Business Corporations Act as the administrator of deposits shall act only the future general partner, the contribution of whom must be equal to 2% of the total deposits of the founding limited partners. Unlike other forms of qualified investors' funds, there shall be no in-kind deposits permissible in the limited partnership.

Conclusions

Although we could find a lot of positive features attached to the new legal forms of qualified investors funds, the principal criterion for any living legal institute or legal system should be its benefits for practical implementation. A question that has to be answered by the future – mainly as regards the joint stock company with variable capital - whether it still can be subordinated under the common type according to the Business Corporations Act. The scope and width of deviations ruled by the ZISIF may lead to consequences that will force future amendments of both the ZISIF and the Business Corporation Act, creation a comprehensive regulation of the stock company with variable capital in the ZISIF only and exempting this special type from Business Corporation Act as “*lex generalis*”.

The new and modern legal framework for the investment fund business brings investors and asset managers a number of opportunities - a wide range of fund structures, providers of various types of fund services and other infrastructure elements well known to investors and asset managers from developed fund centre sectors. The implementation of the Act into a daily routine, both on the part of the CNB, as the financial market regulator, and on the part of the market participants, will need a certain time to take place. It should be, however, noted that the steps taken so far and the open communication on the part of the CNB as regards the new investment fund regime seem to give positive signals for the future.

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RELATIONSHIP BUILDING STRATEGIES: A NETWORK PERSPECTIVE

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Key words:

network orientation – network organization – network strategy – relational capabilities – strategic planning

Abstract

The emergence of new communication and information technology has a tremendous impact on the society, which is described by many authors as the network society, consisting of people, organizations, and communities linked to one another [1]. In the network society firms are operating in a system of interrelated businesses which form a network comprising of a company and its stakeholders, such as customers, suppliers, intermediaries, general public, and other influential groups. Traditional firm-centric strategies need to be complemented by the network-based strategies since increasingly competition occurs between networks replacing competition between companies. The core competencies are no longer the ones that a company owns, but rather those that a company can connect to [2]. Thus, the emphasis in the network approach should be put on the development of relational capabilities, which are crucial for cooperation and building long-term relationships with the key company's stakeholders.

1. Developmental Phases of Corporate Management

The approach to corporate management and strategy formulation process has changed considerably over the years. After World War II and during 50s and 60s, due to the occurrence of excess demand in the markets, companies concentrated primarily on achieving high production efficiency, low costs, and mass production. Corporate activities typical for this period could be characterized as product-oriented. Since customers were interested in widely available and inexpensive products, managers put their efforts into satisfying all of the existing demand and offering products at competitive prices. Corporate management was influenced by the Ansoff's school of

thought and the product/market expansion grid, a portfolio planning tool, was used to identify company's growth opportunities.

The fundamental transformation of the approach to management occurred in the 60s and 70s, which was associated with a change of the company's perspective from a seller's to a buyer's market. Instead of a product-centered philosophy, business shifted to a customer-centered orientation, which was a result of the emergence of a marketing concept. A change towards market orientation approach was caused by the excess supply of goods and saturation in the market. Managers turned their attention to the idea of satisfying the needs of customers, instead of being focused exclusively on the sellers' needs. Market segmentation and positioning started to be used as important tools necessary to customize a firm's market offering to better meet customers' needs.

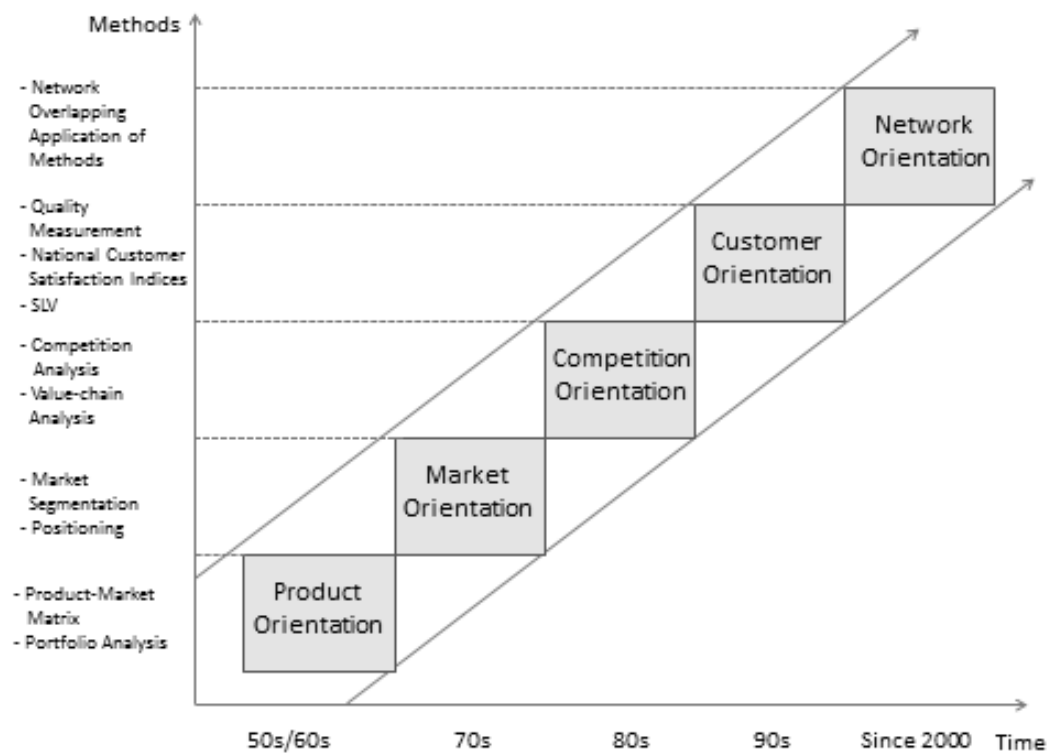
In the 80s, the expanding use of marketing activities similarly designed to meet customers' needs, made it difficult for companies to achieve their goals and desired market performance. Thus, many companies recognized the necessity of changing their approach towards competition orientation putting the emphasis on differentiation among competing products and services. New approaches for the identification of competitive advantage became popular which was reflected by the application of different analytical methods, such as competition analysis and value-chain analysis. The possibilities for creating competitive advantage included: high product and service quality, innovativeness, exclusive image, low price, leading brand management.

In the 90s, it became more and more difficult to differentiate oneself from competitors and customers increasingly expected individual attention, which resulted in a change in approach to customer orientation. This development was caused by the changes in consumer behavior associated with more sophisticated needs and expectations. New methods aiming at increasing customer satisfaction and quality of products and services became popular and companies put the emphasis on customer retention. The changes in approach resulted in application of such methods and tools as SERVQUAL used for determining quality characteristics, customer satisfaction indices, as well as calculation of customer lifetime value.

New communication and information technologies have presently a tremendous impact on corporations and their strategies. Due to growing number of interdependencies and links between companies, managers had to shift their focus to network orientation and

made all decisions in the broader context of networks. Companies must build strategic networks in order to strengthen their position and gain competitive advantage. The ability to develop and enhance the relationships with company's stakeholders plays an important role in the formulation of network-based strategies. Network approach does not necessarily require application of entirely new methodology. Companies might use existing methods like value chain analyses or controlling techniques with respect to the entire network [3].

FIG.1: Developmental Phases of Corporate Management



Source: H. Meffert, *Marketing. Grundlagen marktorientierter Unternehmensführung – Konzepte, Instrumente, Praxisbeispiele*, (9th edition), Wiesbaden: Gabler, 2000, p.5 [4].

2. Strategy Formulation Process

The process of strategic planning involves decisions made on four levels: the corporate level, division level, business unit, and product level. Corporate headquarters is responsible for designing a strategic plan which provides guidelines for the whole enterprise. A clearly defined mission statement gives information about company's goals, major policies, values, and competitive advantage. A mission statement is often based on a vision which describes a desired outcome of the company's performance in the future. Among major competitive spheres listed in the mission statement, the development of relationships with customers, employees, suppliers, and other groups of stakeholders should be highlighted as a company policy. Additionally, corporate headquarters undertake activities in other fields, including establishing strategic business units, assigning resources to each unit, and assessing growth opportunities. Strategic business units require separate strategies and appropriate funding in order to achieve performance goals. Assessing growth opportunities is a very important area of strategic management and includes planning new businesses, downsizing, or terminating old ones.

Business unit strategic planning starts with defining its specific mission within the broader company mission. Then, external and internal analysis is carried out in order to identify environmental opportunities and threats as well as business strengths and weaknesses. Once the company has performed a SWOT analysis, it can develop specific goals with respect to magnitude and time. In the network approach the goals aimed at the development of relationships with the key's company's stakeholders should be set along with financial objectives and sales and market share objectives. Whereas goals indicate what a company wants to achieve, strategy describes the plan for achieving these goals. Companies can choose among three generic competitive strategies which are aimed at winning competitive advantage: overall cost leadership, differentiation and focus. Additionally, in order to create superior customer value, many firms form alliances with other companies that complement their capabilities and resources. After deciding on pursuing the principal strategy, it is necessary to work out programs for all departments and implement them basing on the detailed timetable. As the strategy is implemented, the firm needs to track the results and assess the performance, which requires application of selected control and measurement procedures [5].

3. Developing Relationships with the Company's Stakeholders

Developing relationships with the company's stakeholders plays an important role in the formulation of network-based strategies. The importance of building and enhancing relationships with the company's stakeholders refers to the concept of relationship marketing which was introduced in the 80. Initially, the necessity of attracting, maintaining, and enhancing customer relationships was emphasized [6], and later the concept was extended and a broader view towards relationships was taken. In addition to customer markets, it was suggested to develop relationships with other markets [7]. Despite the fact that customer markets remain of prime importance of marketing activities of a company, developing relationships with other groups of stakeholders has recently gained more significance.

Marketing activities carried out by the company should be aimed at customer relationships development. First, it is necessary to understand customers' needs and then design a product which satisfies those needs. It is also important to specify quality standards as well as develop a quality information system to assess the firm's overall performance. Additionally, it is necessary to differentiate product from competitors through customization and value-added services. Long-term contracts offering price and non-price incentives strengthen the existing relationships and develop new ones. The main focus of distribution should be put on flexibility and product's availability, while promotion efforts should be directed at establishing a consistent interaction and individualized contact with customers. Relationships between the firm and its customers may take a form of loyalty programs, whereas typical communications involves highly targeted methods, such as: direct mail, e-mail, personal sales calls, and personal selling. Developing good relationships with employees is an important aspect of any company's management. It requires implementation of effective human resources policies, good communications within a company, and cooperation and involvement of all company's departments. The process of developing relationships starts with the recruitment procedure focused on hiring the right personnel. A company which has a good reputation, delivers high quality products, and offers a competitive compensation package is able to attract better employees. Training is also an important aspect of human resources management and a good way to strengthen the relationships with staff. Companies which encourage and reward employees for showing initiative and solving

customers' problems tend to have better relationships with personnel and lower turnover rates. Additionally, motivating and rewarding employees as well as implementing a clear control system enable a company to develop good relationships with employees. Besides customers and employees, there are also other important groups of stakeholders, such as suppliers, distributors, investors, local community, general public and the media. Increasingly, the emphasis is put on developing relationships with marketing partners since they play an important role in creating customer value. Good communications is crucial to good relationships, which include e-mailing, mailing, conferences, meetings, trade fairs, and others. Developing relationships with retailers, distributors, and salespeople might involve the same means of communications which are used to suppliers, however, marketing communications addressed to intermediaries is more focused on achieving sales results. Mutual trust, timely delivery and payments additionally improve relationships with marketing partners. Developing relationships with other groups of stakeholders such as investors, local community, general public, and the media involves application of various public relations techniques.

Conclusions

Today's business environment consisting of network organizations with growing number of links and interdependencies between companies changes an approach to management. The network-based nature of business has implications for strategic management, human resources management, marketing and other management areas. Traditional firm-centric strategies should be complemented by network strategies, since competition increasingly occurs between networks replacing competition between firms. Core competencies also look different from network perspective. The competencies that are important are no longer the ones a company owns, but rather the ones a company can connect to. In order to gain a competitive advantage, it is necessary to create a competitive network which requires developing relationships with customers and other groups of stakeholders.

Thus, the necessity of building long-term relationships with the company's stakeholders should be reflected in the mission statement, strategic objectives, as well as plans and programs designed for all firm's departments. Marketing strategy plays an important role in customer relationships development and all marketing tools can be used in order

to enhance those relationships. Building good relationships with employees requires application of suitable human resources policies, good communication within a company and cooperation of all company's departments. In the process of developing relationships with marketing partners, such as suppliers and marketing intermediaries, various communications techniques should be used, whereas public relations tools are the most effective in maintaining relationships with investors, local community, the media, and general publics.

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THE USE OF VALUE-AT-RISK MODELS TO ESTIMATE THE INVESTMENT RISK ON AGRICULTURAL COMMODITY MARKET

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Key words:

Value-at-Risk – agricultural commodity market

Abstract:

The aim of the paper is to verify the estimation methods of the value at risk on the agricultural commodity market in the period of the beginning of 2002 till mid-November of 2013. The conditional and unconditional Value-at-Risk (VaR) models were compared. The following models: GARCH with a skewed Student-t distribution, GARCH-EVT and GARCH-FHS enable to estimate the VaR correctly in very turbulent times on agricultural commodity markets.

Introduction

The global financial crisis influenced the increase of prices volatility on financial and commodity markets. A big decrease of financial instruments prices accompanied by an increase of commodity prices, observed in times of the crisis, aroused interest in commodity markets. Hence, a problem of an accurate estimation of a commodity investment risk became essential. A popular measure of the market risk is Value at Risk (VaR). It is a maximum investment loss (financial instrument, commodity or whole portfolio) which can be experienced in a specific time with a definite probability. Formally, VaR is defined as follows:

$$P(P_t \leq P_{t-1} - VaR) = \alpha$$

where: P_t – a value of the instrument, commodity in time t , α – tolerance definite level.

A proper choice of a correct way to assess VaR is a vital problem. Therefore, the aim of this paper is to verify VaR models on the agricultural commodity markets. VaR of

futures contracts for wheat, corn and soybean where estimated between January, 4th 2002 and November, 20th 2013 of the long and short position, and then the quality assessment of those estimations was performed.

1. Unconditional VaR models

VaR of the long position is the opposite of a quantile of the loss distribution

$$VaR_{\alpha,t+1} = -F_{r_t}^{-1}(\alpha), \quad (1)$$

where $F_{r_t}^{-1}$ is the inverse of cumulative distribution function of commodity returns, F_{r_t} .

For short position it is a $1-\alpha$ quantile of the returns distribution

$$VaR_{1-\alpha,t+1} = F_{r_t}^{-1}(1-\alpha). \quad (2)$$

In this paper VaR is determined on the basis of an empirical quantile of returns distribution – Historical Simulation (HS), quantile of: normal distribution (NORM), skewed Student-t distribution (SST) and the tail of Generalized Pareto Distribution (GPD). Returns modelling on the basis of the skewed Student-t distribution, Generalized Pareto Distribution and empirical distribution enables to include returns fat tails and the skewness.

Generalised Pareto distribution is one of two key distributions of Extreme Value Theory (EVT). Using Peaks over Threshold Model (POT) [7] one can estimate the tail of the returns distribution. A datum in this approach is a conditional distribution of peaks over thresholds (exceedances; hits; violations) of a random variable X of a certain threshold u defined as:

$$F_u(x) = P(X - u \leq x | X > u) = \frac{F(x+u) - F(u)}{1 - F(u)}, \quad (3)$$

where F is an unknown distribution of a random variable X . According to Pickands-Balkema-de Haan theorem for a large class of underlying distribution functions F , and large u , F_u is definite and is well approximated by the Generalized Pareto distribution:

$$G_{\xi,\beta}(x) = \begin{cases} 1 - (1 + \xi x / \beta)^{-1/\xi}, & \xi \neq 0 \\ 1 - \exp(-x / \beta), & \xi = 0 \end{cases}, \quad (4)$$

where: $\beta > 0, x \geq 0$ for $\xi \geq 0$ and $0 \leq x \leq -\beta / \xi$ for $\xi < 0$. This distribution only has two parameters: β – a scale parameter, ξ – a parameter responsible for the tail thickness. To estimate the probability of Pareto distribution one must choose the level

of u threshold. This choice defines the levels of assessed estimators. Combining formulas (3) and (4) results in the following form of the random variable distribution X :

$$F(x) = (1 - F(u))G_{\xi, \beta}(x)(x - u) + F(u), \quad x > u. \quad (5)$$

$F(u)$ should be replaced by an empirical estimator of $F(u) = 1 - N_u / n$, where n is a number of observations and N_u is a number of excesses u . A following estimator of F is received:

$$F(u) = 1 - \frac{N_u}{n} \left(1 + \xi \frac{(x-u)}{\beta} \right)^{-1/\xi}. \quad (6)$$

Calculating x from formula (6) a short-position VaR can be estimated:

$$VaR_{1-\alpha} = u + \frac{\beta}{\xi} \left(\left(\frac{n}{N_u} \alpha \right)^{-\xi} - 1 \right), \quad (7)$$

where α is a significance level for VaR. To calculate VaR of a long position one must carry on estimation for negative returns.

2. Conditional VaR models

The assumption made is that the commodity returns are generated by a following process:

$$r_t = \sigma_t \varepsilon_t, \quad (8)$$

where: σ_t – conditional volatility in time t , $\varepsilon_t \sim iid(0,1)$ and ε_t variable distribution is F . VaR of a long position on the α tolerance level can be presented as:

$$VaR_{\alpha, t+1} = -\sigma_t(1)F_{\varepsilon_t}^{-1}(\alpha), \quad (9)$$

where: $F_{\varepsilon_t}^{-1}(\alpha)$ – α -quantile of ε_t variable, $\sigma_t(1)$ – a one-period ahead forecast of conditional volatility. VaR of a short position can be expressed as follows:

$$VaR_{1-\alpha, t+1} = \sigma_t(1)F_{\varepsilon_t}^{-1}(1-\alpha). \quad (10)$$

Below, the models used in this paper to calculate VaR, are presented.

The most popular models of estimating volatility of financial instruments and commodity are the models originating in Generalised Autoregressive Conditional Heteroskedasticity models (GARCH). In practice the most commonly used model is GARCH(1,1) [1]:

$$r_t = \sigma_t \varepsilon_t, \quad \sigma_t^2 = \omega + \alpha r_{t-1}^2 + \beta \sigma_{t-1}^2, \quad (11)$$

where: $\omega, \alpha, \beta > 0$, $\alpha + \beta < 1$, $\varepsilon_t \sim iid(0,1)$, r_t – returns in t period, σ_t^2 – conditional variation in time t .

In this paper a GARCH(1,1) model will be used with two innovation distributions ε_t : normal and a skewed Student-t distribution as well as GARCH-Extreme Value Theory (GARCH-EVT) and GARCH-Filtered Historical Simulation (GARCH-FHS) models.

Model GARCH-EVT uses the theory of extreme values to model tails of standardized residuals of GARCH model with a normal distribution [7]. In GARCH-EVT model the parameters of Generalized Pareto distribution are estimated for standardized residuals ε_t of GARCH models, and subsequently VaR of a short position is calculated using a formula:

$$VaR_{1-\alpha, t+1} = \sigma_t(1) VaR_{1-\alpha}, \quad (12)$$

where: $\sigma_t(1)$ – a one-period-ahead forecast of conditional volatility of normally distributed GARCH(1,1), $VaR_{1-\alpha}$ – value at risk calculated on the basis of formula (7) for standardized residuals ε_t of normally distributed GARCH(1,1) model.

Model GARCH-FHS uses the historical simulation method for the standardized residuals of GARCH model [5]. It means that in this approach an empirical quantile of standardized residuals ε_t , from GARCH model, is calculated and then VaR of a long and short position is estimated on the basis of formulas:

$$VaR_{\alpha, t+1} = -\sigma_t(1) F_{\varepsilon_t}^{-1}(\alpha), \quad VaR_{1-\alpha, t+1} = \sigma_t(1) F_{\varepsilon_t}^{-1}(1-\alpha), \quad (13)$$

where: $\sigma_t(1)$ – a one-period-ahead forecast of conditional volatility of GARCH(1,1) model, $F_{\varepsilon_t}^{-1}(\alpha)$ – α - empirical quantile of standardized residuals ε_t of GARCH(1,1) model.

3. Data description

VaR was estimated for futures contracts of wheat, corn and soybean traded on the CBOT. To achieve that the series of daily settlement prices for contracts were used in the period of January, 3rd 2000 and November, 19th 2013 (www.stooq.pl). VaR was calculated on the basis of daily percentage log-returns using the formula: $r_t = 100 \ln(P_t / P_{t-1})$, where P_t means a settlement contract price in time t .

Table 1 presents descriptive statistics of the analysed series of returns and the value of Jarque-Bera test.

TAB. 1: Descriptive statistics of returns and value Jarque-Bera test (J-B)

	No. of observations	Mean	S.D.	Max	Min	Skewness	Kurtosis	J-B test
Wheat	3491	0.0277	2.0673	8.9632	-10.1137	0.1748**	4.9242*** *	556.3686
Corn	3490	0.0210	1.8866	10.0488	-13.1563	0.0207	5.7641*** *	1111.2886
Soybean	3488	0.0290	1.6476	7.5874	-13.4128	-0.6200****	7.7172*** *	3457.4060

** significance level 0.01; *** significance level 0.0001 for the null hypotheses 0 skewness (D'Agostino skewness test) and 3 kurtosis (Anscombe-Glynn kurtosis test).

Source: own study

The highest volatility, measured by the standard deviation, characterised the returns of futures contracts for wheat. In case of all analysed futures the average returns were close to zero. The distribution of futures contracts of wheat was characterised by a slight positive skewness and of soybean – a weak negative one. High values of the kurtosis show that the returns distributions of analysed futures contracts of agricultural commodities are characterised by fat tails, that is a frequent occurrence of extremes in the series. It means that the futures returns distributions were not normal distributions. Rejecting the hypothesis of distribution normality of analysed returns was based on the Jarque-Bera test.

4. Empirical research

VaR was calculated for an investor of a long and short position of wheat, corn and soybean futures contracts, that is for left and right tails of returns prices distributions of those contracts. VaR was estimated daily on working days from January, 4th 2002 to November, 20th 2013, using 500 daily log-returns of futures contracts preceding that specific day. Calculations were carried out for two tolerance levels: 0.01, 0.05. To estimate VaR the following unconditional models were used: Historical Stimulation (HS), quantile of normal distribution (NORM), skewed Student-t distribution (SST), the

tail of Generalised Pareto distribution (EVT) – assuming the threshold of 95% (the remaining 5% of positive and negative data were considered extreme observations) as well as following conditional models: GARCH with normal distribution (GARCH-NORM), GARCH with the skewed Student-t distribution (GARCH-SST), GARCH-EVT – assuming the threshold of 95%, GARCH-FHS.

To verify the effectiveness of tested models, the expected (ET) and empirical (T_1) number of exceedances of the estimated VaR by the actual returns was calculated and following tests were implemented: Kupiec test [6] (LR_{UC} , null hypothesis: the share of VaR violations by actual returns is compliant with an assumed α), Christoffersen test [2] (LR_{CC} , null hypothesis: the share of VaR hits by actual returns is compliant with an assumed α and the exceedances are independent – the first hit) and Christoffersen and Pelletier test [3] (LR_D , null hypothesis: the duration of time (in days) between the violations of VaR by actual returns is independent) in the tested period. The results are presented in Table 2 and 3.

TAB. 2: The evaluation of the VaR estimation quality of wheat futures contracts

Position	Long		Short		Long		Short	
α	0.01	0.05	0.01	0.05	0.01	0.05	0.01	0.05
Model	GARCH-NORM Wheat				NORM Wheat			
ET	29	149	29	149	29	149	29	149
T_1	29	125	60	151	39	138	60	157
LR_{UC}	0.0289	4.4995	23.6446	0.0138	2.5406	0.9709	23.6446	0.3794
LR_{CC}	0.5967	4.8372	25.6436	2.4263	5.1530	1.3996	30.7991	4.1637
LR_D	0.0196	0.0700	0.5250	0.4980	7.6212	5.5606	2.0912	7.2016
Model	GARCH-SST Wheat				SST Wheat			
ET	29	149	29	149	29	149	29	149
T_1	29	153	45	142	40	166	44	152
LR_{UC}	0.0289	0.0808	6.6491	0.4131	3.1025	1.8304	5.8453	0.0403
LR_{CC}	0.5967	0.0850	6.7880	2.9452	5.5583	2.7019	7.7383	4.7084
LR_D	2.1218	0.3498	0.0826	0.9878	4.1446	3.4446	0.8624	6.758
Model	GARCH-EVT Wheat				EVT Wheat			
ET	29	149	29	149	29	149	29	149

T_1	35	169	41	157	37	171	41	163
LR_{UC}	0.8262	2.5463	3.7152	0.3794	1.5739	3.0864	3.7152	1.2292
LR_{CC}	1.6550	2.7837	6.0209	3.0291	4.5208	4.9236	9.1903	5.2187
LR_D	0.0126	0.0114	0.0306	0.0476	7.1378	6.4892	2.6014	4.6452
Model	GARCH-FHS Wheat				HS Wheat			
ET	29	149	29	149	29	149	29	149
T_1	37	169	39	157	46	170	40	163
LR_{UC}	1.5739	2.5463	2.5406	0.3794	7.4980	2.8101	3.1025	1.2292
LR_{CC}	2.5008	2.7837	5.1530	3.0291	9.1448	4.7617	8.8344	5.2187
LR_D	0.0014	0.0114	0.0186	0.0476	3.1186	6.7752	1.5138	4.6452

in bold – rejection of the null hypothesis for the significance level of 0.05.

Source: own study

TAB. 3: The evaluation of the VaR estimation quality of corn and soybean futures contracts

Position	Long		Short		Long		Short	
α	0.01	0.05	0.01	0.05	0.01	0.05	0.01	0.05
Model	GARCH-NORM Corn				GARCH-NORM Soybean			
ET	29	149	29	149	29	149	29	149
T_1	40	121	48	147	50	133	43	140
LR_{UC}	3.1093	6.1206	9.3395	0.0460	11.3669	1.9761	5.1143	0.6420
LR_{CC}	3.4412	10.6594	10.9059	1.1088	11.3980	3.5101	5.3188	1.0834
LR_D	0.9626	3.2696	0.0038	0.2174	0.7604	0.1750	0.1188	0.3262
Model	GARCH-SST Corn				GARCH-SST Soybean			
ET	29	149	29	149	29	149	29	149
T_1	29	142	32	148	34	137	38	161
LR_{UC}	0.0283	0.4078	0.1442	0.0170	0.5466	1.1217	2.0470	0.9175
LR_{CC}	1.1641	1.1678	0.8366	0.9972	1.2423	3.2030	2.4823	1.9394
LR_D	0.0082	0.3244	0.0326	0.0032	0.4786	0.5470	0.7564	1.4910
Model	GARCH-EVT Corn				GARCH-EVT Soybean			
ET	29	149	29	149	29	149	29	149

T_1	40	160	31	157	39	150	33	156
LR_{UC}	3.1093	0.7522	0.0396	0.3847	2.5590	0.0021	0.3162	0.2981
LR_{CC}	3.4412	5.2687	0.6892	0.7775	2.9402	0.8242	1.0888	0.3010
LR_D	0.6214	2.9618	0.4424	0.0622	0.0554	0.0020	0.0022	1.4700
Model	GARCH-FHS Corn				GARCH-FHS Soybean			
ET	29	149	29	149	29	149	29	149
T_1	41	159	34	157	40	150	36	156
LR_{UC}	3.7227	0.6164	0.5411	0.3847	3.1230	0.0021	1.1843	0.2981
LR_{CC}	6.0274	4.0716	1.3232	0.7775	3.4542	0.8242	2.0623	0.3010
LR_D	2.1712	2.4652	2.3772	0.0622	0.4764	0.0020	0.2124	1.4700

in bold – rejection of the null hypothesis for the significance level of 0.05.

Source: own study

When assessing the VaR estimation quality for tested returns of wheat futures contracts, by means of Kupiec and Christoffersen test (Table 2), it can be concluded that the worst results were achieved for the unconditional model NORM and the conditional model GARCH-NORM with the tolerance level of 0.01 of the short position. The number of VaR violations by actual returns, estimated on the basis of those models for the tolerance level of 0.01 exceeded the acceptable level. It means that the estimated VaR was underpriced. The results improvement was achieved when using following models (conditional and unconditional): HS, GARCH-FHS, SST, GARCH-SST, EVT, GARCH-EVT. These models enabled to capture empirical returns properties: fat tails and skewness. However, it must be stressed that a good VaR model should be characterised by an iid distribution of VaR violations by empirical returns. Therefore, it must be pointed out that the violations independence tests (Christoffersen, Christoffersen and Pelletier) reject unconditional models. Whereas an iid distribution of VaR violations was obtained for all conditional models (the results of Christoffersen and Pelletier test indicate that on no grounds the independence null hypothesis of duration of time between the violations of VaR by actual returns should be rejected). It results from the fact that conditional models enable to capture the returns clustering. Hence, it can be concluded that taking into consideration the results of all tested models, the best performance refers to following models: GARCH-FHS, GARCH-EVT and GARCH-SST.

The results for other futures contracts – corn and soybean (Table 3) are similar to those of wheat. Table 3 presents the results of tests, which evaluate VaR estimation quality, only for conditional models because independence tests of violations reject the unconditional models. Again the worst performance was recorded according to normally distributed GARCH model with the tolerance level of 0.01 for corn and soybean and the tolerance level of 0.05 for the long position of corn futures contracts. Good results were obtained for following models: GARCH with a skewed Student-t distribution, GARCH-EVT, GARCH-FHS irrespective of the position (long or short) and tolerance level. GARCH-SST model for corn should be distinguished as for this model the number of exceedances was the closest to the assumed one.

Conclusions

The aim of the paper was to verify VaR estimation models on the agricultural commodity market. Unconditional and conditional models were used. On the basis of the obtained results it can be concluded that independence tests reject the unconditional models. In case of conditional normally distributed GARCH model on the tolerance level of 0.01 the calculated VaR was underestimated. Conditional volatility GARCH models with the skewed Student-t distribution, GARCH-EVT, GARCH-FHS appeared to be especially useful on agricultural commodity market irrespective of the position and tolerance level. On the whole they enabled to estimate VaR correctly in times of greater turbulences on commodity markets (the only exception was VaR estimation for wheat futures contracts on the tolerance level of 0.01 for the right tail). Presented results concern VaR models verification on agricultural commodity markets in a short time horizon (one-day). The quality of conditional variance calculated on the basis of a class of ARCH models deteriorates along with the time extension. It means that the results of the quality of long-term forecasts on the agricultural commodity market can vary from those presented in the paper.

In [4] there is a short review of literature where VaR methods to measure the risk on agricultural commodity markets.

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MACROECONOMIC OVERVIEW OF THE CIS COUNTRIES AS THE TARGET MARKET FOR CZECH EXPORTS

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Key words:

CIS countries – macroeconomic overview – international trade – export

Abstract:

The paper presents the macroeconomic overview of the development of the selected countries of the former Soviet Union in the past 20 years. We can state that Baltic countries chose a different development model, aiming the EU membership, and achieved the significant level of economic development, while most of the CIS member states inclined to more autocratic regimes of government and showed weaker economics results. The objective of the paper is to evaluate macroeconomic data and international trade conditions of the Commonwealth of Independent States members, and identify countries with the great perspective for export of Czech products. Russia, Kazakhstan and Azerbaijan seem to have the biggest potential for export cooperation.

Introduction

After the disintegration of the Soviet Union, several new states were founded and majority of them created the Commonwealth of Independent States (CIS) while three Baltic countries decided on an independent path of development and are now member states of EU [6]. 10 out of 15 former Soviet republics became the full members of the CIS, including Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan and Uzbekistan [4]. Ukraine and Turkmenistan are remaining to be associate members, while Georgia withdrawn the CIS agreement in 2008 [4]. International trade relations between the Soviet Union and Czech Republic absorbed the dominant part of Czech export activities during the second part of the 20th. After the broke-up of the Soviet Union, East directed international relationships of the Czech exporters were significantly reduced. Formerly a relatively isolated trade block,

whose limited interactions with the world economy were based on state trading arrangements rather than market prices and decisions, the region as the whole now sends and receives more than two thirds of its goods and services to and from the rest of the world [1]. The volume of the market of CIS countries is vastly growing, while Czech exporters are trying to comeback on the market of the strategic members of this Union. Which countries seem to have the biggest potential for export activities?

1. Gross domestic product of the former Soviet republics

By 1995 the former soviet countries gradually absorbed the changes caused by the broke up, formed an independent government and stated to deal with the new economics reality. In spite of the similarity of the governance of all countries, differences in the economic situation were significant. Table 1 shows the GDP and GPD per capita of the former Soviet republics and its change in the period from 1995 to 2012

TAB. 1: GDP and GPD per capita of the selected countries

	GDP Billions US\$			GDP per capita Thousands US\$		
	1995	2012	Change	1995	2012	Change
Armenia	1.287	10.066	782.1%	1.232	5.838	473.9%
Azerbaijan	2.417	68.804	2846.7%	1.671	10.478	627.0%
Belarus	3.384	63.259	1869.4%	3.382	15.633	462.2%
Georgia	1.897	15.934	840.0%	1.438	5.929	412.3%
Kazakhstan	16.64	196.419	1180.4%	3.724	13.892	373.0%
Kyrgyzstan	1.493	6.473	433.6%	1.003	2.376	236.9%
Moldova	1.441	7.25	503.3%	1.289	3.415	264.9%
Russia	313.326	2021.96	645.3%	6.421	17.708	275.8%
Tajikistan	0.569	7.592	1334.3%	0.778	2.228	286.4%
Turkmenistan	5.874	33.679	573.4%	1.628	8.718	535.5%
Ukraine	37.009	176.235	476.2%	3.205	7.373	230.0%
Uzbekistan	10.168	51.168	503.2%	1.184	3.555	300.3%
Czech Republic	57.786	196.072	339.3%	12.906	27.19	210.7%
Estonia	3.779	21.863	578.5%	6.239	21.713	348.0%
Latvia	4.973	28.38	570.7%	5.105	18.254	357.6%
Lithuania	6.731	42.164	626.4%	2.692	21.615	802.9%

Source: The data were obtained from Economy Watch database.

Considering GDP per capita as the relevant indicator, the CIS countries can be divided into 2 main groups according to their economic situation in 1995. First group include Russia, Ukraine, Belarus, Kazakhstan and Baltic countries with the higher economic development level, caused by the fact that the dominant part of the Soviet industries with the high value added were allocated in these countries, providing them a better starting position for the transformation of their economies. The situation in 2012 indicates that the CIS countries dealt with the transformation period in a different way. Azerbaijan and Turkmenistan by using of their natural resources got close to the group of economic leaders. Ukraine, having no gas and crude oil sources was developing considerably slower. Russia, Belarus and Kazakhstan had a similar economic growth and remained in the leading group of CIS members. Baltic countries chose a different development model, aiming the EU membership, and achieved the significant level of economic development, getting close to the average level of the EU. Having the worst starting position Lithuania achieved the highest growth rate and overcame initially stronger Latvia by 2012.

Substantial difference between the Baltic countries and the CIS members is the type of governance and the level of democracy in these countries. There is an obvious positive correlation (but not necessary dependence) between the economic development of the country and its level of democracy. While all Baltic countries, which are considered by international human rights organizations to be free, are approaching the level of the development of the EU average, all other current, former or associate members of the CIS countries appointed to be either not, or only partly free, are having considerably lower level of economic development [7].

2. Consumer price index and the price stability

Price stability belongs to the factors with the substantial influence on the economy, and represents the basic indication with the great explanatory value relating to the financial and monetary policy of the state. Table 2 shows the Consumer Price Index of the CIS countries, Baltic countries and Czech Republic . We can state that while Baltic republics and several CIS countries implemented liberal financial policies, some counties, including Belarus, has consistently intervened through interest rate controls, mandated financing of the government debt, direct credit allocation and exchange rate

manipulation [3]. Baltic countries showed the ability to control the price stability over the past 13 years, and Armenia became the only CIS member reaching their CPI index level. Most of the CIS member states were able to keep inflation level between 16 and 30 percent p.a. over the past 13 years, and show the great improvement reaching the average level of 6-7 percent p.a. during the past 3 years. Belarus is the only country, which was unable to keep the price index stability in the reference period. The average inflation in Belarus reached the level of 129.1% p.a. since year 2000. Current political and economic situation in Belarus obviously provides preconditions to expect the price stability to be weak for the longer period of time. Exporters, planning to operate on the Belarusian market, are to be aware of the price stability issues.

TAB. 2: Consumer price index of the selected countries

	As the percentage of the previous year					As the percentage of 2000	Average percentage growth per year since 2000
	2001	2005	2010	2011	2012		
Azerbaijan	102	110	106	108	101	223	11.2
Armenia	103	101	108	108	103	170	6.4
Belarus	161	110	108	153	159	1520	129.1
Kazakhstan	108	108	107	108	105	259	14.5
Kyrgyzstan	107	104	108	117	103	245	13.2
Moldova	110	112	107	108	105	279	16.3
Russia	121	113	107	108	105	370	24.5
Tajikistan	137	108	106	113	106	448	31.6
Turkmenistan	...	111	...	105	105	...	...
Ukraine	112	114	109	108	101	312	19.3
Czech Republic	104.5	101.6	101.2	102.2	103.5	133	3
Estonia	105.7	104.2	102.7	105.1	104.2	165	5.9
Latvia	102.4	107	98.8	104.2	102.3	179	7.2
Lithuania	101.6	102.7	101.2	104.1	103.1	145	4.1

Source: The data were obtained from the European Commission and the Executive Committee of the CIS.

3. Unemployment rate and average wages

As most of the CIS countries political regimes are more likely to be called authoritative then democratic, the issue of unemployment, representing potential motive for political protests, has the substantial importance for their leaders. By aiming the low

unemployment, CIS members maintain the social stability, which results in the lower average wage level. Low unemployment aiming becomes evident if we compare the unemployment rates in the CIS countries and the European Union. Table 3 shows unemployment rates in the selected countries. According to the data of International Labor Organization the average wage, adjusted by purchasing power, reached the level of 636 USD in the CIS countries in 2012, while the average wage in the Baltic countries was almost twice as high (1158 USD). Higher adjusted average wages in Belarus and Russia are caused by the state policy of intensive support of the costs of citizens housing and communal services, social programs, free state healthcare, education and subsidized agriculture which effects the CPI [5]. Absolute average wage level is substantially lower (average wage in 2012: Russia - 874 USD; Belarus 553 USD), which indirectly makes FDI in this region to be potentially financially attractive

TAB. 3: Unemployment rate and average wages in selected countries

	In % to economically active population					Average wages adjusted by purchasing power (in U.S. dollars)
	2001	2005	2010	2011	2012	2012
Azerbaijan	1.1	1.3	0.8	0.8	0.8	596
Armenia	9.8	7.6	6.8	5.9	5.9	471
Belarus	2.3	1.5	0.7	0.6	0.5	959
Kazakhstan	2.8	1.2	0.4	0.4	0.4	753
Kyrgyzstan	3.1	3.3	2.6	2.5	2.4	336
Moldova	1.7	1.5	3.1	2.9	2.1	483
Russia	1.6	2.5	2.1	1.7	1.4	1215
Tajikistan	2.5	2.1	2.2	2.5	2.4	227
Uzbekistan	0.4	0.3	0.1	0.1	0.1	n.a.
Ukraine	5.5	4.3	2.7	2.4	2.5	686
Czech Republic	8.1	7.9	7.3	6.7	7	1786
Estonia	12.6	7.9	16.9	12.5	10.2	1267
Latvia	12.9	9.6	19.8	16.2	14.9	1098
Lithuania	13.8	8	18	15.3	13.3	1109

Source: The data were obtained from Economy Watch database, the Executive Committee of the CIS and International Labor Organization

4. International trade partners of the CIS countries

Analysis of the export-import operations of the CIS countries brings some information about selected economies. Table 4 presents the export-import operations of the CIS countries. While most of the CIS members, like Azerbaijan, Kazakhstan or Russia, are quite open for international trade with the rest of the world, Belarus, Kyrgyzstan and Ukraine indicate intensive trade operations mainly within the CIS. In case of Belarus this situation is caused on one side by the fact, that Belarusian industrial base in the present time is quite outdated, energy inefficient, and dependent on subsidized Russian energy and preferential access to Russian markets [5]. On the other side some influence of the sanctions of the European Union and the USA can be traced. Ukrainian situation is similar in case of outdated industrial base, and is also caused by the structure of the Ukrainian export with the substantial agricultural share. The economic growth of Azerbaijan, Kazakhstan and Turkmenistan is in based on the gas and oil export with the main customers out of the CIS, so the export structure is corresponding.

TAB. 4: Export-import operations of the CIS countries in mil. USD

	Export - 2012			Import - 2012			Balance
	Total	CIS	The rest of the World	Total	CIS	The rest of the World	Total
Azerbaijan	23 908	1 252	22 656	9 653	2 378	7 275	14 255
Armenia	1 380	337	1 043	4 262	1 335	2 927	-2 882
Belarus	46 060	23 693	22 367	46 404	30 141	16 263	-344
Kazakhstan	86 442	11 411	75 031	46 302	22 056	24 246	40 140
Kyrgyzstan	1 928	1 126	802	5 576	2 889	2 687	-3 648
Moldova	2 162	928	1 234	5 213	1 624	3 589	-3 051
Russia	525400	78100	447300	314200	41700	272500	211200
Tajikistan	1 360	240	1 120	3 778	2 072	1 706	-2 418
Ukraine	68 810	25 303	43 507	84 658	34 453	50 205	-15 848

Source: The data were obtained the Executive Committee of the CIS

5. Trading across borders rank of the CIS countries

Considering international trade operations with the CIS countries exporters should take into consideration the complexity of the trading operations with the selected countries. As a basic guide we can rely on the Doing business rating provided by IBRD and the World Bank. According to this rating all of the CIS countries, except for Georgia (#43),

belong to the states with the worst trading across borders conditions, when Kyrgyzstan (#182), Kazakhstan (#186), Tajikistan (#188) and Uzbekistan (#189 out of 189) are ranked as the worst countries in the world [2]. Slightly better conditions though are offered in Armenia (#117), Ukraine (#148), Belarus (#149) and Russia (#157).

Conclusion:

The objective of this paper was to evaluate macroeconomic data and international trade conditions of the Commonwealth of Independent States members, and identify perspective countries for export of Czech products. Based on the analysis of macroeconomic data we can state that that Russia, Belarus and Kazakhstan are getting close to the European level of economic development. Belarus seems to be relatively closed for the international trade, as is protecting its market from the foreign import by stringent regulation and support of import substitution, and presents more substantial risk level due to the currency stability issues. Assuming that richer developing countries are not only interested in import operations, especially in the field of industrial development, but also are solvent enough to be reliable partners, Russia, Kazakhstan and Azerbaijan are intended to be the most perspective countries with the biggest potential for export cooperation with the Czech exporters. However, across border trade with the CIS market today is still very challenging, exporters should carefully monitor developments in order to maximize the potential offered by the CIS market.

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FUZZY APPROACH FOR PORTFOLIO SELECTION PROBLEM

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Key words:

fuzzy linear programming – bound and decomposition method – data uncertainty –
portfolio optimization problem – triangle fuzzy number

Abstract:

One of the modern approaches for uncertainty modeling is fuzzy approach, which deals with fuzzy sets defined with fuzzy membership functions. Fuzzy approach is a modeling tool, which solves problems in which data are uncertain. This problem is frequently solved problem in many fields and it is more appropriate for real-life applications, because in practice data are hardly deterministic, but tend to change unexpectedly. The paper introduces fuzzy decomposition methodology to solve fuzzy defined problems and suggests a possibility of solving portfolio optimization problem with uncertain data set using presented method. The applications are described on a case study and provided with mathematical model and its detailed description. The paper also presents computation experiments and its results.

Introduction

One of the recent approaches to modeling uncertainty is fuzzy set approach, where set is described by fuzzy membership function. We distinguish two main classes of fuzzy problems: problems with fuzzy variables and problems with fuzzy parameters. The problems in which both above mentioned elements are applied are called fully fuzzified linear programming (FFLP) problems. Fully fuzzy problem is therefore generalized version of fuzzy linear programming problem where all decision parameters and variables are fuzzy numbers.

In this paper we present portfolio problem formulated as fully fuzzy problem and fuzzy approach to solve the problem. Bound and decomposition method is introduced to find

an optimal fuzzy solution for fully fuzzy linear programming (FFLP) portfolio optimization problem. In the bound and decomposition method, the given FFLP problem is decomposed into three crisp linear programming (CLP) problems with bounded variables constraints, the three CLP problems are solved separately and by using its optimal solutions, the fuzzy optimal solution to the given FFLP problem is obtained. The method is illustrated on a case study, results are provided.

1. The portfolio selection problem and its fuzzy formulation

Let us introduce portfolio optimization problem, where we have to select shares from a given number of shares, respecting the condition that the value of selected shares will not exceed given investment limit K . The aim is to maximize future value of selected shares, future values of shares are given. The problem is that the real share value may be less than predicted value. The purpose of the case study is to find so called fuzzy optimal solution under given circumstances, which respects unexpected decrease in future share value.

Let us define n as a number of shares, K the limit of total expenses on selected shares, for share i a_i is the price of share, c_i is expected profit of share i , d_i is possible decrease in share profit. Binary variable x_i defines the decision to choose share i , when $x_i=1$, or decision not to choose the share in case $x_i=0$.

The basic model of choosing the shares is described below:

$$\max \sum_{i=1}^n c_i x_i, \text{ s.t. } \sum_{i=1}^n a_i x_i \leq K, \quad x_i \in \{0,1\} \quad i = 1, 2, \dots, n. \quad (1)$$

According to this model we will create a fully fuzzy model in the following section.

2. Fully fuzzy linear programming portfolio optimization problem

Consider the following fully fuzzy linear programming portfolio optimization problem with n fuzzy variables, formulated as follows:

$$\max \sum_{i=1}^n \tilde{c}_i \tilde{x}_i, \text{ s.t. } \sum_{i=1}^n \tilde{a}_i \tilde{x}_i \leq \tilde{K}, \quad \tilde{x}_i \in \{0,1\} \quad i = 1, 2, \dots, n, \quad (2)$$

Let the parameters $\tilde{a}_i$, $\tilde{c}_i$, $\tilde{x}_i$ and $\tilde{K}$ be the triangular fuzzy number (a_i, b_i, c_i) , (p_i, q_i, r_i) , (x_i, y_i, t_i) and (L, K, H) respectively. Then, the problem (2) can be written as follows [1, 249]:

$$\begin{aligned} \max (z_1, z_2, z_3) &\approx \sum_{i=1}^n (p_i, q_i, r_i) * (x_i, y_i, t_i), \text{ s.t. } \sum_{i=1}^n (a_i, b_i, c_i) * (x_i, y_i, t_i) \leq (L, K, H), \\ (x_i, y_i, t_i) &\in \{0,1\} \quad i = 1, 2, \dots, n. \end{aligned} \quad (3)$$

Now, since (x_i, y_i, t_i) is a triangular fuzzy number, we can obtain bounded constraint as follows:

$$x_i \leq y_i \leq t_i, \quad i = 1, 2, \dots, n. \quad (4)$$

Using the arithmetic operations and partial ordering relations, we decompose the given FLPP (2) as follows:

$$\begin{aligned} \max z_1 &\approx \sum_{i=1}^n \text{lower value of } ((p_i, q_i, r_i) * (x_i, y_i, t_i)) \\ \max z_2 &\approx \sum_{i=1}^n \text{middle value of } ((p_i, q_i, r_i) * (x_i, y_i, t_i)) \\ \max z_3 &\approx \sum_{i=1}^n \text{upper value of } ((p_i, q_i, r_i) * (x_i, y_i, t_i)) \end{aligned}$$

Subject to (5)

$$\begin{aligned} \sum_{i=1}^n \text{lower value of } ((a_i, b_i, c_i) * (x_i, y_i, t_i)) &\leq L, \text{ for } i = 1, 2, \dots, n; \\ \sum_{i=1}^n \text{middle value of } ((a_i, b_i, c_i) * (x_i, y_i, t_i)) &\leq K, \text{ for } i = 1, 2, \dots, n; \\ \sum_{i=1}^n \text{upper value of } ((a_i, b_i, c_i) * (x_i, y_i, t_i)) &\leq H, \text{ for } i = 1, 2, \dots, n; \end{aligned}$$

and all decision variables are non-negative.

From the above decomposition problem, we construct the following CLP problems namely, middle level problem (MLP), upper level problem (ULP) and lower level problem (LLP) as follows:

(MLP)

$$\begin{aligned} \max z_2 &\approx \sum_{i=1}^n q_i * y_i \\ \text{subject to} \end{aligned} \quad (6)$$

$$\sum_{i=1}^n b_i * y_i \leq K, \text{ for } i = 1, 2, \dots, n; y_i \in \{0,1\} \quad i = 1, 2, \dots, n.$$

(ULP)

$$\begin{aligned}
& \max z_3 \approx \sum_{i=1}^n r_i * t_i \\
& \text{subject to} \\
& \sum_{i=1}^n r_i * t_i \geq z_2^{\circ}; \\
& \sum_{i=1}^n c_i * t_i \leq H, \text{ for } i = 1, 2, \dots, n; t_i \in \{0, 1\} \text{ } i = 1, 2, \dots, n.
\end{aligned} \tag{7}$$

(LLP)

$$\begin{aligned}
& \max z_1 \approx \sum_{i=1}^n p_i * x_i \\
& \text{subject to} \\
& \sum_{i=1}^n p_i * x_i \leq z_2^{\circ}; \\
& \sum_{i=1}^n a_i * x_i \leq H, \text{ for } i = 1, 2, \dots, n; x_i \in \{0, 1\} \text{ } i = 1, 2, \dots, n.
\end{aligned} \tag{8}$$

In decomposition (ULP) and (LLP) problems at least one decision variable of the (ULP)/(LLP) should occur which is not used in (MLP) (and (ULP)); all variables in the constraints and objective function in (ULP)/(LLP) must satisfy the bounded constraints; replacing all values of the decision variables which are obtained in the (MLP) (and (ULP)) and all decision variables are non-negative, where z_2° is the optimal objective value of (MLP).

3. Bound and decomposition method

In this section we describe bound and decomposition method for solving a FFLP problem presented in [1, 250]. The algorithms to solve fuzzy portfolio optimization model with bound and decomposition method proceeds as follows.

Step 1: Construct (MLP) (6), (ULP) (7) and (LLP) (8) problems from the given the FFLP portfolio optimization problem.

Step 2: Using existing linear programming technique, solve the (MLP) problem, then the (ULP) problem and then, the (LLP) problem in the order only and obtain the values of all real decision variables x_i , y_i , and t_i and values of all objectives z_1 , z_2 and z_3 . Let the

decision variables values be x_i° , y_i° , and t_i° , $i = 1, 2, \dots, n$ and objective values be z_1° , z_2° and z_3° .

Step 3: An optimal fuzzy solution to the given FFLP problems is $\tilde{x}_i^\circ = (x_i^\circ, y_i^\circ, t_i^\circ)$, $i=1, 2, \dots, n$ and the maximum fuzzy objective is $\tilde{z}^\circ = (z_1^\circ, z_2^\circ, z_3^\circ)$. (by the Theorem 4.1.).

Now, we prove the following theorem which is used in the proposed method.

Theorem 3.1 [1, 250]: Let $[x_M^\circ] = \{ x_i^\circ, y_i^\circ \in M \}$ be an optimal solution of (MLP), $[x_U^\circ] = \{ x_i^\circ, y_i^\circ \in U \}$ be an optimal solution of (ULP) and $[x_L^\circ] = \{ x_i^\circ, y_i^\circ \in L \}$ be an optimal solution of (LLP) where L , M and U are sets of decision variables in the (LLP), (MLP) and (ULP) respectively. Then $\{ \tilde{x}_i^\circ = (x_i^1, x_i^2, x_i^3), i=1, 2, \dots, n \}$ is an optimal fuzzy solution to the given problem (2) where each one of x_i^1 , x_i^2 , x_i^3 is an element of L , M and U .

Proof [1, 250]: Let $[\tilde{y}_i] = \{ \tilde{y}_i, i=1, 2, \dots, n \}$ be a feasible solution of (2). Clearly, $[y_M]$, $[y_U]$ and $[y_L]$ are feasible solutions of (MLP), (ULP) and (LLP) respectively. Now, since $[x_M^\circ]$, $[x_U^\circ]$ and $[x_L^\circ]$ are optimal solutions of (MLP), (ULP) and (LLP) respectively, we have $Z_1([x_L^\circ]) \geq Z_1([y_L])$; $Z_2([x_M^\circ]) \geq Z_2([y_M])$ and $Z_3([x_U^\circ]) \geq Z_3([y_U])$.

This implies that $Z([\tilde{x}_i^\circ]) \geq Z([\tilde{y}_i])$, for all feasible solution of the problem (2).

Therefore, $\{ \tilde{x}_i^\circ = (x_i^1, x_i^2, x_i^3), i=1, 2, \dots, n \}$ is an optimal fuzzy solution to the given problem (2) where each one of x_i^1 , x_i^2 and x_i^3 , $i=1, 2, \dots, n$ is an element of L, M and U .

Hence the theorem.

4. Case study

Let us solve the problem with investment limit $K=50\ 000$ and set of 23 shares, from which a subset has to be selected. The data subset was obtained from web pages <http://finance.yahoo.com/>, where we used path investment, stocks, earning dates to collect necessary data. Each share has a current price, which was stated in the beginning of April 2013, estimated profit of the share and possible decrease in profits. The price a_i of share i , the profit c_i and decrease of the profit d_i are given in the Tab. 1, where you can also find the highest price of share $a_{i\ high}$ and the lowest price of share $a_{i\ low}$ for a ten year period.

TAB. 1: List of shares and their parameters

	a_i	c_i	d_i	$a_{i \text{ low}}$	$a_{i \text{ hig}}$	$c_i - d_i$	$c_i + d_i$
1	2999	237	64	119	3085	173	301
2	10400	271	31	5927	10400	240	302
3	1633	45	15	1103	2383	30	60
4	6825	72	14	3523	6954	58	86
5	1625	30	14	998	1753	16	44
6	1791	1	13	1791	3647	-12	14
7	1189	10	12	768	3889	-2	22
8	998	-13	12	830	1720	-25	-1
9	2253	42	11	1150	2860	31	53
10	3934	44	9	1800	4476	35	53
11	3554	62	9	2390	3554	53	71
12	3608	61	9	457	3608	52	70
13	3918	102	7	3918	5268	95	109
14	4901	91	6	4038	5344	85	97
15	2543	26	6	2543	6555	20	32
16	768	10	5	355	940	5	15
17	3134	8	3	1854	3135	5	11
18	1398	12	2	748	1398	10	14
19	3299	3,7	2	2260	3299	1,7	5,7
20	5272	58	2	3914	5367	56	60
21	168	-1	0	100	1915	-1	-1
22	283	-8	0	283	852	-8	-8
23	1808	23	0	1361	1808	23	23

We will use the algorithm described above and solve linear problems, results are shown in the Tab. 2.

TAB. 2: **Optimal solution**

method	Solution x	F
MLP	1 1 1 1 1 0 0 0 1 0 1 1 1 1 0 1 0 0 0 1 0 0 1	1104
LLP	1 1 1 1 1 0 0 0 1 0 1 1 1 1 0 1 0 0 0 1 0 0 1	917
ULP	1 1 1 1 1 0 0 0 1 0 1 1 1 1 0 1 0 0 0 1 0 0 1	1291
robust	1 1 1 1 1 0 0 0 1 0 1 1 1 1 0 1 0 0 0 1 0 0 1	994

As you can see in Tab. 2 maximum objective function value for (MLP) is $F = 1104$, for (LLP) is $F = 917$, for (ULP) is $F = 1291$ with the corresponding share selection $x = (1\ 1\ 1\ 1\ 1\ 0\ 0\ 0\ 1\ 0\ 1\ 1\ 1\ 1\ 0\ 1\ 0\ 0\ 0\ 1\ 0\ 0\ 1)$ identical for all the cases. As you can see from the table above, optimal solution for presented approach is the same we achieved by solving given model with robust optimization technique.

Conclusion

This paper offers possibility to solve portfolio optimization problem with uncertain share values using fuzzy approach – bound and decomposition method. The problem takes into account the fact that share profits could not be the same as predicted, but real profit share value could be less. In this paper we concentrate on the fuzzy approach for portfolio optimization model, which use defuzzification method to solve the problem. The presented approach works with a fully fuzzy linear programming problem, defined by triangle fuzzy numbers in objective function, constraints and parameters. The presented method is described on a case study, provided with computation experiments and its results.

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QUANTIFYING THE EFFECT OF THE CNB INTEREST RATE CHANGE ON REAL ECONOMY: THE CASE OF THE CZECH REPUBLIC

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Key words:

interest rate transmission mechanism – repo rate – real economic activity – VAR model – Granger causality test

Abstract:

Qualitatively, the effect of official interest rate change on real economic activity via interest rate transmission mechanism is well documented in the literature. The existence of several channels through which it can operate is also well known. But capturing the propagation of transmission mechanism quantitatively is quite difficult and understanding them properly is very important for conducting monetary policy. In this paper, we explore the functioning of interest rate change transmission mechanism in the case of the Czech Republic. As a research tool, we use VAR models and Granger causality test on economic data of the Czech economy from period 1999 – 2013. Our preliminary findings confirm the existence of some theoretical connections while other links suggested by theory seem to not always be the case.

1. Introduction

The short-term interest rate is a standard monetary policy tool of a central bank. Changing its official interest rate, the central bank can affect the price level and economic activity via several channels, which are often called as the transmission mechanism of monetary policy. Though the existence of these channels has been widely discussed in the literature (Mishkin (1996), Boivin and Giannoni (2002)). Qualitatively, the principle of how these channels function has never been doubted, but to measure the effect of each channel transmitting the change of monetary policy interest rate towards economic activity is very difficult. That may be the reason why there is little work devoted to quantification of the impact of interest rate change on real economy in the case of the Czech Republic. To fill

this gap in the literature, the objective of our research is to quantitatively evaluate the interest rate transmission mechanism in the Czech economy. To achieve this goal, we will use publically available data on the Czech economy and the history of repo interest rate set by the Czech National Bank (CNB) from period 1999 - 2013 with the use of a VAR model and Granger causality test.

2. Interest rate transmission mechanism

Monetary policy operating through interest rate is a very complex process as it works through many channels. These channels transmit the impact of a change in the official interest rate set by a central bank on the aggregate demand of an economy. There is a broad consensus that in the long run, monetary policy determines the general price level in the economy. In the short and medium run, it can affect real economic activity. In the literature, the following links between an interest rate change and its effect on the economy are identified:

- *The interest rate channel.* This channel is the key monetary transmission mechanism in the traditional IS-LM models. A change in the official interest rate leads immediately to changes in the short term interbank interest rate. These changes in the short term rates may cause to some movement of long term rates with delays. For a given inflation expectation, the real interest rates in the economy are affected, which in turn affect interest rate sensitive components of aggregate demand such as consumption and investment.
- *The credit channel.* This channel works on the assumption of asymmetric information problem in financial markets. It also supposes that some households and firms can rely on banks as the only external lenders. A rise in interest rates leads to a fall of equity prices, hence dropping the net worth of households and firms. This lowers the value of collateral the households and firms need for obtaining a loan. In the world of asymmetric information, lower value of collateral reduces the willingness of banks to provide credits to households and firms. Besides the effect on the net worth, an increase in interest rate also affects the quantity of reserves of commercial banks held at the central bank. In fact, it reduces the amount of money available for loans. As a result, consumption and investment demand of households and firms that rely on borrowed funds falls when the interest rate increases. This channel is an extension of

the interest rate channel and increases the impact of monetary policy via changes in the supply of bank credit.

- *The exchange rate channel.* This link functions through the connection between interest rate and exchange rate. For example, given that all other things are kept unchanged, a cut in official interest rates would probably lead to a depreciation of the exchange rate, which changes the relative prices of domestic and foreign goods and services and thereby causing an increase of net export of domestic economy and hence raising aggregate domestic output. This channel plays very important role in transmitting monetary policy into real economy in a small open economy with a flexible exchange rate regime (Taylor (1995), Cevik and Teksoz (2012)).
- *The asset price channel.* This channel functions through the impact of interest rate change on the prices of bonds, equity shares, real estate, and other domestic assets owned by households and companies. An increase of the official short-term interest rate may lead to a rise of market interest rates, which in turn negatively affect the market value of a corporate and a household's wealth. As the firm's value reduces, its capacity for fixed investment spending through balance sheet effects also falls. With the household's consumption, as it depends also on its wealth, a shrinking wealth leads to a cut in consumption too. Hence an increase in the official interest rate may lower the aggregate demand of an economy.
- *The expectations channel.* This channel operates through the influence of interest rate changes on the households and firms expectations about the future development of the economy. These expectations in turn will affect future interest rates, exchange rate, wages, employment, expenditures, and aggregate demand. For example, an increase in official interest rate made by a central bank can be a signal that the economy might be growing faster than expected. This course is unsustainable from the central authorities' perspective and they want to slow it down. This could in turn revert the positive expectation about future growth and confidence in general, which causes a drop in spending on consumption and investment of households and companies.

It is important to emphasize that all monetary policy transmission channels we have depicted above do not function independently and they are by no means mutually exclusive. On the contrary, they work simultaneously and the overall reaction of the

economy to an interest rate change set by a central bank is the result of all individual responses of each channel combined together. The functioning and effectiveness of each channel differ across countries due to variety in the extent of financial intermediation, the development of domestic capital markets, and structural economic conditions. Further, according to several authors (Mishkin (1996), Boivin and Giannoni (2002)) the impact of interest rate changes on real economy has enfeebled over time. According to Kuttner and Mosser (2002, this phenomenon does not indicate that monetary policy has become less effective. Rather, it means that monetary policy has actually become more effective in dampening real economic fluctuations as the less fluctuated economy among others is a result of monetary policy properly operated by the central bank.

Due to the complexity of the problem, there has been little publications on quantification of interest rate transmission mechanism in case of the Czech Republic. When doing this research, we have found only the work of Brůna and Brada (2004), who investigate the sensitivity of short term interbank interest rates PRIBOR to changes in repo rate Czech National Bank. In the next section we will examine the connection between the repo rate of the Czech National Bank and the real economy through the channels we have described before.

3. Data and their econometric analysis

To achieve our goal, we select these time series: from the database of the Czech statistical office series from period 1st quarter of 1999 to 3rd quarter of 2013 on quarterly real gross

TAB. 1: Descriptive statistics of input variables

	REPO	GDP	CONS	INVEST
Mean	2.7	785101.0	382355.4	203297.3
Median	2.4	821859.0	390468.0	204453.5
Maximum	9.5	915398.0	433776.0	273056.0
Minimum	0.1	601559.0	313140.0	156161.0
Std. Dev.	2.0	110482.5	42927.5	27620.3
Skewness	1.0	-0.3	-0.4	0.1
Kurtosis	3.8	1.5	1.6	2.3
Observations	60	60	60	60

domestic product (GDP), consumption (CONS), gross capital formation (INVEST), export (EX), and import (IM) are chosen. From the database of the Czech National Bank series on

repo rate, average quarterly nominal exchange rate of Czech crown to Euro (ERATEE), the quarterly quantity of credit provided by commercial banks to non-financial firms in the Czech economy (CREDIT), and the average interest rate for the loans provided by commercial banks to non-financial firms (IRNFF). As the repo rate is changed irregularly, and sometime more than one time in a quarter, all changes in a quarter of a year are added up and put it in such a way as if it is always set once at the end of a quarter so that this series corresponds to the rest of the used data. The descriptive statistics of all series we use for our analysis are shown in Tables 1 and 2.

TAB. 2: Descriptive statistics of input variables – cont.

	EX	IM	EREU	CREDIT	IRNFF
Mean	530548.2	503407.4	29.4	1355734.0	4.5
Median	555755.0	516793.5	28.5	1472069.0	3.9
Maximum	787612.0	695431.0	37.6	2046710.0	12.4
Minimum	252629.0	264827.0	24.1	615203.0	2.0
Std. Dev.	168203.7	134802.0	4.1	530916.6	2.0
Skewness	0.0	-0.2	0.4	-0.2	1.7
Kurtosis	1.6	1.7	1.9	1.4	6.3
Observations	60	60	60	47	60

TAB. 3: Unit root test results

SERIES	In	Test stat.	Crit.value at 5%	p-value
REPO	1st diff	-5.9556	-1.9465	0.0000
GDP	1st diff	-2.1296	-1.9467	0.0331
INFP	1st diff	-4.7382	-1.9465	0.0000
CREDIT	1st diff	-3.7759	-2.9281	0.0173
EREU	1st diff	-5.8729	-1.9465	0.0000
CONS	2nd diff	-6.9553	-1.9470	0.0000
INVEST	1st diff	-1.9415	-1.9469	0.0506
IMPORT	1st diff	-1.9414	-1.9469	0.0506
EXPORT	1st diff	-1.8705	-1.9469	0.0590

To make our analysis easy for interpretation, we transform all series we use into series of differences of their logarithms except two series of interest rates where these series are converted into series of their differences. Then we test them for stationarity using Augmented Dickey Fuller unit root test. The results are reported in Table 3.

The results in Table 3 shown that all series are stationary in their first differences at the level of significance of 5% except series of consumption which is stationary in its second differences. Then we use these series to estimate pair-wise reduced VAR models. The maximum length of lags we use is 6 as we consider the period of six quarters is long enough for a monetary policy measure to induce its impact on real economy. The estimation results are reported in Table 4 and 5. For the conciseness of our paper, we report only the impact of lagged repo rate on other variables as the reverse impacts are always statistically insignificant. With each lag of the repo rate, the value in first line belongs to the value of estimated coefficient, the value in the second line is the size of standard error and the value in the third line is value of t-statistic.

TAB. 4: VAR model estimation results

	IRNFF	CREDIT	ERATEE	CONS
REPO(-1)	0.706797	0.954365	0.018177	0.001027
	-0.17931	-0.20127	-0.00898	-0.00585
	[3.94171]	[4.74181]	[2.02398]	[0.17551]
REPO(-2)	-0.131713	-0.07585	-0.01424	0.004462
	-0.20827	-0.23377	-0.01055	-0.00676
	[-0.63240]	[-0.32446]	[-1.34961]	[0.66035]
REPO(-3)	0.015824	-0.1136	0.011472	0.003383
	-0.19947	-0.22389	-0.01102	-0.00639
	[0.07933]	[-0.50739]	[1.04117]	[0.52942]
REPO(-4)	-0.079446	-0.24138	-0.00745	-0.01649
	-0.18949	-0.21269	-0.01105	-0.00641
	[-0.41926]	[-1.13486]	[-0.67372]	[-2.57270]
REPO(-5)	-	-	-0.00622	0.004245
	-	-	-0.01026	-0.00661
	-	-	[-0.60603]	[0.64257]
REPO(-6)	-	-	-0.01517	0.002122
	-	-	-0.00919	-0.00522
	-	-	[-1.65064]	[0.40658]

The results tell us that the impact of interest rate change on nominal variables as the (average) market interest rate, the quantity of credit and nominal exchange rate is quite immediate as the coefficient of repo rate lagged by one period is statistically significant for these all 3 cases¹. Then this impact dies out quickly as all coefficients of repo rate with higher lags are insignificant. As far as the effect of repo rate change is concerned, the change positively affects export, import, and GDP straightaway in the first lagged period. The prompt and positive effect of repo rate change on GDP is inconsistent with theory which in our opinion might be due to the disadvantage of a linear VAR model trying to capture nonlinear relationships in an economy (Kodera, 2007). The change later has an opposite impact on consumption and GDP in the fourth lagged quarter from the onset of a change. This change also has rather (statistically) weaker negative influence on investment.

TAB. 5: VAR model estimation results – cont.

	INVEST	IM	EX	GDP
REPO(-1)	0.008382	0.063573	0.079322	0.011753
	-0.02181	-0.02827	-0.02899	-0.00596
	[0.38442]	[2.24877]	[2.73593]	[1.97119]
REPO(-2)	0.040726	0.001881	-0.02854	-0.00498
	-0.02472	-0.03248	-0.03374	-0.00673
	[1.64771]	[0.05792]	[-0.84582]	[-0.73951]
REPO(-3)	-0.04556	-0.04485	-0.01975	-0.00376
	-0.02639	-0.03299	-0.03495	-0.00679
	[-1.72643]	[-1.35939]	[-0.56510]	[-0.55407]
REPO(-4)	0.002776	-0.01794	-0.05691	-0.01236
	-0.02758	-0.03343	-0.03399	-0.00683
	[0.10064]	[-0.53672]	[-1.67431]	[-1.81029]
REPO(-5)	0.020376	-0.01475	-0.01345	-0.00434
	-0.02674	-0.03207	-0.03455	-0.0068
	[0.76191]	[-0.45999]	[-0.38926]	[-0.63814]
REPO(-6)	-0.0502	-0.00932	0.002156	-0.00488
	-0.02163	-0.02892	-0.03157	-0.00586
	[-2.32124]	[-0.32223]	[0.06830]	[-0.83248]

¹ From the values of a reduced model the coefficients of the structural model in which the unlagged term of repo rate is included can be recovered under certain assumptions.

This finding is consistent with theory as well as the finding of other authors (Bernanke and Gertler. (1995), Dedola and Lippi (2005), and Vizek (2007)).

Further, we use Granger causality test to examine the direction of causal relationship between a repo rate change and other real economic variables. The results of the test are shown in Table 6. The test result confirms the impact of repo rate change on market interest rates and the quantity of credits provided by banks to nonfinancial firms as it was identified in the VAR model. It also proves that a change in repo rate can induce some effect on GDP. Other causality effect in the sense suggested by Granger as well as all reverse causal relationships is not approved.

TAB. 6: Granger causality test results

Null hypothesis	Num of Obs	t-stat.	P- Value
IRNFF does not Granger Cause REPO	53	0.74434	0.6173
REPO does not Granger Cause INFP		5.34588	0.0004
CREDIT does not Granger Cause REPO	40	1.41656	0.2447
REPO does not Granger Cause CREDIT		2.35583	0.0585
EREU does not Granger Cause REPO	53	1.24534	0.3043
REPO does not Granger Cause EREU		0.32449	0.9202
GDP does not Granger Cause REPO	50	0.98602	0.4487
REPO does not Granger Cause GDP		2.42132	0.0449
INVEST does not Granger Cause REPO	50	0.84603	0.5429
REPO does not Granger Cause INVEST		2.28978	0.0559
CONS does not Granger Cause REPO	50	1.47269	0.2144
REPO does not Granger Cause CONS		1.49468	0.207
IMPORT does not Granger Cause REPO	50	0.69983	0.6514
REPO does not Granger Cause IMPORT		1.85814	0.1145
EXPORT does not Granger Cause REPO	50	0.19922	0.9749
REPO does not Granger Cause EXPORT		2.18301	0.0667

4. Conclusion

Theoretically, official interest rate changes affect real economic variables through transmission mechanism with several channels. In practice, it is still very difficult to

quantify the magnitude of this effect as well as the contribution of each channel to overall response of the economy to a change of the official interest rate. In this paper, we investigate interest rate change transmission mechanism in the case of the Czech Republic using VAR models and Granger causality test on economic data of the Czech economy from period 1999 – 2013. The results of our experiment with VAR models have clearly shown the link between the CNB repo rate and market interest rates and the quantity of credit in short run and between the repo rate and real economic quantities like GDP and consumption, to some extent, also investments in the longer run. Both these findings are consistent with theory. The results obtained by using the Granger direction of causality, but not vice versa. Also no other link between the CNB repo rate and the remainder exists. At this stage, we do not discuss the magnitude of these links in details and it will be subject of our further research.

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DETERMINANTS OF CZECH TRADE WITH ROAD VEHICLES

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Key words:

exports – road vehicles – Grubel-Lloyd index – gravity model

Abstract:

Automotive industry is considered to be one of the most important export articles for the Czech Republic. In the same time, nowadays we can observe increased vertical specialisation in international trade. By using Grubel-Lloyd index and gravity model we study what impact does the growth in intra-industry trade in road vehicles have on the Czech exports in this group. The results of our analysis suggest that the increase in intra-industry trade leads to an increase in overall Czech road vehicle exports.

Introduction

The Czech Republic is famous for its production of road vehicles, most importantly the motor cars. Hence, new entrants in a market from countries which didn't used to have comparative advantage in road vehicles are succeeding in gaining market share in this area. More countries produce road vehicles but in the same time bigger cooperation arise thanks to the growth in vertical specialisation in trade. The aim of this paper is to analyse what effect might an increased intra-industry trade have on the Czech Republic's road vehicle exports.

1. Methodology

In order to analyse the impact of intra-industry trade on Czech exports we use cross-sectional data and the OLS method. The Czech vehicle exports are explained by proxy for intra-industry trade and by other regressors typical of the gravity models. In this part of paper we first explain the composition of Grubel-Lloyd index designed to measure

intra-industry trade and later we focus on the origin and logic behind the gravity models. At the end the regression equation is presented.

Grubel and Lloyd (1971) proposed an index to measure the intra-industry trade. This index is computed as follows:

$$GL_I = 1 - \frac{|X_I - M_I|}{X_I + M_I}$$

Where X is the exports, M is the imports and I is the industry for which the index is computed. This index has values between 0 and 1 where 0 stands for non existence of intra-industry trade and 1 indicates that the industry's exports are equal to its imports.

Our model follows the voluminous literature on gravity models. Gravity models were first used by Tienbergen (1962) and Pöyhönen (1963) but it was not until the 80s that the microeconomic foundation of these models was proposed (Bergstrand, 1985). These models have been used to explain export, import, trade and even investment flows. They were used to assess the impact of different policies as well as the effects of economic integration on these flows.

As the name suggests the idea for this type of trade analysis follows the Newton's law. It suggests that the trade is being determined by the economic size and the distance between the trading partners and the gravity equation in its simplest form can be written as follows:

$$X_{ij} = \frac{M_i * M_j}{D_{ij}}$$

Where X represents the exports¹, M the economic size, D the distance and i and j stand for the trading partners. The logic behind this model is very simple. Distance in this model represents proxy for the transportation costs which negatively influence the volume traded. The economic size often measured by GDP represents the growing market size in case of importing country and the increasing capacity to produce in case of the exporter. Other regressors might be added to capture other phenomena causing the trade to increase or decrease.

¹ As mentioned previously other dependent variables could be used such as trade volume or foreign direct investment flows. But this case is most suitable for our analysis.

In our model we try to explain the Czech exports of one particular industry. Classical regressors of gravity models have been used. Distance between capital cities is used to proxy the transportation costs, GDP per capita and the total of population are used to capture the possible foreign demand for Czech vehicles and the production of Czech cars is used instead of Czech GDP to better show the Czech capacities to produce road vehicles. An index to show impact of institutional environment on trade is added in our analysis. Finally, the Grubel-Lloyd index is added to demonstrate the impact of changes in intra-industry trade on Czech exports. The regression therefore looks as follows:

$$X = dist + GDP + prod + pop + BERI + GL$$

The following part of paper will present the data used in our model.

2. Data

This paper analyses data in the period from 2000 till 2010. By our model we try to capture how changes in the parameters between the years 2000 and 2010 have influenced the change in dependent variable. All of the variables are therefore computed as compound average growth rate between the years 2000 and 2010. Only the variable distance is for obvious reasons not calculated as the growth rate.

Different databases are used to construct our dataset. Exports (X) of road vehicles are based on the SITC methodology and are taken from the Czech statistical office's External trade database. Two-digit codes of exports are used.² For the distance (dist) we use the distance between capital cities of the trade partners. The GDP per capita (GDP)³ and the total population (pop) of Czech road vehicle importers comes from the World Bank database. The institutional environment index (BERI) is represented by BERI dataset. And finally the Grubel-Lloyd index (GL) is computed using information on exports and imports from External trade database provided by Czech statistical office.

² The SITC code for road vehicles is 78.

³ Because the average growth rates are computed the currency in which these variables are reported is not important

Our regression is limited to 45 observations due to two main reasons: (1) The BERI index is constructed only for limited number of countries. (2) Countries with zero exports of cars to the Czech Republic must be eliminated from our dataset.⁴

3. Results

Results from our regression are available in table 1. We find that BERI is not a good measure for the institutional environment. The coefficient suggests there is a positive impact of institutional environment on Czech road vehicle exports to these countries but we cannot exclude the possibility that the impact of this regressor is zero. That is why we conduct a sequential elimination of variables and we perform new regression:

$$X = dist + GDP + prod + pop + GL$$

When the variable BERI is omitted, the results do not change significantly. We observe the same pattern as in the previous model.

The impact of regressors on the Czech road vehicle exports is not always as expected. First of all, the distance in most gravity models is expected to have negative impact on export volume. This is because the distance is perceived as a proxy for transportation costs and higher transportation costs should be lowering the trade. In our model the higher is the distance, the higher is the impact on trade. However, this phenomenon can be explained by the specification of our model. As explained before, we do not analyse the volume of exports but the changes in exports between the years 2000 and 2010. The positive coefficient tells us that the higher the distance is, the more dynamic the exports of road vehicle to this country were. This might indicate that while the air distance between capital cities did not change over time, the transportation costs for long distances have decreased significantly therefore allowing for bigger increase in trade between those countries where the trade was previously restricted by high transportation costs. Second, the higher the growth in GDP per capita was, the lower was the growth in Czech exports to this country. This might be a sign of a shift towards more luxury cars

⁴ This is because of the impossibility to calculate compound average growth rate for their Grubel-Lloyd indexes. On the other hand not many countries were excluded from the analysis due to this reason. From countries for which BERI is computed only Chile, Colombia, Kazakhstan, Nigeria, Peru and Venezuela were excluded because of zero exports of road vehicles to Czech Republic. Also Taiwan, R.O.C has been excluded from the dataset because of the lack of data in the World bank database. Data from different databases could further bias our analysis.

in countries with higher growth in GDP per capita. Third, the bigger the growth in population was, the lower the growth in car exports was. Furthermore, the impact of the growth in car production is as expected. The positive growth in car production between years 2000 and 2010 led to an increase in Czech road vehicle exports. Finally, our analysis shows that intra-industry trade measured by Grubel-Lloyd index increases Czech exports to these countries. The analysis was conducted on the two-digit SITC codes which include final goods as well as components. Therefore our analysis might suggest that the exports in certain goods increase thanks to the vertical specialisation in trade.

TAB. 1: Determinants of Czech car exports

variable	Model 1	Model 2
distance	0,00147744 (0,01347)	0,00155441 (0,00410)
GDP per capita	-0,19849 (<0,00001)	-0,195623 (<0,00001)
Car production	1,34541 (<0,00001)	1,25152 (<0,00001)
Population	-4,20059 (0,10332)	-4,27578 (0,08205)
Grubel-Lloyd index	0,0879744 (0,08546)	0,0902571 (0,08161)
BERI	1,33205 (0,56072)	-
R ²	0,279031	0,273862

Source: Author's computations

Conclusion and discussion

The growth in Czech road vehicle exports between years 2000 and 2010 to the set of 45 countries was most importantly determined by the growth in Czech capacity to produce cars. The growth in the GDP per capita and growth in population showed to have negative impact on the exports to these countries. It seems that thanks to the decreasing

transportation costs, there was an increased growth in exports to countries with bigger distance from Czech Republic. The growth in intra-industry trade showed to have positive impact on the growth of Czech exports. However, our model is able to explain only 27% of changes in the Czech road vehicle exports. This is due to the use of cross-sectional data and important differences between countries included in our dataset which are not easy to be addressed by our model.

Further research should be done in order to improve the results of our model and in more detail analyse the determinants of Czech road vehicle exports. First of all, the dataset should be broadened by more observations. Viewing that BERI was not able to address the issue of institutional environment, in the future research we do not need to rely on the BERI dataset and we can extend model by countries for which BERI index is not computed. The number of observations could be also extended by using panel data analysis. Finally, in order to provide better picture of the export determinant more detailed SITC division should be used. When using more detailed data question of vertical and horizontal specialization in trade can be answered more properly.

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THE IMPORTANCE OF TYPES OF CUSTOMERS FOR HOUSING COOPERATIVES FROM THE ŚWIĘTOKRZYSKIE PROVINCE

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Key words:

cooperatives – customers – revenue

Abstract:

The aim of the article is to show results of the research that were performed in eight housing cooperatives from Świętokrzyskie province. The purpose of the research was to investigate the importance of customer types for housing cooperatives in terms of revenue generation. Managers were asked about the importance of types of such customers as the members of the cooperative, the property owners who are not members of the cooperative, condominiums, tenants, leaseholders. They could also point out other customers.

Introduction

A business model establishes how value is created for customers and a firm's strategy to appropriate returns derived from that value [3]. To be willing to pay, a customer must derive value from a market offer [4]. Nowadays, customers have the power, because they are making decision on where and who to choose. They need to feel that they are very important. If the company does not meet their expectations they can choose another one. As the result of this situation, companies must devote much more attention and focus in nurturing such an asset. A variety of studies find that higher levels of customer satisfaction lead to greater customer loyalty [1]. Loyal customers are both a scarce resource and a source of value [2]. Through increasing loyalty, customer satisfaction helps to secure future revenues, reduce the costs of future transactions, decrease price elasticities, and minimize the likelihood customers will defect if quality falters [1]. This article shows results of conducted research about the importance of customer types for housing cooperatives in terms of revenue generation

1. An analyzis of the importance of customer types

Cooperative executives were asked to assess the degree of importance of customer types from the point of view of revenue generation. Interview results are shown in Table 1 and Figure 1.

TAB. 1: The importance of types of customers

Types of customers	Cooperative								Average rating
	„A”	„B”	„C”	„D”	„E”	„F”	„G”	„H”	
The members of the cooperative	4	4	5	4	4	4	3	4	4.0
The property owners who are not members of the cooperative	4	3	3	4	4	4	5	2	3.6
Condominiums	2	3	4	3	4	2	3	4	3.1
Tenants	3	1	0	0	0	4	0	4	3.0
Leaseholders	3	0	0	1	0	0	0	4	2.7
Other customers	0	0	0	0	0	0	0	0	0

5 - extremely important, 4 - very important, 3 - quite important, 2 - little important, and 1 - completely unimportant. If the cooperative did not have a specific customer - 0 - not applicable.

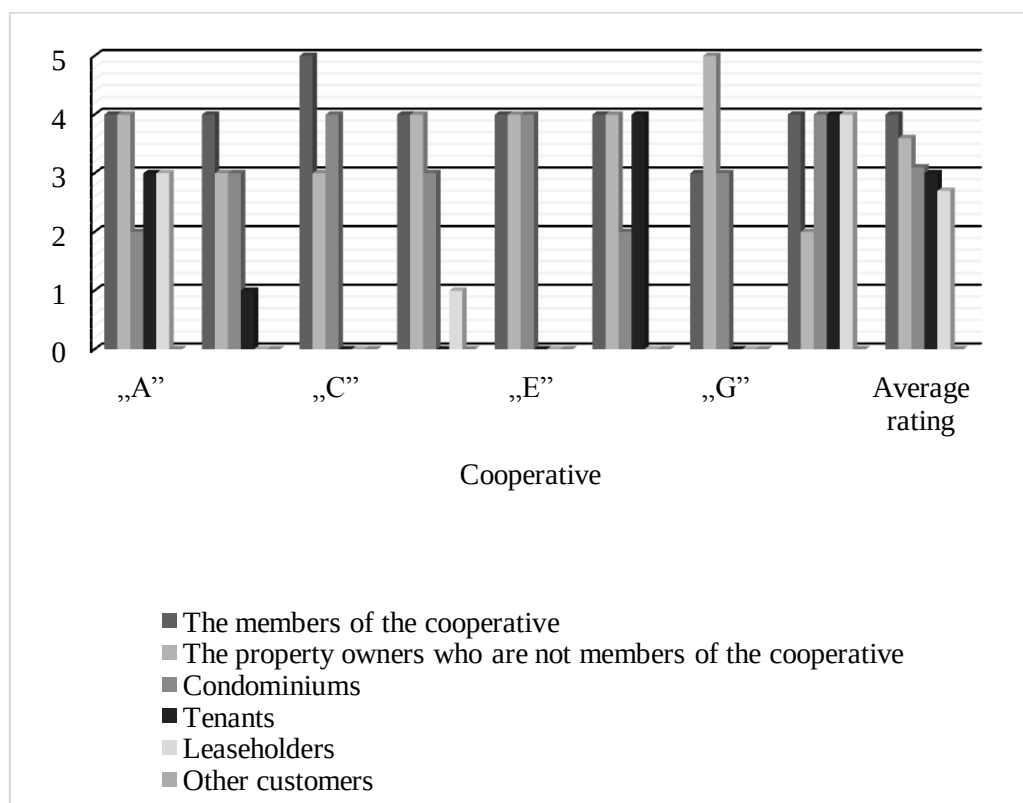
Source: Compiled by author.

When analyzing Table 1 and Figure 1 it is clear that from the point of view of revenue generation:

- The members of the cooperative were considered as extremely important by one cooperative, as very important by six cooperatives, and as quite important by one cooperative (average rating is 4.0).
- The property owners who are not members of the cooperative were indicated as extremely important by one cooperative, as very important by four cooperatives, as quite important by two cooperatives, and as little important by one cooperative (average rating is 3.6).

- Condominiums were considered as very important by three cooperatives, as quite important also by three cooperatives, and as little important by two cooperatives (average rating is 3.1).
- Tenants were indicated as very important by two cooperatives, as quite important by one cooperative, and as completely unimportant also by one cooperative (average rating is 3.0). Four cooperatives does not have this type of customers.
- Leaseholders were considered as very important by one cooperative, as quite important by one cooperative, and as completely unimportant also by one cooperative (average rating is 2.7). Five cooperatives does not have this type of customers.
- All cooperatives did not indicate other customers.

FIG. 1: The importance of types of customers



5 - extremely important, 4 - very important, 3 - quite important, 2 - little important, and 1 - completely unimportant. If the cooperative did not have a specific customer - 0 - not applicable.

Source: Compiled by author.

Taking into account housing cooperatives, and analyzing Table 1 and Figure 1, it is also clear that:

- In the cooperative “A” as very important were indicated the members of the cooperative, and the property owners who are not members of the cooperative. Tenants, and leaseholders were considered as quite important, while condominiums were considered as little important. The cooperative “A” does not have other customers.
- In the cooperative “B” as very important were considered the members of the cooperative. The property owners who are not members of the cooperative, and condominiums were indicated as quite important, whereas tenants were considered as completely unimportant. The cooperative “B” does not have leaseholders, and other customers.
- In the cooperative “C” as extremely important were indicated the members of the cooperative. Condominiums were considered as very important, while the property owners who are not members of the cooperative were considered as quite important. The cooperative “C” does not have tenants, leaseholders, and other customers.
- In the cooperative “D” as very important were indicated the members of the cooperative, and the property owners who are not members of the cooperative. Condominiums were indicated as quite important, whereas leaseholders were considered as completely unimportant. The cooperative “D” does not have tenants and other customers.
- In the cooperative “E” as very important were considered the members of the cooperative, the property owners who are not members of the cooperative, and condominiums. The cooperative “E” does not have tenants, leaseholders, and other customers.
- In the cooperative “F” as very important were indicated the members of the cooperative, the property owners who are not members of the cooperative, and tenants. Condominiums were considered as little important. The cooperative “F” does not have leaseholders, and other customers.
- In the cooperative “G” as extremely important were considered the property owners who are not members of the cooperative. The members of the

cooperative, and condominiums were indicated as quite important. The cooperative “G” does not have tenants, leaseholders, and other customers.

- In the cooperative “H” as very important were indicated the members of the cooperative, condominiums, tenants, and leaseholders, whereas the property owners who are not members of the cooperative were considered as little important. The cooperative “H” does not have other customers.

Conclusion

An analysis of importance of customer types, based on the results of conducted research in housing cooperatives from the Świętokrzyskie province, shows that from the point of view of revenue generation, cooperatives assess the highest the members of the cooperatives and the property owners who are not members of the cooperative. The lowest the cooperatives found the leaseholders. The results of research also shows that cooperatives differently assess the importance of types of customers. Assessed the highest the members of the cooperative are extremely important only for one cooperative, while for other cooperatives they are very important or quite important. The property owners who are not members of the cooperative that were also assessed high are extremely important for one cooperative, whereas for others they are very important, quite important or little important.

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EFFECTIVE CORPORATE TAXATION OF THE VISEGRAD GROUP

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Key words:

effective taxation – basic tax rate – implicit tax rate – effective average tax rate –
Visegrad group

Abstract:

At present, the issue of corporate taxation is a widely discussed topic because a part of the Czech political spectrum intends to increase the corporate tax, especially for big corporations. In view of the fact that the basic corporate tax rates do not have much information capability in international comparison, it is preferable to use a comparison of effective taxation. The aim of this paper is to evaluate the effective taxation of corporations which can be expressed using either implicit corporate tax rate or the effective average tax rate (EATR), and to compare the effective corporate taxation of the Visegrad group countries.

Introduction

The enlargement of the European Union and the globalisation process also substantially affect taxation systems and fiscal policy in the individual countries [5]. In the sphere of direct taxes the important external factor is the tax competition between single countries and that is also in the frame of the expanded European Union. It depends on historical development of each country, and also on economic, political, and, last but not least, philosophical opinions, how the structure and content of the tax system will be influenced. It is important for the state to pursue a favourable tax policy to ensure support to all taxpayers and thus to ensure competitiveness of the state and development of the society.

According to the comparison of legal entities income tax, decreasing tax burden for firms has been showed unambiguously in the last decade. However, apart from that,

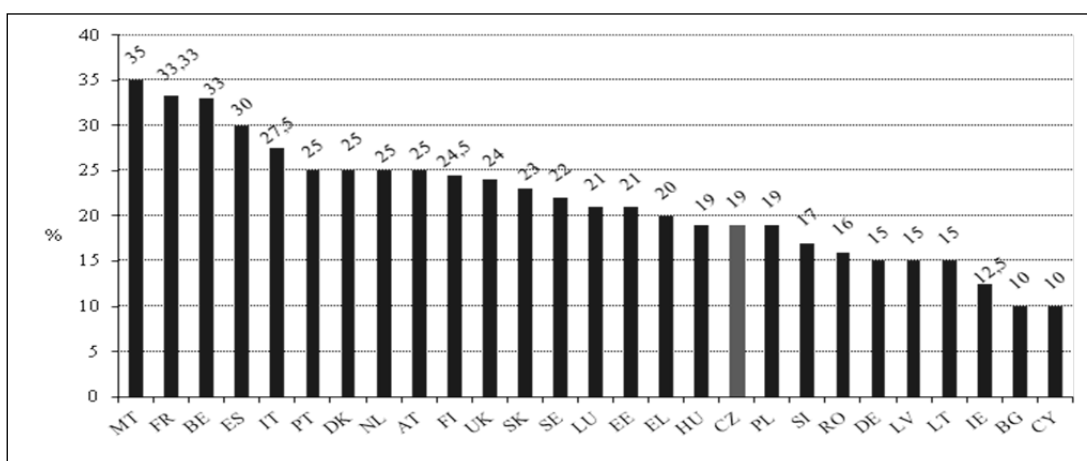
economic behaviour of companies, in connection with positioning their capital abroad, reacts on comparability of tax conditions in single countries. According to Šíroký, appropriate adjustment of corporate tax rate may stimulate businesses for more economic activity [6].

1. Basic corporate taxation

In the Czech Republic, the income tax has showed a gradual fall, including the income tax of legal persons (corporations). This trend has been reflected across the European Union in the long term, but not in all countries. Therefore, differences between corporate tax rates have arisen when the lowest rates are in Bulgaria and Cyprus, both at the level of 10 %. On the other hand, the group of countries with the highest basic rates over 30 % includes Malta, France and Belgium.

The following graph shows the basic rate of corporate income tax in the individual countries of the European Union in 2013. It may be deduced from it that the Czech Republic is, with the rate of 19 %, below the EU average rate which is just under 22 %. The corporate tax rates at the same level of 19 % are both in Poland and Hungary. The same rate was in neighbouring Slovakia but it has proceeded the opposite direction than most of the EU countries and has increased this rate by 4 percentage points to 23 %. [3].

GRAPH 1: The basic tax rate on corporate income in the EU countries in 2013

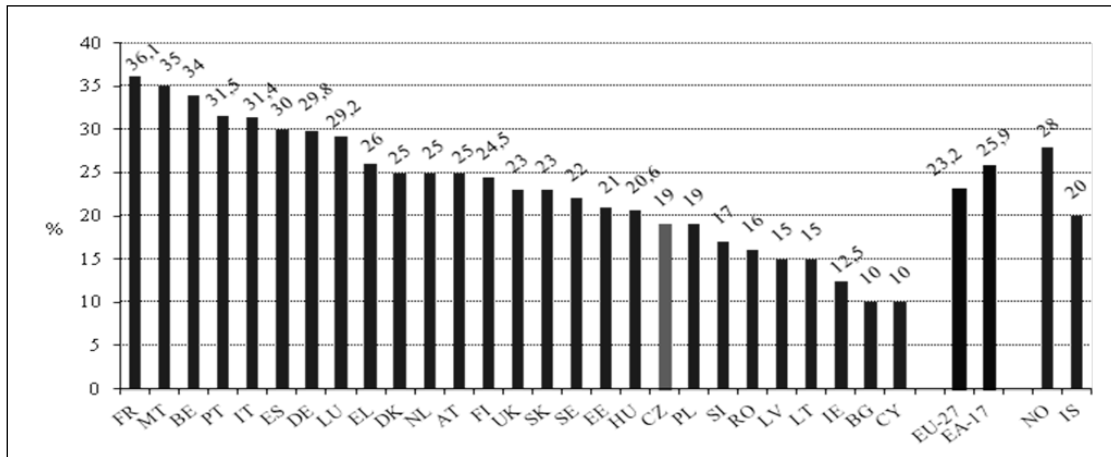


Source: authors by [3]

Some states added the various surcharges or local rate to the basic tax rate. The Belgian basic corporate tax (33 %) is increased by 3% surcharge. In Luxembourg there is not only 7% surcharge but also the local rate in the amount of an additional 6.75 %. The

additional local rates are used more in Hungary, Italy, France, Spain and Germany. The statutory income tax rates, which include not only basic tax rates, but also temporary or permanent additional taxes and reliefs, are shown in graph 2.

GRAPH 2: The statutory tax rate on corporate income in the EU countries in 2013



Source: authors by [4, 38]

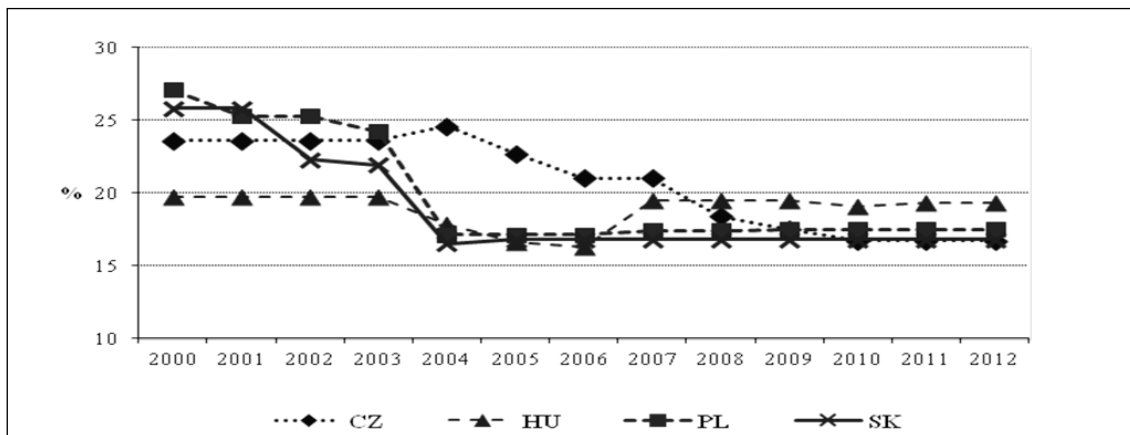
Different rules for setting corporate tax base and its amount, which are caused by individual tax legislations in the particular countries, also mean a substantial limitation for an objective comparison of tax burden for companies by statutory income tax rates in those countries. Consequently, statutory tax rate cannot serve as an impartial indicator for the purposes of mutual comparison of this burden in different states, and therefore economists had to come up with a new measure for effective taxation of corporations.

2. Effective corporate taxation of V4 countries

When companies are taking a decision about the location and implementation of their business activities, they find out the tax consequences of such activities. In most cases, they address the issue by comparison of statutory corporate income tax rates. Nonetheless, this approach does not seem to be satisfactory with respect to complexity and diversity of elements creating the national tax systems. The impact of taxation on the choice is measured by the proportion of total income taken in tax in each location. Devereux and Griffith proposed a measure of an effective average tax rate (EATR) to identify the effect of taxation on such discrete location choices [2].

The tax system is expected to remain unchanged over the life of the investment. The impact of taxation depends on a number of features of the tax system, including the statutory tax rate, capital allowances, the treatment of foreign source income, wealth taxes paid by the company, as well as possibly the treatment at the corporate and personal level of dividends paid by the company, and wealth and capital gains taxes at the personal level.

GRAPH 3: The Effective average tax rate of V4 countries in the years 2000 - 2012



Source: authors by [4, 262]

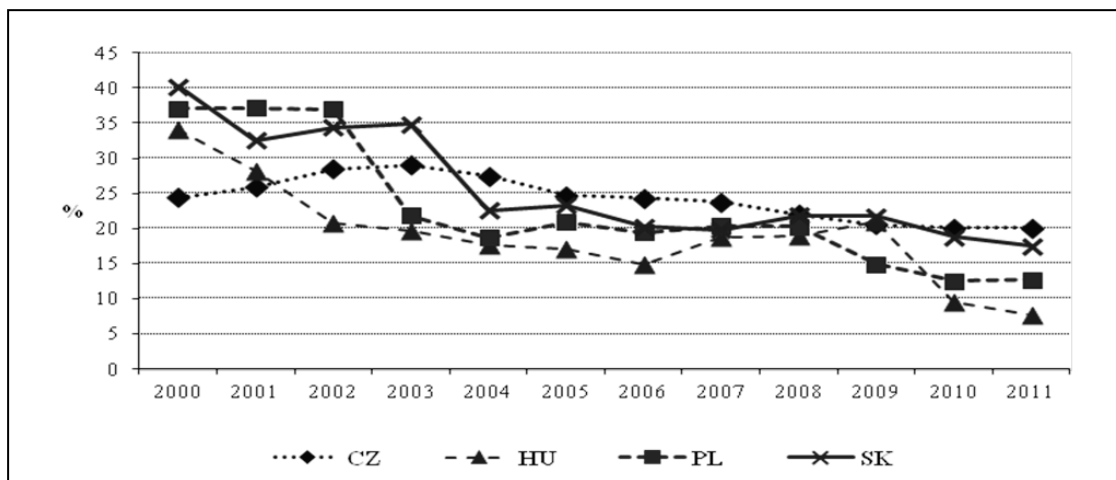
The graph 3 shows the development of an effective average rate of V4 countries between 2000 and 2012. In 2000 the lowest EATR was in Hungary (19.7 %). In this country there was finally the smallest decrease of this rate, only 0.4 percentage points to 19.3 % in 2012. Significant decrease of this rate is evident in the Czech Republic from 23.6 % in 2000 to 16.7 % in 2012, then the largest in Poland (- 9.6 %) and the Slovak Republic (- 9 %).

The forward-looking effective tax rates offer a convenient theoretical framework for summarising at a broad level the interaction of tax rules relating to capital investment. It should be noted that the indicator should be interpreted with caution, taking into account the assumptions related to the hypothetical investment as well as to the modelling detail of the tax systems.

3. Implicit corporate taxation of V4 countries

Implicit corporate tax rate also appears to be an appropriate measure of comparison of effective corporate taxation. This tax rate takes into account not just the amount of the statutory tax rates from corporations' rates but also other aspects of taxation systems determining the total amount of effectively paid taxes. The implicit corporate tax rate is calculated as a ratio of the aggregated income taxes or from profits paid by corporations to the value of tax base, which is the corresponding potentially taxable base including these aggregated values: net operating profit/loss of non-financial and financial corporations, the difference between the received and paid interest, rent of lands, income from property insurance and dividends distributed by companies operating in the particular state and credited to non-financial and financial corporations, households, independent entrepreneurs and non-profit institutions, state authorities and the rest of the world [1, CD]. The following graph presents the development of the implicit tax rate of corporate income of V4 countries in the years 2000 - 2011.

GRAPH 4: The implicit corporate tax rate of V4 countries in the years 2000 – 2011



Source: authors by [4, 257]

The implicit tax rate on corporate income did not change significantly and fluctuated around 19 % in the Czech Republic in the monitoring period. In 2000 it was the lowest rate of all V4 countries when the highest implicit taxation was reached by corporations in Slovakia (40.2 %). In the neighbouring countries there was a gradual reduction of the implicit rate to below the level of implicit taxation in the Czech Republic.

Conclusion

Rates and development of corporate taxes in individual countries are carefully observed because their amounts are really important in corporate decision-making about the allocation of investment. The simplest alternative is the comparison of statutory corporate rates of income taxes. For its simplicity and easy availability of data, this comparison has been becoming the most commonly applied. Different rules for setting corporate tax base and its amount, which are caused by individual tax legislations in the particular countries, are a substantial limitation for an objective comparison of tax burden for companies by statutory income tax rates in those countries. Consequently, for the purposes of the reciprocal international comparison, statutory tax rates are not quite an appropriate and objective indicator.

The instrument which removes the imperfect information capability of the basic or statutory tax rates is the implicit tax rate. It takes into account the tax base and the method (if any) by which the systems of corporate and personal income taxes are integrated. For comparison, companies can also use the effective average tax rate which is calculated by special methods.

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TERRITORIAL BUDGET AND DEVELOPMENT OF SELECTED RURAL MUNICIPALITIES IN THE SOUTHERN BOHEMIAN REGION

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Key words:

municipality – countryside – municipal budget – municipal management – local action group

Abstract:

The aim of this paper is to characterize the territorial budget of municipalities in connection with the economic situation of the selected municipality. The selected municipality is Kamenná, located in the South Bohemian Region. An analysis of the development of this municipality will be done, strategic planning in the municipality will be mapped out and the existence of micro-regions and local action groups associated with the municipality will be determined.

Introduction

Rural municipalities are defined in three ways. The first method is based on the criterion of the population of the municipality, yet such a criterion is not uniform in practice. One of the possible boundaries used to separate urban and rural municipality populations is the generally accepted limit of 2,000 inhabitants. By deviation from the foregoing variation the legislation contained in Act No. 128/2000 Coll., on Municipalities (municipal system), as amended, determines the boundaries of rural municipalities at 3,000 inhabitants [7].

The second approach is based on a formal point of view where settlements which do not have city status are considered rural [1, 89]. As of 1 January 2012 there were a total of 6,251 municipalities in the Czech Republic - 595 towns and 5,656 so-called non-city municipalities. The population of these non-city municipalities was 3,165,769 inhabitants [9].

The third way of defining rural municipalities is based on population density. Using the OECD methodology field, rural communities are considered those with a population density of less than 150 inhabitants per 1 km². However, in strategic documents in the Czech Republic, the level of 100 inhabitants per 1 km² [1, 90] is applied. The definition of rural areas by population of rural communities according to the statute and the population density is important for sociological research [1, 91].

Generally, it can be summarized that the Czech Republic is characterized by dense and fragmented settlement with a large number of small rural communities that have their own self-governments [1, 93].

1. Strategic planning in municipalities

Strategic planning is “a systematic process for how to organize and manage change, and develop in organizations, communities, cities, regions and consequently in the whole society a wide consensus on a common vision for a better economic future.” [5]

At the municipal level, a number of short-term plans are prepared with a period not exceeding one year. These include the municipal budget, financial plan for the municipality, etc. The long-term plan of a municipality is its strategic plan. These strategies are prepared for a period of three to five years. When creating a long-term strategic plan for the municipality it is important to consider the length of term of office. “Strategic decisions at the local level of government must be in accordance with the functions and competences of local governments, they must respond to unique local needs and problems and respect local human, material and financial resources.” [6]

The strategic plan of a municipality is a document that sets out the most important activities of the municipality and its long-term vision. The task of the strategic plan of the municipality is to define the common interests of the municipality, the residents of the municipality and businesses. The strategic development plan of the municipality should coordinate the use of public investments, define the long-term objectives of the policy of the municipality and strengthen responsibility and solidarity in the development of the municipality for residents and businesses [2, 44]. The strategic plan is also a means of maximizing the potential of the municipality to strengthen the capacity to use EU funds, thus facilitating the implementation of projects and fulfilment of its goals. [2, 45] Every strategic development plan of a municipality must correspond

with the objectives of the micro-region, region or county and be in line with national strategies.

2. Financial management of the municipality

The financial management of municipalities is subject to Act No. 250/2000 Coll., on budgetary rules of territorial budgets, which states that the management of municipalities is governed on the basis of an annual budget and financial perspective [8]. Municipalities are accounting entities. Revenues and expenses are reported in the mandatory division broken down by budget structure. Implementation of budget expenditures is monitored from two different perspectives, which are cash basis (recorded in current accounts) and actual executions (budget costs represent the final consumption of all resources at a given time) [5].

The budget and municipality assets are important pillars on which stands the management of territorial units. The budgets of territorial units have many features in common with the state budget [3]. Local government budgets are an essential element in the public budget system.

3. Characteristics of Kamenná

Kamenná is located in Southern Bohemia in the České Budějovice district in the administrative district of a municipality with extended powers and administrative district of a municipality with an authorized municipal office: Trhové Sviny. The cadastral area of the municipality is 1,261 ha. In 2012 there were a total of 304 inhabitants in the municipality. Of the total population in the municipality, there are 159 men and 145 women. The population has grown slightly in recent years [9]. In an interview with the mayor, Mr Josef Bašta, he said that “it is in the interest of Kamenná to attract more inhabitants and to keep the existing residents.” The population, in particular the sharp decline, is related to the expulsion of the Germans. Records show that there were 774 inhabitants in Kamenná in 1869, 720 inhabitants in 1930 and only 344 inhabitants in 1950.

Of the 304 residents in Kamenná, 220 are people of working age (72%), of whom 115 are men and 105 are women. In Kamenná there are 52 persons (17%) younger than 15

years and 32 persons (11%) over 65 years. The average age is 38.3. The average age in the Czech Republic is higher: 40.6 years [9].

Kamenná does not have a school, post office, police or medical facility. The municipality has sewerage works connected to a wastewater treatment plant and no natural gas distribution.

Kamenná belongs to the local Sdružení Růže (Rose Association) action group, which is a civic association founded in 2004. The main reason for its creation was the opening of the LEADER and LEADER + programmes, through which it was possible, under certain conditions, to apply to the Ministry of Agriculture of the Czech Republic and the State Agricultural Intervention Fund for grants for development of the region [11]. Kamenná is one of those that did not utilize the Leader+ implemented in the Sdružení Růže local action group. At the time when funds could be drawn, Kamenná had not planned such projects that would have been appropriate to the programme in terms of their content. In addition, no businesses took advantage of this opportunity either. All implemented projects in Kamenná are of such a nature that there is no need for large investment funds. Examples include carnivals, hunting balls or football tournaments. In 2005, Kamenná called a meeting the natives to mark 60 years since the settlement of the village.

4. Budget of Kamenná

The municipal budget is a tool for Kamenná's operation and management. The budget is always prepared for one calendar year and it is proposed by the municipal council. The proposal must also be approved at a public meeting of the municipal council. The budget can be compiled as a balanced, deficit or surplus budget.

The largest item in terms of revenues of the municipality are taxes. These include general taxes on goods and services, income taxes for individuals and legal entities, and property taxes. Other tax revenues are environmental fees and charges, waste fees and fees for dogs. Non-tax revenues of the municipality are revenues from its own activities; from rent of real estate and land plots, interest and profit sharing. Grants make up a substantial portion of the municipal budget of Kamenná.

In all years, tax revenues of the municipality accounted for a majority of all revenues. The total revenues for of the municipality for 2012 amounted to more than 5.5 million

CZK, of which nearly 2.8 million CZK was tax revenue, 1.3 million CZK non-tax revenue, over 0.2 million CZK capital revenues and more than 1.1 million CZK from grants. The smallest proportion of tax revenues was in 2012, where tax revenues accounted for 50.6 % of all revenues. By contrast, in 2009 tax revenues accounted for 65.7 % of total revenues.

Distribution of value added tax and income tax is determined by the Ministry of Finance pursuant to Act No. 243/2000 Coll., on Budgetary Allocation of Taxes. With effect as of 1 January 2013, there was an increase to these taxes on the basis of Decree No. 449/2012 Coll., on the share of each municipality to set a percentage of the gross revenue of value added tax and income tax. In 2012 Kamenná was granted special subsidies for the establishment of a multi-purpose field.

Expenditures of the municipality are used to ensure the functioning of the municipality and are divided into “regularly repeating at different amounts” and “one-time” expenditures. Regular expenditures are, for example, expenditures on forestry, roads, drainage and wastewater treatment, drinking water, road transportation, education, municipal services, housing development, waste management, etc. In the event of one-time expenditures, these are mostly planned long-term projects. The municipality may apply for grants for such projects. In particular, this means reconstruction of roads, building of a water supply, sewerage, repair of the library and fire station. The last significant one-time expense was the establishment of a multi-purpose playground for leisure activities. Another one-time expense item are minor and emergency repairs.

In 2011 expenditures of the municipality were 4.5 million CZK; in 2012 they were more than 9.5 million CZK, which was due mainly to an increase to physical education and leisure activities, industry and environmental protection chapters.

The economic results in Kamenná have differed greatly in recent years. The reasons for these differences are mainly expenses. This is especially true for 2012, where the above expenses were almost double the revenue of the Kamenná. The reason was the mentioned construction of a multipurpose field. The status of the budget of Kamenná from 2000 to 2012 is in the negative, namely -550,070 CZK.

Conclusion

In the overall budget of the Czech Republic, small municipalities, so-called non-city municipalities, constitute the largest share. In terms of the functioning of the municipality, in addition to the population, the territory of the municipality and legal subjectivity, a very important element is the economic situation of the municipality. In the selected municipality, Kamenná, there was a shortage in relation to the budget of the municipality and grants were not utilized, wherein it could have been possible for the municipality in the programme period of 2007-2013 to use grants through local action group Sdružení Růže. Kamenná did not receive any grants for any projects, not even in the public sphere or within the private sphere. Currently, Kamenná has a budget deficit and will have to deal with a poor economic situation in the near future.

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IMPORTANCE OF INDIGENOUS KNOWLEDGE FOR DEVELOPMENT

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Key words:

indigenous knowledge – knowledge management – regional development

Abstract:

Indigenous knowledge contains several important characteristics which distinguish it from other types of knowledge. These include originating within the community, maintaining a non-formal means of dissemination, collectively owned, developed over several generations and subject to adaptation, and imbedded in a community's way of life as a means of survival. A proper management of this kind of knowledge is still missing, and moreover, the indigenous knowledge importance is usually not a recognized or important issue for regions within developed countries. In our paper we try to stress the importance of indigenous knowledge recovery, maintenance, and exploitation for solving some problems in regions.

Introduction

Indigenous, or traditional knowledge, means such knowledge and skills that has been developed outside the formal educational system as embedded in culture of a population within particular location. A typical example is knowledge developed for ages within indigenous communities living for hundreds of years in their original location (native, aborigine communities). Undoubtedly, knowledge of this type has been used for ages in the given region for overcoming troubles with food supply and security, as well as with health problems of people from the community. Last but not least, indigenous knowledge includes important knowledge also about preventing from natural disasters, like floods or avalanches, if they pose a threat for the community. Although many authors in the past wrote a lot about the importance of indigenous knowledge, the proper management of this kind of knowledge is still missing, and moreover, the

indigenous knowledge importance is usually not a recognized or important issue for regions within developed countries. We believe that it is possible to manage indigenous knowledge via an integration of both scientific and indigenous knowledge, and that this integration is important also for solving many regional problems not only in developed countries. In our paper we try to stress the importance of indigenous knowledge recovery, maintenance, and exploitation for regions and their development.

1. Growing Importance of Indigenous Knowledge

What is indigenous knowledge and why its importance seems to be continuously growing in these years? Grenier in her useful guide [4] writes that *indigenous knowledge refers to the unique, traditional, local knowledge existing within and developed around the specific conditions of women and men indigenous to a particular geographic area.... The development of indigenous knowledge systems, covering all aspects of life, including management of the natural environment, has been a matter of survival to the peoples who generated these systems. Such knowledge systems are cumulative, representing generations of experiences, careful observations, and trial-and-error experiments.*

According to Turnbull [13], *local knowledge is a generic term referring to knowledge generated through observations of a particular environment or at a particular site and produced by a specific group of people with specific practices and tools.* Indigenous knowledge then is local knowledge held by indigenous peoples, or local knowledge unique to a given culture or society based in particular relationships to the land or place. Berkes and Berkes [1] briefly characterize indigenous knowledge to be a way of life, a way of knowing. It is worth stressing, that in some sense we all are indigenous and all knowledge including science is in this sense local [1]. It is clear, that local knowledge creates the basis for local level decision making in agriculture, healthcare, food preparation, education, natural resource management and a host of other activities mainly in rural communities.

It is estimated that at the beginning of this millennium there were 300–350 million indigenous people in the world, that is about 6% of the total population spread over

5000 different groups in 72 countries. As Turnbull [13] shows, indigenous peoples and their cultures are at risk of extinction through the combined effects of modernity and globalisation which are driving them into acculturation and assimilation. They are losing their territories due to climate change, logging, clearing, mineral extraction, road building, expropriation of land, and poaching of animals and plants.

Stevenson [12] pointed out an important fact that for many indigenous people experience is knowledge and knowledge is experience. Thus, it is not easily shared among individuals unless there is a mutual understanding and appreciation of that experience. Therefore, in many cases it is difficult for indigenous people to communicate to outsiders what their traditional knowledge is, and why it is equally as hard for outsiders to understand and appreciate how that knowledge can be used in environmental assessment and management. Indigenous people often possess more detailed understanding of their environment than outsiders, as they usually have had more extensive contact with the land. The potential to misrepresent and misuse traditional, indigenous knowledge is great when that knowledge is separated from the broader system of knowledge and the cultural context (cf. [2], [6], or [7]).

Grenier [4] writes that *indigenous knowledge is stored in peoples' memories and activities and is expressed in stories, songs, folklore, proverbs, dances, myths, cultural values, beliefs, rituals, community laws, local language and taxonomy, agricultural practices, equipment, materials, plant species, and animal breeds. Indigenous knowledge is shared and communicated orally, by specific example, and through culture. Indigenous forms of communication and organization are vital to local level decision making processes and to the preservation, development, and spread of indigenous knowledge.*

Indigenous knowledge contains several important characteristics which distinguish it from other types of knowledge. These include originating within the community, maintaining a non-formal means of dissemination, collectively owned, developed over several generations and subject to adaptation, and imbedded in a community's way of life as a means of survival. This kind of knowledge is generally passed by word of

mouth through generations and is not often recorded in writing but to achieve the desired results for development it should be recorded and latest available technologies could be proven useful. Indigenous knowledge is dynamic in nature, and changes its character as the needs of people change.

2. Indigenous Knowledge Systems

According to Mbilinyi [8] and also other authors (cf. also [6], [9], or [11]), indigenous knowledge has now been recognized and accepted as a vital knowledge source for development. Mbilinyi [8] pointed out that this recognition is directly related to the growing realization that locally generated knowledge can be used to change and improve agriculture and natural resource management, among other areas. Greater efforts therefore should be undertaken to strengthen the capacity of local people to develop their own knowledge base and to develop methodologies to promote activities at the interface of scientific disciplines and indigenous knowledge. Developing of sophisticated but still usable indigenous knowledge systems can be helpful here.

Indigenous knowledge system consists of a wide range of knowledge that has largely remained hidden from the mainstream of education, innovation, industry and commerce. Indigenous knowledge holders, as custodians thereof, have enormous potential for innovation and commercialization of indigenous knowledge. The existing knowledge about critical spheres such as health, agriculture and water management could be captured using a variety of existing means such as stories, songs and skits. These may be recorded using a variety of existing media such as paper, images, audio and video. Collect and record existing practices using 'low-tech' ICT without adding large, expensive infrastructure and is retained in the local language using local techniques for capturing it, indeed low-tech approach should be a good starting point.

Indigenous knowledge systems are typically human centered, very diverse, applying technology of local origin with strong cross-linkages. Properly used management of knowledge is important here since connecting knowledge with its application empirically or conceptually to desirable social ends is essential. Indigenous knowledge systems generally provide a way of connecting, a way of knowing, a way of feeling and also a way of doing. It is necessary to integrate indigenous knowledge systems to other

knowledge systems, mainly with Western (scientific) knowledge systems for achieving more benefits.

The focus on the role of knowledge in development processes is the result of understanding about the relationship between economic growth and the application of knowledge. Indigenous knowledge is an important resource in the development process of local communities. Sharing indigenous knowledge within and across communities can help to enhance cross-cultural understanding and to promote the cultural dimension of development. Indigenous knowledge is an important part of the lives of the poor while it is also an integral part of the local ecosystem.

3. Some Regional Dimensions of Indigenous Knowledge

Recent frequently used top-down approaches that feature expert-led diagnoses of developmental problems were apparently blind to local knowledge and understanding, as Sillitoe and Marzano pointed out [11]. They argue that in response to development's failure to address growing poverty and vulnerability world-wide, bottom-up oriented paradigms emerged. For instance, farming systems research from 1970s has proven to be largely irrelevant to poor farmers. Similarly, other approaches, as Integrated Rural Development Programmes, again did not fulfil their perceived potential in supporting a dynamic and diversified rural or regional economy and were replaced by other programmes. Global efforts to modernise poorer nations are also continually changing, one programme replaced by another (e.g., market-access approaches, structural adjustment, trade liberalisation, etc., see [7], [11] or [14]).

According to [5], indigenous knowledge is capable of increasing production and real economic growth rate without further damaging the environment by better knowing, harvesting and using knowledge as a vital and competitive development resource. In Pakistan, a typical developing country, about 66% people are living in rural areas, overall literacy rate is approximately 55% (even less for rural areas), and about 25% people are living below the poverty line. Due to varied climate Pakistan is quite rich in medicinal herbs scattered over a large parts of the country. That is the reason, why many indigenous communities living in different parts of the country are more and more indicating the importance of managing indigenous knowledge. Significance of

indigenous knowledge for Pakistan is more due to its large area with high mountains and varied climate. According to [10], in Himalayan ranges (Pakistan) at least 70% of medicinal plants and animal species in the region consist of wild species, and 70-80% population depends on these traditional medicines for healthcare. And Elisabetsky [3] reported that annual world market value for medicines derived from medicinal plants by indigenous people is US \$ 43 billion.

Intelligent and sustainable use of land, water and soil without causing damage to the resilience and functioning of the surrounding ecosystem is what is required and expected by indigenous communities. Of course, this can be possible using appropriate management at local and national level. It is crucial for Pakistan and other countries, not only for developing ones, to improve scientific as well as indigenous knowledge at the local level for monitoring and managing complex ecosystems, such as watersheds, forests, and seas, and for helping to predict (and thereby manage) the impact of climate change and the loss of biodiversity.

Conclusions

Turnbull [13] argues that *it has become apparent that the future is invisible, the age of management is over, and the need is to develop robust institutions that are flexible and adaptable to deal with complex and constantly evolving problems of change and diversity. ... Coping with and sustaining the commons in conditions of messy contingency is now the problem facing humanity.*

Many authors share now an opinion that the future must involve also indigenous knowledge and that the future for indigenous knowledge lies in such knowledge management approaches that are able to create a knowledge space for assembling diverse knowledge, with a strong accent on indigenous local knowledge. Indigenous knowledge should be moved to become a part of the global knowledge, but the challenge here is in the fact that this is perhaps impossible without losing its local and cultural specificity. The future will bring some results in that, we hope.

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ROLE OF WRITE-DOWNS OF RECEIVABLES IN THE BALANCE SHEET OF LOCAL GOVERNMENT ENTITIES

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Key words:

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Abstract:

The accounting of the public finance sector has, however, undergone a number of key changes triggering transformation from a passive tool designed for recording how the budget is executed into a functional active tool which facilitates management through the provision of better quality information about a given entity's assets, sources of financing and financial results. The present article seeks to outline the role of write-downs of receivables for the assets of local government entities. The main focus is on short-term receivables and the effect of write-downs on their value in the consolidated balance sheet of a local government unit at the level of commune.

Introduction

Changes which have been taking place in the public finance sector worldwide and in Poland over the past dozen years or so have had a significant impact on the development of accounting systems of local government entities. At present, steps are being undertaken to ensure that the public finance sector is managed similarly to commercial entities. It should be noted, though, that certain qualities inherent in the operation of the public finance sector prevent the application of all available commercial tools. Accounting of the public finance sector, often referred to as budget accounting, initially served as a means of recording the execution of budgets of the state and local government entities. The accounting of the public finance sector has, however, undergone a number of key changes triggering transformation from a passive tool designed for recording how the budget is executed into a functional active tool which

facilitates management through the provision of better quality information about a given entity's assets, sources of financing and financial results.

The present article seeks to outline the role of write-downs of receivables for the assets of local government entities. The main focus is on short-term receivables and the effect of write-downs on their value in the consolidated balance sheet of a local government unit at the level of commune.

The article is organized into three parts. The first part outlines the scope of financial reporting in local government entities. The second part concentrates on the role of short-term receivables for the status of assets in local government entities. The final section contains an analysis of short-term receivables in communes, performed on the basis of the consolidated balance sheet of local government entities. The present study is based on the logical analysis and construction method.

1. Financial reporting in local government entities

The final outcome of the accounting process is the financial report which provides both its external and internal recipients with information about a given entity's financial standing and assets. Financial reporting in local government entities has evolved significantly over the past several years, becoming increasingly similar to financial reporting systems used by commercial entities.

At the end of each year, i.e. as of 31 December, local government entities prepare two types of reports:

- budget implementation report,
- financial statement comprising: balance sheet, profit and loss account and statement of changes in the entity's fund [3].

Budget implementation report illustrates the execution of budget adopted in a given local government entity – on the cash basis. By contrast, individual components of the financial report, which present the entity's assets, sources of financing, financial results and changes to the entity's fund, are prepared on the accrual basis.

Financial reports drawn up by local government entities are often marginalized, and information included in them is not typically used for management purposes. Financial analysis is performed mainly for budget implementation reports, particularly the annual report which contains information about incomes and expenditures, revenues and

expenses. Budgets of local government entities are executed on the cash basis, which means that expenditures and incomes arise at the time when they are physically credited to or debited from the account. It should be noted, though, that the assessment of assets and sources of financing of an entity should be based on the financial report. Financial reports are drawn up on the accrual basis which provides that regardless of the payment date the register must include all business transactions giving rise to revenues and costs in a given entity.

The present article concentrates on the consolidated balance sheet of a local government unit which is prepared in order to represent comprehensive data on the assets and sources of financing of its subordinate organizational units.

2. Status of short-term receivables in the consolidated balance sheet of a commune

According to the Accounting Act receivables can be defined as resources of a reliably estimated value controlled by an entity, resulting from past events and causing the inflow of economic benefits to the entity in the future [6].

Receivables arise in business entities that sell their products, goods and other assets with deferred payment date – by granting the customer trade credit. Whenever an entity gives loans to other entities, makes advance payments to staff members or – less commonly – overpays taxes, receivables also result. Consequently, as M. Kiedrowska argues, receivables are elements of an entity's assets which are temporarily placed at the disposal of other entities – until they are paid in full [2].

In the public finance sector, however, this component of current assets has a different structure – as opposed to commercial entities in which receivables due to the delivery of goods and services are the dominant item. In local government entities the item comprises mainly other receivables such as receivables from budgetary revenues.

Short-term receivables at the end of the financial year are valued in accordance with the principle of cautious valuation, meaning that they are represented in the balance sheet at a value that can reasonably be enforced. Naturally, the above statement should not be taken to mean that entities – in spite of executing write-downs of receivables – decide not to enforce them. Table 1 below illustrates principles governing the execution of write-downs of receivables in local government entities.

TAB. 1: Write-downs of receivables in the public finance sector

The value of receivables is written down depending on the degree of probability of their collection, with due account taken of the following categories:	
1.	Amounts due from debtors that have been put into receivership or declared bankrupt. Write-downs are performed up to the amount that is not guaranteed or secured in any other manner, as reported to a receiver or judge-commissioner during bankruptcy proceedings.
2.	Receivables disputed by debtors and overdue receivables – where a review of the debtor's assets and financial position demonstrates that the collection of the contractual amount due is unlikely. Write-downs are performed up to the amount that is not guaranteed or secured in any other manner.
3.	Overdue receivables or non-overdue receivables which are very unlikely to be collected, in cases justified by an entity's type of business or the client structure. Write-downs are performed up to the amount of a reliably estimated write-down, including a general write-down, in respect of uncollectable receivables.
Write-downs of receivables are executed no later than on the balance sheet date.	

Source: own work based on [6, 3].

3. Analysis of short-term receivables in Ustronie Morskie and Dygowo communes

Write-downs have a major influence on the value of short-term receivables in local government entities, which is shown in Table 3. In order to better illustrate the relationship between the value of receivables prior to and after write-downs, an analysis of rotation of short-term receivables was carried out.

The turnover of receivables is typically investigated using the rotation index which specifies how many times during a year a given enterprise restores the level of its receivables. By Western standards, the index should range from 7.0 to 17.0, which means that receivables should be settled in 21-52 days. If the value of the index is lower than 7.0, the entity concerned provides its clients with an excessively long crediting period – in relation to generally recognized standards – which demonstrates that cash is frozen in receivables for too long. Since the entity fails to receive its due cash on time, it faces problems with the settlement of its own financial obligations. The rotation index is

very important. If it is too low the situation should be thoroughly investigated and root causes should be identified [4, 1].

Table 2 below lists principles governing calculation of the index in commercial entities and a proposed method of its application in local government entities.

TAB. 2: Receivables rotation index

Receivables rotation index	
Commercial entities	Local government entities
Receivables rotation index	
$\frac{\text{Net revenues from sales of products goods and materials}}{\text{Average state of receivables}}$	$\frac{\text{Net revenues from operating activity}}{\text{Average state of receivables}}$
Receivables rotation index in days	
$\frac{\text{Average state of receivables} \times 365}{\text{Net revenues from sales of products goods and materials}}$	$\frac{\text{Average state of receivables} \times 365}{\text{Net revenues from operating activity}}$

Source: own work based on [4].

The receivables rotation index will be used to demonstrate crucial aspects related to the write-down of receivables in Polish communes. The analysis performed for the purpose of this study encompassed short-term receivables listed in the consolidated balance sheet of two communes. Table 3 contains an analysis of rotation of short-term receivables in the Ustronie Morskie and Dygowo communes.

TAB. 3: Analysis of receivables of local government entities at the level of the commune

Specification	Ustronie Morskie			Dygowo		
	2010	2011	2012	2010	2011	2012
	Value (PLN)					
Receivables from sales	65 683.13	65 348.28	28 200.36	0.00	1 279.00	16.30
Receivables from budget	0.00	24 674.97	81 791.30	0.00	0.00	0.00
Receivables from social security	0.00	0.00	0.00	0.00	0.00	0.00
Other receivables	3 848 070.28	1 580 231.75	1 686 818.40	1 184 936.06	2 323 784.78	2 458 952.94

Total short-term receivables	3 913 753.41	1 670 255.00	1 796 810.06	1 184 936.06	2 325 063.78	2 458 969.24
Write – downs of short receivables						
Write – downs of short receivables	7 647 735.97	7 643 063.54	1 127 016.92	676 043.23	903 721.94	227 539.41
Relation of write – downs for receivables (%)	195.41	457.60	62.72	57.05	38.87	9.25
Analysis of receivables 2010 - 2012						
Receivables rotation index	6	8	11	13	9	6
Receivables rotation index in days	58	45	33	28	39	57
Analysis of receivables including write – downs of short receivables 2010 - 2012						
Receivables rotation index		2	3		6	5
Receivables rotation index in days		168	115		56	71

Source: own work based on [5].

The list of components of short-term receivables in the two communes under study, which is given in the first column of Table 3, shows that the main component comprised other receivables. The situation is thus the opposite of commercial entities where the structure of receivables is dominated by those arising from the deliveries of products, works and services. The initial stage of analysis involved determination of the relationship existing between write-downs of receivables and the sum of short-term receivables.

Write-downs of short-term receivables in the Ustronie Morskie commune amounted to 195.41% of the value of short-term receivables in 2010. In 2011, the figure was much higher, reaching 457.60%. The year 2012 brought an improvement of the relationship, with write-downs of receivables accounting for 62.72% of short-term receivables. Lower write-downs show that the entity handles the collection of receivables better. A similar trend was noted for write-downs of receivables in the Dygowo commune: in 2010 write-downs accounted for 57.05% of short-term receivables. In consecutive years, the percentage gradually decreased until, in 2012, write-downs constituted 9.25% of short-term receivables.

The analysis of rotation of short-term receivables was performed in two variants:

- Short-term receivables reported as a net value – adjusted for the value of write-downs,
- Short-term receivables reported as a gross value – increased by the value of write-downs.

The rotation index determined for short-term receivables in the Ustronie Morskie commune was at the desirable level in the 2011-2012 period. It should also be noted that the index improved steadily year by year. In 2011, the commune had to wait an average of 45 days for the payment of its receivables. In 2012, the period was reduced to 33 days. If, however, the commune's write-downs of receivables are introduced into the analysis, the index assumes values that deviate from standards defined in reference literature. In 2011, the average period of waiting for the settlement of receivables was 168 days; in 2012 it decreased to 115 days.

The rotation index calculated for receivables in the Dygowo commune in 2010 and 2011 was at the recommended level. In 2010, receivables were settled after an average of 28 days. In 2011, the period increased by 11 days. In 2012, however, the value of the index exceeded the standard level quoted in reference literature by 5 days. Taking into consideration write-downs of short-term receivables both in 2011 and 2012, the receivables rotation index (in days) exceeded the standard levels specified in reference literature.

Conclusions

The inclusion of short-term receivables adjusted for write-downs in the balance sheet complies with the principle of cautious valuation. The high value of write-downs, however, shows clearly that the entity has difficulties with the collection of short-term receivables. Local government entities should strive to reduce as far as possible the value of their write-downs. Consequently, enforcement of an appropriate policy of receivables management, incorporating ongoing review and monitoring, is of vital importance. The above claim is corroborated by results obtained in the analysis of short-term receivables in two communes, which demonstrated that write-downs of receivables have a significant effect on the status of the entity's current assets.

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CORPORATE GOVERNANCE IN THE UNFAVOURABLE ECONOMIC CONDITIONS

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Key words:

manufacturing companies level of employment – level of production – economic recession

Abstract:

This study focuses on an analysis of trends in economic development and level of employment in manufacturing companies in the conditions of economic recession and only mild economic growth. The analysis is based on macroeconomic connection between economic development and level of employment, which is widely recognized within the economic theory. We compare two above mentioned indicators with specific microeconomic indicators of economic development and employment in manufacturing companies. Moreover, indicators of economic growth in manufacturing companies in given period were compared with the indicators of employment and with the management's behavior and actions.

Introduction

Economic recession caused by today's world crisis essentially influenced economic development and the situation of labor market. Theoretical discussion about the course of the world financial crisis, questions about its phases and especially the period of its ending are still opened and unanswered. In the analysis of the reasons and impacts of the world financial crisis upon the economic development we can go out from the fact that the level of economic production predominantly in the advanced countries had fallen to red indexes. As a consequence of this the level of employment was falling – production companies were forced to lay off employees. In the common repute but also within the professional community the belief stays valid that in finishing the economic

recession and in growth of the level of economic production will also the level of employment rise – for the achievement for most of the pre-crisis level of production, the companies will return to pre-crisis status of employment.

The goal of this study is to find the character of relation between the trends of economic production and employment on the level of production companies in the period of today's economic growth, following after the phase of economic recession caused by world financial crisis. Research methods used in given study: correlation analysis of trends of economic production and level of employment in the phase of economic recession and in the phase of smooth economic growth, realization of empirical research by the methods of structured interview with the purpose of finding the level of economic production and employment at the level of production companies in the phase of economic recession and in the phase of tame economic growth.

Scientific originality of the article is: defining the relations of indices of economic growth and level of employment in various phases of economic development – recession and growth, finding of the relation among the indices of economic production and employment at the level of production companies in the phase of slow economic growth.

1. Economic development and employment in the manufacturing companies in terms of macroeconomic soundness

It is known that the structure of economic production changes in the process of technological development and labor productivity growth mainly in the industrial production, where it causes lazing off unnecessary workers. This redundant labor power in the conditions of extensive development of industrial and agricultural production was absorbed by the growing need within developing tertiary sector. However, in the second half of 20th century the industry shifted into the phase of intensive production (followed by agriculture and services at the end of century), in which the added value growth is seen as a result of higher labor productivity and reduction of input factors including labor power. The advancement of knowledge economy, which is based on human intellectual capital and does not require vast amount of financial resources, raw material and man-power, has changed the situation.

In these conditions the direct linear correlation between the economic growth results and the input production factors can no longer be applied. Especially these dependences have been complicated by the economic recession caused by the world financial crisis. Nevertheless the crisis itself did not influence nor caused the non-linear correlation. It has merely revealed the problems caused by the previous period of economic growth. That is why the world financial crisis followed by economic recession has become some sort of milestone not only in the economic development but in the economics as well. Even before the crisis some economists expressed doubts about the ability of the modern economic order to ensure the stability of the economic system and to solve the existing problems with its development [5]. This author emphasizes that the belief in the power of neoliberalism was not consistent enough. While there was strong rhetorical enthusiasm about the free market, the government's support (particularly subsidies for agriculture in developed countries) often resulted in negative effects on economic development.

In their responses to the world financial crisis most economists not only in its beginning [1; 2; 3; 4; 6; 11] voiced their opinions on the incapability of economic neoliberalism to solve existing economic problems. As stressed out by Joseph E. Stiglitz, the Great Depression undermined the belief in macroeconomy – the ability to retain full employment, stable prices and sustainable growth. The present financial crisis struck a blow to the belief in microeconomy – the ability of markets and companies to effectively distribute labor force and capital. This was a result of so many catastrophic cases of incorrect distribution of financial resources and inability to adjust to the risk factors that the private sector was forced to ask for help from government in order to prevent the collapse of the entire system [4].

The tight direct correlation between GDP growth and the employment and at the same time quite tight indirect correlation between GDP growth and unemployment rate were typical for the whole period of this economic growth. During this period of time (2001–2007) an average rate, by which grew the number of employed persons in the economy, reached 1.7%. Unemployment rate sank by 8.8 % a year according to methodology of selected findings of labor force and by 13.1 % according to methodology of filed unemployment [9]. This movement in employment or unemployment development set in the period of 2001 - 2004, when the economic development expressed by GDP

growth shifted from 3.4 % to 5.2 % and the unemployment rate fell from 19.8 % to 14.6 % [7]. Prior to this phase in spite of growth of economic efficiency the employment rate was falling and the unemployment rate was rising. However within above mentioned period the development of the employment rate was quite the opposite [10, p. 211].

Exactly these positive trends in economic and employment development invoke optimistic expectations and influence the evaluation of present economic processes caused by world financial crisis and ensuing economic recession. With a certain amount of optimism we can say that it was year 2010 which presented a milestone in the economic development of develop countries including Slovakia and which was characterized by mild economic growth. But the development of events in 2011 and in the beginning of 2012 did not reflect expected economic growth. That is why we will look into the way the economy is developing in these times of moderate economic growth not only on the macroeconomic level but on the level of individual manufacturing companies.

2. Correlation between GDP growth and the growth of employment

In order to understand the nature of present economic processes it is necessary to briefly describe the course and origin of economic recession in Slovakia, which originated after and under the influence of world financial crisis. It is known that as a result of dependence of Slovak economy on exporting to other countries the economic downfall during the period of world crisis was influenced by fall of demand on the product market, which was observed in Europe and the rest of the world. The height of GDP dipped to 4.2 % in 2008. This drop was followed by another one during the next year – this time GDP fell by 12 percentage points (as seen in Tab. 1). The indirect correlation of filed employment rise was only 0.2 percentage point in 2008 and almost 5 in 2009. Year 2010 was marked by GDP growth by 7.5 percentage points – from minus 6.4 % in 2009 to 1.1 % in 2010. In spite of this tendency the unemployment rate decreased only by 0.4 percentage point. That means that slightly over 5 thousand applicants for work were employed in 2010, whereas more than 140 thousand employees lost their job during economic recession in the past two years.

TAB. 1: GDP and unemployment rate in 2007 - 2012.

Year	GDP growth (%)*	Number of applicants for work (in thousands)**	% of economically active population**
2007	10.4	239.9	9.2
2008	6.2	248.5	9.5
2009	-6.4	379.5	14.3
2010	1.1	374.2	13.9
2012	1.9	377.1	14.0

Source: *<http://www.finance.sk/hospodarstvo/hdp/tempo-rastu/> [7].

**http://www.upsvar.sk/statistiky.html?page_id=1247 [8].

The question, whether this economic growth is sustainable or it is only certain oscillation within economic recession will be answered by time. Same as the question, whether or not in case of sustainable GDP growth the unemployment rate will fall, as it is expected. However, these macroeconomic relations do not provide relevant readings about specific causes and factors of decrease or rise of unemployment. Generally as a rule, the laying off of employees matches the economic soundness of unemployment increase. Companies usually lay off their employees in the times of economic difficulties and drop in demand for their products. Nevertheless this drop at the level of macroeconomic indicators may be influenced by some other factors, especially in short-term. These factors can be: elevated demand on new gained market segments, investment interventions, labor force migration, legislative measures, retiring of relevant part of unemployed etc.

The development during economic recession was very much alike. The fall of demand for products and goods forced the companies to reduce their costs. Laying off employees is one of the most frequent consequences and fairly effective way to do so in short time. This happens every time, when the company has to face economic difficulties. With the arrival of another economic phase – growth or the smallest possible oscillation connected with economic revival and the need for production enhancement – the companies do not employ workers automatically. Uncertainty caused by previous fall forces the management of these companies to be very careful when employing new workers. More often the companies begin to look for ways to rationalize within the organization of labor, management structure, motivation, standards and

regulations, information flows, organization of overtime labor while absents flexible forms of employing etc.

This tendency in behavior of companies is confirmed by the study we realized within the framework of solving the scientific assignment by grant agency MS SR VEGA in October and November 2010. The directors (or representatives or production managers) of 57 manufacturing companies mostly active in automobile, engineering or electrotechnic industry were addressed through the structured interview. In addition to the questions about the flexibility of labor relations we looked into the trends in production in the conditions of economic recession and into precautions taken to eliminate its negative impact.

All approached companies were compelled to reduce production mainly during the period 2008 to 2009. The production was cut by 16 % to 45 % in most of them. The dominant and practically the only measure, which came into consideration under these circumstances, was employee dismissal. Nearly half of these companies (47 %) reduced their staff by 3 %, one fifth by 5 %, one tenth by 6 to 10 % and 3 % of the companies dismissed more than 10 % of their employees. 14% of the companies did under the threat of further reduction of production lay off even more employees than the up-to-date production situation demanded, what was consequently considered to be a useful step. Only 19 % of them tried to take different approach to the problem of costs reduction. In most cases they were applying organizational measures, work rationalization etc.

Simultaneously with staff reduction was also often implemented work rationalization. And exactly this precaution was according to 95 % of respondents considered decisive in cost reduction and creation of certain reserve for production enhancement. Organizational changes aiming to reduce production costs were executed by 65 % of the companies, production standards and directions were revised by 89 %, information flows and processing were improved by 75 %, the system of motivation and rewarding was made more effective by 58 %, 14 % invested into new technologies, 12 % made use of their own innovations and 56 % used overtime work. These actions were rewarded in the case of 3 % of companies already by the end of 2009, when they obtained commissions which led to extended production. The biggest part of interviewed

companies (87 %) started to raise their production in 2020 but 7 % of them have not managed to solve their problems. 84 % from the overall number of companies, which succeeded in implementing of necessary precautions and managed to increase the production, reaches the pre-crisis level of production in 2010 (78 % of all respondents).

Still, in most cases, this enhancement was not accompanied by recruiting new employees. Only 29 % of companies hired new employees in 2010 and their number by no means matched or exceeded the number of workers dismissed at the beginning of economic crisis and this status is not expected to change in the near future. Merely one fifth of approached companies would be willing to recruit higher number of employees under the condition of obtaining the bigger amount of commissions, despite the fact that these dispose of necessary technological potential. Two thirds would employ more workers and invest into new technologies in case of obtaining stable orders and return on investment and state subventions would convince only one quarter. Under other than these conditions they see no need to recruit new staff, since they “learned” to produce more with fewer employees.

Conclusion

One of many impacts of economic crisis as statistic data and results of our research of production companies suggest is the absence of expected tight indirect correlation between GDP height and unemployment rate. While during pre-crisis period the GDP growth was accompanied by proportional unemployment rate decrease, in the conditions of present GDP growth there is no tight correlation between GDP growth, employment growth and unemployment rate fall. In case this trend continues to prevail henceforward and is confirmed by further findings, it will require clarification and explanation of some economic theory soundnesses – generally accepted macroeconomic relations between GDP and employment. Simultaneously it will require a change of rules and approaches to the creation of specific measures taken by government. In the conditions when GDP growth does not solve the unemployment problem, the change of state policy principles is necessary in order to take such precautions, which would be effective when solving unemployment problems and which would eliminate its negative impact on economic and social development.

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METHODS FOR JUSTIFICATION AND ASSESSMENT OF ENTERPRISE INFORMATION PORTALS: REVIEW AND IMPLICATIONS

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Key words:

enterprise information portal – assessment – intangible benefits – IS success – strategic alignment

Abstract:

The purpose of this article is to suggest a way how to design a new method for assessment of Enterprise Information Portals (EIPs). The usual assessment methods are not able to include intangible benefits of EIPs into their results. Only one possible approach able to deal with intangible benefits and specifically designed for EIPs assessment was found in existing literature. This approach cannot be compared with another method, therefore, a candidate method (Multilevel Strategic Fit model) for modification was chosen, and a way how this method could be modified suggested.

Introduction

With decelerating economic growth and especially in the time of recession, companies are willing and forced to focus more on investment decisions and performance measurement. The former gets bigger attention when financial resources are scarcer, and therefore fewer projects can be chosen from the set of considered projects. The potential of the latter rises when companies are assessing already finished investments. Therefore, both justification and assessment of investments projects are becoming more crucial and corresponding theory should be enhanced. This article tries to suggest a way, how the theory should be enhanced for information technology projects.

From its start, few decades in the past, the evolution of information systems and information and communication technologies (IS/ICT) is accelerating. The increase in using of IS/ICT (not only in business) is evident. Companies are more dependent on IS/ICT than ever and entirely new business models are emerging according to

technological advancements (e.g. social networks). In this very fast changing environment, it is difficult for companies to be able to identify which IS/ICT brings them value and which do not. The main reason for this inability is the intangible nature of IS/ICT benefits, because with IS/ICT development, the technology is more people oriented and dependent, and is solving more complex information needs than simple automation.

The orientation of IS/ICT on people causes problems with measurability of its performance, because human actions such as knowledge transfer, faster information retrieval etc. are hard to measure in financial measures. Therefore, it is not possible to evaluate the monetary impact of IS/ICT benefits on company performance. Consequently, companies decisions about future investments in their IS/ICT are made on partial and inaccurate information. Moreover, IS/ICT can be even discriminated by projects that have higher ratio of tangible to intangible benefits. Typical example of IS/ICT with high level of intangible benefits are Enterprise Information Portals (EIP), which are used as a frequent information system that support knowledge management [1] and information management [2].

Because of all above mentioned reasons, the aim of this article is to identify and review possible methods or approaches that are used for EIPS assessment and suggest a possible direction for future research. For this purpose, the text of this article is divided into XX sections. First section describes Enterprise Information Portals and its potential benefits. In the second section, types of assessment methods of IS/ICT are reviewed. Third section reviews published methods and approaches that are designed specifically for Enterprise Information Portals measurement. The last part concludes this study with discussion and recommends directions for future research.

1. Enterprise Information Portals

Enterprise Information Portals developed from web portals and from the concept of intranets in 1998 [2, 3]. EIP can be defined as: *“a single-point web browser interface used within organizations to promote the gathering, sharing, and dissemination of information throughout the enterprise”* [2] and they *“enable e-business by providing a unified application access, information management and knowledge management both within enterprises, and between enterprises and their trading partners, channel partner*

and customers” [1]. However, the definition of EIP has changed during the time with their technological advancement. Currently, EIPs can be described by the six most distinctive features: personalization, integration, searching, publishing, collaboration, and taxonomy [5]. These features characterize them in the same way as the definition would.

Enterprise Information Portals have lots of synonyms, because the process of naming IS/ICT is usually driven by marketing reasons [4]. The most frequent synonyms of EIP are: corporate portal, business portal, knowledge portal, employee portal, business-to-employee portal [1, 3, 4]. The most implemented EIPs are: IBM WebSphere Portal, Liferay Portal, Microsoft SharePoint, Oracle WebCenter Portal, SAP NetWeaver Portal. Through EIP using, companies can utilize EIPs, resulting into higher productivity, effectiveness, efficiency, and lower costs [4, 8]. EIPs are usually used as an information support for knowledge management [1], information management [2, 3], and collaboration [6]. Most of these benefits have intangible nature, i.e. they have indirect (and usually not monetary measurable) impact on company’s performance. This fact results in difficulties to assess EIP properly, because using return on investment (ROI) metric causes problems with ability to assess all possible benefits [9, 10].

2. Assessment of IS/ICT

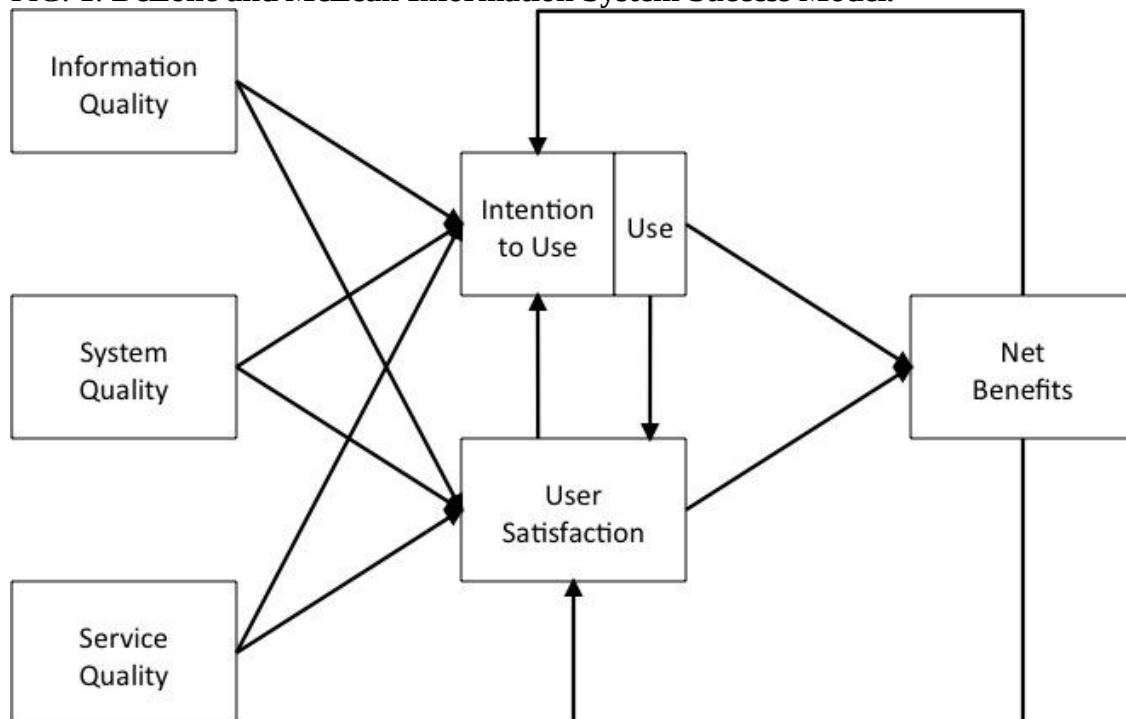
According to publications [4, 8] targeting practitioners, usual methods for IS/ICT assessments are Total Cost of Ownership (TCO), Return on Investments (ROI), benchmarking, Cost Benefit Analysis (CBA), and Activity Based Costing (ABC). These methods are using different kinds of monetary measures and therefore cover only tangible and quantitative benefits. The nature of IS/ICT and EIP especially is prevalent presence of intangible benefits [9, 10]. Therefore usual methods do not assess intangible benefits and can significantly bias the result of assessment and prohibit possible investments that would be in fact profitable.

Besides these usual methods, companies assess and measure their investment performance by companywide methods such as Balanced Scorecard. These approaches are used for measuring organizational performance on strategic level. Their low usability for assessment of IS/ICT projects is caused by using high aggregated data. Moreover, the metrics used in these methods can not cover causal relationships and thus

connect allocate performance gain to particular IS/ICT. Their companywide purpose also prohibits using them solely for single project.

Because of shortcomings of traditional methods, new and more complex methods, addressing intangible benefits, have been developed. The most used and developed are Information System Success models. They were introduced by DeLone and McLean in 1992 as DeLone and McLean IS success model (D&M model). From that time, model was optimized, developed and used few hundred times [7]. The idea of the model is based on the fact that quality of the system has an impact on its usage of and user satisfaction and this has an impact on net benefits of company (more details see fig. 1).

FIG. 1: DeLone and McLean Information System Success Model.



Source: Adapted from [7].

Information System Success models are not the only available option, different approaches based on strategic evaluation can be used [4]. The most promising approach is measuring strategic alignment of the IS/ICT project. If it is not possible to evaluate and compare the benefits of projects in monetary means, project contribution to organizational strategy can be used for comparison. Multilevel Strategic Fit Model (MSF model) developed by McLaren et al. [6] for the Supply Chain Management (SCM) Systems is an example of such approach. The MSF model measures the fit between IS capabilities and actual (not declared) organizational strategy. IS capabilities

are defined as: “*organizational capabilities enabled by an organization’s information system*” [6]. MSF model consists of seven steps (see tab. 1), during which developed scales, taxonomies and questionnaires are used.

TAB. 1: Multilevel Strategic Fit Model steps.

Step	Description
1	Identify the IS Capabilities Set to be Measured
2	Measure the Firm’s Realized Level of Support for Each IS Capability
3	Identify the Firm’s Realized Competitive Strategy Archetype
4	Determine the Theoretically Ideal Level of Support for Each IS Capability
5	Calculate the Overall Strategic Fit of the Firm’s IS
6	Calculate the Detailed Strategic Fit of the Firm’s IS
7	Check for Corroboration of the Assessment of Strategic Fit of the Firm’s IS

Source: Adapted from [6].

3. Assessment methods of Enterprise Information Portals

Particular types of IS/ICT vary from each other in such extent that usually no general method or approach used for IS/ICT assessment cannot be used without modification. During review of literature, only two methods, which are tailored for EIPs, were found. Tojib et al. [9] developed business-to-employee portal user satisfaction (B2EPUS) model, and Urbach et al. [10] customized D&M model (see section 2).

B2EPUS model consists of five factors (each defined by several items), namely usefulness, confidentiality, ease of use, convenience of access, and portal design. As the user satisfaction concept is part of D&M model, Urbach et al. [10] incorporated this concept in their customization of D&M model for EIP needs.

Conclusion

The current situation in EIPs assessment is not satisfactory. Usual assessment methods based on financial or companywide measures do not cover intangible benefits or causal effects. The lack of empirical testing of Urbach’s et al. [10] assessment method based on D&M model and the fact that no other assessment method for EIP was developed implies the need for new EIPs assessment method. Moreover, D&M model based methods cover only user side of IS/ICT assessment, and thus assess the IS/ICT from operational perspective. MSF model [6] seems to be a good candidate for modification

for EIPs needs. It is based on examining the fit between IS capabilities that are enabled by EIPs and organizational strategy.

MSF model was developed specifically for SCM information systems and must be modified for the needs of EIPs. Existing research from the field of EIPs assessment and deployment can be used to find needed information for this modification. Future research in the EIPs field should identify the IS capabilities that EIPs provides for organizations. Then, this information can be used for modifying the MSF model for EIPs assessment.

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FINDING EQUILIBRIUM IN A MONOPOLY PASSENGER RAILWAY MARKET: A COMPARISON OF AGENT-BASED SIMULATIONS WITH THEORETICAL PREDICTIONS

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Key words:

railway – Salop – monopoly – price – timetable

Abstract:

This paper presents an agent-based model of passenger rail services. It provides an algorithm that is able to find the optimal price and timetable for a service provided by a monopoly train operating company. For testing the efficiency of the algorithm, it presents a simplified setting in which the equilibrium price and timetable can be found analytically using the Salop model of competition. The paper finds that the algorithm approximates well the predicted price and timetable and that an increase in the equilibrium number of trains in the market reduces the efficiency of the algorithm.

Introduction

An overwhelming majority of long-distance passenger rail services in Europe are provided by state-owned monopolies. In a handful of cases, mainly in Sweden, Great Britain, and Germany, long-distance connections are served by private monopoly franchisees. The instances in which two or more train companies operate on the same track are rare. In most of these markets, including several markets in Germany and Great Britain and a few tracks in other European countries, the entry occurred thanks to the open-access regulation. The rest are British connections with competition between two franchisees operating mainly on the routes between London and regional centers.

One of the reasons why authorities do not support the introduction of competition on long-distance connections might be the insufficient understanding of the impact of such policies on consumer welfare. The effect of competition on consumer is also difficult to

study empirically as the number of instances of competition is limited and it is difficult to collect relevant data. Hence a potentially useful way to study competition for and in railway markets is a model simulation.

Transportation economics focused mainly on development of route based models in which the effect of specific pricing strategies or timetables is studied. The most prominent examples of these models are the PRAISE model developed at the Institute for Transport Studies of the University of Leeds ([1], [4], [8]) and the model presented by Steer Davies Gleave [7] in the report prepared for the European Commission. These models do not find the equilibrium outcomes of competition. Instead, they study the effect of specific changes in prices and timetable on profits of train companies and consumer welfare using calibrated demand and supply.

For finding the equilibrium price and timetable in a railway market, this paper uses an agent-based technology (see [2] and [3] for different agent-based models of markets). The algorithm presented here is the first step towards an equilibrium model of rail passenger market. It presents an algorithm that can be used for finding the equilibrium price and departure times of trains. The algorithm is tested in a simplified setting with uniformly distributed passengers in which the equilibrium price and timetable can be found analytically using the Salop model of circular city ([5]).

The paper is organized in the following way. Section 1 introduces the model of a passenger rail market. Section 2 presents the results of simulations and compares them to the analytical solution of the model. Finally, the last section concludes.

1. Description of the model

This section presents a model of a passenger rail service implemented in the modeling environment Netlogo 5.0.4. Each simulation of the model approximates the equilibrium price and timetable in the market. In each simulation, the model is first initialized and then moves through a number of periods. This section will describe the model in the order in which the simulation evolves.

The initialized model contains the landscape (world), passengers and an initial set of train connections of a monopoly train operator. The world is a line with a length equal to 240 patches (a patch in Netlogo is a square field which side can be used as a measure of distance). The line represents 24 hours at a railway station in a departure city. Furthermore, the world wraps at both ends, so that the line can be viewed more accurately as a circle with the circumference of 240 patches and interpreted as 24 hours at a station in a sequence of identical days (e.g. a working day in the middle of the week). The world is populated by g identical passengers who are uniformly distributed along the line. Passengers have reservation price p_r which is the maximum price they are willing to pay for a train ticket to the destination city. Finally, the model creates n_I initial train connections where n_I equals to the equilibrium number of firms n_E minus a constant λ . Each train is assigned an initial price p_0 and a random location in the landscape $l_0 \in [0, 240)$.

The initialization is followed by a certain number of periods which can be divided in three phases: The first price-adjusting phase takes up the first T_P periods. In this phase, the model adjusts the ticket price given the initial number of trains and timetable. The price-adjusting phase is supposed to eliminate the potential effect of the arbitrarily set initial price on simulation results. In the second phase, the model adjusts both the ticket price and timetable for a given number of train connections. The second phase lasts for T_S periods. The third phase, called the entry phase, consists of entry cycles. Each entry cycle has a length of E periods. The total number of entry cycles is determined in the course of the simulation.

The actions of the agents in a given period may be divided in two steps: 1) entry and reset and 2) adjusting price and timetables. First, I explain how the price and departure times are adjusted. In the price-setting phase, all trains may keep the current price or increase or reduce the price by a constant ε_t which is drawn out of a uniform distribution between 0 and $\varepsilon_{\max}$ in every period. Hence in each period $t \leq T_P$, the monopoly train operator chooses the price $p_t + \varepsilon_t$, $p_t - \varepsilon_t$ or p_t in order to maximize its profit Π_t which is equal to the sum of profits of all its trains $\pi_{it} = p_t q_{it} / g - F$, where q_{it} is the number of passengers on the train, g is the total number of passengers, and F is the fixed cost of

the train. I divide the train's revenue by g in order to normalize total number of passengers to one, so that the structure of the agent-based model corresponds to the Salop model with passengers uniformly distributed on a unit circle. The choice of train i by passenger j depends on the reservation price p_r , ticket price in period t p_t , waiting time in hours h_{ijt} , and per-hour weighting cost $w > 0$. Passenger j chooses the train with the lowest $p_t + wh_{ijt}^2$ if $p_r > p_t + wh_{ijt}^2$, and no train otherwise.

In each period of the second and third phase, the train operating companies adjust the price and timetable at the same time. The individual trains consider leaving the departure time unchanged or changing it by a time step s_t in both directions. In each period $t > T_p$, the time step s_t is drawn from a uniform distribution between 0 and $240/(n_E\tau)$, where n_E is the equilibrium number of trains and τ is a constant determining the maximum size of the time step. In the adjustment process in each period $t > T_p$, the train operator creates a random order of all its trains. In this order, each train chooses the price and departure time out of the nine possible combinations of prices $p_t, p_t + \varepsilon_t, p_t - \varepsilon_t$ and departure times $l_t, l_t + s_t, l_t - s_t$ which maximizes its profit. It means that the price may change n_t times in period t , where n_t is the total number of train connections. If the profits in two or more alternatives are equal, the trains choose the departure time and price according to the following preference ordering: $l_t + s_t, p_t + \varepsilon_t; l_t + s_t, p_t - \varepsilon_t; l_t + s_t, p_t; l_t - s_t, p_t + \varepsilon_t; l_t - s_t, p_t - \varepsilon_t; l_t - s_t, p_t; l_t, p_t + \varepsilon_t; l_t, p_t - \varepsilon_t; l_t, p_t$. E.g. if the profits for $l_t + s_t, p_t - \varepsilon_t$ and $l_t + s_t, p_t$ are equal and the profit for $l_t + s_t, p_t + \varepsilon_t$ is lower and the profits for the remaining elements of the preference ordering are lower or equal, the train company increases the departure time and reduces the price ($l_t + s_t, p_t - \varepsilon_t$).

Entry and reset occur only in the entry phase. A new train connection is created in the first periods of each entry cycle, i.e. in periods $t = \{T_p + T_s + 1, T_p + T_s + E + 1, T_p + T_s + 2E + 1, \dots\}$. The new train is assigned a random location $l_t \in [0, 240)$ and the price charged in the previous period p_{t-1} . In the last period of each entry cycle, the profit of the operator is compared with the profit E periods back (in the last period before the latest entry). If the current profit is lower ($\Pi_t < \Pi_{t-E}$), the number of trains, their location, and the price from period $t - E$ is reset. The simulation ends when the entry fails to increase the profit (i.e. when $\Pi_t < \Pi_{t-E}$) in c entry cycles in a row.

2. Results

In this section, I compare the results of the simulations with the solution of the model. This allows us to evaluate the overall efficiency of the model algorithm and the impact of different settings of the algorithm on its efficiency.

The structure of the model resembles the Salop model with passengers uniformly distributed on a circle with a unit circumference served by a monopoly train operator with n trains (see [6] for a detailed description and the solution of the theoretical model). The profit-maximizing monopoly distributes the trains on the circle so that the distances between all the trains are identical and all passengers are served by the operator. The equilibrium number of trains is

$$n_E = \left(\frac{w}{2F} \right)^{\frac{1}{3}}, \quad (1)$$

where w is the waiting cost and F the fixed cost. The equilibrium price in the market is given by $p_E = p_R - w/(2n_E)^2$, where p_R is the reservation price. The profit of the operator is the difference between its total revenue, which is equal to price as the equilibrium quantity $q_E = 1$, and fixed costs of all plants $\pi_E = p_E - n_E F$.

The algorithm needs some time to converge to the equilibrium price and timetable. Sufficient length of the first two phases and of the entry cycle seems to be 100 periods ($T_P = T_S = E = 100$). The remaining parameter values are set as follows: the number of passengers $g = 1,000$; the reservation price $p_r = 1$; the initial price $p_0 = 0.5$; the fixed cost $F = \{0.01, 0.02\}$; the equilibrium number of trains $n_E = \{5, 10, 15, 20\}$; the per-hour weighting cost is set so that the equation (1) holds, i.e. $w = 2Fn_E^3$; the initial number of trains is $n_I = n_E - \lambda$, where $\lambda = 3$; the maximum price step $\varepsilon_{\max} = \{0.005, 0.01\}$; the maximum departure-time step is $s_{\max} = 240/(\tau n_E)$, where n_E is the equilibrium number of trains and the time-step constant is $\tau = \{6, 12\}$; and the number of resets in a row that ends the simulation $c = 2$. Furthermore, I run 4 random initializations of the model for each setting of the model using random seeds 1, 2, 3, and 4 (see the random-seed function of Netlogo 5.0.4). Hence the total number of simulations is $S = 128$.

At the end of each simulation, I measure the number of trains N , profit Π , price P , and quantity Q . The values of the variables generated in the simulations were close to the predicted values. The mean (standard deviation) of the difference between the simulated and predicted number of trains $N - n_E$ equals -0.047 (0.47), of the difference in profits $\Pi - \pi_E$ is $-1.58 \cdot 10^{-3}$ ($1.2 \cdot 10^{-3}$), of the difference between prices $P - p_E$ is $-1.69 \cdot 10^{-3}$ ($7.22 \cdot 10^{-3}$), and of the difference in quantities $Q - q_E$ equals to $-0.44 \cdot 10^{-3}$ ($1.23 \cdot 10^{-3}$).

TAB. 1: OLS estimation

Dependent variable: Profit difference ($\Pi - \pi_E$)

	coefficient	standard error	p-value
constant	-0.0007	0.0004	0.11
fixed cost (F)	0.011	0.015	0.46
maximum price step ($\varepsilon_{\max}$)	-0.04	0.03	0.18
time-step constant (τ)	5.45e-05	2.49e-05	0.03
equilibrium no. of trains (n_E)	-9.87e-05	1.34e-05	1.98e-11
S = 128 Adj. R ² = 0.33 ln L = 726.6			

Source: Author

Using the difference between simulated and predicted profits $\Pi - \pi_E$ as a measure of the efficiency of the algorithm, I regressed $\Pi - \pi_E$ against all exogenous variables of the model changed in the simulations (except for the random seed). Table 1 shows that a change in the fixed cost has no statistically significant effect, a reduction in the maximum-price step $\varepsilon_{\max}$ and the departure-time step $s_{\max}$ (a rise in the time-step constant τ) tends to increase the efficiency of the algorithm, although only a change in τ is marginally statistically significant, and a rise in the equilibrium number of trains n_E statistically significantly reduces the efficiency of the algorithm.

Conclusion

This paper presents an agent-based model of a monopoly market of passenger rail services. The model contains an algorithm that approximates the equilibrium price and timetable of the operator. The efficiency of the algorithm is tested against the equilibrium price and timetable found analytically using the Salop model of circular

city. The simulations show that the algorithm is efficient and that the efficiency of the algorithm depends negatively on the equilibrium number of trains in the market.

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USE OF TREASURY MANAGEMENT SYSTEMS FOR EFFECTIVE FINANCIAL MANAGEMENT AND DECISION-MAKING OF ENTERPRISES

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Key words:

Treasury management system, cash management, liquidity management, financial risk management

Abstract:

The paper is focused on treasury management systems (TMS) and their use in business management and decision-making processes. After theoretical background dealing with treasury management systems and common modules usable for effective corporate financial management, an overview of selected treasury management systems is stated. The use of treasury management systems is examined on the basis of the results of realized research in this area. There are analyzed results of survey provided by the Association for Financial Professionals concerning the use of TMS in different world regions and then results of own empirical research focused on use of TMS in the Czech Republic.

Introduction

Companies around the world are trying to improve their performance and optimize resource utilization, pay attention to cost control and efficiency of economic and business processes. Performance measurement systems are tools commonly used in the management and decision-making processes to assess the level of achievement of corporate objectives, including different types of indicators [7]. As well as large enterprises SMEs are exposed to various financial risks such as credit risk arising from provided receivables, liquidity risk or various market risks (according to the business activity). They can solve trade finance options, international payments and currency transfers or credit insurance and many other activities from corporate treasury management. But a lot of enterprises solve issues relating to financial and business

management separately, focusing on individual activities (most often payment of invoices) without a comprehensive view of company finance. They do not pay sufficient attention to the issue of treasury management in their operation and management [3] and often do not have any TMS, which would assist them.

Regarding financial management of enterprises, many business activities are time sensitive, such as cash management, payments, as well as reports. These activities tend to respond to every movement in the market. Other activities are less time-sensitive, but they are important in strategic decision making, for example capital structure decisions, relationships with financial institutions and many others. Thus accurate, consistent, complete and relevant data are required to support financial and strategic corporate decisions regardless of company size. As state Horcher [6], despite ability of technologies, many companies devote to activities bringing relatively low value due to the poor quality of available information. For effective functioning of the financial and other corporate activities, it is necessary to ensure adequate software which allows management of transactions and forecasting for future development. Technologies bring benefits to the management of time-sensitive activities as well as can assist in the analysis for strategic decisions. Enterprises should strive to obtain appropriate technologies that will meet the requirements and will also be cost-efficient [6].

1. Treasury Management Systems

Treasury management system (TMS) is the basic treasury transactions database or software that allow recording all information about treasury transaction [4]. Such systems can provide functions such as cash and liquidity management, cash forecasting, in-house banking, cash pooling, performance reevaluation, dealing, electronic banking, confirmation and settlement, accounting, valuation, risk measurement and analysis tools or reporting which help to effective corporate financial management. Cooper [4] divides treasury management systems into three basic groups:

- Spreadsheets;
- In-house systems (creating a TMS with a high level of specification, but with high investment costs and long development time);
- Specialized treasury systems (TMS is modified according to the demands and requirements of company).

Following table illustrates the overview of selected TMS, which can be used. It is necessary to assess suitability for an enterprise based on detailed analysis of systems.

TAB. 1: Overview of Selected Treasury Management Systems

<i>Company</i>	<i>Home Country</i>	<i>System Name</i>
Bellin	Germany	Tm5
CRM Treasury Systems	Sweden	CRM Finance
Exalog	US	Allmybanks.net
Financial Software Systems	US	Spectrum Treasury
FTI Treasury	Ireland	FTI Star
GTreasury	US	GTreasury
Hanse Orga	Germany	FinanceSuite
IT2 Treasury Solutions	UK	IT2
Kyriba	UK	KyribaTI
Misys	UK	Misys KTP
Murex	France	MX.3
Numerix	US	Numerix CrossAsset
OpenLink	UK	Findur
Piteco	Italy	Piteco
Reval	US	Reval
Sage	Spain	Sage XRT Treasury
Salmon Software	Ireland	Salmon Treasurer
SAP	Germany	SAP Treasury and Risk Management
Sungard	US	AvantGard Treasury
Treamo Business Consulting	Austria	TFM
Treasury Intelligence Solution	Germany	Bank Transaction Manager
Trinity	Germany	Trinity TMS
Visual Risk	Australia	Visual Risk
WallStreet Systems	US, Regional	Wallstreet System

Source: [5, 1]

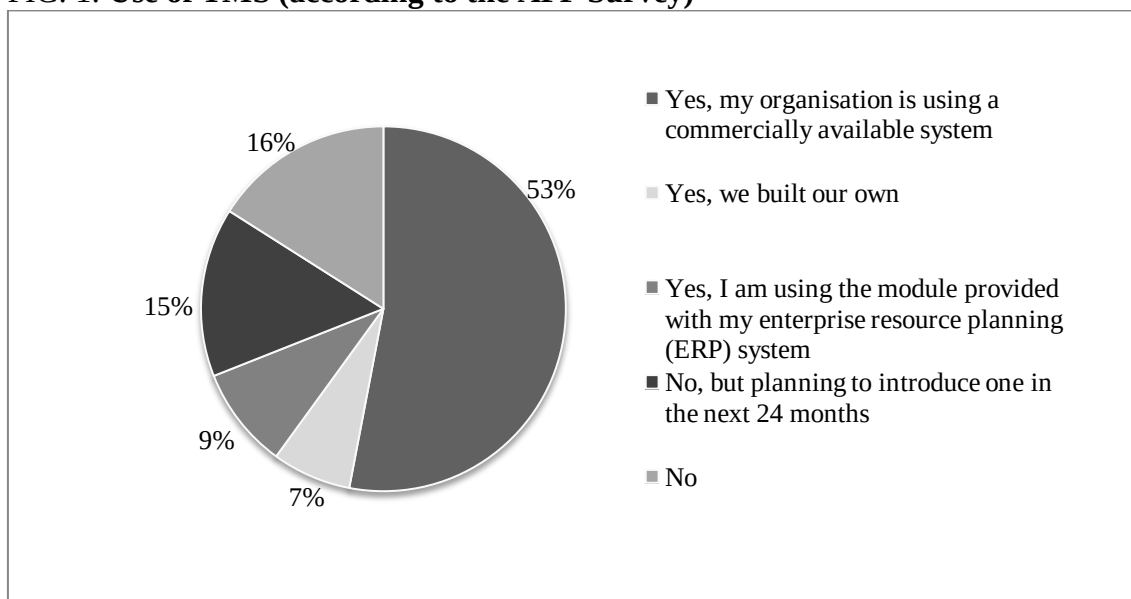
2. Use of Treasury Management Systems in Practice

Use of TMS worldwide is summarized in the online *Treasury Management Systems Survey* [2] carried out by gtnews, an Association for Financial Professionals (AFP) in 2012. Respondents from around the world participated in this survey (506 respondents in total, 40% Western Europe, 31% North America, 17% Asia-Pacific Region, 8%

Middle East and Africa and 4% Central and Eastern Europe). Organizations of all sizes were represented in the survey.

The importance of adopting a TMS to handle treasury operations was confirmed by the nearly 70% of respondents who use a TMS (as Fig. 1 shows). 53% of enterprises currently use a commercially available TMS, 9% of enterprises use a TMS in the form of the module provided with their enterprise resource planning (ERP) system, while 7% use a system built in-house [2].

FIG. 1: Use of TMS (according to the AFP Survey)



Source: [2]

The use is dependent on company size. The use of TMS is prevalent at larger enterprises, many small enterprises do not have a TMS and they do not plan to introduce one. The smallest organisations (with annual revenues of less than US\$250m) are most likely to build their own TMS when needed, but roughly one quarter of those smallest organisations that do not currently have a TMS indicate they do not plan to introduce one either. Corporate treasury departments use a TMS mainly to manage multi-currency and cross-country transactions, as well as to comply with regulatory regimes that represent the norm in Europe, so is explained the extensive use of TMS in this region [2].

The use of TMS by enterprises in the Czech Republic was examined by authors provided empirical research. It was one part of a study of treasury management of Czech enterprises carried out in 2013. There were 139 respondents asked. Because different results depending on the size of the company were expected, respondents were categorized into small, medium-sized and large enterprises (34% were small enterprises, 40% medium-sized and 26% large enterprises). The categorization was made based on the Directive of European Commission No. 70/2001. As regards the representation of enterprises in sectors, 43% of respondents were from the industry sector, 37% from the service sector and 20% from the trade sector. Systems used by Czech enterprises for treasury management are shown in next table. As we can see, in spite of the many benefits offered by the latest treasury management system technology, the spreadsheet remains the tool of treasury management for many enterprises. Specialized treasury management systems are not widely used by Czech enterprises.

TAB. 2: Treasury Management Systems Used by Czech Enterprises (according to own empirical research)

<i>What system for management of treasury activities do you use?</i>	Small Enterprises	Medium-sized Enterprises	Large Enterprises
Special system for treasury	1	2	8
Treasury module of ERP system	12	12	17
Spreadsheets	38	45	26

Source: own

Conclusion

Application of methods and tools of treasury management is seen as one of the possible ways to achieve increased business performance and sustain a stable position of the company in the global competition. Treasury management is becoming a prerequisite for success not only for large multinational companies, but also for SMEs, which also face a number of financial risks (especially if they carry out international transactions). Development of corporate treasury management is connected with development of information technologies, growing international trade and increasing competitive environment. Every company aims to improve their financial flows visibility and to create appropriate systems for business management. Although TMS is an important

investment, enterprises could consider their use in business management in order to increase efficiency and competitiveness.

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THE NEED OF BIG DATA ANALYSIS

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Key words:

big data – information – big data analysis

Abstract:

Since the turn of the century innovations in technology and greater price affordability of digital devices caused the industrial revolution of data, which is characterized by an explosion of the amount and variety of data. Data are collected on an unprecedented scale across a wide range of areas. Therefore this phenomenon received the commonly used name Big data. However, if companies understand and use added value of Big Data, thus they can gain the real pluses in various fields. The main aim of this article based on various surveys is to assess the importance of the big data analysis.

Introduction

Since the turn of the century innovations in technology and greater price affordability of digital devices caused the industrial revolution of data, which is characterized by an explosion of the amount and variety of data. Data are collected on an unprecedented scale across a wide range of areas. Therefore this phenomenon received the commonly used name Big data. Big data currently affect nearly every aspect of our modern society, including trade, manufacturing, financial services etc. The task of their analysis is to transform imperfect, summary, often unstructured data into usable information that will become the potential to improve the performance and success of many businesses.

1. Big data

Data are based on ISO/IEC 11179-4 the representation of facts, concepts or instructions in a formalized style suitable for communication, interpretation or administration of human or automated means. Three aspects of the data are identified, namely their objectivity, subjectivity and intersubjectivity. Based on an objective point of view, we

suppose that all data is processed automatically, unlike subjective view, which stresses that if the data is processed using a technique, there is an increasing amount only high unstructured and reformatted data output. Intersubjective view allows the possibility to process the data using techniques as well as direct human activity.

The concept of data is often confused with information, knowledge and wisdom. The differences between these various terms are very unclear. Their differentiation boundaries have shades of grey. Is not clearly defined interface between their white and black colours [5]. While there are no universal definitions of these terms, the authors agree on their continuum that Cleveland already defined in 1982 [1].

The data are mostly structured, eternal and often numeric. They are obtained through research, creation, collection, discovery, and are registered in the system database. Information has the context. They accrue from organization of data, and on their basis we can draw conclusions. The information is factual, but unstructured and in many cases in the form of text. Data and information describe past. Knowledge is deductive, abstract and are necessary for decision and hypotheses making. Knowledge is present and has a dynamic character as opposed to static information, because they are part of the people and their performance. Wisdom is the highest level of understanding. It is backed by sharing knowledge and predicts the future.

There is no consensus on the definition of the term big data. Merv says that Big data extends beyond the scope of commonly used hardware and software of ordinary users for collecting, managing and processing of data within an acceptable time period [4]. A similar definition gives us a global company McKinsey, which says that the concept of big data refers to data sets whose size exceeds the capabilities of typical software tools to capture, store, manage and analyse.

In general, we can summarize that big data is currently a much-used phrase describing a massive volumes of structured and unstructured data. This volume is so vast that it is difficult to process it using traditional databases and software engineering. Indicators

which in principle contradistinguish big data are called "3 V" (volume, velocity, variety) [3].

Volume - the size of the data. Due to technology it is often very restrictive to talk about data volumes in absolute concept. As the development of technology is progressing, the numbers are becoming outdated, so it is better to think about the volume of data in relative concept. If the amount of data you are working with in your industry is larger than with which you have previously experienced, you probably are dealing with big data. For some companies this can represent tens of terabytes for another one tens of petabytes.

Velocity – the speed, which refers to how fast the data is received, but also to how quickly businesses need to be able to analyse this data and use it. We must also keep in mind the speed of creating data, which is the main cause of big data.

Variety - the diversity of data, which shows the number of sources leading to the databases. Incoming data is rarely in a form suitable for processing, so in the processing of big data occurs to extract knowledge from unstructured data into a structured input into software applications. Transition process from source data into processed data involves the loss of information. Therefore it is necessary to pay close attention to this selection.

2. Importance of big data analysis

Big data analysis is the process of large volumes data examining with a view to uncover hidden patterns, unknown correlations and other useful information, which can be a source of competitive advantage and can lead to more effective action in the company. The main objective of the big data analysis is to help companies to achieve better business decisions. Big data analysis is possible by using commonly used software tools in the advanced analytical disciplines such as predictive analytics and data mining. The oversaturation of database may occur due to the large volume of data, and then the database cannot handle the processing. As a result, enterprises have to obtain a new data technology. The important thing is that the companies must be able to integrate new big data with traditional business data, because the new perspective on solving does not

come only from the big data analysis but it also have to be able to offer new perspectives on old problems.

In big data analysis there are potential pitfalls. The organization Economist Intelligence Unit Limited conducted the survey in June 2011 with 586 senior executives from around the world [6]. From many aspects it also focused on the major challenges and problems of enterprises in acquiring value from big data. Obtaining, collecting, organizing and reconciling of data are fundamental aspects of any data management. But difficulties arise when companies try to extract meaningful information from the data for the needs of the enterprise. This critical step in the management of large amounts of data is the least developed among other knowledge management operations. The most common reason (45 %) based on the aforementioned survey is the existence of very large amounts of data and a small number of resources for their management. 30 % surveyed believes that they have not the right skills for effective data analysis within the organization. Another frequently recurring response (23 %) was the lack of enterprise data connectivity with right employees who would be able to extract wisdom from data.

752 respondents (executives) of another survey also reached a similar conclusion. The survey was conducted in March 2012 also by the Economist Intelligence Unit Limited [7]. In this survey, 41% of surveyed answered the question *What key challenges, if any, does your organisation face when attempting to process data more rapidly?* so that enterprises do not have enough staff skills that would ensure the selection and use of data to the correct decision. The reason was mainly featured by executives in industries with high technical skills, such as the technology industry and financial services.

Big data brings to enterprises not only challenges but also opportunities as presented in the surveys. Research of the Economist Intelligence Unit Limited from 2011 presents us that the strategic management of data is crucial factor to the financial performance and that top management takes responsibility for data management strategy in most enterprises. In the present survey they also addressed the question *What new opportunities do you see for your organisation as the result of the availability of*

increased amounts of data? Of course the answers were dependent on industry, market conditions and strategic imperatives of the company but even 51 percent of those questioned expected the increase of operational efficiency. Other relevant answers as information of strategic direction, better customer service, identification and development of new products, identifying new markets, faster market entry, comply with regulations, they have lower percentages.

The survey of McKinsey Global Institute in 2013 has the similar conclusions. Based on this survey, big data is seen as a starting point for productivity growth, innovation and competition in the future [8]. Responses indicate growth of the corporate use of big data and is also noted that managers assign critical priority to analysis and pay attention to the introduction of new analytical tools. Compared to 2012, respondents indicated that increased use of data leads mainly to improved automation of routine or ambiguous decisions, to improving of the R & D process, and also to improving of budgeting, forecasting and planning processes as well as to improving of many other areas.

Conclusion

Innovations in technology and the increased availability of digital devices dominate in present period of large data amounts. Term for an explosion in the volume and diversity of data is big data. These data have the potential, yet largely untapped, so decision-makers in enterprises should monitor progress in the development and understand that existing policies and programs of enterprises require adaptation. On the basis of the above, we can define five factors by which the big data analysis creates value.

Firstly, big data analysis is able to find significant value by clarifying flood of information, so they become eligible. Second, if enterprise makes and stores more data in digital form, it collects accurate and detailed performance information and the enterprise may reveal variability, volatility and increase overall performance. Thirdly big data provide increasingly closer customer segmentation, i.e. they may provide the products or services more accurately according to their requirements. Fourth, sophisticated analysis significantly improves decision-making processes. Finally, big data can be used to improve the development of new products, services and aftersales service of business.

The use of big data has become a key basis of competition and growth for individual companies. In terms of competitiveness companies seriously have to deal with the concept of big data because competitive businesses and new entrants have big data management strategies in most industries.

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ANALYSIS OF BUSINESS EXPENDITURES ON RESEARCH AND DEVELOPMENT IN THE CZECH REPUBLIC

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Key words:

research and development – manufacturing – knowledge stock, sales – Czech Republic

Abstract:

This paper provides an overview of Business Expenditures on R&D (BERD) collected from the Frascati Manual Surveys compiled with the database of firms' economic results (P5-01) carried out by the Czech Statistical Office. The role of R&D investments represented by knowledge accumulation is studied using panel data econometric estimates carried out on a subset of firms operating in processing industries. The early results confirm the hypothesis of the positive role of R&D expenditures on firms' sales.

Introduction

The perspectives for sustaining the world economic leadership are associated with stimulating technological progress through innovations and investments to R&D. This is a challenge for the companies operating in the private sector to remain competitive in the increasingly globalised market.

There has been an increasing attention directed to Research and development activities in the Czech Republic. Gross expenditures on R&D have doubled between 2000 and 2008 and the private R&D sector remains the biggest contributor to this expansion. Based on this observation, the private R&D sector potentially represents an important source of growth and innovation in the Czech economy. Precisely due to its strategic

role in the economy, it is necessary to properly quantify its effects on economic growth and productivity.

In this paper, firm-level data on Business Expenditures on R&D (BERD) collected from the Frascati Manual Surveys that were compiled with the database of firms' economic results (P5-01) carried out by the Czech Statistical Office are analyzed. Consequently, the role of R&D investments represented by knowledge accumulation is studied using panel data econometric estimates carried out on a subset of firms operating in manufacturing industries.

1. Empirical evidence on the role of R&D investments on productivity

There is convincing empirical evidence that cumulative domestic R&D and knowledge stocks are important determinants of productivity. The effect of R&D investments on productivity was already studied in 1960s by Griliches [6]. Griliches used a dataset of US manufacturing companies in 1957-65 to quantify the relationship between firms R&D expenditures and their TFP. The basic model framework that Griliches applied and further extended for non-constant returns to scale was based on an augmented Cobb-Douglas production function, which modelled output Q as a function of classical inputs of capital and labour (C and L) and the accumulated research capital K :

$$Q_t = A \cdot e^{\lambda t} \cdot K_t^\alpha \cdot C_t^\beta \cdot L_t^{1-\beta}, \quad (1)$$

where A is constant and λ stands for the rate of disembodied external technical change. The research capital K_t represents weighted sum of the previous R&D investments R_t :

$$K = \sum w_i \cdot R_{t-i} \quad (2)$$

By applying equation (1) on cross-sectional data from 1963 and, Griliches found an overall elasticity of output with respect to R&D investments 0.07% (with significant industry differences), from which he derived an implied return to R&D investments reaching 27%, in some industries up to 40%.

With an improved availability of firm-level datasets and a progress in modelling technical efficiency, the recent literature on R&D spillovers is more closely related to the micro-level evidence. For instance, Aiello and Cardamone [1] used a survey of Italian manufacturing firms over 1998-2003 to quantify R&D spillovers on firms performance with a translog production function. They concluded that R&D spillovers matter and their power increases with the geographical proximity. Relationship between

R&D productivity and globalization was studied by Cincera and Ravet [2] who analyzed 1000 large European multinational R&D companies using combined databases of R&D scoreboard and Amadeus and concluded that globalization has a positive impact on R&D productivity.

2. Objectives of the paper and the methodological approach

The first objective of the paper is to analyze the Business R&D expenditures of the Czech firms engaged in private sector with respect various aspects regarding participation in industry or firm size. The second objective of the paper is to assess the role of R&D investments in production, by quantifying a knowledge-augmenting production function for a subset of manufacturing firms.

Regarding the first objective, the method of analysis is applied on a compiled dataset comprising of R&D surveys on firm-level following the Frascati Manual carried out periodically by the Czech Statistical Office in their VTR surveys (starting from 1995) and economic surveys of firms carried out by CZSO in their P5 -01 surveys (starting from 2000). In 2000 when the economic surveys were initiated, only 57% of firms included in Frascati database were also included in the economic database. In 2009, the coverage reached 70% regarding the number of companies and 88% regarding the value of R&D expenditures, which is relatively acceptable.

Regarding the second objective, panel data econometric techniques are applied. Firms operating in processing industry were selected due to three reasons: i) manufacturing industries are the biggest contributors to R&D expenditures ii) they predominantly carry out research in technical sciences (thus the R&D effects are comparable) ii) they represent a rather homogenous group for modeling the production technology.

The estimation approach follows the traditional Griliches model (Equation 1):

$$Q_{i,t} = A \cdot L_{i,t}^{\alpha} \cdot C_{i,t}^{\beta} \cdot M_{i,t}^{\delta} K_{i,t}^{\chi} \cdot e^{u_{i,t}} \quad (1)$$

All variables were logarithmized such that the coefficients inform us about the elasticity. The description of the variables is following:

- ❖ $Q_{i,t}$ represents sales of each firm in processing industry, deflated by prices of gross production on OKEC 2 level expressed in prices of 2005
- ❖ $L_{i,t}$ represents number of employees per firm and observation, expressed as a full time equivalent (FTE). The FTE was calculated by dividing deflated R&D-corrected

labor costs (subtracting employees in R&D from total number of employees) by representative wage on OKEC2 level.

- ❖ $C_{i,t}$ represents capital stock per firm and observation, calculated as fixed assets of firm cleared from accumulated R&D expenditures and consequently deflated by investment index calculated as a ratio of gross fixed assets in current and 2005 prices in NACE classification.
- ❖ $M_{i,t}$ represents inputs of materials and energy cleared from expenditures on materials and energy in R&D departments and deflated by input price index per OKEC2 that was created as a weighted index of prices of agriculture, industry, construction and market services. Weights were obtained from SIOT input output tables per OKEC 2.
- ❖ $K_{i,t}$ represents knowledge stock, calculated by Perpetual Inventory Method, assuming a uniform depreciation rate of knowledge (15%) and a mean compound growth rate of real R&D expenditures of firms included in the dataset (3.9%). The real RD expenditures were calculated using R&D deflator. R&D deflator was constructed by deflating separately current R&D expenditures, wages in the R&D sector and the capital R&D expenditures.

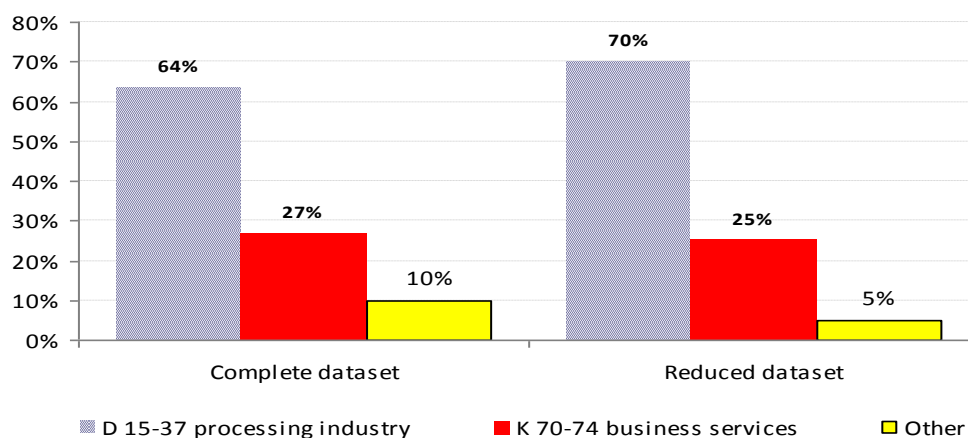
The dataset was cleared from negative, zero and interrupted observations. Due to the constrained shape of the dataset – it is highly unbalanced with most frequent records per firm of three years, only “between” estimates were calculated. The estimates were checked for the presence of heteroscedasticity (due to eliminating time dimension, autocorrelation problem was omitted). All dataset manipulations and regression calculations were done in R software.

3. Results

3.1 Analysis of Business R&D expenditures

Figure 1 provides comparison of sectoral R&D expenditures over 2000-2009 in the complete dataset and merged (reduced) dataset. It can be observed that in both datasets, the sector of processing industry is the largest contributor to private R&D expenditures; however in the reduced dataset the participation of industrial firms is even more concentrated. Overall, 95% of all R&D expenditures are provided just by to production sectors – processing industry and business services.

FIG. 1: Comparison of R&D expenditures per sector in complete and reduced dataset (calculated from the sum over 2000-2009)

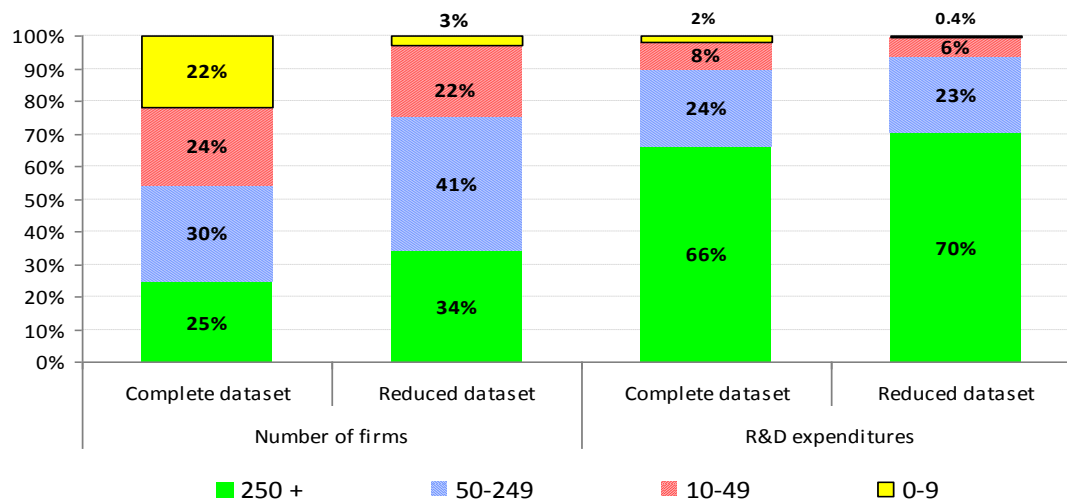


Data Source: CSO Frascati Manual Surveys (1995 – 2009) and Economic Surveys (2000-2009) [5]

Within the processing industry, the most important sectors that contribute to R&D expenditures are sectors of transportation, production of electric and optic equipment, machinery and chemical industry. These sectors contain 60% of all firms engaged in industrial research and they contribute by 80% to all R&D expenses in processing industry. After the EU accession the R&D expenditures in the processing industry noticeably increased, mainly due to the contribution of chemical industry and electric and optic equipment. Nevertheless, the transport industry provides the most important contribution in the aggregate industrial research, with a stable share of 50% in total R&D expenditures. Concerning the group of business services (K 70-74), most of the firms make business in R&D and ICT sectors.

Another criterion is the size structure of the firms included in both datasets. Whereas the representation of all firm sizes is rather balanced in the complete dataset, the reduced dataset is skewed towards larger companies (Figure 2). This is explained by the fact that most of the companies with less than 10 employees are not recorded in the economic surveys. When considering the value of R&D expenditures, the two datasets differ to a lesser extent, due to the negligible share of small firms in total R&D expenditures. Particularly after 2004, the R&D expenditures of the largest firms increased noticeably and overreached 20 billion CZK. The second ranked the group with 50-249 employees, in which R&D expenditures reach about 10 billion CZK.

FIG. 2: Comparison of R&D expenditures per size of firms included complete and reduced dataset (calculated from the sum over 2000-2009)



Data Source: CSO Frascati Manual Surveys (1995 – 2009) and Economic Surveys (2000-2009) [5]

There are considerable differences between the types of businesses in which the firms are engaged according to each size category. Concerning the smallest firms, the largest share of their research expenditures is devoted to services including ICT, consulting and R&D itself. Compared to other size forms, the smallest firms also invest in research in commercial services. With increasing size of the firms, the share of services in R&D declines. In case of the largest companies, majority of research expenditures is spent in the processing industry.

Finally, the two datasets are compared regarding the field of science that the included firms are engaged in. It is concluded that firms included in the reduced dataset are slightly more concentrated in technical sciences and this field dominates in the whole dataset. This is obviously connected to the firms' affiliation to processing industry and is also closely associated with the firm size and ownership (the largest firms are in foreign ownership). In 2009, 80% of total expenditures were spent in the field of technical sciences, followed by natural sciences (11%), whereas both agricultural and social sciences represented only 2% of all expenditures. It can be also noted that the expenditures to technical sciences grew considerably after the EU accession.

3.2 The effect of Private R&D expenditures on firms sales

Two types of model were compared: *model 1* includes only the important inputs to production and *model 2* captures the effect of firm size and production sector. In both

cases, the real output represented by deflated sales is modeled in an augmented form where knowledge stock is incorporated as an additional production factor.

Results of model 1 are provided in TAB 1. There were 4,197 firms included in the dataset which were recorded for the period of 1 up to 10 years.

TAB. 1: Outputs of regression of Model 1 (Heteroscedasticity-consistent coefficients)

```
plm(formula = ln_Y ~ ln_L + ln_C + ln_M + ln_K + factor(OKEC_P2) +  
      factor(firm_size), data = IPD_regressionC_final, model = "between")
```

Unbalanced Panel: n=1007, T=1-10, N=4197

	Estimate	Std. Error	t value	Pr(> t)	
(Intercept)	1.1038544	0.0608898	18.1287	< 2.2e-16	***
ln_L_meanC	0.2589825	0.0259926	9.9637	< 2.2e-16	***
ln_C_meanC	0.0623591	0.0110665	5.6350	2.278e-08	***
ln_M_meanC	0.5936164	0.0240109	24.7228	< 2.2e-16	***
ln_K_meanC	0.0518940	0.0095265	5.4473	6.443e-08	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Multiple R-squared: 0.9539, Adjusted R-squared: 0.9537
F-statistic: 5160 on 4 and 997 DF, p-value: < 2.2e-16

Source: author's calculation

The results of Model 1 show that all included variables are highly significant. Comparing the values of the coefficients, it can be concluded that materials and energy have the largest effects on production. This finding is in line with the high role of intermediate consumption in final production, which is typical for these types of industries. The coefficient for physical capital is lower than labor which shows a rather weaker role of fixed assets in production. This might be caused by clearing fixed assets from knowledge stock in order to isolate properly the R&D effects. The results show that knowledge stock is significant variable in explaining sales of industrial firms. An increase of knowledge stock by 1% will result in growth of sales by 0.05%. This finding is comparable to Griliches, who derived the elasticity of knowledge with respect to output at the level of 0.07%.

The second model includes also firm size and industrial dummies. The results, as shown in Table 2 indicate that all considered inputs are highly significant. The effect of knowledge stock is slightly smaller. Regarding the industrial dummies, the model is computed for electronic equipment. All other industry dummies increase sales, the most dramatic is the participation in the chemical industry, where the dummy is significant. Concerning the firm size effects, the model is computed for firms bellow 10 employees. Surprisingly, the dummies for larger firms are negative. For the firms with more than

250 employees, the constant is reduced by 0.79. Given that the dummy variables are not logarithmized, the coefficients represent growth effects. In the cross-sectional context, which corresponds to the between estimate, it can be understood as a growth from firm with smaller to a firm with higher sales. Therefore, it is understandable that to expand the sales in large firms is more difficult than in case of small firms.

TAB. 2: Outputs of regression of Model 2

```
plm(formula = ln_Y ~ ln_L + ln_C + ln_M + ln_K + factor(OKEC_P2) +
     factor(firm_size), data = IPD_regressionC_final, model =
"between")
```

Unbalanced Panel: n=1007, T=1-10, N=4197

Residuals :

Min.	1st Qu.	Median	3rd Qu.	Max.
-1.6300	-0.1890	-0.0479	0.1470	2.6400

Coefficients :

	Estimate	Std. Error	t-value	Pr(> t)	
(Intercept)	1.3023338	0.1403705	9.2778	< 2.2e-16	***
ln_L	0.3557377	0.0226064	15.7361	< 2.2e-16	***
ln_C	0.0547078	0.0096372	5.6767	1.801e-08	***
ln_M	0.5857653	0.0128120	45.7201	< 2.2e-16	***
ln_K	0.0493095	0.0081860	6.0236	2.399e-09	***
factor(OKEC_P2)Equipment	0.0107892	0.0352930	0.3057	0.7598936	
factor(OKEC_P2)Chemicals	0.1244029	0.0419525	2.9653	0.0030959	**
factor(OKEC_P2)Metals	0.0610988	0.0399643	1.5288	0.1266233	
factor(OKEC_P2)Other industry&mining	0.0591078	0.0334936	1.7648	0.0779126	.
factor(OKEC_P2)Transport industry	0.0687510	0.0450279	1.5269	0.1271153	
factor(firm_size)10-49	-0.4478718	0.1348322	-3.3217	0.0009273	***
factor(firm_size)250 +	-0.7829871	0.1461276	-5.3582	1.044e-07	***
factor(firm_size)50-249	-0.6214177	0.1363000	-4.5592	5.774e-06	***

Source: author's calculation

Conclusion

This paper provided an overview of the Business R&D expenditures of the private companies in the Czech Republic. Data obtained by a compilation of two databases were analyzed. The sample of firms with available economic results forms about 70% of all R&D active firms with and their contribution to total private R&D expenditures reaches 88%. Furthermore this sample gives a strong evidence of the fact that private R&D expenditures in the Czech Republic are typically provided by foreign-owned middle-large and large firms operating in processing industry focusing on technical science research.

In line with this finding, the effect of R&D expenditures was studied for a selection of firms operating in processing industry. The preliminary results confirmed a positive effect of accumulated R&D investments on firms' sales in spite of the heteroscedasticity

problem. Significant effects of firm size and industry dummies were proved in the following model. These effects will be studied in bigger detail in the upcoming research.

Acknowledgement:

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FACEBOOK'S IMPLEMENTATION IN TO STUDY PROCESS

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Key words:

Facebook – information technologies – Lithuania – study process – students

Abstract:

Facebook becomes one of the most important intermediaries for the youth in the last decade. The vast majorities of students have a Facebook account and are spending a considerable amount of time logged in. We raise the question: do student see Facebook as the mean in study process? The empirical study with questionnaire was provided to answer to this question. Results showed that explored students are not very positive for Facebook's usage in study process especially of course information posting in Facebook. However they are more positive to use this space for communication with other students and with professors in study process. Finalising, we could say that it seems Facebook will be a regular mean in study process in future decades.

Introduction

The first priority in education is to prepare people to integrate into information society. The most important elements of information society are communication systems connected with the most advanced information – communication technologies, the latter eliminating time and distance limitations and providing citizens with the possibilities of open and distance learning [2; 6]. New media have begun to develop by adoption of improvements in computer and information processing to communication technologies since the 1970s.

The actions, which take place in virtual extent, such as corresponding via e-mail, chatting on MSN or Skype, using Social networks such as Myspace or Facebook, searching information on websites, e-shopping, playing digital games online or offline,

using mobile messenger, and the iPod, have been taking hold of the time and the place traditional media occupies in our daily life and have become a natural part of our lives. The purpose of this paper is to analyse students' attitudes for Facebook usage in study process.

Methods of the research are analysis and synthesis of the scientific literature and empirical study.

1. Theoretical Background

Facebook was originally created in February 2004 as a Harvard online social networking site but had opened its site to the general public in 2006 [9; 12]. In December 2006, Facebook had more than 12 million users, and by July 2010, the number of active users increased to 500 million, and by October 2013, the number grew up to 1.19 billion monthly active users [4].

College students have a myriad of reasons for visiting Facebook's online social-networking site [7]. Facebook is essentially an online social network site in which individuals can share photographs, personal information, and join groups of friends with one another [1]. Whether it is connecting with friends and family (regardless of location), keeping up with the latest events and happenings or making new friends with similar interests, Facebook allows for one-stop social networking [11]. Although other online sites such as MySpace and Friendster are also designed to connect people, Facebook is generally considered the leading social networking site used by college students [3; 5; 10].

Facebook has become an essential part of student life for most college students; it serves not only as a primary tool of communication but also electronic socialization [5]. Unlike other social networking sites, Facebook has its roots in academia and remains unique in its organization of academic networks wherein faculty and students are connected by their association and must possess an "edu" extension in their user e-mail to gain access [7]. The fundamental question of whether Facebook and social

networking sites pose more of a distraction from academic pursuits than a conduit towards educational goals is at the heart of an article [8].

Bosch explains that, in 2007, Facebook experimented with adding an online version of Blackboard CMS that allowed 95 percent of Blackboard's functionality to migrate to a Facebook environment. This experiment was quickly "phased out" in 2008 and Facebook is said to be currently working on other educational platforms for its web site. To date, several other outside vendors such as Podcast have created applications that provide instructors with CMS options that synchronize with Facebook.

Research [8, 161] showed a further breakdown of the academic-related Facebook communication into the following five categories:

- Recounting and reflecting on the university experience.
- Exchange of practical information.
- Exchange of academic information.
- Displays of supplication and/or disengagement.
- "Banter" (i.e. exchanges of humour and nonsense).

Only 4% of a total of 68,169 Wall postings were related to education-use (Selwyn, 2009). The same author found no significant difference in terms of education-related Facebook activity by students' gender, year of study or assessment marks. Based on all this analysis authors of this paper provided study to find out if students use Facebook in study process and what is their opinion about this.

2. Empirical research and its results

The main purpose of the survey was to find out students' opinion and their Facebook usage in daily life and during study process.

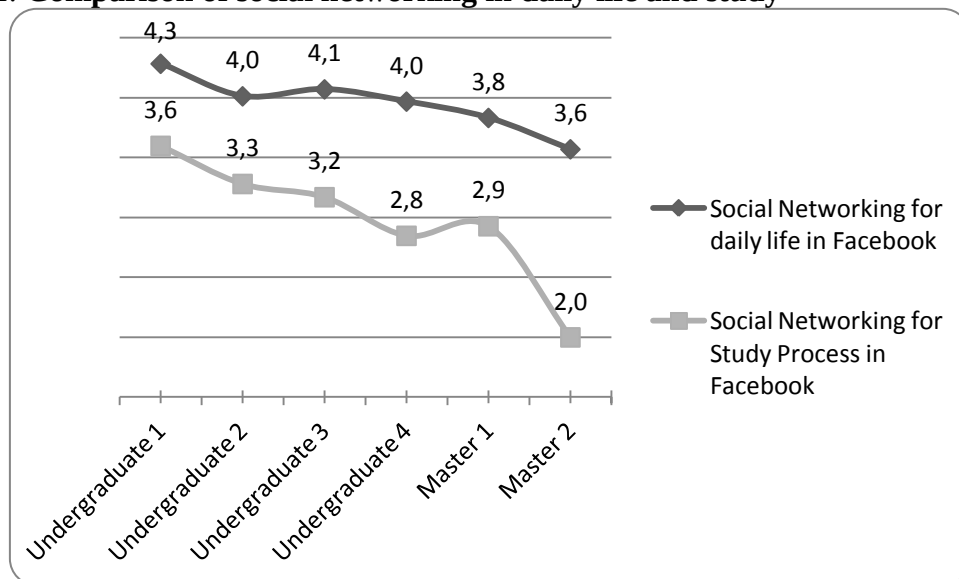
Looking at literature review and earlier researches the questions were formulated and given for students to find out:

1. How often students use Social Facebook Networking in their daily life.
2. How often students use Social Facebook Networking in Study process.
3. Students' view about communicating with students and professors for studies in Facebook and posting study material in this Social network.

5 point scale was used for evaluation. Calculated statistical means were used for the analysis of data in this paper. 434 university business students from Lithuania participated in the poll. 79.4% of respondents were females and 20.6% males. Undergraduate and master students took part in this study. Their activity was following: 1st year students -36.3%, 2nd -17.1%, 3rd- 27%, 4th – 8.3%, and master students: 1st year – 9.7% and 2nd -1.6%.

Undergraduate and Master students were asked about using social networks in daily life and study process. The results are shown in Figure 1 (5 means using social networks every day; 1-never at all). As we see from the results, the usage of social networks in daily life as well as in study process is decreasing for upper course students. Most students are using social networking in daily life (Mean 4,09) while usage of social networking in study process is much more lower (Mean 3,27).

FIG. 1: **Comparison of social networking in daily life and study**



As we see from Figure 1, 1st, 2nd, and 3rd year students are using Facebook and other means of social networks in study process more frequently than average. So it could be forecasted increasing importance of social networks in study process in future as it is in daily life among young generation now.

Looking at connections among Social Networking in daily life and FB use, significant statistical differences were found (see Table 1). Results showed that students who use social networking more often are more positive about communication with professors and students for studies and study course information posting in Facebook. Students would like to communicate more with other students rather than with professors in Facebook. In most cases they are against of study material posting in Facebook, even 1st year students more disagree than agree with course information posting in Facebook.

TAB. 1: Correlations of Students' opinion about using Facebook in study process

		Communication with professors about studies	Communication with other students about studies	Study information posting in Facebook
Social Networking (Facebook)	Spearman Correlation Coefficient	,342(**)	,438(**)	,328(**)
	Sig. (2-tailed)	,000	,000	,000
	N	510	510	510

** Correlation is significant at the 0.01 level (2-tailed).

Conclusion

Popularity of Facebook is increasing every day. There were 727 million daily active Facebook users on average in September 2013. Reviewed literature and provided research showed increasing popularity of social media and Facebook in students' daily life. Facebook has also introduced a new set of educational opportunities for educators and students. Our survey results corresponded with Kolek and Saunders (2008) research, which showed that younger year students were more likely than seniors to use Facebook. Results also showed that most students (70.4%) are not willing to communicate with professors a lot throw Facebook and to have them as friends in this social network. Similar results by Ophus and Abbitt (2009) reported that 85.5% of

respondents had never used Facebook to communicate with their instructors. However this negative attitude is decreasing year by year.

Summarizing we can say that Facebook could be implemented into study process even explored Lithuanian students are quite critic and conservative about Facebook's using in the study process as use it more for leisure and disport, but from the other hand they prefer to use the same media for all purposes.

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THE USAGE OF MULTINOMIAL LOGISTIC REGRESSION TO RESEARCH THE DIFFERENCES IN HOUSING SITUATIONS OF POLISH HOUSEHOLDS IN THE RELATION URBAN – RURAL AREA

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Key words:

multinomial logit model – legal title to the property – households – urban-rural area

Abstract:

The main aim of the paper is to show the usefulness of multinomial logit model which can identify differences in the housing situation in the urban-rural relation. This model has been applied to the unordered categories defining the housing situation in the household with legal title to the home (ie: the property without the burden of a loan or mortgage, the property with burden of loan or mortgage, the cooperative legal right to property, lease) measured on a nominal scale. Multinomial logit model parameters were estimated on the basis of data from the individual budgets of households in Poland in 2010. The impact of economic, socio-demographic and urbanisation factors on having a status of property titles was considered. Class of the residence place significantly differentiates the chances of households in the state have a place to live. Urban dwellers compared with the villagers have a greater chance of local ownership charged borrowings and cooperative right to the premises and lease, the larger the city the greater the chances.

Introduction

Having the place to live is the basic need for every human being. It gives us the sense of security which allows us to develop the higher desires. The location of accommodation, its size and standard are determinants of social status [4, 5]. The living situation of households is defined by various indicators. Their influence on the possession of house indicates the wide spectrum of activities with different strength and impact including particular spatial levels such as region or classes of living places in the given country.

The urbanisation and households social-economic features affect the formation of needs.

The main aim of the paper is to show the usefulness of multinomial logit model which can identify differences in the housing situation in the urban-rural relation. The housing situation is described by the households ownership (defined according to the legal title of inhabited premises).

This model was applied to the unordered categories which define the housing situation in the households with the legal title to the house (i.e.: the property without the burden of loan or mortgage, the property with burden of loan or mortgage, the cooperative legal right to property, lease) measured on a nominal scale [1,2,3].

Multinomial logit model parameters were estimated on the basis of the data from the individual budgets of households in Poland in 2010. Annual trial covered 37 412 households¹. The impact of economic, socio-demographic and urbanisation factors on having a status of living place was considered. The estimated models can be broadly used in the socio-economic analysis.

The method

The identification of differences according to the housing situation in urban-rural relation was done on the basis of multinomial logit model. This model describes the natural logarithm of the relative risk ratio in housing situation according to base category by using describing its factors. The dependent variable is discrete with a finite number of values (category 1,2, ..., J), the values of this variable are not ordered. It is assumed that the i -th unit (household) has to choose one of the J category (the legal title to the property). The following categories were considered to define the legal title to the apartment: property burdened with loan or mortgage, property not burdened with loan or mortgage, cooperative right to the premises, lease or sublease. Ownership of the housing category is determined by the set of exogenous variables. The following independent variables were used in this work: income (or total expenditure), the number of people in the household, class of residence place, education of household reference

¹ It should be noted that the use of these data for the analysis of the housing situation can create some difficulties arising from the fact that the main objectives of the household budget survey are income and expenses. However, the information is also given on the housing situation of analysed Polish families' budgets. The advantage is the ability to study the housing situation in connection with the information on household characteristics: the demographic composition of the family, its wealth, class, place of residence, etc.

person and socio-economic group of the household. The probability function of the observed choice j -th category by the i -th unit can be written as a multinomial logit model [1,2,3]:

$$\Pr(Y = 1 | x_1, x_2, \dots, x_m) = p_{i1} = \frac{1}{1 + \sum_{j=1}^J \exp(\beta_{j0} + \sum_{i=1}^m \beta_{ji} x_i)}$$

$$\Pr(Y = j | x_1, x_2, \dots, x_m) = p_{ij} = \frac{\exp(\beta_{j0} + \sum_{i=1}^m \beta_{ji} x_i)}{1 + \sum_{j=1}^J \exp(\beta_{j0} + \sum_{i=1}^m \beta_{ji} x_i)} \quad \text{for } j = 2, \dots, J$$

Logits are subjects to be modeled, i.e. the logarithms of ratios selection probabilities of accessible categories. Usually, it is assumed to choose one of the categories as the reference one and compare the others to it (in this work, the base comparisons of the households having legal title to property without or with burden of a loan or mortgage). In the case of J category receives a $J-1$ logit equations:

$$\ln \left(\frac{\Pr(Y = \text{category } j)}{\Pr(Y = \text{reference\_category})} \right) = \beta_{j0} + \sum_{i=1}^m \beta_{ji} x_i$$

The parameters of multinomial logit model were estimated by the maximum likelihood method. The likelihood function and the logarithm of the likelihood function can be written as [2,3]:

$$L(y_i | x_i; \beta_2, \dots, \beta_J) = \prod_{i=1}^n \prod_{j=1}^J (p_{ij})^{d_{ij}}$$

$$\ln L(\beta_2, \dots, \beta_J; y, x) = \sum_{i=1}^n \sum_{j=1}^J d_{ij} \ln p_{ij}$$

d_{ij} has a value of 1 when the i -th unit has selected the j -th category, and 0 otherwise.

The odds ratio is mostly used as a measure for determining the impact of exogenous variable on the probability of observing each category²:

$$\frac{p_{ij}}{p_{i1}} = \exp(x'_i \beta_j), \quad j = 2, \dots, J$$

² While you are interpreting it you have to remember that all parameters are interpreted in relation to the previously established base category.

On the basis of the estimated model parameters, the probabilities of choice j -th category of variable Y under the influence of exogenous variables are determined.

The data

The unpublished data from surveys 37412 household budgets conducted by the Central Statistical Office in Poland in 2010 were used in the study. The housing situation of the household through the legal title to property (ownership without or with the burden of a loan or mortgage - the base category, cooperative right to the premises, lease or sublease) was considered. The following household characteristics were used as factors affecting the housing situation: income (or general expenditure), the number of people in the household, class of residence place, education of reference person in the household, socio-economic group of the household. Taking into consideration the location of the household, the class of residence place was used including cities (population over 500 thousand; population 200-500 thousand; population 100-200 thousand; population 20-100 thousand; population 20 thousand and less) and the rural areas. The category of persons with at most lower secondary education, basic vocational education, secondary and post-secondary and higher education was used for the education of the reference person. Socio-economic groups of households were considered as employees manual labour positions, employees non-manual labour positions, self-employed workers, farmers, retirees, pensioners and living on unearned sources.

Selected results

Estimated parameters of multinomial logit model had low standard errors which showed the significance of parameters (p -values $< 0,05$) and a good adjustment of model to empirical data³. The estimation of model equation is presented in the table 1. The signs of estimated parameters can inform about the influence of independent variables on logarithm of choice probability ratio for variable Y . For example, positive values parameters of variables *employees non-manual labour positions* and *self-employed workers* mean that households of indicated employees have better chances to get properties burdened with loan or mortgage in comparison to *farmers*. What is more,

³ The calculation was done by using GRETl and SATA 12 statistical software.

better chances for this kind of properties have the urban households than families from rural areas. In addition, the bigger city generates the better chance.

TAB. 1: The housing situation in the household with legal title to the property is based on the estimated multinomial logit model (the property with burden of loan or mortgage compare to the property without the burden of a loan or mortgage)

Exogenous variables		Beta coefficient	Standard error	Z	p-value
Cons		-3.24701	0.19698	-16.48	0.000
Total expenditure		0.00004	0.00001	3.969	0.000
Number of people in the household		0.03624	0.02011	1.802	0.072
Socio-economic group (the base category = farmers)	employees - manual labour positions	0.82533	0.17730	4.655	0.000
	employees - non-manual labour positions	1.33941	0.17898	7.483	0.000
	self-employed workers	1.30595	0.18440	7.082	0.000
	retirees	-0.56318	0.19806	-2.843	0.005
	pensioners	-0.62556	0.28955	-2.16	0.031
	living on unearned sources	0.55262	0.25743	2.147	0.032
Class of residence place – households in cities (base category = rural area)	population over 500 thousand	0.91661	0.08017	11.43	0.000
	population 200 to 499 thousand	0.50433	0.09680	5.21	0.000
	population 100 to 199 thousand	0.68486	0.10767	6.361	0.000
	population 20 to 99 thousand	0.55752	0.07599	7.337	0.000
	population 20 thousand and less	0.22772	0.08715	2.613	0.009
Education of the reference person in households (base category = higher)	most lower secondary education	-1.82334	0.16637	-10.96	0.000
	basic vocational education	-0.97131	0.08722	-11.14	0.000
	secondary and post-secondary	-0.64679	0.06420	-10.08	0.000

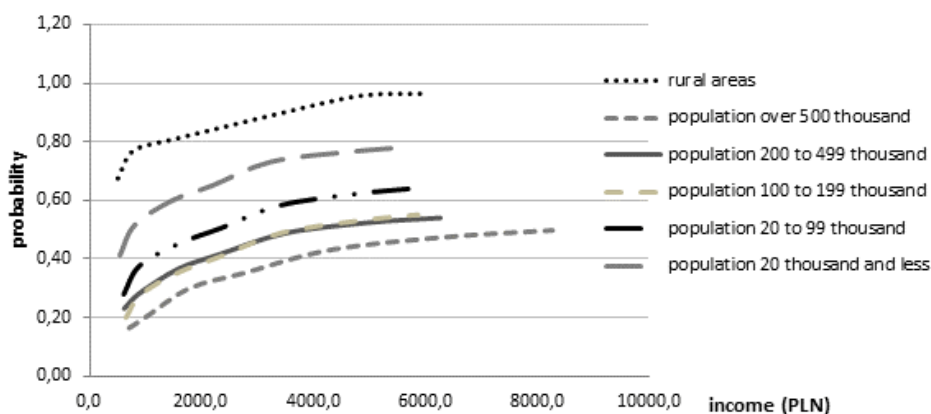
Source: Author

Taking into consideration the education level of the reference person in the household, it is possible to notice that the families of persons with basic, vocational, secondary or post-secondary education have less chances on getting the properties with the burden of

a loan or mortgage than families of persons with higher education. In addition, people with lower education in the household have less chances.

The choice probability of j -category variable Y was calculated on the basis of estimated model parameters under the influence of exogenous variables. The figure 1 presents the probability of having property without burden of loan or mortgage in the income households groups in relation urban-rural areas. It was noticed that the households of rural areas (above 0.6) had the highest probability of having this category of legal title to housing places. The higher economic status of the family generated the greater probability value. On the other hand, the lowest probability of property without burden was characteristic for families living in big cities (population over 500,000).

FIG. 1: The probability of having legal title to property - ownership without the burden of a loan or mortgage in the urban – rural relation



Source: Author

The data in table 2 presented that the highest probability of having property without the burden of loan or mortgage had rural households in comparison to urban households. In addition, the bigger city generated less probability. On the other hand, less popular and the least probable in the rural areas is living in the properties burdened with loan or mortgage. It can indicate the huge diversity among analysed households groups in connection to the level of satisfying their housing needs.

TAB. 2: The average probability of having by household legal title to the property in relation urban – rural areas on the basis of multinomial logitic model

The legal title to the property	The class of residence place					
	rural areas	population over 500 thousand	population 200 to 499 thousand	population 100 to 199 thousand	population 20 to 99 thousand	population 20 thousand and less
ownership without the burden of a loan or mortgage	0.85	0.36	0.42	0.42	0.51	0.66
ownership with the burden of a loan or mortgage	0.04	0.08	0.05	0.05	0.05	0.05
cooperative right to the premises	0.01	0.24	0.29	0.26	0.22	0.11
lease or sublease	0.08	0.31	0.24	0.27	0.21	0.18
others	0.02	0.00	0.00	0.00	0.01	0.01

Source: Author

This results from differences in income, education level of people in the households, different number of people in the households, various kinds of professional work and households environment. The consequence of this can be the fact that the needs hierarchies are differential and depend on the above mentioned factors, although they have similar income [4].

Conclusion

This analysis showed the following assumptions⁴:

1. The multinomial logitic model, which was used in the research, turned out to be useful tool to analyse the diversification of housing situation of Polish households in the urban-rural relation.
2. The used exogenous variables that include economic, demographic and social-economic factors, living places and education had significant influence on housing situation of households which was expressed by the legal title to the property.

⁴ Not all results of the analysis were presented according to editorial limitations but assumptions were made in relation to complete research.

3. The households with higher income had better chances for house burdened with loan or mortgage and lower chances on the cooperative legal right to property or lease.
4. Taking into consideration the possession of households to social-economic group, in comparison to farmers, the better chance for house burdened with loan or mortgage had families of any other groups excluding pensioners. Minor chances for condominium or lease had the farmers' families which were connected with the lack of this form of properties in rural areas.
5. The class of living place significantly diversified the chances of households' possession status. The inhabitants of cities had higher chances for property burdened with loan or mortgage, the cooperative legal right to property or lease in comparison to inhabitants of villages. In addition, bigger cities generated higher chances.

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AGENT-BASED SIMULATION AS TOOL FOR TEACHING PRINCIPLES OF MICROECONOMICS

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Key words:

agent-based modeling – teaching microeconomics – price – scarcity

Abstract:

The paper proposes an agent-based computer simulation as a supplementary tool for teaching the principles of microeconomics. Such simulation can graphically illustrate how the individual behavior produces the studied aggregate outcomes, can bridge the gap between the abstract theories and the real world, and can mitigate the emotional aversion students have against some theories. The approach is demonstrated on a case of allocation of a scarce resource: the model is described, the simulator is created, and its features are analyzed. The simulator has been made available on the Internet for free.

Introduction

Teaching principles of microeconomics has always been a difficult task for at least two reasons: 1) some students have a problem to grasp some theories because of their prejudices and value judgments (it is especially true for topics from the welfare theory), and 2) students often cannot see how the highly abstract theory corresponds to the real world. As the increasing part of the population studies at the college level, the teaching becomes even more difficult because of rising diversity of students' abilities and prior education. In particular, more and more students are not helped by the language of mathematics and graphs we use to teach them but rather see them as an obstacle.

The traditional way around these problems is to use classroom experiments (see e.g. [1]). In this paper, I propose another approach: computer simulations. The simulation has many advantages: 1) it is faster, more graphic, independent from the number of participants, and can be run at home, 2) it can be repeated many times,

possibly with a changed setting, which allows the students to learn in an inductive way: the teacher asks questions, the students try to find answers from a simulation, formulate hypotheses with the help of the standard theory, and test their hypotheses by experimenting with the simulation, and 3) it can be framed with emotionally touching stories to overcome students' prejudices. The best type of educational computer simulation in microeconomics seem to be the agent-based simulation (see e.g. [5] for a good introduction into this mathematical technique) because with a proper visualization it allows the students to observe how the individual agents' respond to stimuli, how their individual behavior produces the aggregate outcomes, and what aggregate behavior correspond to what set of conditions. Moreover, it can introduce the students into the scientific use of the agent-based simulation (see e.g. [2] or [3]). In the rest of this paper, I will describe a new simulation I have created and use in teaching the principles of microeconomics course at Masaryk University.

1. Case study: price and scarcity

One topic the students find especially challenging is the relationship between a price and scarcity and the way in which prices allocate scarce resources. It is difficult on the technical level because it is not obvious from the static charts what the consumers' and producers' surpluses might be at disequilibrium prices because it is not certain which customers buy and which producers sell at such prices. On the emotional level, it is difficult for students to accept that the price should rise when the resource get scarcer, e.g. after a disaster (various anti-price gouging laws show that it is difficult for the general public and law makers too).

To address the problem, one might use a mental experiment, e.g. a question whether the parking in front of the only children's hospital in the city should be free if the number of the parking lots is small and the hospital is near the city center (as in Brno) so that there is a great demand for parking both from the parents of the sick kids and from other city center visitors. Assuming that the parents of the sick kids are willing to pay for parking more than the visitors, it is efficient (and also better for the sick kids) if the parking is paid. If it was not, the place would be occupied by the visitors, and the sick kids would not be able to park there.

However, the problem is somewhat tricky: 1) the optimal price depends on the number of the parking lots, the number of cars, the proportion of the cars with the sick kids, and the willingness to pay of the two groups of customers, 2) the cars come at a particular time, i.e. the demand randomly fluctuates, 3) the price affects not only what cars use the parking lot but also how long they stay, and 4) the market for parking is not competitive, hence it is not obvious whether the efficiency is higher if the price is monopolistic or if it is zero. For all these reasons, students might not be convinced with such a mental experiment. The simulation can provide a graphic illustration of the case.

2. Model implementation

The simulator has been implemented in NetLogo 5.0.4 [6] and exported as an applet available at http://www.econ.muni.cz/~qasar/mse/netlogo_5_0_4/parking.html. For the model's graphical interface, see Fig. 1.

The model setting is as follows: There is a circular road consisting of forty “patches”, four parking lots (the white patches), and thirty two cars wanting to park. The red cars carry sick kids, the blue ones do not. Each car's willingness to pay for a period of parking depends on three factors:

- its general willingness to pay (WTP) in cents which is randomly drawn from a uniform distribution $U(0,100)$ and is constant over the whole simulation,
- whether the car carries a sick kid: if it does, its WTP is increased by 100 cents per period, and
- how long the car is parking: its WTP decreases by 10 cents per period.

Example: If a car has the general willingness to pay equal to 53, carries a sick kid, and has been parking three periods, its willingness to pay is 123 cents per one period now.

The model is initialized in this way: 1) the road and parking lots are created, 2) the cars are created and assigned its general WTP, 3) some cars (ten in the initial setting) are assigned to carry sick kids; their WTP is increased temporarily by 100.

The simulation proceeds in “days”; each simulation day consists of forty “ticks”. In each tick, the actual WTP of the parking cars is decreased by 10, each car that wants to

leave the parking lot leaves (its actual WTP is reset), each car on the road moves one patch ahead, and each car that is staying in front of an unoccupied parking lot and wants to park (i.e. is willing to pay the price) moves into the parking lot. When a car with a sick kid leaves the parking lot, the kid in the car gets well and another kid gets sick at the same time to keep the number of the sick kids constant over time; their actual WTPs are modified accordingly. Aggregate statistics are calculated at the end of the day.

FIG. 1: Part of the model web interface



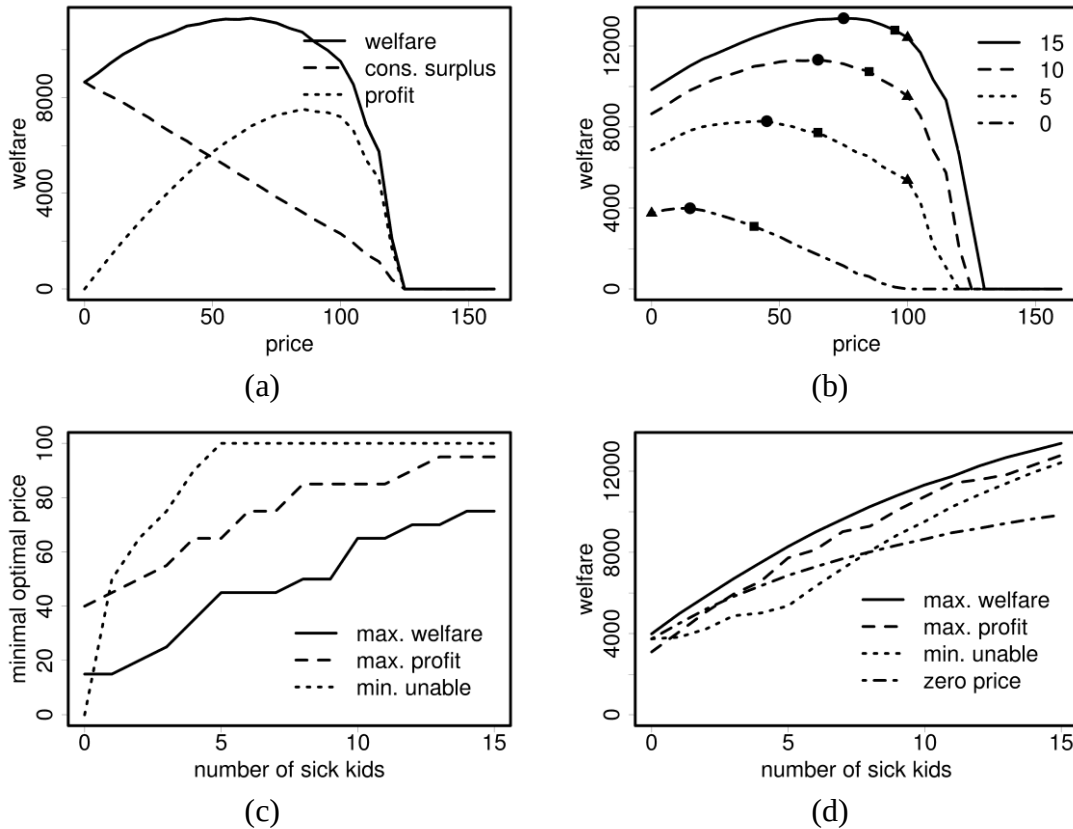
Source: Author

The user of the model can change the price for the period of parking at any time and watch what cars do and what cars do not park in the parking lot at any moment. The user can also see the parking lots owner's profit, consumers' surplus, total surplus, parking lot usage (total, by the visitors, and by the cars carrying the sick kids), and the number of cars with sick kids unable to park at the current price. (Since the daily values fluctuate a lot, the simulator shows their moving averages by default.) The user can slow the simulation down to see better the individual behavior, or speed it up to see better the aggregate statistics.

3. Features of the model

Even though the structure of the model is very simple, its aggregate behavior is interesting and heavily stochastic. Its basic features are shown in Fig. 2 which was calculated for one particular initialization of the model (random seed 1); each number is an average of 2100 “daily” values (the first 100 “daily” values were rejected).

FIG. 2: **Model features**



Source: Author

Fig. 2a shows a typical dependence of the welfare (the total surplus) on the price charged (depicted for the case with ten sick kids). When the price is small and rises, the consumers’ surplus decreases less than the profit rises, and hence the welfare rises. When the price is high, its further rise decreases the welfare and from some level even the profit decreases. Fig. 2b shows how the welfare depends on the price charged for zero, five, ten, and fifteen sick kids. The price maximizing the welfare is denoted with a dot. The welfare maximizing price rises with the number of sick kids, i.e. with the

demand for parking. The square denotes the profit-maximizing price, the triangle the price minimizing the number of sick kids unable to park in front of the hospital.

Fig. 2c shows how the price maximizing the welfare, maximizing the profit, and minimizing the number of kids unable to park depends on the number of sick kids. All the prices are always positive and are rising in the number of sick kids. Since the owner of the parking lot has some monopoly power, the profit-maximizing price is higher than the welfare-maximizing price; however, it is usually lower than the price minimizing the risk that a sick kid would not be able to park in front of the hospital. Fig. 2d shows how the welfare depends on the number of sick kids and the price charged. In every case, the welfare rises in the number of sick kids, which increases the demand. With the exception of the lowest numbers of the sick kids, the loss of welfare is lower when the owner charges the monopoly price than when the parking is free.

4. Pedagogic use of the simulator

Since we use the textbook [4] at Masaryk University, our students know all terms and theories necessary to be able to analyze the results of the simulation. It is sufficient to tell them to watch the aggregate statistics and what cars park in front of the hospital at various prices and ask them the following questions:

1. What price should you charge (a) if you care only about your own profit, (b) about the overall welfare, and (c) about the sick kids' ability to find parking?
2. The owner of the parking lot has a monopoly power. Does the profit-maximizing price coincide with the welfare maximizing price? If not, what causes a higher inefficiency: the monopoly price or the zero price?
3. Is it optimal to have such a price that each parking lot is occupied at every moment? What is the welfare cost and benefit (if any) of having a lot empty?
4. Why a price increase raises the owner's profit more than it decreases the consumers' surplus (i.e. it rises the overall surplus) when the price is low?
5. Is there any way to allocate the scarce parking lots efficiently other than charging a price? Is there any such way not involving a "parking police"?
6. How does the optimal price change when you start a new simulation with a lower or higher number of the sick kids? Can the same price be optimal at

healthy time and after a disaster? If not, when it should be higher if you care only about (a) the overall efficiency or (b) the sick kids' ability to park?

Conclusion

The course opinion polls have shown that our students consider the animated charts, simulations, and other e-learning tools provided them in the past to be highly beneficial. The more complex simulations (such as the one described above) can not only help them to understand difficult topics but also create an exploratory mindset and raise an interest in the economic theory.

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FOREIGN DIRECT INVESTMENT INFLOW AND RESOURCES LOCATED IN THE POLISH AUTOMOTIVE INDUSTRY

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Key words:

foreign direct investment – automotive industry – Poland

Abstract:

Foreign direct investment (FDI) is direct investment by a company located in another country either by buying a company in the country or by expanding operations of an existing business in the country. Foreign direct investment plays a very important role in the Polish economy. FDI contributes mainly to its technological modernization and increases in export capacity. The paper presents the changes in resources and capital inflows taking the form of foreign direct investment into the Polish automotive industry in the years 2002-2011.

The study used statistical data published by the National Bank of Poland.

Introduction

A manifestation of the international competitiveness of industry is not only the ability to sell manufactured products to foreign markets, but also being effective in attracting foreign means of production, particularly capital. The presence of foreign capital plays an important role in stimulating the economy as a whole and its individual sectors. Due to foreign investment inflows it is possible to supplement the shortage of capital resulting from insufficient internal savings, modernize technologically the economy as well as to increase export capacity. Foreign investments also contribute to the reduction of unemployment by generating demand on the labour market and economic development of less developed regions [3, 72-73]. Foreign companies may be interested in a particular market as a place of their investment, due to its size, the ability to improve the efficiency, natural resources found there, or the ability to gain access to strategic resources such as, for instance, technological potential and human capital [2, 30-64].

The automotive industry is one of the branches with the highest level of the internationalization of production processes. Inflow of foreign direct investment into the Polish automotive industry occurred especially in the nineties. The main form of FDI inflows were at that time acquisitions of privatized plants made with a view to restructuring and joint venture investments. Then not only concerns of Western Europe (e.g., Italian Fiat) but also South Korea's Daewoo located their production facilities in Poland [1, 7-19]. The purpose of this paper is to present the changes in resources and capital inflows in the form of foreign direct investment, which was located in the Polish automotive industry in the years 2002-2011. All analyses conducted were based on statistical data published by the National Bank of Poland.

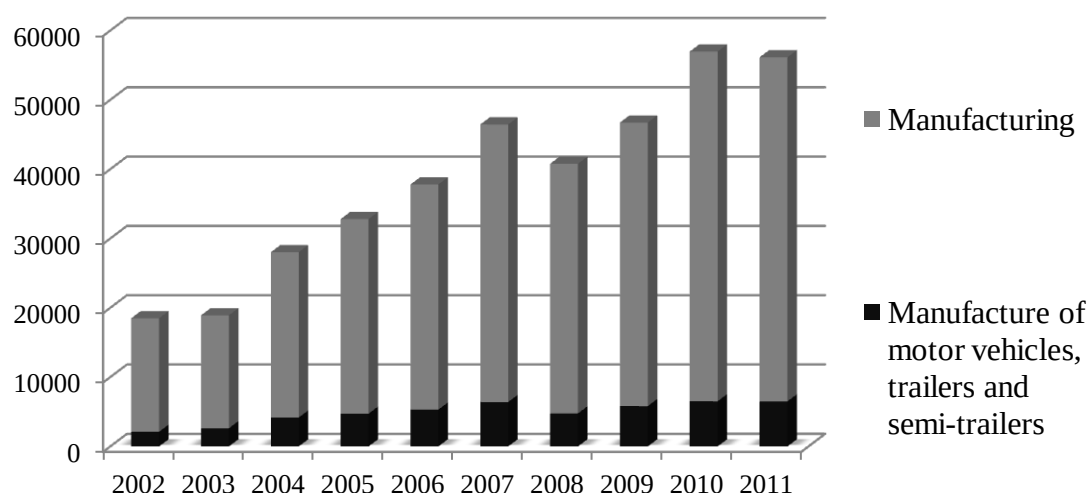
1. Capital resources in the form of foreign direct investment in the Polish automotive industry

Within the structure of foreign direct investment inflows to Poland manufacturing occupies an important position. According to the National Bank of Poland, the cumulative value of the capital in the form of foreign direct investment and located in manufacturing was in Poland at the end of 2011, 49.6 billion euros. This represented 31.6% of the value of foreign direct investment channelled into the entire economy. The following were particularly popular among foreign investors: manufacture of food, beverages and tobacco products and sectors engaged in the manufacture of chemical and electronic products. In terms of foreign direct investment, the automotive industry turned out to be an important industry. The cumulative value of foreign investment in the industry, at the end of 2011 amounted to 6.5 billion euros, which accounted for 13.1% of the capital (in the form of FDI) invested in manufacturing and 4.2% in the whole economy (see Figure 1).

Poland is a major automobile manufacturer in the region of Central and Eastern Europe, and foreign capital is present in many enterprises of the automotive industry. In Poland, the production of passenger cars and of the so-called light trucks is carried out by such companies with foreign capital as Fiat Auto Poland S.A., General Motors Manufacturing Poland Sp. z o.o. (formerly Opel Poland Sp. z o.o.), Volkswagen Poznań Sp. z o.o. and FSO S.A. Poland is also a major bus manufacturer in Europe. Foreign capital is present, for instance in such companies as MAN Bus Sp. z o.o., or Scania Production Słupsk S.A., which produce urban, intercity and tourist buses. Poland has also become a European centre for production of automotive components and spare parts for many brands of the world. Poland specializes in

manufacture of automotive engines. Their manufacturing for Toyota, Peugeot and Citroën is performed by Toyota's plants. The factories of Fiat produce small-bore engines for their own and Ford's needs. In Tychy there is situated a factory manufacturing diesel engines for Opel cars. Volkswagen, in turn, located in Poland its plant producing high-pressure diesel engines for passenger cars and vans used by Volkswagen, Audi, Seat and Škoda [5; 6, 2-3].

FIG. 1: The cumulative value of foreign direct investment in the automotive industry in Poland in the years 2002-2011 (in million euro)



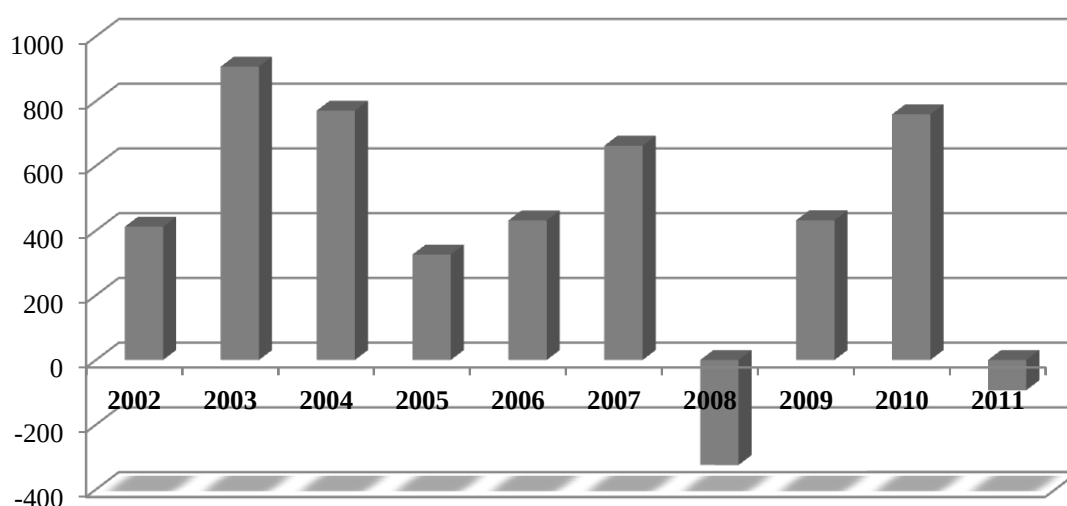
Source: [7]

2. The inflow of foreign direct investment to the automotive industry in the years 2002-2011

In the years 2002-2011 capital inflows into manufacturing in Poland due to foreign direct investment reached the level of 26.7 billion euros. Out of that capital 16.1% was located in the automotive industry. The amount of capital in the form of FDI that flowed into the automotive industry differed in specific years of the time period researched (see Figure 2). Particularly favourable results were reported in the years 2003-2004. In that period investments on the Polish automotive market were made by Volkswagen and Fiat. The next two years were also successful in terms of foreign direct investment despite the fact that their value decreased slightly. However, 2008 saw a decline in the positive trends in the inflow of foreign capital into the Polish automotive industry. There was a negative value of foreign investments amounting to -346.7 million euros. This does not mean, however, that there was no new investment at the time, although it is clear from the analysis of data published by the National Bank of Poland that they were largely reduced. The negative balance of foreign

direct investment in the automotive industry had its source primarily in the balance sheet losses incurred by foreign automotive companies operating in Poland. As a result, net reinvested profits, one of the components of capital inflows into Polish, had a negative value of -212.7 million euros (see Table 1). The scale of the problems faced by the automotive industry in 2008 is also illustrated by the decline by one-fourth in the cumulative direct investment (from the level of 6.5 billion euros in 2007 to 4.8 billion in 2008) that happened within the year. In terms of investment value, the following years were much better for the Polish automotive industry. Especially in 2010, when the influx of capital (in the form of FDI) reached the level of 759.1 million euros. However, the data for 2011 already indicate that the Polish automotive industry faced again the phenomenon of the so-called divestment¹, which this time was a consequence of the withdrawal of capital by selling stocks or shares (see Table 1). Overall, in the period 2002-2011, the value of the streams of foreign direct investment in the automotive industry to the greatest extent was influenced by reinvesting profits. During the analysed period their share in the total FDI inflow into the industry was as high as 56.7%. A large share of reinvested profits indicates the financial soundness of foreign investors and confirms foreign companies' plans as to continue to invest and expand the range of activities in Poland.

FIG. 2: The inflow of foreign direct investment into the automotive industry in Poland in the years 2002-2011 (in million euro)



Source: [7]

¹ Divestment is defined as the withdrawal of capital by selling stocks and shares, bonds redemption, repayment of loans, or negative reinvested profits [4, 197-198].

TAB. 1: The inflow of foreign direct investment into the automotive industry in Poland in the years 2002-2011 (in million euro)

Specification	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
TOTAL of which: MANUFACTURING of which:	4389.5 1401.4	3670.5 1918.3	9982.6 3668.2	7668.4 2131.7	15061.1 3568.2	16582.1 4946.9	9971.6 1442.4	9863.1 3359.5	10473.0 483.3	14831.8 3743.5
NACE Rev. 2, 29 Manufacture of motor vehicles, trailers and semi- trailers* of which:	411.8	906.4	770.3	325.9	431.3	662.2	-324.6	431.7	759.1	-93.4
	Equity Capital	806.8	175.9	88.0	86.3	53.3	-68.3	129.9	145.2	-766.0
	Reinvested profits	-47.9	-46.0	142.7	285.0	489.7	-212.7	473.2	217.0	468.5
	Other capital transactions	225.2	145.6	95.2	60.0	119.2	-43.6	-171.4	396.9	204.1

*Category covers manufacturing of motor vehicles (excl. motorbikes), bodies, trailers and semi-trailers as well as automotive parts and accessories.

Source: Author's own compilation based on: [7]

Summary

The Polish automotive industry is a major recipient of capital in the form of foreign direct investment. The cumulative value of foreign investment in this industry, estimated at the end of 2011 at the level of 6.5 billion euros, which accounted for 13.1% of the capital (in the form of FDI) invested in manufacturing. Polish companies representing the automotive industry engaged actively in the process of the internationalization of production. The fragmentation of the production process in the automotive industry has contributed to the emergence of many new factories specializing in the production of automotive parts and components. An important role in attracting foreign capital have played the advantages of Poland's economy such as the availability of skilled labour, labour costs lower than in Western European countries, or the proximity of suppliers and markets.

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INTEGRATION POLICY TOWARDS M&A IMPLEMENTATION IN KAZAKHSTAN

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Key words:

corporate management – mergers – acquisitions – antitrust policy – economic integration

Abstract:

This paper summarizes the best practices in corporate management, law and integration management based on merger and acquisition transactions. The analysis of modern integration policy of the Republic of Kazakhstan from the perspective of expanding economic ties with Europe has been carried out. A retrospective and contemporary assessment of integration processes in the most attractive sectors of Kazakhstani economy has been given. The recommendations on the formation of process-oriented concept of the company's growth based on merger and acquisition transactions have been developed.

Introduction

The analysis of Kazakhstan's practice in mergers and acquisitions shows that the most common type of M&A is "acquisition", where the target company maintains its existence, and the result of the transaction is only a change of shareholders (participants). This is due to the fact that Kazakhstan's experience in market relations, including the transactions of mergers and acquisitions, has launched since the independence in 1991. Currently, when making corporate transactions in Kazakhstan, managers often draw on the experience from Russia and countries of the European Union, including its positive features and negative consequences.

The retrospective evaluation of stages of development of M & A market is shown in Table 1. The basis of the typology is the annual periodicity with singling out the sectors - leaders in the number of transactions.

TAB. 1: Periods of Formation of Kazakhstan's Market of Mergers and Acquisitions

Period	Sectors – leaders of M&A market	Characteristics of a period
1990-1996	Sectors of economy in general	Privatization with giving the document proving the right of ownership.
1996-1998	Mining and smelting complex, machine-building, oil and gas, petrochemistry	Gaining the control over the enterprises of state sector through the realization of collateral bonds on state loans.
1999-2003	Mining and smelting complex, machine-building, oil and gas, petrochemistry, estate property	Redistribution of property after crisis to increase the effectiveness of companies. The rise in role of administrative resource and companies of high capitalization.
2004 - 2007	Mining and smelting complex, machine-building, oil and gas, petrochemistry, estate property, power industry, telecommunication, financial sector	Aggressive policy of companies' growth to diversify the manufacture and to penetrate into new markets.
2008 - 2010	Mining and smelting complex, machine-building, oil and gas, petrochemistry, estate property, power industry, telecommunication, pharmaceuticals, financial sector	Strengthening the activity of the state at the market of mergers and acquisitions as a forced measure to overcome the consequences of the world financial crisis.
since 2011	Mining and smelting complex, machine-building, oil and gas, petrochemistry, estate property, power industry, telecommunication, pharmaceuticals, financial sector	Horizontal and vertical mergers and acquisitions, withdrawal of the state from the controlling interest, subsidiary companies of Sovereign Wealth Fund Samruk – Kazyna JSC. Entrance of national companies to the domestic stock market within the program "People's IPO".

Source: own compilation

The analysis of trends in the formation of M & A market in Kazakhstan showed that its formation was determined largely by external factors. The significant ones include the impact of two financial crises in 1998 and 2007. During these periods the role of large corporations and government increased. Most leaders, who appeared in the period of M

& A market activity, which occurred in 2004-2007, still use mergers and acquisitions transactions as a tool for corporate growth.

1. Characteristics of modern integration policy of the Republic of Kazakhstan from the standpoint of expanding economic ties

The world community has large, medium-sized and small firms that are usually seen as social and economic systems forming systems of a more complex level, such as industries, regions, states and other social formations.

The main problems, business entities in Kazakhstan face, can be described as follows:

- an innovation breakthrough and the commercialization of knowledge;
- organization of relations with the research and consulting centers;
- modernization of production;
- introduction of a process approach of management of the resource base, production and sale of products (labor, services);
- combination of several business entities for the purpose of constructing a single technological chain for products and services with high added value.

It can be stated that the integration processes at the macro level entail the need for a mechanism of integration at the level of organizations of both representatives of the real economy and educational institutions (*see Figure 1*).

A progressive example of integration at the macro level is the Shanghai Cooperation Organization (SCO), which originated in 1996 and includes Kazakhstan, Russia, China, Kyrgyzstan, Tajikistan and Uzbekistan. According to the President of Kazakhstan Nursultan Nazarbayev (2011) the share of the SCO member states is at least 25 percent of world oil reserves, 30 percent of world gas reserves and 50 percent of explored reserves of uranium [10]. The priority of the SCO is economic cooperation. The specific features of the economies of the SCO countries are the development of real industrial production, construction of market infrastructure and job creation. The positive effect for domestic businesses from Kazakhstan's participation in the SCO is specified by the possibility of a business combination with China's growing companies.

Describing the economic integration within the framework of the Eurasian partnership, it is useful to note the influence of global trends in the vertical and horizontal companies' growth. The rich information base required for potential partners for joint

FIGURE 1: Content of Contemporary Integration Policy of the Republic of Kazakhstan

Integration policy at the macroeconomic level with states-members of the European Union, the Shanghai Cooperation Organization within common economic space, the Eurasian Economic Community
Target points: • sustained development and innovation breakthrough; • implementation of joint projects in gas sphere, metallurgy, oil production and processing; in the sphere of space technologies, nanotechnology, microbiology; machine-building and agriculture; • ensuring the equal access to the unified energy and transport systems.
Mechanisms of economic integration: • cooperation, formation of joint companies, transnational corporations; • purchase of solid assets and holding of shares of the enterprises – partners (mergers and acquisitions transactions), outsourcing on mutually profitable agreements; • formation of joint working groups, selection of specialists in the sphere of assessment, development of schemes of purchase of holding of shares and consolidation of capitals through the management companies; • introduction of business – processes in the spheres of advanced technologies.
Innovation prerequisites of integration processes: integration of educational and scientific space through the Eurasian associations of universities, Eurasian club of scholars, International center of high technologies, consulting centers; entering the international market of innovation projects in the sphere of renewable sources of energy, research of problems of climate changes.

Source: compiled by authors.

management of business appears in the “World Investment Reports” of UNCTAD (United Nations Conference on Trade and Development), reports of the International Finance Corporation and World Bank “Doing business in a more transparent world”.

According to the annually changing method of calculation Kazakhstan in 2012 improved its position in the ranking “Doing Business 2013: Smarter Regulations for Small and Medium-Size Enterprises” by 7 points (in 2011 according to the method of calculation of 2013 Kazakhstan ranked the 56th place) and took the 49th place. Kazakhstan entered the list of countries demonstrated significant improvements in facilitating business for the last year [8]:

-the rating “Registration of companies”: Kazakhstan rose for 30 positions (from 55 place to 25 place), the simplified procedures of the foundation of enterprises and removal of a claim for payment of minimum capital for three months after registration contributed it;

- the rating “Resolution of insolvency” (55th place): the reforms on introducing the accelerated rehabilitation proceedings, prolonging rehabilitation period, extension of powers and increase of qualification requirements for the trustee of bankruptcy were

conducted; the requirements to provide information on bankruptcy, creditors' rights expansion, changes in the position of continuing operations, the introduction of the period for the adoption of the rehabilitation plan, and addition to the requirements of judicial supervision changed;

- the rating “Getting Credit” (from 97 place to 83 place): the rights of secured creditors through the introduction of new grounds for relief from automatic stay in rehabilitation procedures were strengthened.

Growth of rating position allows judging the improvement of investment climate, mitigation of taxation burden for manufacturers. So, on March 1, 2011, the Law of the Republic of Kazakhstan “On making amendments and additions to some legislative acts of the Republic of Kazakhstan on issues of state property” (2011) came into effect that made changes and additions to some legislative acts of the Republic of Kazakhstan on issues of mortgage lending and protection of rights of consumers of financial services and investors [3]. Such conditions are beneficial to attracting foreign direct investment and integration processes in general.

2. Characteristics of the integration processes in the most attractive sectors of Kazakhstan economy

Economic concentration may serve as an indicator of M & A market. The analysis of the current situation of competition development in Kazakhstan shows that some sectors of economy are over concentrated. In particular, such sectors as railway, communication, air transportation, oil and gas, fuel and energy, pharmaceuticals, as well as the spheres with state participation. The “Program on the Development of Competition in the Republic of Kazakhstan for 2010-2014” (2010) reports about the presence of threats from the monopolies’ side in the country's economy, even if the companies operating in these markets now are competitive.

The growth of the size of a functioning enterprise is equated to the strong side of business, economies of scale, market leadership. The borders of growth are regulated by law. According to the analytical data of the Agency of the Republic of Kazakhstan on Competition Protection (Antimonopoly Agency) it is possible to trace the dynamics of numbers of mergers and acquisitions among the market entities for the period of 2007-2011, *Table 2*:

TAB. 2: Information about the state of economic concentration (according to the Antimonopoly Agency of the RK)

Indicator of economic competition	2007	2008	2009	2010	2011
Number of petitions about granting the consent to economic concentration	360	387	308	313	286
Number of granted permissions	210	224	134	150	120
Number of entities which are in the public register of market entities taking a dominating or monopolistic position (on the state of affairs for the beginning of the period)	754	969	945	612	600

Note: compiled by authors to the source Statistics and reports “On the petitions for the economic concentration” of the agency of the Republic of Kazakhstan on the competition protection (2012).

As compared with 2007 in 2008, the number of permissions for economic concentration has increased by 7%. According to data for 2009 the Antimonopoly Agency (2012) received 308 petitions for consent to economic concentration. Among them, in 110 cases transactions were made in industry, agriculture and other sectors, 106 - in the sphere of fuel and energy complex, 64 - in transport and communications and 28 - at the financial markets. Out of 308 petitions, 134 petitions were agreed, 140 petitions were not taken into consideration. In connection with the transactions within the same group of persons consent was not required for 21 petitions. The data presented show that, despite the expansion of customs borders, the total number of application for merger in 2011 is lower as compared with 2010. On the basis of official data one can state that the number of mergers over the past three years is below pre-crisis indicators, but there is a tendency to increase. Moreover, transactions concluded with foreign firms are supported which increases the international status of the state before the potential investors.

The confirmation of this serves the example of the transaction at the end of 2010, made in the banking sector according to the resolution of the Board of the Antimonopoly Agency of November 28, 2010 № 295-OD “ On granting the consent to economic concentration of the company” Punjab National Bank” (PNB), New Delhi, India. According to the Kazakhstan Stock Exchange KASE (2011) that is now JSC “DanaBank” renamed to JSC “Subsidiary bank “Punjab National Bank “JSC” SB

“PNB” – Kazakhstan” is a subsidiary of Punjab National Bank. The Indian Bank acquired 3500000 common voting shares of JSC “Danabank” which is 63.64% of all issued shares. According to analysts of “BATT” Investment Company (2010) (the owner of approximately 10% of shares of JSC “Danabank”), for several years, the bank plans to take place among the top ten banks in Kazakhstan, and with further expansion in the CIS Kazakhstan bank will be the basic structure¹.

In 2011 permission for the merger by acquiring shares in the authorized capital and acquiring assets, the following market participants received: “Mineral Resourcez BVBA”, “Soldesa Indonesia BV”, “Pepsi-Cola (Bermuda) Limited”, “Laybridge limited”, “Gemini Oil & Gas Investments BV”, “Medeu Holdings BV”, LLC “Eurasia leasing”, LLC “SBS Trade”, LLC “Technocentre Ltd”, LLC “KazPetroDrilling”, LLC Tivit Energy Kazakhstan”, LLC “Allur Tech”, LLC “CNPC International”, LLC “SDB Group”, “Cisco Systems”. The sectoral belonging of these firms is different, but all participants have a chance to enter new stage of development, entering the capital of other market entities, or acquiring new types of assets. From this list you can single out one company that has chosen a strategy of integration and business diversification through mergers and acquisitions as a basic way of development.

According to reports “The People's IPO” (2012), Beginning since 2012 Kazakhstan launched the program “The People's IPO” in accordance with the draft of Government of RK. The Commission has carried out the selection of companies whose shares will be placed at the Kazakhstan Stock Exchange KASE step-by-step in over several years. The companies of the first echelon will enter the market first: JSC “KazTransOil” (oil transportation, export and import of petroleum and petroleum products); JSC Kazakhstan Electricity Grid Operating Company “KEGOC” (electrical power engineering).

The second echelon of companies approximately includes: JSC “KazTransGas” (gas transportation systems and main pipelines); JSC NMSC Kazmortransflot (sea freight); JSC Samruk-Energo - Holding on Management of power assets in Kazakhstan (heat power engineering and electrical power engineering).

¹ “BATT” Investment Company (2010): Working Paper “*Investments DanaBank*”. 2010. Available at: <http://www.batt.kz/en/investments/bank>.

The third echelon: JSC “NC” Kazakhstan temir zholy” (passenger, transit, cargo transportation); JSC “Kaztemirtrans” (freight rail); National Company KazMunayGas JSC (exploration, production, processing and transportation of oil and gas); NAC Kazatomprom JSC (import-export of uranium, rare metals, nuclear fuel for nuclear power plants, special purpose equipment, technologies and dual-use materials).

Considering Kazakhstan's M & A market across sectors, analysts note that the most universal is still oil and gas sector. The other sectors of the economy, which large M & A transactions were concluded from 2009 to 2012 became the banking, mining and metallurgical industries.

As an example of a corporate strategy realization based on business scale growth in the mining industry, we will consider the corporate strategy of major Kazakhstan’s corporation Eurasian Natural Resources Corporation PLC (hereinafter ENRC). The basic acquisitions of ENRC Group are described in *Table 3*. Objects of transactions, investment items, are characterized from the position of investment attractiveness.

TAB. 3: Characteristic Features of the Investment Management Strategy of the Group ENRC

The ENRC Group's mission	
achieve growth as a leading natural resources group and to enhance overall value for its shareholders	
Strategy of Investment Management	
entry into the world economy by expanding the boundaries of business	
Stages of Implementation Strategy: forecasting the responses of market and competitors' actions - creating conditions for the company’s growth of - assessing and forecasting of cash flows - determining the cost of capital - carrying balanced assessment of the acquired business - a comparative analysis of the data	
Responsible executives : Chairman, members of the Investment Committee of the Board of Directors of ENRC, consultants - Heads of the Group	
Company - aim	The motive of M & A transactions
99,44% JSC “Serov Ferroalloy Plant”;	Access to the chrome ore, processing and sale of ferroalloys (medium - and low carbon ferrochrome).
98,8% JSC Saranovskaya mine “Rudnaya”	
50% Xinjiang Tuoli Taihang Ferro-	Entering the Chinese market of high carbon

Alloy Co. LTD (China)	ferrochrome production.
ENRC PMP LLP, which owns 100% of shares of JSC “Pavlodar Machine-building Plant”	Savings on payment of outsourced services, meeting the large domestic needs of the Group in overhead cranes.
25% of JSC “Shubarkol Komir”	Strengthening of an integrated business - model through getting a reliable and cost effective supply of coal char and relatively high quality thermal coal.
75% of JSC “Shubarkol Komir”	
95% Central African Mining and Exploration Company (Africa)	Access to the growing market with the presence of transport operations, projects of the asset portfolio development in coal, bauxite, fluorspar, and platinum in the DROC.
90% Chambishi Metals PLC (Zambia, Africa);	Integration of mining and smelting enterprises for extraction and processing of copper and cobalt in Zambia and the DROC.
100% Comit Resources FZE (Dubai, UAE)	
50,5% of shares of company Camrose Resources Limited	Acquisition strategy, which is based on raw material assets of copper and cobalt, potential opportunities for synergies.
100% Mineracao Minas Bahia SA (“MIBA”)	Expansion of the Iron Ore Division which is able to increase the value of the Group as well as the growing commitment to work in Brazil.
51% Mineracao Peixe Bravo SA (“MPB”)	

Note: compiled by authors from source²

The strategy of ENRC is based on its mission “achieving the growth as a leading group in the sphere of extraction and processing of natural resources and improving the overall value for its shareholders. ENRC operates in Kazakhstan, China, Russia, Brazil and Africa (the Democratic Republic of Congo, Zambia, Mozambique and South Africa). The successful implementation of this strategy is directly linked to the Investment Committee of the Board of Directors of the Group. Of course, the decision-making process to expand the boundaries of business leaders considers the professional opinion of the functional departments, independent experts. Therefore, the implementation of mergers and acquisitions (hereafter M & A) is a complex process that requires strict

² Official site of ENRC / <http://www.enrc.com/about-us/our-strategy>

regulation and analysis. An important component of the growth strategy is the risk - management program.

ENRC has made a number of acquisitions. Geographically, these are the companies in Brazil and Africa. The enterprises are divisions of other non-ferrous metals. The division produces and refines copper and cobalt ore, and also includes a road transport business operating in Central and Southern Africa and a number of projects for the development of coal, bauxite, platinum, fluorspar across Africa. CAMEC's acquisition in November, 2009 was the beginning of the Group's diversification in Africa. In April, 2010, a 90% share of Chambishi Metals PLC was acquired. In June, 2010, 12.2% share of Northman Platinum, one of the largest producers of platinum in South Africa was purchased. Subsequently the share was increased and now it makes up 14.35%. In August, 2010, 50.5% share of Camrose Resources Limited, the world's largest independent producer of cobalt concentrate, which produces about 10% of world demand, was acquired.

The newly entered into the corporation businesses require funding of projects on modernization of production. It is possible that some sources will not be available to use in connection with reduction in assessments of credit rating agencies. To improve the financial positions the following functions of the Treasury, the Audit Committee and the Investment Committee under the Board of Directors have been stepped up, namely:

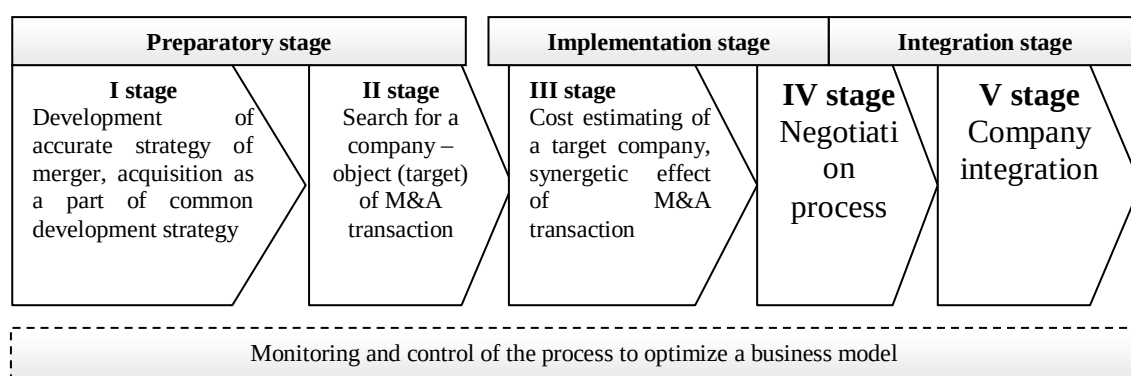
- monitoring and reporting are improved;
- relationships with providers of finance and credit rating agencies are established and maintained;
- the cash flow projections are regularly prepared and submitted to the Board of Directors;
- the annual budget with the inner process of quarterly reports is drawn up;
- the financial plan for a period of five years, which is designed to orient the ENR finance system development has been developed;
- the control over the financing of operating and investing has been strengthened.

These measures should reduce the probability of failure to perform its payment obligations, limited opportunities for the Group to obtain financing. In addition, there will be sources of funding available to complete the project and make further acquisitions.

3. Conclusions - Recommendations for the development of process-oriented concept of the company's growth based on mergers and acquisitions

The concept is based on a process approach to managing the integration of companies in M & A. The concept is informational - analytical framework consisting of the description of the M & A transactions of domestic companies over the past three years. Using the concept will allow firms to create a real process model strategy of growth through mergers and acquisitions. The process of implementation of the company's growth strategy through M & A is expedient to split into five main stages inherent in the various stages of mergers and acquisitions, *Figure 2*.

FIGURE 2: **Process of implementation of Strategy of Company Growth through M&A**



Note: complied by authors

The preparatory stage of M & A

At the initial stage it is necessary to identify the quantitative and qualitative parameters of growth, the time horizon, which will match the plans for business expansion and development of the company in whole.

The condition of Kazakhstan business environment is reflected in the reports of Interfax-Kazakhstan News Agency, information-analytical service of centre Business Resource Central Asia (BRCA), “BCC Invest” JSC, “Halyk Finance” JSC, Financial portal PROFINANCE, “Aibn Asset Management” JSC, “Asia Capital” JSC, “Greenwich Capital Management” JSC, Group of companies Resmi, “Sayat Zholshy & Partners” a law firm, “GRATA” law firm and others.

The stage of M&A implementation

The most significant and responsible stage is connected with estimating the cost of a target company, defining synergetic effect of transaction of M&A. Approaches to business estimation are multidirectional since many-sided nature of the transaction “purchases – sales” must be taken into account. According to group of experts in the field of an estimation of investment appeal led by Novikov AB (2009), to increase the probability of a reliable estimate, experts - appraisers traditionally use the set of three directions [10]: the profitable approach (capitalization-of-earnings method and discounting method); the market approach (method of public company - analogue and method of transactions M&A); the approach on assets (adjusted book value method and liquidation value method).

Experience shows that exactly at an evaluation stage there may be miscalculations which can turn out to be serious problems and even a negative outcome of the whole operation on merger of firms. The reasons of such errors lie in the following: poor quality of the information received at the previous stages of “due diligence”, unduly overestimated evaluation of the synergetic effect; change of the external factors little depending on participants of transaction M&A; in particular, consequences of financial crisis when strategy of the companies’ growth by means of mergers and acquisitions have undergone serious adjustments.

The analysis of materials on the perfect and successfully conducted transactions shows, that synergies can be reached in such functional areas as personnel, marketing, engineering business - processes, optimization of resource provision, qualitative and quantitative parameters of production (services) produced by newly established or expanded in the course of M&A firm.

Review of M&A of public Kazakhstan corporations, such as Eurasian Natural Resources Corporation PLC (ENRC), KAZAKHMYS, allows drawing a conclusion on necessity of using the following criteria when estimating the expediency of the future transaction: growth of a correlation of market capitalization of the estimated company (“P”) and proceeds from sales of production, services (symbolic representation “N”); indicator growth of earnings per share “EPS”, or net income per share, as correlation of the total net profit of the united companies and total quantity of shares of the united companies.

Integration stage

At this stage social aspects and human values since merger of the companies demands an individual approach to workers of the firms which are subject to merger or acquisition are important. The success of integration will be defined by continuity of corporate traditions, observance of the rights and duties of the people occupied in given firms.

In the conclusion, we can emphasize that the process approach to organization of mergers and acquisitions allows minimizing all types of risks that accompany M&A transactions.

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INTEGRATION PROCESSES IN THE CONDITIONS OF EXPANDING ECONOMY OF KAZAKHSTAN

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Introduction

Globalization of world economy is related to integration processes, which are manifested in the formation of economic alliances between states, strengthening the role of transnational corporations, the growth of investment activity of public and private companies through transactions with and without partners' capital.

The global crisis has strengthened measures to consolidate the joint actions of the Republic of Kazakhstan with the European Union, the Eurasian Economic Community, Shanghai Cooperation Organization and the Commonwealth of Independent States. The ultimate goal of integration processes is the creation of a competitive industrial and technological base of innovative type.

Due to the modernization of production and export of raw materials over the past three years, Kazakhstan's economy has provided a high rate of economic growth. According

to the Information of Joint Stock Company Regional Financial Center of Almaty (JSC RFCA, 2011), the international agency Standard & Poor's estimated the position of the Republic of Kazakhstan as follows: long-term foreign currency sovereign rating of Kazakhstan upped from “BBB” to “BBB +”, the outlook – “stable”. Short-term sovereign credit rating of the country rose from “A-3” to “A-2.” National scale rating – “KzAAA”- the agency confirmed. Long-and short-term local currency rating were affirmed at the level of “BBB +” and “A-2”, respectively¹. It is emphasized that the external financial position and budget of Kazakhstan improved significantly as a result of budget surpluses, sustained economic growth, prudent fiscal policy and foreign investment inflows. The agency also took into account that increased oil production almost doubled over the next decade, and the fact that the net inflow of direct investment is on average 4% of GDP, and GDP growth in 2011-2014 will make up average 6%.

This information is confirmed by the static data of the Agency of the Republic of Kazakhstan on Statistics (2012), Table 1.

TAB. 1: Main Macroeconomic Indicators of Republic of Kazakhstan (as % of the previous year)

Indicator	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Gross											
domestic	113,5	109,8	109,3	109,6	109,7	110,7	108,9	103,3	101,2	107,3	107,5
product											
Industrial											
production	114	110	109	110	105	107	105	102	103	110	103,5
Capital											
investments	145	111	117	123	134	111	114	105	103	97	102,4

Source: Agency of the Republic of Kazakhstan on statistics.

Kazakhstan's economy is referred to a type of economy of developing countries, and the dynamics to the openness and security for private investment is clearly observed. This is supported by the international community. In 2012 at the 152nd session of the General

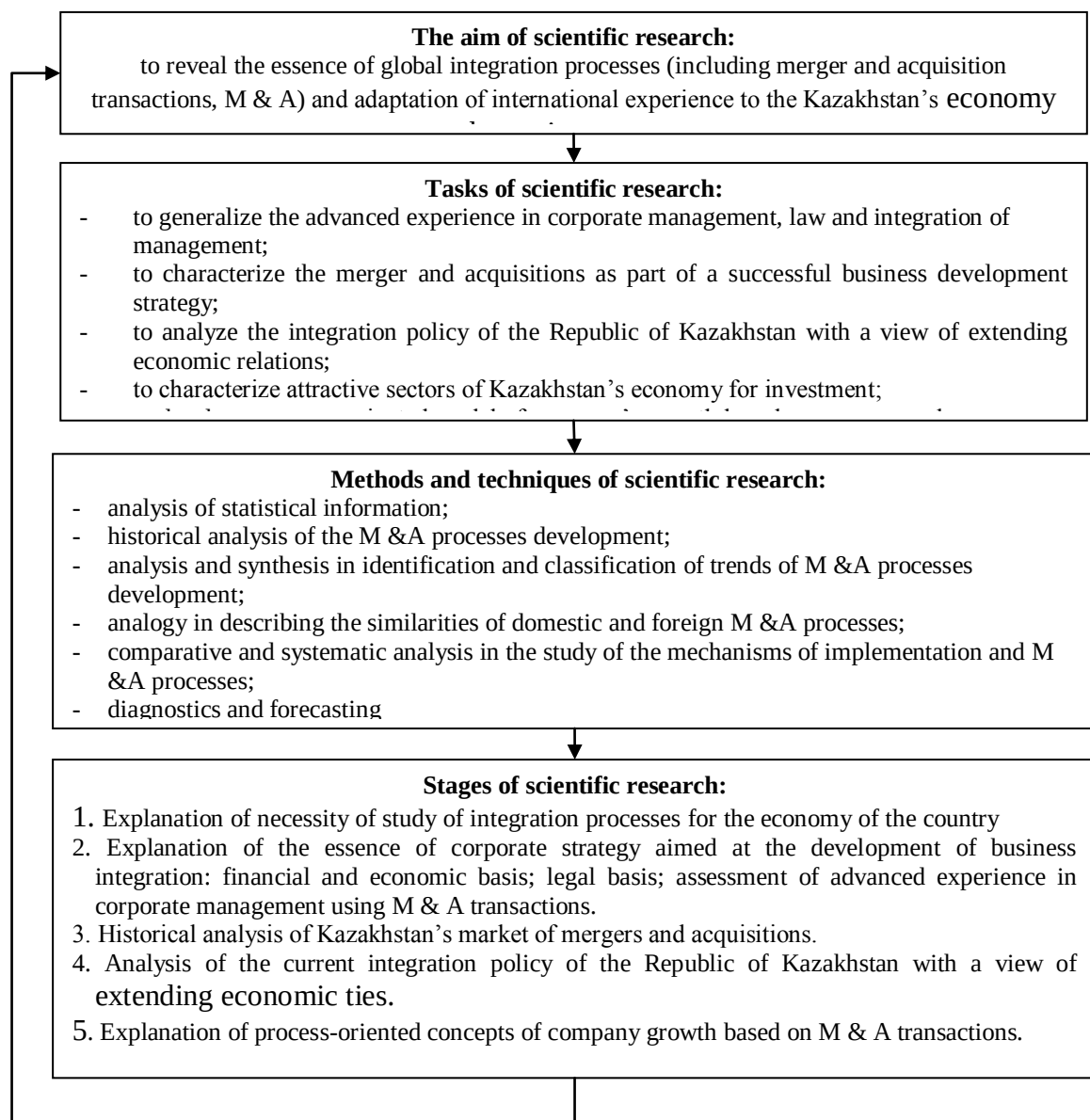
¹ Database of Joint Stock Company Regional Financial Center of Almaty (JSC RFCA, 2011): “*Standard & Poor's raises Kazakhstan's sovereign rating 08/11/2011*”. Available at: <http://www.rfca.kz/en/news/1001741>.

Assembly of the International Exhibitions Bureau the Republic of Kazakhstan won the right to host EXPO-2017. Despite the efforts there is an acute problem to overcome the negative trends, such as:

- weak economic diversification with the predominance of extractive industries;
- lack of high-tech equipment and manufacturing facilities with high added value;
- lack of transparency and predictability of business - environment;
- lack of foreign direct investment.

To overcome the structural deformation and enhance the innovative activity is possible

FIGURE 1: Structural and Logical Scheme of Scientific Research



Source: compiled by authors

using special financial - economic instruments, including the integration at the level of companies with mergers and acquisitions (merger and acquisition transactions, M & A), as well as forms of international cooperation without direct equity (Non-Equity Modes of International Production). Therefore, the aim of this study is to reveal the essence of global integration processes (including merger and acquisition transactions, M & A) and adaptation of international experience to the Kazakhstan's economy to enhance its transparency. The tasks which the study is based on, as well as methods of scientific research can be described as follows (Figure 1).

1. Essence of corporate strategy aimed at the development of business integration

An important role in the development and implementation of an effective business strategy by integrating is carried out by the scientific and research works of famous scientists and consulting firms.

Research in the field of mergers and acquisitions take into account the signs by which one can give an accurate assessment of what happened and is happening in the business - environment. The research methodology is a set of techniques and methods of scientific knowledge applicable to the study of integration processes (Table 2).

Scientific developments touch both historical analysis and forecasts of companies' development. So Richard Brealey, Stewart Myers [1] in their work "Principles of corporate finance" reveals the essence of mergers and acquisitions as an economic category. Along with this work, a professional interest is attracted by the statistics of M & A market of the United States of America, tracked over the 90-s. A special place in this study is given to the observation of trends and methods of cost estimating, the payment, sellers and buyers' motivation. Frank C. Evans, David M. Bishop [4] interpret the term "strategic synergism", appreciate objective and subjective factors of forecast of merger or acquisition synergy.

The scientists of the Commonwealth of Independent States are studying the European, American experience and adapt it to their own economic, legal conditions. The researcher Ignatishin, J. V. [9] gave a description of the sources, forms and methods of financing of M & A transactions in Russia. Gomcjan, S. V. (2010) in his monograph

presented findings based on a comparative legal analysis of the acquisition of joint stock companies in Russia and the European Union.

TAB. 2: Methods of Study of Mergers and Acquisitions processes (M&A)

Name of research methods	Methods description
Historical analysis of development M & A processes	Study of M & A processes business integration in chronological order.
Methods of analysis and synthesis in the identification and classification of trends in M & A process development	Review of M & A process from different angles (historical stages, territorial boundaries, transboundary or domestic nature of a transaction and other features).
Economic methods of M & A study: comparison; grouping; graphic.	Comparing and grouping of economic performance of enterprises (according to quantitative and qualitative criteria) before and after integration into a specific group of companies; Graphic representation of results of analysis.
Methods of statistical analysis	The use of average and relative values of the index method to develop a methodology for the analysis of investment attractiveness and protect companies from hostile takeover.
Methods of diagnosis and prediction	The use of extrapolation methods and expert assessments, economic analysis to develop a methodology for the analysis of investment attractiveness and protection of companies from hostile takeovers.
The method of analogy in describing the similarities of domestic and foreign M & A processes	Identification of general properties of M & A processes of domestic companies with foreign M & A processes.

Source: compiled by authors

For the scientists, concerned with the assessment of sustainable development and investment attraction, the works of Novikov, A. V. [10], Endovitsky, D. A., Soboleva, V. E. (2010), Gvardin, S. V. (2006), Kurbangaleeva, O. A. (2004) are of great interest. These scholars have focused on the study of the investment characteristics of the M & A processes.

Defining the essence of business integration processes through mergers and acquisitions can be summarized as Table 3. In our opinion, in defining the nature of mergers and

TAB. 3: Classification of Approaches to the Revealing the Essence of Integration Processes through M&A Transactions

Essence and mechanisms of M&A		Purpose of M&A	Source
merger	acquisition		
Business Combination (Assets and Liabilities) (p.898)		Increasing the value of a merged company (p.898)	Brigham Ju., Gapenski L. (1999)
Mergers and acquisitions - response to the changing market situation. The transformations that can radically change the organizational structure or the external business environment of the company (p.55). Merger - a kind of purchase (p.924).		M & A as part of a global development strategy is considered in management of change (p.55). Acquisition provides companies with a shortcut to achieve strategic objectives (p. 923).	Timoti Dzh. Galpin, Mark Hendon (2005) Damodaran A (2006)
Combination of two companies in which one of them survives, and the other ceases to exist (p. 21).	The term “takeover” is more uncertain, may refer to “friendly and hostile takeovers” (p.22)	M & A serve companies growth	Gokhan Patric A (2004)
Merger of organizational forms - the process of reorganization, which results in formation of a new company on the basis of merging companies (p.31).	Acquisition is the process of acquiring the rights of corporate control unilaterally and within the existing organizational - legal forms (p.29).	M & A is the goal of integration management.	Ignatishin JV (2005)
Merger – combination on certain terms of assets and management functions of several companies under one corporate merger or under its auspices (p.11).	Acquisition is equated to merger. Types: “Friendly takeovers”, “Hostile takeover” (p.12).	Mergers and acquisitions - economic categories. Mechanisms for implementation: - purchase of votes; - direct purchase of shares; - reorganization in the form of merger or affiliation; - assets acquisition (p. 14).	Gomcjan SV (2010)

Source: compiled by authors

acquisitions as a form of business integration it is important to focus on the economic and legal bases of these processes.

The definition of the M & A process within the legal legislation is in the Law of the Republic of Kazakhstan “On joint stock companies” (2003)². The merger of companies is recognized as the emergence of a new company through the transfer of the entire property, rights and obligations under the merger agreement and in accordance with the transfer acts of two or more companies to cease their activity. At the same time the charter capital of a company formed by the merger of companies, is the sum of the equity of the reorganized companies.

According to international practice regulated by the International Financial Reporting Standard (IFRS) 3 (2008) “Business Combination”, a business combination is defined as a transaction or event in the result of which an acquirer obtains control over one or more types of businesses³. Business is defined as an interrelated set of activities and assets managed in order to provide investors or other owners with income. As the basic mechanisms of business combination reflected in the standards there are four types presented in Figure 2.

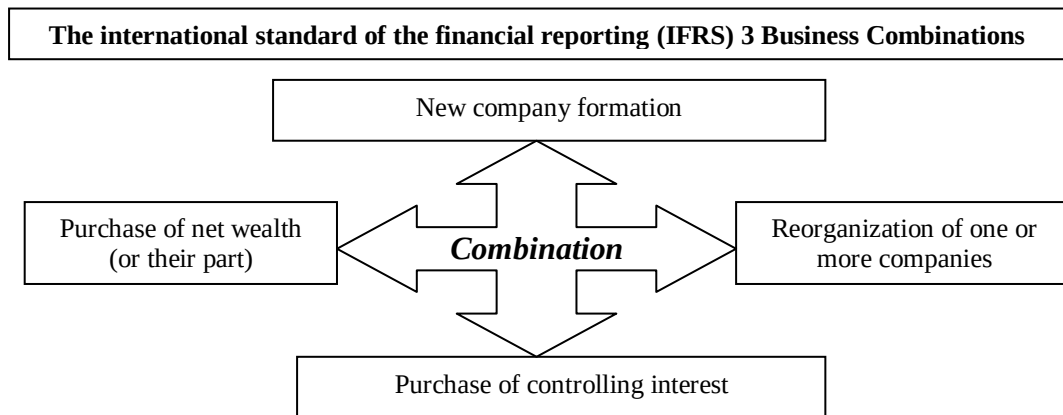
It historically developed that any corporation that wishes to increase its value through integration, bases on growth strategy, including M & A transactions (Figure 3). The aim to increase the value is the starting point for choosing strategic alternatives, as M & A transactions have meaning only if they provide the value growth of the company [6].

Recent economic studies show that now multinational companies make extensive use of models of development based on contracting industrial and agricultural manufacturing, transfer of services to outsourcing (outsourcing), franchise and licensing.

² Law of the Republic of Kazakhstan of 13 May 2003 N 415 On joint-stock company (2003)// *Register of Parliament of the Republic of Kazakhstan, 2003., N 10, article 55; Newspaper “Kazakhstan’s truth” of 16 May 2003 N 141-142*. Available at: <http://www.ordacapital.kz/files/laws/ao2007.pdf>.

³ The international standard of the financial reporting (IFRS) 3 Business Combinations (2008). Available at: http://static.bdo.uk.com/imported/2010/3/IFRS_3_Business_Combinations.pdf.

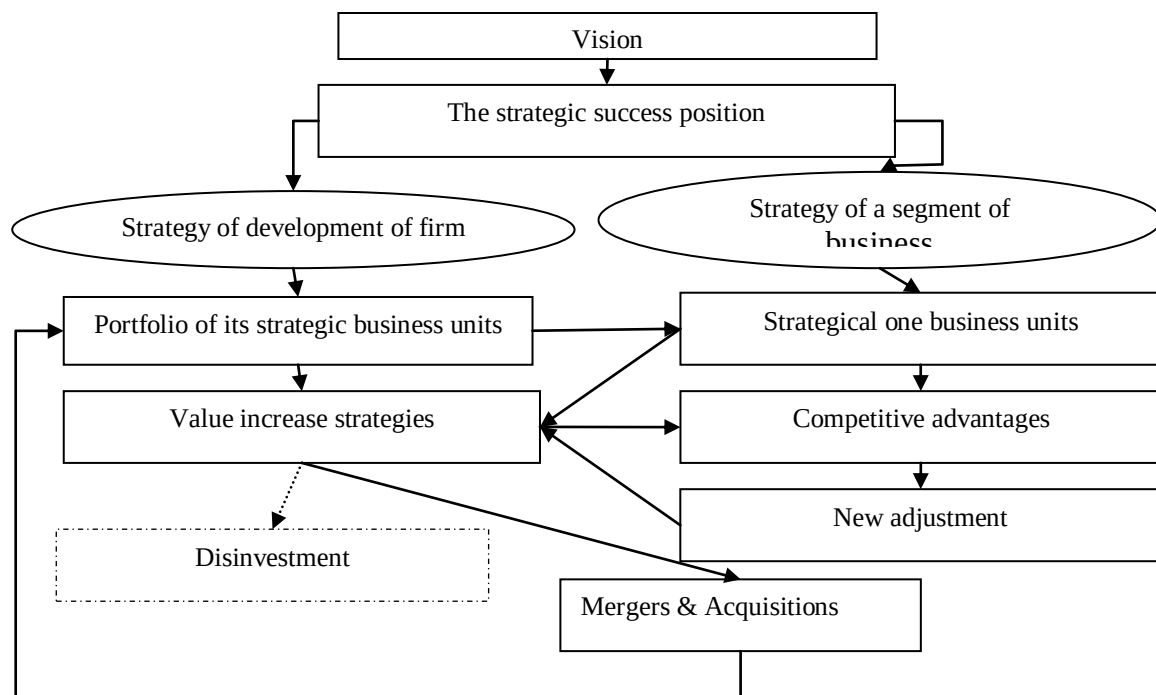
FIGURE 2: Business Combination Mechanisms According to (IFRS) 3 Business Combinations



Source: compiled by authors

However, the integration processes at the level of companies also involve direct participation in the capital of companies - partners, i.e. M & A transactions. Such transactions can be carried out both among small firms, and at the level of transnational corporations.

FIGURE 3: M&A Transactions and Strategic Management



Source: compiled by authors

Despite the fact that the growth of companies through M & A is more expensive than licensing, franchising, outsourcing, it is able to improve the economic, social responsibility of the newly formed company or the company - buyer to the employees of the acquired company. In the case of integration of companies without equity participation there is a high risk of refusal of the service company, under contractor's agreement with the main corporation, or the probability of termination of the contract before the expiration if there is a company - analogue.

2. The legal bases of integration processes regulation

Turning to the Kazakhstan's experience of regulation of operations on the integration of companies one can focus on important issues that relate to economic concentration and the participation of foreign companies. In 2009 the Republic of Kazakhstan introduced a new law "On Competition" (2008)⁴. The law "On Competition" was prepared in the period of the beginning of the economic recession, at the time of the burst of mergers and acquisitions. The processes of economic concentration led to fundamental changes in the fuel and energy complex, chemical industry, telecommunications and banking environment of the Republic of Kazakhstan.

The law of economic concentration, subject to preliminary agreement with the antitrust authority, admits:

- merger or acquisition of market entities;
- acquiring by a person 25% or more percent of shares of market entity;
- getting basic fixed production assets and (or) intangible assets of another entity of the market into the ownership;
- the acquisition by the market entity the rights enabling to determine the business activity in another market entity;
- participation of the same individuals in the administrative organs of two or more market entities provided the determination of business activity.

In connection with the expansion of the international borders the urgency of legal regulation of business combination involving foreign partners is growing. According to

⁴ Law of the Republic of Kazakhstan "On competition" of 25 December 2008 № 112-IV (2008). Available at: <http://www.azk.gov.kz/rus/ml/npbazza/cgtrnm/>.

the analytical report⁵ of the Department of Mergers and Acquisitions of Law firm “Sayat Zholshy & Partners” (2011), the share of foreign participation in authorized capital is limited in the Republic of Kazakhstan: air transport - 49%; mass media - 20%; telecommunications and the main lines of communication - 49%; financial sector: pension funds -25%.

International practice shows that the observance of legitimacy of transactions on business combinations is the basis for their future financial well-being.

2.1 Studies of advanced experience in corporate management of integration processes

A striking example of a corporate culture based on M & A transactions, is a corporation «Cisco» - hi-tech industry representative. The corporation “Cisco” has 25- year history, for the period of 1993-2009 the company acquired 129 companies and 85% of the employees of the acquired companies kept jobs in acquired structures⁶. “Cisco”, being the product of venture investment, controls the venture capital of more than two billion dollars. As the exchange of innovative experience one can focus on the following positions of integration policy “Cisco” (see Table 4).

The “Cisco” partnership programs are of great interest in IT industry. In late 2009 for the first time in CIS in Kazakhstan, the IP project - new generation network based on optical networking solutions of “Cisco” has been implemented. When implementing the project “Cisco Systems” actively cooperates with “Kazakhtelecom”.

The corporation “Cisco” uses financial mechanisms to maintain profitability of partners and companies entered the corporation. For example, the employees of the company

⁵ “Peculiarities of legislation of the Republic of Kazakhstan on the realization of transactions of mergers and acquisitions” (2011): Department of Mergers and Acquisitions of Law firm “Sayat Zholshy & Partners”, March, 2011. Available at: <http://www.zakon.kz/faq/kuplya-prodaga.html>.

⁶ Hilton Romanski “We paid special attention to the acquisition of companies which could bring 1,0 billion dollars a year”// Journal “ Merger and Acquisition” №3(73) 2009

TAB. 4: Characteristic Features of Corporate Development Strategy of the Corporation “Cisco”

Element of corporate development strategy	Characteristic features of the element of corporate development strategy
Compliance with corporate strategy	To make the world more comfortable for work, study and rest.
Aims of corporate development strategy	• Using the market transition condition and holding the leading position of “Cisco” in the sector. • Ensuring the optimal level of investment, acquisitions, technology and partnership relations.
Structure of corporate development department: • subgroup of business development; • technology subgroup.	Functions of subgroups of corporate development department: - assessment of the potential of new acquisitions and investments through the “matrix” approach, including both geographical and technological factors; - close cooperation with the subgroup of business development, from the earliest stages of assessing future acquisitions till supporting them after the completion of the transaction, providing smooth entry of a new company into the structure of “Cisco”; - assessment of potential acquisitions for the best technologies and products.
Principles of functioning the corporate development department	Performance of various functional responsibilities and close cooperation in the interest of maximizing growth of the strategic potential of each market initiative.
The quality criteria for a positive decision on the question of new acquisition	- the target company must have a solid business and share strategic views on business and technology “Cisco”; - the target company must have a solid business and share strategic views on business and technology “Cisco”.
The quantitative criteria of a positive decision on the question of new acquisition	- the prospect of getting the revenue from a newly acquired company of the amount of \$ 1 billion a year; - the resource-saving policy, preference to the companies operating in close proximity to areas of “Cisco” functioning.
The composition of the investment portfolio	- direct investment: China Communications Services (\$ 100 million), VMware (U.S. \$ 150 million), Nimbus Communications (\$ 20 million), Alibaba (17,5 million), and others; - venture capital funds: Softbank Asia Infrastructure Funds I, II and III, Bodhi (China and India), CoreOptics (Italy, India, USA), 3TS-Cisco Growth Fund III (Central and Eastern Europe), CXC (China), Almaz Capital Partners (Russia), etc.

Source: Compiled by the authors

developed a financial program “Cisco Capital”, which allows purchasing the equipment “Cisco” on credit on reasonable terms. The users of the program are companies with high reputation, good credit history, expanding business with “Cisco”.

Harmonizing business relations can serve as a basis for conducting mutually beneficial transactions in the near future connected not only with the realization of assets but also the integration of corporate business - structures of new generation with participation of Kazakhstan’s firms.

Conclusion

Global changes in the world economy are a complex process that takes place under the influence of a set of socio-economic and political factors. In this case the main factor of economic growth of a single state may be called the investment attractiveness of sectors of its economy, i.e. quantitative and qualitative indicators of inflow and outflow of capital that contribute to the strengthening of its internal and external socio-economic policy.

Measures to increase the investment attractiveness are the formation of an effective integration policy development, implementation of specific government programs, overcoming of structural deformation, support of efficient and competitive enterprises, transformation of old ties, identification of specific investment and innovation priorities, continuous monitoring of the country’s economy.

The most important indicator of investment climate in any country in the world is M & A transactions. Their nature, qualitative and quantitative parameters, sectoral belonging carry an objective assessment of the state functioning from side of the strategic partners. Meanwhile the key indicator is the dynamics of foreign direct investment. Direct foreign investments are a means by which transnational corporations and groups realize the industrial migration from some countries and regions to the other ones, make mergers and acquisitions (M & A) of required assets.

The analysis of international practice shows that the transactions at M & A market are mainly international and carried out to enter a new country. Therefore, it is not surprising that the development of the market is held with a significant participation of foreign capital. Undisputed leaders in the level and dynamics of integration processes are the countries of the European Union. Among the CIS countries Russia and

Kazakhstan play a significant role in the transformation of bilateral economic relations. The crisis has brought its changes in all economic phenomena, including the processes of companies' combination: reduction in the number and value of transactions in 2007-2008, and a gradual increase in 2009-2011. Kazakhstan managed to reach a positive economic growth, which in 2011 made up 107, of 5%.

Ministry of Industry and Trade of the Republic of Kazakhstan offers to investors to take part in four key areas of industrialization of Kazakhstan's economy, namely:

- infrastructure development, which involves the implementation of investment projects in energy, transport and telecommunications;
- deep processing of raw materials;
- promotion of related industries related to the commodity sector and the development needs of the country (it seems promising to strengthen the oil and gas, transport, agricultural machinery industry, pharmaceuticals, service companies, providing high-tech services);
- technological development, which will be supported by innovation grants through the system of innovative development institutions to increase productivity and efficiency of enterprises.

These directions do not exclude the possibility of the appearance of new companies at the Kazakhstan market, both existing and formed in the process of mergers and acquisitions. M & A transactions are common in the world, but the problem of their effectiveness is the greatest during the crisis. Management of domestic companies must use innovative approaches in the formation of the integration policy of their companies. Newly reorganized companies will have support from the government in the form of tax incentives, favorable credit conditions.

To improve the quality of M & A transactions, partnerships are formed to attract financing to the global market. the example of such partnership is the Global M & A - one of international partnerships in the field of mergers and acquisitions. This system combines the professional market players, helps to expand the search for investors and partners for Russian companies and make it international. The Czech Republic with the support of the Ministry of Finance and the Agency CzechInvest has implemented the unique project CzechLink, designed to ease the Czech companies to establish contacts

with investors, to ensure the capital replenishment of business entities and raising the flow of foreign direct investment to the Czech Republic, Jenerálová Ivana [8].

The analysis of trends in mergers and acquisitions market in Kazakhstan showed that the country has innovation potential for the operation of such projects. It can be assumed that the gradual processes of mergers and acquisitions of Kazakhstan's companies will shift from the raw materials and financial sectors into the spheres proposed by the Ministry of Industry and Trade of the Republic of Kazakhstan as priority spheres for economic development. Soon these may be the representatives of real estate and construction, food processing, hotel, pharmaceutical business, consulting, education.

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AN APPLICATION OF THE FUZZY ANALYTIC HIERARCHY PROCESS TO EVALUATE THE FACTORS INFLUENCING THE DEVELOPMENT OF AN ADMINISTRATIVE UNIT

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Key words:

fuzzy analytic hierarchy process (FAHP) – development – commune – strategic factors

Abstract:

The aim of this study was to show the possibility of applying the method of the fuzzy analytic hierarchy process (FAHP) to evaluate the factors influencing the development of an administrative unit. The proposed approach was applied to evaluate the validity of the strategic objectives and tasks (activities) for Sieraków commune in Wielkopolska voivodship. In the study the data from an opinion poll carried out among the councillors of Sieraków commune in 2013 were used. The proposed approach can be used in the process of creating development strategies for administrative entities.

Introduction

Many administrative units have develop and periodically update their strategies. They contain a diagnosis of the unit's general condition, the analysis of development opportunities, vision, strategic objectives, implementation tasks and allocation of funds. However, there is often no quantification of the validity of the identified factors influencing the development of an administrative unit. The paper presents the evaluation of the validity of strategic factors (strategic objectives and tasks) in the commune using the fuzzy analytic hierarchy process (FAHP). The FAHP method is one of the mathematical methods used to solve multi-criteria decision problems and the decision problem is represented by a hierarchical decision tree. This scheme is constructed by dividing the considered problem into decision components: the main objective, subordinate objectives and tasks (activities). On each level of the hierarchy pairwise comparisons of these factors are made. The pairwise comparisons represented by

linguistic variables are transformed into triangular fuzzy numbers. Then each factor's weight of importance is estimated. The proposed approach was used to evaluate the factors influencing the development of Sieraków commune in Wielkopolska voivodship. The basis of the research were the source data obtained from a survey on "Condition and development opportunities of Sieraków commune" conducted among 15 councillors in 2013.

1. Research methodology

The evaluation procedure of strategic factors based on the fuzzy analytic hierarchy process [1, 3, 4, 8] is a method used to solve multi-criteria decision problems and takes the following stages:

Stage I. Construction of a hierarchical decision tree. In this process it hierarchical scheme consisting of the main objective, subordinate objectives and tasks is constructed. The main objective is placed on top of the hierarchy and present the general intention, which should be achieved in the future (level I). The main objective is divided into subordinate objectives (level II). Next (level III) tasks are created which are necessary to achieve subordinate objectives. The tasks can also be divided into subordinate activities. The number of levels in the hierarchy depends on the assumed degree of generality.

Stage II. Pairwise comparison of the tasks within the subordinate objectives. At each level of the hierarchy the importance of strategic factors is compared in pairs using the fuzzy nine-point scale (Table 1). These comparisons are analysed in terms of their weight of the validity in the decision-making process.

The scale is useful for making pairwise comparisons¹ of importance of the subordinate objectives in relation to the main objective and tasks within each of the subordinate objective. The results of the comparisons are presented in the form of matrixes of fuzzy pairwise comparisons $\tilde{A}_j = [\tilde{a}_{jkg}]$ where: $\tilde{a}_{jkg} = (l_{jkg}, m_{jkg}, u_{jkg})$ and $\tilde{a}_{jgk} = \tilde{a}_{jkg}^{-1} = (1/u_{jkg}, 1/m_{jkg}, 1/l_{jkg})$, $j = 1, 2, \dots, n$; $k, g = 1, 2, \dots, p_j$, and $k \neq g$, $\tilde{a}_{jkg}$ - are evaluations

¹ Pairwise comparisons of the importance of factors at each level of the hierarchy is made by experts directly connected with the considered decision-making process.

of the importance pairwise comparisons of tasks within j -th subordinate objective, specified by the experts or geometric means of the expert group's evaluations.

TAB. 1: Fuzzy nine-level scale for measuring the importance of pairwise comparisons of elements

<i>Definition</i>	<i>Intensity of importance</i>
Equal importance	$\tilde{1} = (1, 1, 1)$
Moderate importance	$\tilde{3} = (1, 3, 5)$
Strong importance	$\tilde{5} = (3, 5, 7)$
Very strong or demonstrated importance	$\tilde{7} = (5, 7, 9)$
Extreme importance	$\tilde{9} = (7, 9, 9)$
For compromise between the above values	$\tilde{2} = (1, 2, 4); \tilde{4} = (2, 4, 6);$ $\tilde{6} = (4, 6, 8); \tilde{8} = (6, 8, 9)$
Transitivity evaluations. If activity i has one of the above nonzero numbers assigned to it when compared with activity j , then j has the reciprocal value when compared with i	Reciprocals of above value

Source: Own elaboration based on Satty [5], Wang, Cheng, Kun-Cheng [7].

Then, the fuzzy pairwise comparisons arranged in matrixes of comparisons are checked for correctness. For this purpose, an inconsistency ratio is calculated. It allows to determine to what extent the pairwise comparisons of importance of the strategic factors are consistent. The lowest value of this ratio is expected. This paper assumes that the rate should not be higher than 10% [2].

Stage III. Calculation of the sum of the elements of each row of the matrix of the fuzzy pairwise comparisons $\tilde{\mathbf{A}}_j$ ($j = 1, 2, \dots, n$) and normalization of the row sums of matrixes with operations on fuzzy numbers:

$$\tilde{Q}_{jk} = (l_{jk}, m_{jk}, u_{jk}) = \sum_{g=1}^{p_j} (l_{jkg}, m_{jkg}, u_{jkg}) \otimes \left[\sum_{k=1}^{p_j} \sum_{g=1}^{p_j} (l_{jkg}, m_{jkg}, u_{jkg}) \right]^{-1}, \quad j=1, 2, \dots, n; \quad k=1, 2, \dots, p_j.$$

Stage IV. Calculation of the possibility that the number of fuzzy $\tilde{Q}_{jk}$ is bigger than or equal to the number $\tilde{Q}_{jg}$ ($\tilde{Q}_{jk} \geq \tilde{Q}_{jg}$) by means of the following equation:

$$V(\tilde{Q}_{jk} \geq \tilde{Q}_{jg}) = \begin{cases} 1, & \text{for } m_{jk} \geq m_{jg} \\ 0, & \text{for } l_{jg} \geq u_{jk} \\ l_{jg} - u_{jk} / (m_{jk} - u_{jk}) - (m_{jg} - l_{jg}) & \text{in other cases} \end{cases}$$

where $\tilde{Q}_{jk} = (l_{jk}, m_{jk}, u_{jk})$ and $\tilde{Q}_{jg} = (l_{jg}, m_{jg}, u_{jg})$ are two fuzzy numbers.

Stage V. Determining of the smallest degree possible $V(\tilde{Q}_{jk} \geq \tilde{Q}_{jg})$ of a fuzzy number $\tilde{Q}_{jk}$ in relating to all other $(p_j - 1)$ fuzzy numbers as:

$$V(\tilde{Q}_{jk} \geq \tilde{Q}_{jg} | g = 1, \dots, p_j; k \neq g) = \min_{\substack{g \in \{1, \dots, p_j\} \\ g \neq k}} V(\tilde{Q}_{jk} \geq \tilde{Q}_{jg}); k = 1, 2, \dots, p_j.$$

Stage VI. Calculation of share rates:

$$w_{jk}^{(l)} = V(\tilde{Q}_{jk} \geq \tilde{Q}_{jg} | g = 1, \dots, p_j; k \neq g) / \sum_{h=1}^{p_j} V(\tilde{Q}_{jh} \geq \tilde{Q}_{jg} | g = 1, \dots, p_j; h \neq g); k = 1, 2, \dots, p_j,$$

which are taken as local weights (priorities)² of tasks.

Stage VII. Calculation of global priorities³. They are calculated by multiplying the local priorities of tasks by the global priorities for the subordinate objectives $w_{jk} = w_{jk}^{(l)} \cdot w_j$. As a result, the values w_{jk} are taken as global priorities for the tasks and presented in the

form of vector $\mathbf{W}_j = (w_{j1}, w_{j2}, \dots, w_{jp_j})^T$, where $\sum_{k=1}^{p_j} w_{jk} = w_j$, $\sum_{j=1}^n w_j = 1$, $\forall_j w_j \geq 0$.

Likewise stages II-VI the local priorities (weights) for the subordinate objectives can be calculated. What is more, local and global priorities for the given subordinate objective are the same.

2. Evaluation of strategic factors in the commune

Civilization trends indicate the necessity to keep the balance in the macro-system of society-economy-environment. Basing on this principle, the main objective, subordinate objectives and tasks were set. The main strategic objective was to ensure sustainable

² Local weights (priorities) determine the relative importance of tasks within each subordinate objective. The sum of local weights for tasks within a subordinate objective is equal to one.

³ Global weights of tasks represented their importance in relation to the main goal. The sum of all global weights for tasks is equal to one.

socio-economic development of Sieraków commune. The subordinate objectives, however, were related to: the environment, quality of life, technical infrastructure, social infrastructure and economy (Figure 1). The subordinate objectives are complex and too general, and therefore to achieve the packages of strategic tasks were made:

Subordinate objective 1: Improving the environment (environment)⁴: Tasks:

- construction of landfills waste (landfills waste),
- use of water bodies (water bodies),
- use of alternative energy sources (energy sources),

Subordinate objective 2: Increase the quality of life (quality of life): Tasks:

- reducing unemployment (unemployment),
- increased sense of safety (safety),
- expansion and modernization of communication (communication),
- improvement of street lighting (lighting),

Subordinate objective 3: Improving the technical infrastructure (technical infrastructure): Tasks:

- expansion of the water supply (water supply),
- construction of sewage system (sewage system),
- development of the gas network (gas network),
- modernisation of roads (roads),

Subordinate objective 4: Improving social infrastructure (social infrastructure): Tasks:

- improvement of health care (health care),
- improvement of the level of education (education),
- development of culture and the arts (culture and arts),
- construction of sports facilities (sports),

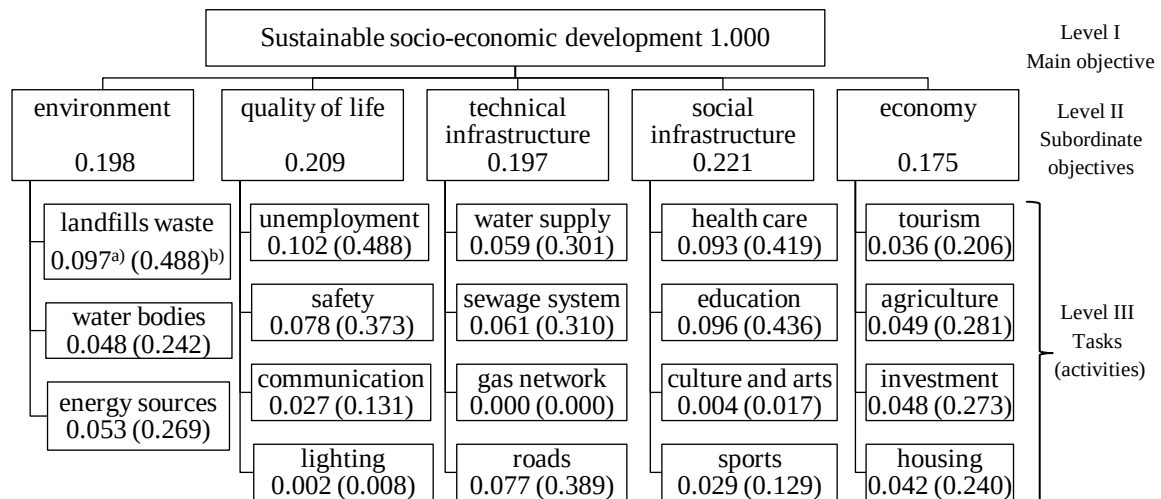
Subordinate objective 5: Improvement of the state of the economy (economy): Tasks:

- development of tourism (tourism),
- modernization of agriculture (agriculture),
- use of land for investment (investment),
- housing development (housing).

⁴ Keywords that will be used in the further part of the paper.

In order to evaluate the importance of the subordinate objectives and strategic tasks a questionnaire was conducted among 15 councilors of Sieraków commune. First the councilors estimated the importance of the pairwise subordinate objectives in respect to the main goal and strategic tasks within each subordinate objective. The pairwise comparisons were made using the nine-point Saaty's scale. The pairwise comparisons represented by linguistic variables were transformed into triangular fuzzy numbers and were averaged with the help of the geometric mean. The comparisons were tested using the CR inconsistency ratio which in each case had the value less than 10%, which means that the comparison is consistent.

FIG. 1: **Hierarchical structure and value of importance of the factors influencing the sustainable socio-economic development of commune Sieraków**



a) Global priority. b) Local priority.

Source: Own calculation based on the results of the questionnaire study among local experts in Sieraków commune [6].

The highest value of the global priority was attributed to the subordinate objective concerning improving of the social infrastructure (global priority – 0.221). This means that the social infrastructure influenced the sustainable socio-economic development commune Sieraków in more than 22%. Another important objective was to improve the quality of life of the residents (0.209). The subordinate objectives connected with the environmental protection (0.198) and development of technical infrastructure (0.197) had similar importance. The least important was the subordinate objective connected with the economy (0.175). The most important strategic task was the fight against

unemployment (0.102). It had a more than 10% of the impact on the achievement of the main objective. Simultaneously, the local priority of this task (0.488) affects nearly 50% of the improvement in quality of life. Another important task was to build a landfill (0.097), also the tasks related to education (0.096) and the improvement of health care (0.093) had similar weight of importance. The tasks related to the development of the gas network (0.000) and the development of culture and arts (0.004) had the smallest impact.

Summary

The empirical research confirmed the usefulness of the fuzzy analytic hierarchy process to evaluate the validity of some strategic factors – strategic objectives and tasks. This method allowed to quantify the importance of individual strategic factors.

In the commune Sieraków the priority of the subordinate objectives were the social infrastructure improvement, followed by improving the quality of life, the environmental protection and development of the technical infrastructure. However, in the opinion of the councilors the subordinate objective related to the economy turned out the least important.

According to the councilors the achievement of the main objective depended mainly on the following tasks: the fight against unemployment, the construction of landfills, improving education and improving health. The activities related to the development of the gas network and the development of arts and culture were the least important tasks. The proposed approach has a practical dimension and can be used by administrative units to create their development strategy.

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SOCIO-ECONOMIC ANALYSIS OF SMALLER TERRITORIAL UNITS AS A STARTING POINT FOR FORMULATION OF MEASURES TO SUPPORT ECONOMIC DEVELOPMENT

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Socio-economic analysis – sub-regions – resilience – competitiveness – economic structure

Abstract:

Administratively delimited territorial units not always reflect key functional links and differences among particular units. Hence, there is an effort to create alternative approaches to delimitation of territory. The main purpose of this paper is to briefly introduce a new method of delimitation of sub-regions, which may be subsequently used as suitable territorial units for socio-economic analysis of such areas. Theoretical background represents a concept of regional economic resilience. Consequently, a selected sub-region will be analysed by means of “the resilience capacity index” developed by Katherine Foster, and factor analysis. Based on the analysis, major strengths and/or weaknesses can be identified and possible strategies for strengthening the local economy formulated.

Introduction

A question of economic disparities on various levels (local, regional, national, international,) has belonged to the red-hot topics for a very long time. This comes along with a necessity to delineate meaningful regions in order to formulate appropriate development strategies and/or economic measures in times of economic problems. Generally, administratively delimited regions are used for such purposes for several reasons. Firstly, it is easier to get reliable statistical dates on the economic situation of a region. Secondly, administrative capacity exists within such regions to formulate as well

as impose the economic policy measures. Unless specificities of various areas within administrative regions are taken into account, measures applied in this way may miss its aim, though.

Within the TA CR project TD010029, a new method of delimitation of sub-regions has been developed based on the commuting flows (for more details see [10]) as a starting point for an analysis of the socio-economic situation of such catchment areas. The Czech Republic has been divided into 411 sub-regions reflecting functional relations among municipalities. Functional sub-regions appear to be a convenient level for the analysis of regional economic disparities and subsequently, formulation of the long-term development strategies.

The main purpose of this paper is to demonstrate on the example of one concrete sub-region how this new regionalization can be used. As a theoretical background, a concept of economic resilience will be applied. Consequently, the analysis of socio-economic situation of one newly delimited sub-regions will be carried out by use of the “resilience capacity index” and factor analysis. This may serve as a starting point for a formulation of possible strategies and/or measures to strengthen the economic stability of the sub-region.

1. Methodological background: Economic Resilience of Regions

Conventionally, economists focus on competitiveness of economy at any territorial level. Economic competitiveness is mostly discussed in times of prosperity. However, in times of economic disruptions a wider range of questions may arise that are associated with the ability of regions to recover fully and as fast as possible from the negative consequences of the crisis. Obviously, this issue cannot be solved only after the economic shock happens. Regions should think more strategically in terms of long-term stability and/or prospect of a region beforehand. Thus, an alternative approach consisting in resilience of the local/regional economies in face of various economic shocks has come into discussion among economist. Generally speaking, economic competitiveness and resilience are not in contradiction. Nevertheless, resilience may epitomize more long-term aspects of economic development whereas competitiveness may put a greater emphasis on short-term aspects of economic growth. Thus, a strategy

supporting the stability and resilience of the local economy may sometimes lead to a slowdown of economic growth in the short run. On the other hand, strengthening the local economy in terms of its ability to respond to the challenges whether they be economic, social or environmental, may build a solid ground for future economic success.

The concept of resilience has its origins in environmental studies. Subsequently, it has been used by experts in regional analysis, spatial development and economic geography. The number of studies on regional or local economic resilience has risen rapidly as the world endeavours to overcome the negative consequences of the 2008 financial crisis, which has spread across all sectors and national economies. Worthy mentioning are for instance contributions of Martin [6], Foster [2], Hill et al. [3] and McInroy and Longlands [8]. In Czech academic literature the issue of regional resilience has been explored for instance by Kučerová [4] and Lungová [5].

There is no general agreement in how to define the word “resilience” itself, nor how best to quantify or measure a region’s resilience. Interestingly enough, most of the authors identify four properties of resilience. For instance Martin [6] defines four mutually interlinked dimensions called resistance, recovery, re-orientation and renewal. According to Foster [2, 14], the regional economic resilience represents a capability of the region to anticipate, prepare, respond and recover from a disruption of any kind. Apparently, such a definition requires two aspects of economic resilience: preparatory and performance resilience. It means that more resilient local and/or regional economy will naturally exhibit sort of long-term stability.

Thus, it is of crucial importance to look at factors that may boost the economic resilience with the aim of more stable and less volatile economic development. Firstly, an efficient tool to measure the economic resilience has to be developed. One of the most interesting contributions in terms of measuring resilience represents the ‘Resilience Capacity Index’ developed by Kathryn A. Foster. This index consists of 12 equally weighted indicators, which reflects the aspects of regional economic, socio-demographic and community attributes. Foster uses income equality, economic

diversification, regional affordability and business environment to assess the regional economic capacity. Aspects associated with educational attainment, level of poverty as well as health care in the region reflects the socio-demographic capacity. Community connectivity capacity may be measured via existing civic infrastructure, homeownership and/or voter participation. This description suggests that regional resilience is a wider concept that goes beyond purely economic resistance or flexibility. It can help to uncover regional strengths and weaknesses and provides quite a simple comparison of different regional profiles. Provided that required data are available, it can be implemented to any regional and/or even sub-regional level. Obviously, the data accessibility represents a most serious obstacle to its full application in reality.

2. Application to a newly delimited sub-region: an example of the Kyjov sub-region

As already stated, newly delimited sub-regions might be a suitable territorial level for the analysis of the regional disparities. Within the TA CR project an extensive database of statistical data on the municipalities as well as the sub-regions as a whole has been created. It should allow an easy and quick comparison of various areas and an identification of main impediments to their future development and/or their strengths to draw on [10]. This database stems mainly from the Census carried out by the Czech statistical office in 2011 and from the databases of its regional offices. It has to be noted that not all required data are available on the sub-regional level, though.

Based on the data, a basic assessment of the socio-economic situation of the selected sub-region in a similar structure to the one given by “regional capacity index” can be provided. To get a complex picture of the sub-region, factor analysis will follow. Due to a very limited extent of the paper, only one illustrative example with the most necessary set of data will be elaborated: the Kyjov sub-region.

The Kyjov sub-region is situated in the South Moravia region within the Hodonin district. Its location can be valuable both from the national and international point of view. The sub-region is located approximately 50 km far from Brno, not more than 120 km from Wien, 100 km from Bratislava and 270 km from Prague. Its border location is deemed to be a potential advantage for the future socio-economic development.

The surrounding area has a character of uplands with fields, orchards and vineyards which is the reason of a traditionally agricultural orientation of the whole region. Kyjov as a natural and administrative centre of Kyjovsko region represents at the same time the nodal centre of the sub-region. The whole area has a great potential for tourism especially thanks to its natural amenities, culture heritage, folklore and traditions.

The sub-region is relatively large regarding the number of municipalities related to the nodal centre. It includes 26 municipalities and thus partially coincides with the area of Kyjov as the municipality with extended powers - the third degree municipalities (which is larger: involves 42 municipalities in the area of 470 km²). Population density noted in the sub-region is 142,28 people per km², which is slightly above the national average of 133 people per km². Besides the nodal centre Kyjov with the population density about 383,6 people per km², only several smaller municipalities exceed the average, such as Bukovany (225) or Kostelec (166). On the other hand, there are villages below the average population density, such as Skalka, Celoznice or Moravany.

2.1 Assessment of regional capacity

Regional economic capacity may be described via indices reflecting economic structure of the sub-region in terms of prevailing sector and size of the businesses. Economic situation is significantly affected by the structural changes of agricultural companies and relatively low number of industrial companies. The share of industrial companies to the total number of economic entities in the Kyjov sub-region represents approximately 31 %. Traditionally, agriculture used to be a main source of employment and population's income in the sub-region. Yet, the current dates suggest certain changes towards a greater involvement of tertiary sector, which may be regarded for a positive sign. A share of firms providing services to all economic entities represent approximately 58,93 %, however, this number do not reflect firm's size nor the employment. Especially the nodal centre shows the prevalence of tertiary sector (almost 70 % share), followed with Skalka and Ostrovánky. On the other hand, the importance of agriculture seems to be receding with the share of agriculture businesses to all economic entities at about 5,68 %. Higher involvement of agriculture demonstrate municipalities Nechvalin, Skoronice, Vresovice a Zadovice with more than 10 % share

of agriculture companies on all economic entities. More than 35 % of all the economic entities represent private entrepreneurs without employees.

To describe *socio-demographic capacity*, indices of the age structure and the total population increase can be of use. Obviously, there are no significant differences in the age structure among the municipalities across the sub-region. Average population age of the sub-region as a whole is 41,7. Slightly younger population has been identified in Hysly with 38,9 average age and/or Kostelec with 39 average age. On the other hand, above the average population age is Kyjov (43), and smaller villages such as Labuty, Skalka, Vresovice (somewhat above 44 years). Information of similar kind provides the age index comparing a share of the population above 65 to the population below 15. The highest share of population above 65 has been noted in Labuty or Skalka whereas the highest share of population below 15 in Kostelec, Hysly and Milotice. Demographical trends can be well illustrated via total population change, which seems to be negative (-0,125) across the whole sub-region. The same cannot be claimed about all municipalities, though [9].

Community connectivity capacity can be assessed based on voter participation and civic infrastructure (educational and health facilities). The Kyjov sub-region scores relatively well in an index defining number of people per a doctor (approximately 1210,2). Also the availability of kindergartens and primary schools in the sub-region seems to be adequate in terms of number of children and/or pupils per a facility (46 children of age 3-5 per a kindergarten and approximately 144,4 pupils per a primary school). Should we compare this numbers with a sub-region of similar size, Blansko could serve as a good example. In all three indices, Blansko shows higher numbers (1326,7 person per doctor, 53,63 kids of age 3-5 per kindergarten and 168,47 pupils per school) which might signify a greater stress on the capacity of schools as well as medical facilities within the sub-region. Whether it may negatively affect provided services is a relevant question to ask. An index of vote participation may be a sign of vivid and active community. It is defined as a number of actively voting population to the total number of voters. In the Kyjov sub-region, 63,83 % voter's participation has been noted, which is somewhat above the national average (62,6 % in the last election). In comparison, there are areas

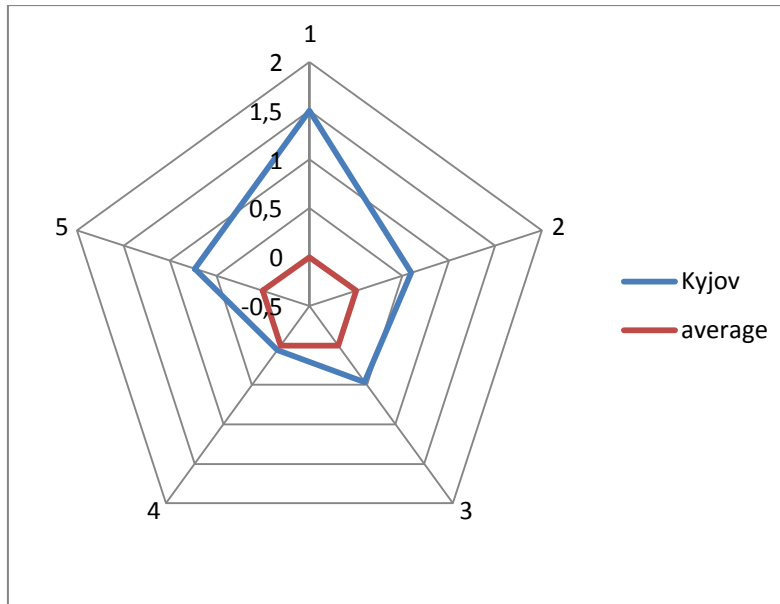
with significantly lower (about 55 %) voter's participation (for instance border regions in the North Bohemia)[9].

2.2 Factor analysis

All the statistical dates available were processed within the factor analysis. All indicators were categorised to saturate five main factors. According to the factor score, all the sub-regions can be ordered from the weakest to the strongest one. Factor 1 called 'employment' is saturated particularly by dates relating to unemployment rate and available jobs and indirectly with employment and a number of economic entities to productive population. Factor 2 describes age structure of the sub-region. Factor 3 titled 'activity of non-industrial type' is affected by the population density, the share of tertiary sector and indirectly by the share of economic entities in agricultural sector. Factor 4 is titled 'population' and is saturated by demographical dates relating to the population growth and the divorce ratio. Factor 5 is associated with number of private entrepreneurs and the share of population in non-productive age to the population in productive age. It reflects whether it is possible for people to ensure a reasonable standard of living in the area [10]. First three factors are of minimizing type (meaning the lower the factor score the better the situation in this area) whereas the last two factors are of maximizing type.

Based on the factor analysis, we may illustrate the situation of the Kyjov sub-region on the following radar chart. Better values within the minimizing factors (F1, F2 and F3) situates the sub-region below the zero border of negative score, the closest to the centre of the chart whereas better values within the maximizing factors (F4 and F5) puts the sub-region above the zero border (the more distant from the centre the better).

FIG. 1 Radar chart of the factor score: the Kyjov sub-region



Source: [9], own elaboration

The radar chart suggests that the Kyjov sub-region do not score well in most of the analysed areas (particularly in F1, F2 and F3). Factor 2 points out at an emerging problem of population ageing within the sub-region, which is a trend visible across the whole country. Factor 3 reflects still relatively high importance of agriculture. Yet, there are signs that significance of the tertiary sector is on the rise. Factor 4 is indubitably affected by the negative population change, which may be attributed to both outflow of young people and population ageing. Strangely enough, positive results are noted in factor 5 reflecting how well people live in the region. This may be rather surprising, taking into account hard economic dates describing employment and unemployment, which are reflected in factor 1. The Kyjov sub-region reports comparably high rate of unemployment to the structurally affected regions of the Moravian-Silesian and the Usti Region. The average rate of registered unemployment was about 15 % in years 2010-11 and the long-term unemployment rate about 6,55 % [9].

3. Recommendations for strengthening the local economy

Based on the analysis of the regional economic, socio-demographic and community capacity and results of the factor analysis, several recommendations can be derived for strengthening the local economy and support of long-term stability of the sub-region.

Out of the analysis, main weaknesses have been identified as:

- fragile economic structure,
- high unemployment rate,
- ageing of population,
- outflow of the young population.

It is clear that a main emphasis should be laid on the strengths and specificities of the sub-region that might help to distinguish the area from other places. On the other hand, identified weaknesses should be eliminated (or at least mitigated) in order to support long-term and steady development. Strong and resilient local economy requires both support of economic development and boost of local capacity in terms of creating networks between public and private sector. Active public leadership, vivid and prosperous community, and strong voluntary sector may be of crucial importance.

In economic terms, it is necessary to ensure wider economic diversification by means of support of small businesses set-up, especially focused on local traditions and specificities such as sewing folklore costumes, preparing local specials. More active involvement of youth might be incited by binding this type of businesses directly to the follow-up educational and leisure time activities. Taking into account regional specificities, tourist infrastructure within the local wine-lanes should be reinforced and a supply of accommodation and catering facilities augmented. Insufficiently recognized local amenities and natural heritage should be identified and embodied into tourist materials. Common system of marketing and promotion of local products might be of great use to the local entrepreneurs. The number of social care as well as leisure time facilities would be worthy increasing. It would contribute to mitigation of the high unemployment rate by creating new work opportunities. At the same time, it would address the problem of ageing population and draining young people out of the sub-region.

It is to be noted that several of suggested measures have already been included into number of strategic documents of existing micro-regions within and outside the analysed sub-region [7].

Conclusion

The paper introduced a new method of regionalization that was elaborated within the TA CR project. In order to support long-term stability of smaller areas, an assessment of their socio-economic situation has to be made possible. Functional sub-regions based on commuting flow seem to be a convenient level for analysis of regional economic disparities and subsequent formulation of meaningful long-term development strategies. This paper demonstrated on the example of one concrete sub-region how this new regionalization can be used. The socio-economic analysis of the Kyjov sub-region by means of resilience capacity index and factor analysis was carried out. Based on the results of the analysis, several suggestions were made to support prosperity and stability of local economy.

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