ISSN 1648-7974

LIETUVOS VERSLO KOLEGIJA
LITHUANIA BUSINESS UNIVERSITY OF APPLIED SCIENCES

VADYBA

2016 Nr. 2 (29)

Journal of Management

KLAIPĖDOS UNIVERSITETO LEIDYKLA
Klaipėda
2016

Name of publication: **Journal of Management** (ISSN: 1648-7974)
Issue: Volume 29/Number 2/2016
Frequency: Semianual
Languages of articles: English,
Office of publication: Klaipeda University Press
Herkaus Manto 84
LT-922294, Klaipėda
Lithuania

Editorial Office: Assoc. prof. Jurgita Martinkienė
Scientific Research Department
Public Institution Lithuania Business University of Applied Sciences
Turgaus st. 21, LT-91429
Klaipeda, Lithuania

Phone +370 46 311 099
Fax +370 46 314 320
E-mail: jurgita.martinkiene@ltvk.lt

Journal of Management Homepage: https://www.ltvk.lt/VADYBA

The journal is reviewed in:
Index Copernicus (IC) database http://www.indexcopernicus.com, http://jml2012.indexcopernicus.com/VADYBA,p24783103,3.html
Central and Eastern European online Library (CEEOL) database http://www.ceeol.com/
EBSCO Publishing, Inc. Central & Eastern European Academic Source https://www.ebscohost.com/titleLists/e5h-coverage.htm

http://www.mab.lt/lt/istekliai-internete/mokslo-zurnalai/282

Every paper is revised by two reviewers.

Leidinio pavadinimas: **Vadyba** (ISSN: 1648-7974)
Leidimas: Volume 29/ Number 2/2016
Periodiškumas: Leidžiamas dukart per metus
Straipsnių kalba: Anglų
Leidėjo adresas: Klaipėdos universiteto leidykla
Herkaus Manto g. 84
LT-922294, Klaipėda

Redakcijos adresas: doc. dr. Jurgita Martinkienė
Mokslo-taikomųjų tyrimų skyrius
Viešoji įstaiga Lietuvos verslo kolegija
Turgaus g. 21, LT-91429
Klaipėda

Telefonas +370 46 311 311099
Faksas +370 46 314 320
Elektroninis paštas: jurgita.martinkiene@ltvk.lt

Žurnalo internetinio puslapio adresas: https://www.ltvk.lt/VADYBA

Žurnalas referuojamas:
Index Copernicus (IC) database http://www.indexcopernicus.com, http://jml2012.indexcopernicus.com/VADYBA,p24783103,3.html
Central and Eastern European online Library (CEEOL) database http://www.ceeol.com/
EBSCO Publishing, Inc. Central & Eastern European Academic Source https://www.ebscohost.com/titleLists/e5h-coverage.htm

http://www.mab.lt/lt/istekliai-internete/mokslo-zurnalai/282

Kiekvienas straipsnis yra peržiūrimas dviejų recenzentų.

Vadyba
Journal of Management
2016, Vol. 29, No. 2
ISSN 1648-7974

Turinys / Contents

Editorial

"Journal of Management" is periodically published applied sciences journal by Lithuanian Business University of Applied Sciences. It is being published since 2002 and already has solid experience. During this period there was a change in journals form, structure and content. Journal has been positively evaluated by foreign scientists, as number of them publishing is constantly increasing. Articles in the journal can only be published in English. Currently, 29 th number of the journal is being released to readers. Only thoroughly selected articles by Editorial Board are being published. Authors of these articles represent various Lithuanian and foreign countries science, education and business institutions, such as Jiangxi University of Finance and Economics (China), Szent István University (Hungary), Xi'an Siyuan University (China), Baltic International Academy (Latvia), Budapest Business School, University of Applied Sciences (Hungary), Alexander Dubček University of Trenčin (Slovakia) and other institutions.

The journal provides opportunity for academics and professionals to interact and communicate in international forum. Applied research journal „Journal of Management" Editorial Board goal is to achieve that published articles will analytically describe foreign countries economical, business and technological environment. These criteria will be evaluated while selecting articles. So, we expect that when readers get familiar with published articles, they will be able to find new and thoughtful material.

Multiple articles in the journal are presented by foreign scientists. It is worth mentioning the article by scientist E. Grmanová, where author thoroughly describe how particular factors affect the efficiency of insurance companies.

In this particular article scientist identifies whether different groups of commercial insurance companies created according to their size have a statistically significant different average score of technical efficiency and whether the group of the largest insurance companies achieves the highest average score of technical efficiency and the group of the smallest commercial insurance companies achieves the lowest average score of technical efficiency. The results of the study are presented in the article.

Another distinctive research in the journal is made by few Lithuanian author S. Paulauskas, as he analyses the strategy of European Union in his article and examines the hypothesis that aged political governance and partocratic dictatorship culture is not appropriate for realisation of EU 2020 strategy and next efficient and peaceful integration of community.

Journal also presents some researches made by scientists from other countries, as Hungarian scientist I. Kovács predicts what type of effects corporate social responsibility choices make on consumer decisions in Hungary.

Undoubtedly all researches in the Editorial could not be reviewed, so we encourage familiarizing with them in the journal.

We invite scientists to actively publish in the journal, share their research results and methodological insights. We expect for close cooperation.

Prof. Dr. (HP) Valentinas Navickas
Editor-in-Chief

Vadyba
Journal of Management
2016, № 2 (29)
ISSN 1648-7974

HEALT AWARENESS KNOWLEDGE MANAGEMENT THROUGH SOCIAL MEDIA APPLICATIONS

Éva Görgényi-Hegyes, Mária Fekete-Farkas
Szent István University, Hungary

Annotation
Nowadays use of social media applications has become one of the most important factors in the daily life of both individuals and organisations. Due to the rapid diffusion of the Internet, organisations had to change their communication strategy and focus on exploiting the opportunities offered by different web 2.0 applications. The study is intended to present the process and tools how the organisations can effectively use the different social media applications in order to pass their important messages building the costumers' health awareness. Through the use of developed knowledge based decision support tools health organisations also contribute to consumer behaviour change in health awareness as a factor of sustainability.
KEY WORDS: social media, health awareness, knowledge management, communication, consumer behaviour, sustainability

Introduction

In the past two-three decades the concept of creativity and health promotion and disease prevention are not unknown concepts for anybody, however, most of the people can forget the importance of them during their daily life. Health awareness therefore is not a new phenomenon, but a continuously increasing trend day-by-day due to the rapid information flow and the campaigns of different health institutions. The aim of these campaigns is always the prevention (primary, secondary or tertiary prevention) or support by influencing the knowledge and awareness in order to help to change many health-related behaviours. (Robinson et al, 2014). Due to the widespread use of social media, health 2.0 is now commonly used terminology. Last few years brought the phenomenon and use of the social media to the mainstream of health communication, information generation and dissemination. Similarly, the patients have been becoming from to information generators and sharers from the simple consumers of Internet content. Although healthcare staff (doctors, nurses, health professionals) continue to remain the first choice for most people with their health concern, patients and their family members started to use also the Internet and the social media applications to give feedback, create forums, share their positive or negative experiences with certain doctors, diseases, symptoms etc., discuss with each other or educate the others with similar health condition. (Lapointe, Ramaprasad and Vedel, 2014; Brodalski et al, 2011).

This fact supports the need of consumers for health-conscious behaviour, therefore health organisations need to help them in building knowledge based health awareness.

Problem Statement – why health awareness and environmental health is so important in terms of sustainability

Definition of sustainability derives from the Brundtland Report of 1987 which said that "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (WCED, 1987). However, recently a more practical and detailed approach has spread, which said that sustainability is the ability to continue a well-defined behaviour indefinitely. The three pillars of sustainability are known as environmental, economic and social sustainability. Figure 1 shows the detailed categorisation of the three pillars.

Attention to health awareness in terms of sustainability is more and more increasing. During sustainability planning and the organization of different health intervention programs, a clear understanding of the concept of sustainability and operational indicators is required. Important categories of indicators include:

- maintenance of health benefits achieved through an initial program
- level of institutionalization of a program within an organization and
- measures of capacity building in the recipient community.

Moreover, planning for sustainability requires the use of programmatic approaches and strategies that favor long-term program maintenance. (Shediac-Rizkallah and Bone, 1998).

Fig. 1: Three pillars of Sustainability (Adapted from ConocoPhillips Company, 2006)

According to Dannenberg, Frumkin and Jackson (2011) relationships between public health, health awareness and sustainability is defined in the definition of environmental health. Environmental health as the subcategory of public health, focuses on the relationships between people and their environments. There are many goals of environmental health, but the most important objectives are to control environmental threats and hazards and also to promote healthy environments. Traditional environmental health focused on sanitation issues, such as clean water, sewage, waste management, food safety and rodent control. In recent decades, environmental health has expanded its scope to address chemical and radiological hazards, such as pesticides and air pollution. And most recently, environmental health has addressed cross-cutting issues, including the built environment, climate change and sustainability. (Dannenberg, Frumkin and Jackson, 2011)

Aim and Objective

The aim is to develop a simplified framework in order to manage the health awareness knowledge with the advanced use of the social media applications.

This is to provide a well-understandable tool for the different organisations and individuals who would like to increase the customers' health awareness and improve the effectiveness of the use of social media during their communication related to health awareness.

Method

Developing knowledge based tools building health awareness for health organisations by collecting the main literature and real industrial experiences. Research methodology contains the main phases and tasks were performed during the study. Full methodology is represented by Figure 2, however, this paper primarily presents the related literature and the developed knowledge based tools.

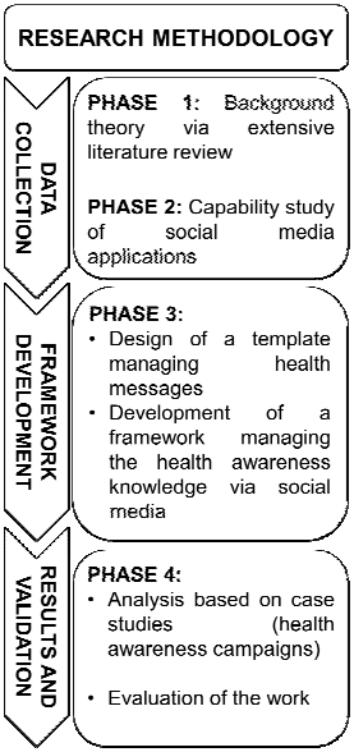


Fig. 2: Research methodology

Results

In last few decades health awareness and health conscious lifestyle became hot topic not only in social

media but in our personal relationships. Consumers have become information generators parallel with the use of new information platforms provided by the Internet based social media. Moreover, public health organisations and practitioners have been trying to emphasize the health awareness through the social media for decades – the first health communication campaign that incorporates social marketing concepts was in the 1960's. Since then, social media campaigns in health awareness have been used in prevention of many public health issues, such as cancer, diabetes, heart attack, stroke and asthma. In health communication effective message development and dissemination process is decisive for these health organisations or healthcare staff in order to reach their target audience with their key messages. Based on the available resources it is clearly seen that health messages are crucial to prevent, early detect or handle the problem and thus to change the consumer behaviour. Thus, health conscious behaviour can help in building sustainability.

Due to the literature review and analysed health campaigns, it can be easily determined that health awareness messages follow more or less similar, well-defined structure. Although target groups are not mentioned in most cases, they can be easily identified based on the message. Health messages usually consist of the action(s) that are necessary in order to prevent, or handle some problem (e.g. Smokefree - Take the first step) and further benefits are also mentioned in some cases. Health message development process follow the basic ACME framework which is used or customised in most cases – not only health awareness message development but also in case of other awareness campaigns.

Reviewing the available resources, this paper defined that there is not a comprehensive, detailed framework or generic process map for managing properly the health awareness knowledge. Therefore, this study is intended to synthesise the good practices of industry and develop a simplified framework with clear process steps (as "know-what" knowledge) and required tools/methods (as "know-how" knowledge) in order to abolish the above-mentioned research gap.

Although this template and framework offers a good starting point to the health awareness commination and health message dissemination, there are some limitations observed during the work. Firstly, the framework contains a generic process model with required tools and methods and based on available literature and industrial good practices, however, some customisations may be needed in certain cases or organisations.

Discussion

- Effective health message development

To understand the role that different social media applications can play in health communication and the need why organisations should use knowledge based tools during their communication, it is essential to clarify some basic definition and concepts. The most integrated and accepted definition of health was defined by the World Health Organisation (WHO) in 1948. According to the Preamble to the Constitution of the WHO: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." (WHO, 1948) It is increasingly recognised fact that health can be maintained and improved not only through the health science and different healthcare services, but also through the smart lifestyle of the individuals or society. Thus, WHO also determined the main elements of health, which include the social and economic environment, the physical environment, and the person's individual characteristics and behaviours. Over the last decade, WHO paid an increasing attention to the social and economic fundamentals. (McMichael, 2006)

Health awareness or health–conscious behaviour is all of the individual attitudes, behaviours and activities in order to live longer and remain healthier. To reach these targets, people:

- keep important and enforce their health aspects during their decisions,
- control consciously their habits (e.g. proper nutrition, physical activity, sexual behaviour, avoiding the harmful practices and habits) and thus, they are actively involved in the development of health,
- learn basic assistance and self–help skills
- develop and apply an informed consumer behaviour in relation to the healthcare system:
  - the knowledge of the nature of the disease and possible outputs
  - the knowledge about the operation of the healthcare system
  - the knowledge of the patients' rights
  - the knowledge of health consumer protection

During health communication, communicators follow a well-defined message development process in order to reach the target groups effectively. An effective message development process has well-defined process steps, which based on the Audience-Channel-Message-Evaluation framework according to Noar (2011). Figure 3 shows the basic framework indicating the relationships between the most important principles of health campaign design, implementation and evaluation:

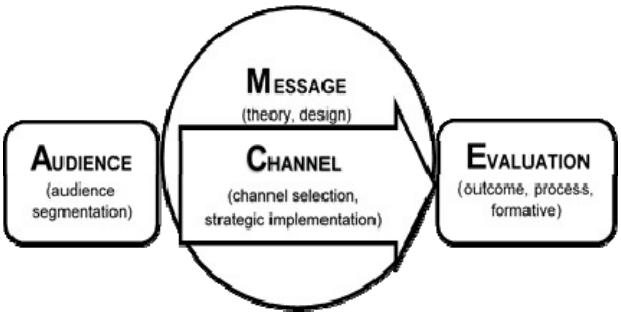


Fig. 3: ACME framework for health communication campaigns (reproduced from Noar, 2011)

According to the framework, it can be clearly seen that audience segmentation, message design and channel selection are the most important factors before the message dissemination. Consequently, the effective

message should be audience-centered and channel-focused to increase the awareness.

However, the awareness of the above-mentioned process steps are not enough. It is also necessary to be aware the main characteristics of a health message. Morrison, Kukafka and Johnson (2005) describe the essential elements of health messages:

- Message recipient – means the identified target groups
- Threats to health – means the main health issues and key risk factors what the organisation would like to communicate during the health awareness campaign
- Actions to be performed to reduce the threat – contains all activities which can be done in order to prevent, handle or solve the problem
- Benefits achieved from performing the actions – describe the further benefits of the activities as supporting arguments

In one word, the effective message development process should focus on the main elements and characteristics of the typical health messages, and also follow the identified main process steps.

- Health awareness and social media – opportunities and limitations

In health communication, the information dissemination is the key element of building health awareness and thus, a crucial factor in the primary, secondary and tertiary prevention and early detection of chronic diseases. Lapointe, Ramaprasad and Vedel (2014) provide a comprehensive overview of the role of social media-enabled collaboration and its impact on creating health awareness through Figure 4:

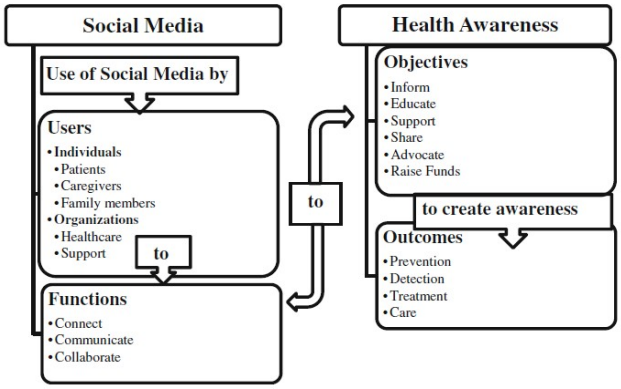


Fig. 4: The users and functions of social media to create health awareness (Adapted from Lapointe, Ramaprasad and Vedel, 2014)

It can be clearly seen that individuals use social media to interact and share information with each other or provide support to people in similar situation. Similarly, organisations use social media to achieve a wide range of objectives – such as education, supporting or fund-raising. Through these activities both individuals and organisations can create or increase the awareness of the need for prevention, early detection (via screening), and options for treatment or care. In addition to, social media enable them to collaborate effectively with each other.

With the new technology developments – such as smartphones, tablets and other new mobile technology devices – the importance of social media is continuously increasing. The information and knowledge can be disseminated directly to the individuals, regardless of geographical distance or time. Therefore, social media can perfectly serve the newly emerged consumer needs – people have an increased demand of information, they would like to communicate or share information with each other in real time etc. However, consumers have more opportunities to use social media and get or share information through various social media channels. This study is also intended to provide a better understanding about the most important channels in terms of publishing health awareness. Table 1 shows the list of social media channels, a short description and example platforms of these channels.

Table 1: Classification of social media channels (source: Kaplan and Heinlein, 2010; Ryan 2014)

Social media channels	Short description	Examples
Blogs	Sites that contains regularly-updated, date-stamped entries, displayed in reverse chronological order.	Technology: Blogger, WordPress Sites: HealthLive Blog
Collaborative projects	Online forums or discussion sites that allow certain groups of people to collaborate, work together in order to create online content.	Google Groups, Business Forums
Media sharing sites	Contact channel that enables people to share different media content (photos, videos, clips etc.) with others.	YouTube Flickr
Micro-blogging	Allow users to share small amounts of digital content – such as short sentences, video links or images. The main difference in compared with blogs is the smaller content size.	Twitter Tumblr WeiBo
Podcasts	Series of digital media content (audio or video) distributed in websites.	Podomatic
Reviews and rating sites	Websites that enable the users to share their own opinions, feedbacks related to other people, products, services etc.	Booking.com FourSquare Tripadvisor.com Amazon.com

Social networking sites	Online communities for information sharing, social connection and other interactions.	Facebook LinkedIn MySpace
Virtual game and social worlds	The group of platforms that simulate a three-dimensional world in which users can interact with others in this environment (similar to real life).	World of Warcraft Wizard of Oz Second Life
Wikis	Websites that enable users to edit and publish easily documents (interlinking pages) using a simple language and a web browser.	Ekopedia Familypedia Wikipedia
Widgets/badges/gadgets/buttons	Small applications that can be easily shared or embedded in other sites.	

Due to the rapid expansion of new technology developments, the role and importance of social media is continuously increasing. Although Facebook, Twitter and YouTube are still the most important and popular platforms of social media, health organisations need to pay attention to other options in order to increase the level of engagement - social networking sites and photo/video sharing sites are the most important channels despite the higher engagement level of virtual reality systems. Moreover, it is interesting that the popularity of microblogs (e.g. Twitter) is higher than blogs in spite of the character limits. Hence, consumers like short and clear messages rather than long stories. Despite the many opportunities and various advantages it offers, there are some drawbacks social media possesses in terms of health awareness communication. In addition to, presence of these limitations is a general phenomenon, not platform-specific characteristics. Table 2 summarises the most important opportunities and limitations that social media have in terms of health communication:

Table 2: Opportunities and limitations of social media

Opportunities	Limitations
Can increase the timely dissemination and potential impact of health and safety information	Resource availability, capacity
More diverse target audience regardless time and location	Lack of control, danger of misinformation due to anonymity
Facilitate the information sharing	Lack of trust and credibility
Easily targeted and personalised health messages	Limitations of space (e.g. character limit)
Facilitate interactivity, online connection and public engagement, thus, create health awareness	Overcrowded platforms
Empower customers to make healthier decisions	Limited audience

- Development of knowledge based tools

Health organisations aim to reach their target groups with their key messages in order to disseminate their knowledge – in other words, make explicit knowledge from their tacit knowledge. Michael Polanyi, a Hungarian economist, chemist and philosopher was among the earliest theorists who popularized the above-mentioned concept of characterizing knowledge as tacit or explicit which is known as the de facto knowledge categorization approach. (Bali and Dwivedi, 2007)

In order to effectively develop a knowledge-driven framework and template, it is crucial to collect all available information, previous experiences and results of brainstorming. Mind map is a suitable tool for the visual representation of all collected and selected pieces of knowledge which can help us in creating knowledge based template and framework. A mind-map is an image-centred, radial diagram that illustrates semantic or other relationships between portions of learned material hierarchically (Buzan, 1991).

This study is intended to provide a well-organised tool which can help in creating a health awareness knowledge template and also the health awareness knowledge management framework. The extensive literature review is a good starting point, however, real industrial experiences and good practices are also necessary to create these knowledge based tools.

Therefore, good practices are collected from the following organisations via their available social media toolkits:

- Centers for Disease Control and Prevention, Office of the Associate Director for Communication
- NHS Employers
- Cancer Research UK
- Toronto Public Health
- AMC Research Center
- International Center for Alcohol Policies

These good practices are also used in creating the above-mentioned mind map.

Figure 5 presents first level of health awareness knowledge management mind map based on the literature and real industrial experiences.

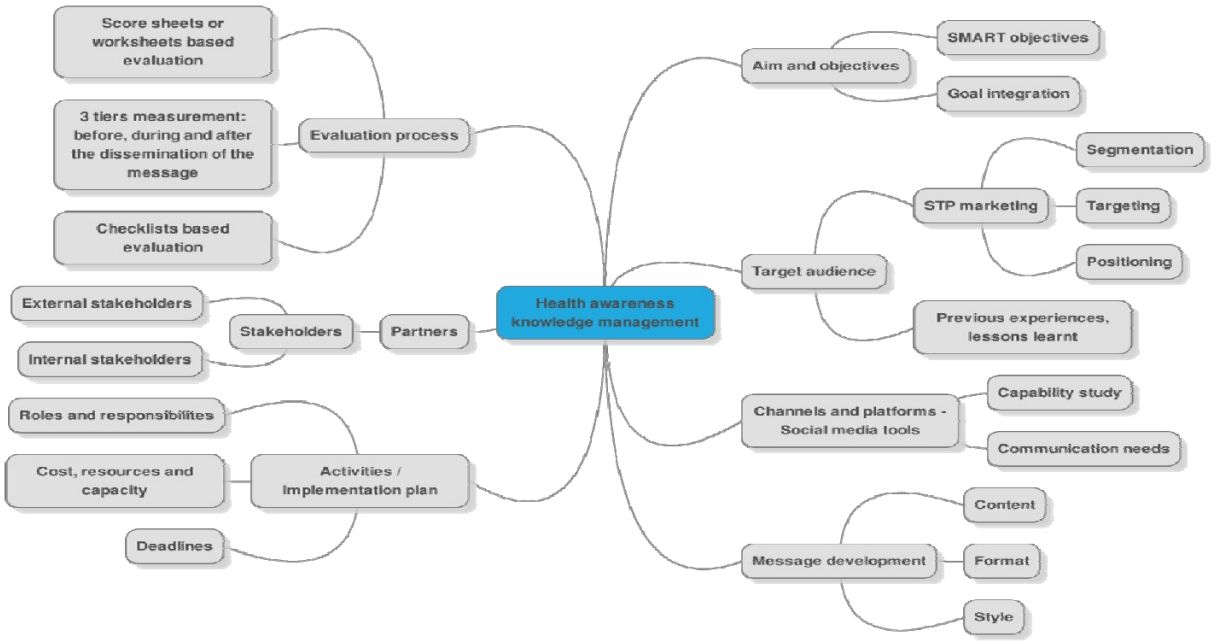


Fig. 5: First level of mind map managing the health awareness knowledge

The key components of the health awareness knowledge management process identified from literature review and industrial experiences are the aim and objectives, target audience, channels and platforms, message development, activities, partners and evaluation. According to these components a well-structured A3 template is developed to represent visually the health message development and dissemination process. The idea of the template derives from A3 thinking and its purpose is to provide a deep, fact-based understanding of the process that can be easily shared with others and evaluated for the future improvements.

This tool should be used in A3 size in order to help the health organisations in better understanding of customers, the message development process and also in documentation. The customised A3 template consists of three different part reviewing the message development process (separated by columns):

- before the message development (1st column),
- during the message development and dissemination (2nd column),
- after the message dissemination (3rd column).

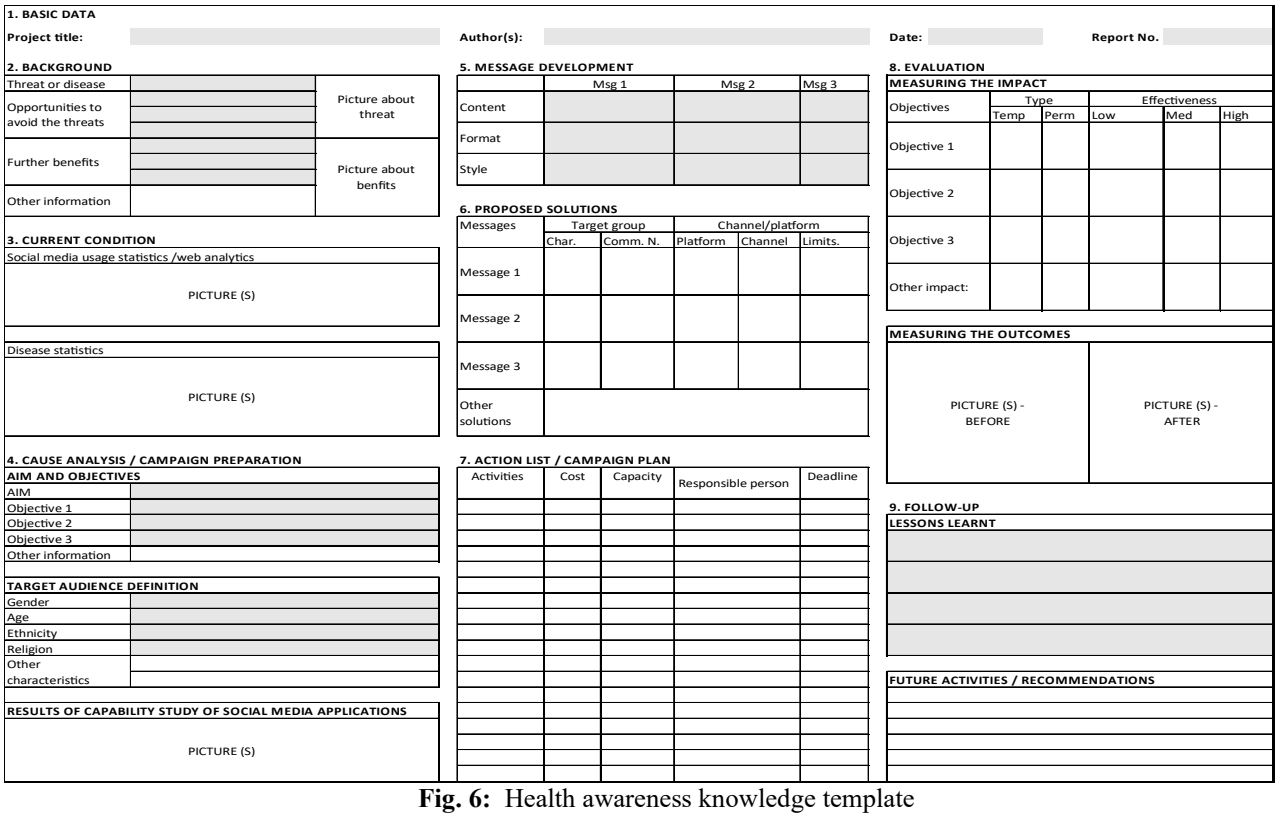


Fig. 6: Health awareness knowledge template

As a result of the extensive literature review, the comprehensive mind map and well-structured template the author was able to identify the generic process of the health awareness message development and dissemination with its key activities (HAKM framework) as can be seen also in Figure 7:

1. Assess the situation
2. Acquire the knowledge
3. Develop key messages
4. Plan the message dissemination
5. Pass the message(s)
6. Evaluate the work
7. Follow-up
8. Further PDCA (Plan-Do-Check-Act)

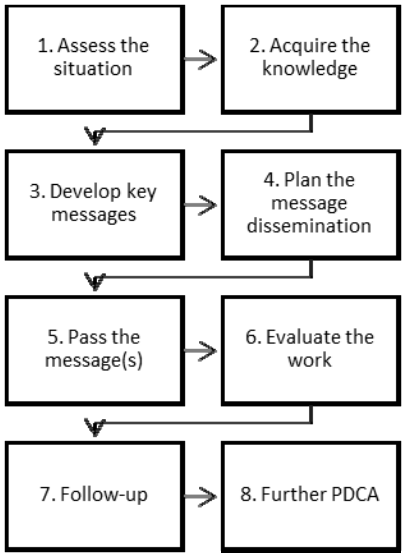
HAKM (Health Awareness Knowledge Management) Framework	
Objective	Based on the literature review, the discussions with my supervisor, my previous learnings in knowledge management and the good practices of health organisations a simplified framework has been developed in order to manage the health awareness knowledge.
Process steps	

Fig. 7: HAKM framework – generic process

The logic of the framework is the following:

- Each main step consists of different sub-steps with own objectives.
- Each level of the framework describes the objective of that particular level or step, the process steps, and the different tools and methods can be used to reach the output of that particular level. Example is shown by Figure 8:

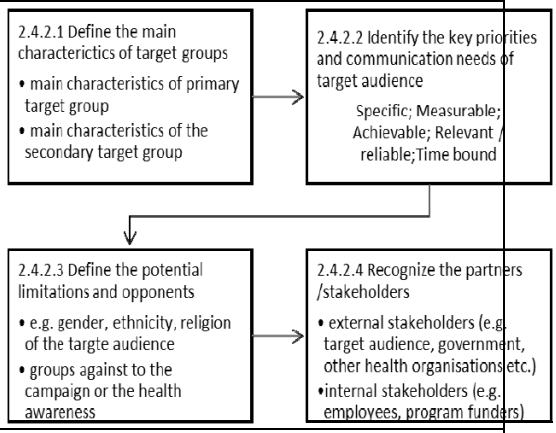
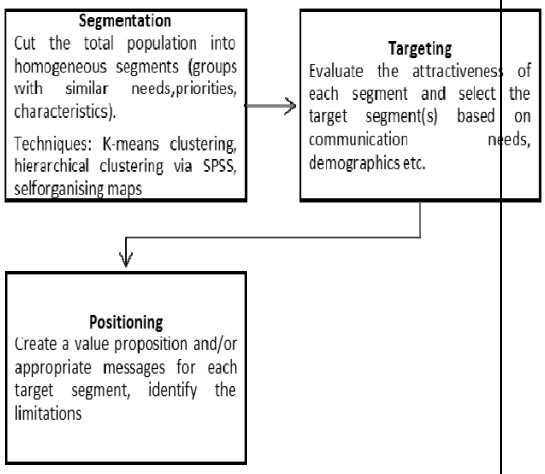
STEP 2.4.2: IDENTIFY THE TARGET AUDIENCE	
Objective	To identify and know the different target groups (primary and secondary target groups) in order to disseminate effectively the key messages of the organisation.
Process steps	
Tools and methods	Target audience definition: • via STP marketing:  • based on previous experiences, expert opinions, lessons learnt. Communication needs definition: • based on market research: o secondary market research: web analytics, statistics o primary market research: focus groups or consultations, surveys and questionnaires, in-depth interviews • based on previous experiences, expert opinions, lessons learnt.
Output (s)	Target audience characteristics

Fig. 8: HAKM Framework – Step 2.4.2.

- there are different relationships between A3 template and HAKM framework in some level – relations are signed in HAKM framework levels as it can be seen for example in Figure 9:

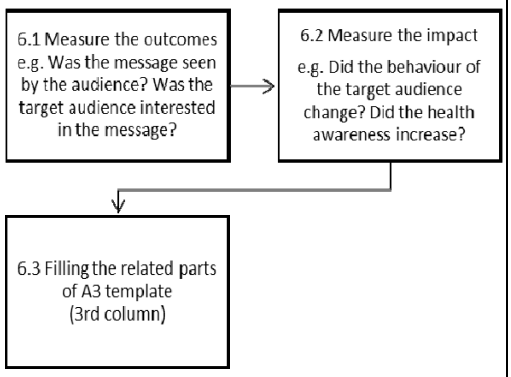
STEP 6: EVALUATE THE WORK	
Objective	To evaluate and measure the outcomes and impacts of the project (campaign) on health awareness and behaviour (or habits) of the public.
Process steps	
Tools and methods	Measuring the outcomes: scoresheets, worksheets, checklist, statistics: number of likes, shares and comments Measuring the impacts: 3-tiers measurement (before, during, after) through focus groups (using the same groups during the total process), surveys for pre-tests and post tests, in-depth interviews
Output (s)	Evaluation report

Fig. 9: HAKM Framework – Step 6.

Conclusions

Based on the literature review there is not a well-structured and generic process model or framework for health awareness knowledge management. Although various industrial experiences are available or acquired during the project, they do not show total identity apart from the basic ACME framework (that is very similar in case of other awareness management). Despite the many opportunities and various advantages that social media offers, there are some drawbacks it possesses in terms of health awareness communication. Health organisations need to know about limitations as well as opportunities during the preparation of health message dissemination as the engagement level of consumers can be increased exponentially by a detailed capability study and well-organised preparation. In order to represent visually all the available and acquired knowledge, a well-structured A3 template and HAKM framework were developed as standard formats of the health message development and dissemination process. With these tools, knowledge can be easily acquired, evaluated and illustrated to others.

In future work, a representative research is planned which examines the consumer behaviour in terms of health awareness. Moreover, based on the developed framework it is highly recommend to create a computer-assisted message design and authoring system that can identify the elements of the message content (according to the first part of designed A3 template), and develop the most suitable message(s) for the target audience.

References

AMC Cancer Research Center, Centers for Disease Control and Prevention (1994), Beyond the Brochure: Alternative Approaches to Effective Health Communication, Denver, CO USA: The Center, 74 p.

Bali, R.K. and Dwivedi, A.N. (2007), '*Healthcare Knowledge Management: Issues, Advances and Successes*', Springer

Brodalski, D., Brink, H., Curtis, J., Diaz, S., Schindelar, J., Shannon, C. and Wolfson, C. (2011), *The Health Communicator's Social Media Toolkit*, Atlanta, GA USA: CDC Electronic Media Branch

Buzan, T. (1991), *Use both sides of your brain: new mind-mapping techniques*, New York: Plume Books

Cancer Research UK (2009), *Design your own health campaign*, Aberdeen: Cancer Research UK

ConocoPhillips Company (2006), 'Sustainable Development Report', p.5, Available at: http://www.sgcc.com.cn/csr/gwqy/images/20071227/7236.pdf (Access on: 30.03.2016)

Dannenberg, A.L., Frumkin, H. and Jackson, R.J. (2011), '*Making healthy places: designing and building for health, well-being, and sustainability*', Washington D.C.: Island Press

Davies, J., Dhaliwal, M., Brankley, L., McColl, K., Mai, D. and Williams, M. (2014), *Social Media Toolkit for Ontario Public Health Units*, Guelph, Ontario: Wellington Dufferin-Guelph Public Health

Hegyesné Görgényi, É. (2015), 'Managing the health awareness knowledge via the advanced use of social media applications' Unpublished dissertation

Kaplan, A.M. and Haenlein, M. (2010), 'Users of the world, unite! The challenges and opportunities of Social Media', *Business Horizons*, 53 (1), pp. 59-68

Lapointe, L., Ramaprasad, J and Vedel, I. (2014), 'Creating health awareness: a social media enabled collaboration', *Health and Technology* 4 (1), pp. 43-57

McMichael, A.J. (2006), 'Population health as the 'bottom line' of sustainability: a contemporary challenge for public health researchers', *European Journal of Public Health*, 16 (6), pp.579-582

Morrison, F.P., Kukafka, R. and Johnson S.B. (2005), 'Analyzing the Structure and Content of Public Health Messages', *AMIA 2005 Symposium Proceedings*, pp. 540-544

NHS Employers (2014), A social media toolkit for the NHS, London: NHS Confederation

Noar, S.M., (2011), 'An Audience-Channel-Message-Evaluation (ACME) Framework for Health Communication Campaigns', *Health Promotion Practice*, 13 (4), pp. 481-488

Robinson, M.N., Tansil, K.A., Elder, R.W., Soler, R.E., Labre, M.P., Mercer, S.L., Eroglu, D., Baur, C., Lyon-Daniel, K., Fridinger, F., Sokler, L.A., Green, L.W., Miller, T., Dearing, J.W., Evans, W.D., Snyder, L.B., Viswanath, K.K., Beistle, D.M., Chervin, D.D., Bernhardt, J.M., Rimer, B.K. and the Community Preventive Services Task Forces (2014), 'Mass Media Health Communication Campaigns Combined with Health-Related Product Distribution', *American Journal of Preventive Medicine*, 47 (3), pp. 360-371

Ryan, D. (2014), *Understanding digital marketing: marketing strategies for engaging the digital generation, 3rd edn.* London: Kogan Page

Shediac-Rizkallah, M.C. and Bone, L.R. (1998), 'Planning for the sustainability of community-based health programs: conceptual frameworks and future directions for research, practice and policy', *Health Education Research*, 13 (1), pp. 87-108

Sobek, D.K. and Smalley, A. (2008), *Understanding A3 thinking*, New York: Productivity Press

WCED (1987), Report of the World Commission on Environment and Development: Our Common Future, p. 43.

WHO (2015), Health Impact Assessment, Available at: http://www.who.int/hia/evidence/doh/en/ (Access on: 22 March, 2016)

RECEIVED: 1 June 2016 **ACCEPTED: 20 October 2016**

Éva Görgényi-Hegyes – a graduated MSc student in a double degree program – MSc in Marketing at Szent Istvan University, Hungary and MSc in Knowledge Management for Innovation at Cranfield University, United Kingdom. BSc degree is in International Business Economics from Budapest Business School, Hungary. Éva has more than 4 years of work experience in marketing department as a product manager within different industries. Tel.: +36 30 257 2780; e-mail: gorgenyieva@gmail.com

Mária Fekete-Farkas, PhD, Habil, Professor, Szent István University, Faculty of Economic and Social Sciences, Institute of Economics, Law and Methodology, Field of scientific research: sustainable development, valuation and management of production factors, focusing on natural resources, H-2100 Gödöllő, Páter Károly u. 1, Hungary, Tel.: +36-20-970-4987; Fax: +36-28-522-912, e-mail: Farkasne.Fekete.Maria@gtk.szie.hu

Vadyba
Journal of Management
2016, № 2(29)
ISSN 1648-7974

CHARACTERISTICS OF SMALL BUSINESS IN LATVIA

Yuri Kochetkov, Elena Sventitskaya
Baltic International Academy, Riga

Annotation
In developed countries, particular attention was devoted to small businesses. This was demonstrated by special conferences organized by the White House of the United States on the issues of small businesses in 1980 and 1986, thanks to which the Congress amended the law to facilitate the development of small businesses. Small and micro businesses are one of the leading sectors defining the rate of economic growth, the state of employment, structure and quality of the gross national product and, as a consequence, economic independence and security of the country. According to Eurostat data, about 99 % of the enterprises of the European Union are referred to the category of micro and small businesses, which provide two-thirds of jobs in the private sector. Small and micro companies make up 98–99 % of all enterprises in Latvia. The objectives of the article are to identify and specify the main features of the development of small business in Latvia. The novelty of the article is that the features of the functioning of micro and small enterprises in Latvia's economy have been investigated for the first time under the conditions of the global financial crisis and its aftermath. The goal of the research is to analyze the functioning of small and micro businesses in Latvia, determine their impact on the main macroeconomic indicators of the national economy and develop recommendations for improving the business conditions of small companies. Methods of research: analysis of statistical data, mathematical modelling, correlation and regression analysis. The comparison of the main statistical indicators of small business functioning in Latvia with that of the EU developed countries indicates that small business is not given due attention in Latvia and this causes it to lag. To accelerate the pace of economic development, eliminate the imbalance in the development of territories, implement innovations and fight against poverty, it is necessary to stimulate the establishment of new small enterprises.
KEY WORDS: micro and small enterprises; mathematical modelling.

Introduction

It is known that many ancient nations, for example, the Egyptians, Greeks, Romans, Phoenicians and others run a small business successfully. Thanks to the commodities they had produced and trade for more than 4 thousand years, in the countries at that time the civilization began spreading and scientific achievements developing. In our time, the role and importance of small business began rising especially in the second half of the 20th century. This was encouraged by the release of new products and creation of new jobs by small businesses. In developed countries, particular attention was devoted to small businesses. This was demonstrated by special conferences organized by the White House of the United States on the issues of small businesses in 1980 and 1986, thanks to which the Congress amended the law to facilitate the development of small businesses (White House…1980, McDonald 1984). For example, the Small Business Innovation Act and Regulatory Flexibility Act were proclaimed, which contributed to the account of the interests of small businesses in the federal institutions and the allocation of funds for research and development activities of small businesses. Even earlier, in the mid-twentieth century, the Small Business Administration (SBA) was created in the United States to assist in the development of small businesses. Many universities began educating specialists in the field of small businesses; scientific journals devoted to the problems of small businesses began to be published. In the US, about half of the country's labor force is employed in small businesses (U.S. Small…1988). Therefore, a small business is vital to the development of the national economy as a whole.

In modern conditions, the economic stability of development of any country is impossible without the functioning of micro and small businesses. Due to specific conditions of the country, the nature of small business may vary. Small and micro businesses are one of the leading sectors defining the rate of economic growth, the state of employment, structure and quality of the gross national product and, as a consequence, economic independence and security of the country. The development of micro and small businesses meets the global trends towards the formation of flexible mixed economy, combination of different forms of ownership and management models. The presence of a well-developed small business sector dramatically increases the employment growth, which is especially important in conditions of economic restructuring and structural unemployment accompanying this process. In this regard, micro and small businesses are the basis for the market economy of any developed country.

Small business objectively exists and develops as a relatively independent sector of the modern market economy, involving the coexistence and cooperation of enterprises of different types and sizes. While large business provides the basic needs of the national economy using the effect of economies of scale, small businesses occupy a niche in the market, satisfying local demand or specific requirements for specialized products and services, including in the sphere of innovation (Siropolis 1990). For example, General Motors Co. buys components for its products from more than 30 thousand suppliers, most of which are small businesses. This is mainly explained by economic considerations and customer requirements.

Subject and relevance. In market conditions large enterprises form the market environment, and small businesses adapt to it. Small companies lack detailed strategic plans; therefore, even the most important decisions are often made situationally. Low level of strategic thinking has the most negative effect in the first years of the existence of small businesses, when in fact the need for goods and services they offer is verified. If a small business has found its niche, in the future it will be necessary to maintain a steady-state mode of operation based on standard operative decisions. Such processes take place in the most developed countries of the world. For example, in the U.S. only half of small businesses exist one and a half years, and only 20 % of them operate up to 10 years (Siropolis 1990). The main cause of such business failure is considered to be poor governance: lack of management experience, business incompetence, lack of experience in the industry, etc.

A number of studies refer to small business as to an activity carried out by a relatively small group of persons, or an entity managed by a single owner. As a rule, the most common criteria indicators, based on which the actors of the market economy belong to small business, are the number of employees, the size of the authorized capital, the value of assets, the volume of turnover (profit, income) and others. According to World Bank data, the total number of indicators by which enterprises are considered small businesses, exceeds 50. The most commonly used criteria are the following: the average number of persons employed by the enterprise, the annual turnover and the value of assets. However, in almost all developed countries, the main criterion for classifying enterprises as small ones is a number of employees. According to Eurostat data, about 99 % of the enterprises of the European Union are referred to the category of micro and small businesses, which provide two-thirds of jobs in the private sector (Eurostat 2016).

According to the Commission Regulation (EC) 364/2004 of 25 February 2004, in Latvia businesses are divided into the following groups.

Micro businesses

- the maximum number of employees – 9;
- the annual turnover and / or annual balance sheet do not exceed the total amount of € 2 million.

Small businesses

- the maximum number of employees – 49;
- the annual turnover and / or annual balance sheet do not exceed the total amount of € 10 million.

Medium-sized enterprises

- the maximum number of employees – 249;
- the annual turnover sheet does not exceed € 50 million and / or annual balance sheet does not exceed € 43 million.

In other parts of the world, it may be different. For example, in the United States, the maximum number of employees at small companies is 500 people.

Small and micro companies make up 98–99 % of all enterprises in Latvia. The simplicity of the organizational structure, personal involvement and interest of a chief executive in all the activities of the company are the most typical features of small enterprises in the Republic of Latvia. Particular characteristic of management of small company is that a chief executive can and should take responsibility for solving most problems. In a market economy, a small company as compared with a large company is characterized by a relatively large proportion of living labor costs per unit of output. Small businesses are "inclined" to the laborious work of middle- and low-skill workers. Therefore, to maintain competitiveness, small businesses are forced, on the one hand, to save on wages, on the other, to increase worker productivity. Solving the first problem, entrepreneurs face difficulties in recruiting highly qualified personnel, which is a clear disadvantage for the company's development. Solving the second problem, entrepreneurs strive to increase the degree of involvement of employees in the enterprise activities, creating a special type of intra-relations of people as members of the "big family". In this regard, a majority of workers are employed by small enterprises on a permanent basis, while in developed countries temporary employment is more widespread (CSB 2008).

The tasks of the article are to identify and specify the main features of the development of small business in Latvia. *The novelty of the article* is that the features of the functioning of micro and small enterprises in Latvia's economy have been investigated for the first time under the conditions of the global financial crisis and its aftermath. *The object of the research* is a cluster of Latvian companies that are referred to micro and small businesses. *The goal of the research* is to analyze the functioning of small and micro businesses in Latvia, determine their impact on the main macroeconomic indicators of the national economy and develop recommendations for improving the business conditions of small companies. *Methods of research:* analysis of statistical data, mathematical modelling, correlation and regression analysis.

Computations and analysis

Within the framework of the research, all calculations and analyses were carried out according to the data of the Central Statistical Bureau (CSB) of Latvia (CSB 2016). Number of enterprises relating to micro enterprises increased in the period from 2005 to 2014 in spite of the global financial and economic crisis of 2008–2010 (Fig. 1, Table 1). The exception was only the year 2011, when the number of micro enterprises declined slightly (by 4 %) compared to 2010. According to the CSB of Latvia, micro enterprises represent manufacturing and construction sectors, and small enterprises represent all sectors of the national economy. Diagrams related to micro enterprises are marked with the letter "A" in the article, while the diagrams related to small enterprises are marked with the letter "B". After 2008, due to the global crisis, the number of small enterprises decreased dramatically by 25.6 % in 2009. Then, since 2010 the number of small enterprises has been slowly increasing. According to the calculations, in 2014 the total number of small enterprises in Latvia was about 12 per thousand people, which was much less than in developed countries. For example, according to the official statistics at the beginning of the 21st century in the EU, on average, there were 30 enterprises per thousand people.

Table 1. The results of computation of factor dependence

No	Dependence, years	Regression equation y=f(x)	R - squared	Correlation coefficient **r**	Fisher Statistics		DW statistics
					F act.	F crit.	
1.	Change in the number of micro (A) enterprises, Fig. 1. (2005-2014).	y = 882.65x + 7443.8	0.9473	0.9733	143.85	5.32	1.6568
2.	Change in the production value of micro (A) enterprises, Fig. 3. (2009-2014).	y =111920x+ 1E+06	0.8847	0.9406	30.71	7.71	2.2163
3.	Change in the production value of small (B) enterprises, Fig. 3. (2009-2014).	y =220559x+ 2E+06	0.8914	0.9441	32.83	7.71	1.8611
4.	Change in personnel costs at micro (A) enterprises, Fig. 4. (2009-2014).	y = 20930x+ 49630	0.7902	0.8889	15.06	7.71	1.3976
5.	Change in personnel costs at small (B) enterprises, Fig. 4. (2009-2014).	y = 22373x+ 245157	0.7363	0.8581	11.17	7.71	1.4514
6.	Changes in the number of persons employed by micro (A)enterprises, Fig. 5. (2005-2014).	y = 928.32x+ 26581	0.4681	0.6841	7.04	5.32	1.7645
7.	The relationship between GDP and the production value of micro (A) enterprises, Fig. 6. (2008-2014).	y = 9.2078x+ 7E+06	0.9391	0.9691	77.05	6.61	2.5384
8.	The relationship between GDP and the production value of small (B) enterprises, Fig. 7. (2008-2014).	y = 4.9564x+ 8E+06	0.9633	0.9815	131.34	6.61	2.0573
9.	Changes in the share of production value of A and B enterprises to GDP, Fig. 8. (2009-2014).	y = 0.5592x+ 16.666	0.699	0.836	9.29	7.71	1.686
10.	The relationship between the unemployment rate and the total number employed by A and B enterprises, Fig. 9. (2005-2014).	y = -0.0002x+ 49.4	0.829	0.910	38.78	5.32	0.9565

Thus, micro enterprises in comparison with small enterprises were more resilient to the global economic cataclysm. The coefficient of determination of the calculated regression equation $R^2 = 0.9473$ indicates that the equation explains almost 95 % of the variation in the number of micro enterprises in the period under consideration (Table 1). Consequently, the correlation coefficient r = 0.9733 indicates strong correlation dependence of the number of micro enterprises on time. Testing the resulting regression equation by the Fisher's exact test showed its statistical significance and the possibility of its practical application ($F_{act.} > F_{crit.}$). The dependences investigated in the article are related to time series. Therefore, all regression equations calculated within the framework of the research were tested for the absence of first-order residual autocorrelation by Durbin-Watson (DW) test at a significance level of $\alpha = 0.05$. If the criterion fell in the zone of uncertainty, the graphic residue analysis was performed. In all cases, it was found that first-order residual autocorrelation was absent.

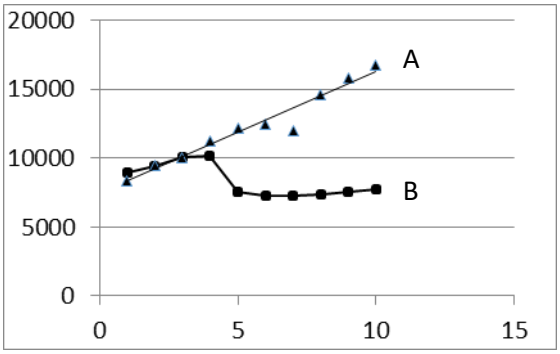


Fig. 1. Changes in the number of micro (A) and small (B) enterprises, 2005 – 2014. The OX axis: 1 – 2005; 2 – 2006; ... 10 – 2014.

If we consider the changes in turnover of micro and small enterprises, it can be stated that during the global crisis these changes differed in the two groups of enterprises (Fig. 2). Due to the crisis, micro enterprises experienced 28 % decrease in turnover in 2009 compared to 2008. In the same period of time, in small enterprises a decrease in turnover accounted for 35.84 %, which was even more significant. In 2012, both groups of enterprises almost achieved the pre-crisis level of turnover. According to the volume of turnover of micro enterprises, the CSB of Latvia took into account the results of the companies in the manufacturing and construction sectors. Statistics on small enterprises comprised all sectors of the national economy similar to data on the number of enterprises. Regression and correlation analysis performed to establish the dependence of turnover of micro and small enterprises on time showed the inability to use directly proportional linear relationships. Thus, for micro enterprises the estimated value of Fisher's criterion $F_{act.}$ was 3.22, and the critical value $F_{crit.}$ was 5.32 ($F_{act.} < F_{crit.}$). Consequently, the regression equation was not statistically significant. In that case, it was also impossible to use the regression equation due to the low value of the coefficient of determination $R^2 = 0.287$. In general, it can be stated that the total turnover of small enterprises over the period under consideration exceeds more than 7.5 times the turnover of micro enterprises.

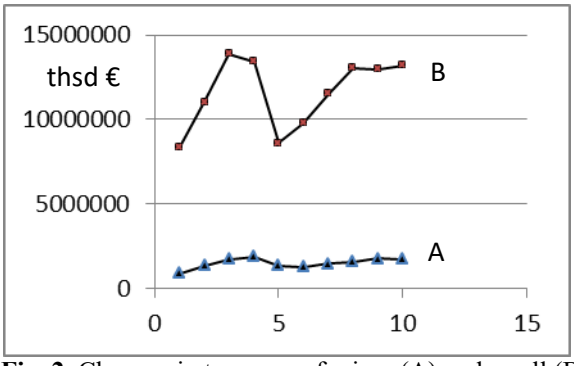


Fig. 2. Changes in turnover of micro (A) and small (B) enterprises, 2005 – 2014. The OX axis: 1 – 2005; 2 – 2006; ... 10 – 2014.

Due to the global economic crisis of 2008–2010, in Latvia both micro and small enterprises experienced a sharp decline in the production value. In 2009, the production value of Latvian micro enterprises decreased by 34.2 %, i.e. more than one-third, compared to 2008. At the same time, the production value of small enterprises decreased by 37.5 %. Since 2010, growth of production volume has resumed in both sectors of the economy under consideration (Fig. 3). According to the CSB of Latvia, by the production value manufacturing and construction sectors are represented in both sectors of small business. Statistical data were used to calculate regression equations of changes in the production value for micro and small enterprises in the period of 2009–2014 (Table 1). The coefficients of determination were obtained respectively for micro enterprises $R^2 = 0.8847$ and for small enterprises $R^2 = 0.8914$. Thus, the obtained equations explain almost 90 % of the variation in the production value in the given period of time, which is a good indicator. The calculated actual Fischer's criteria considerably exceed critical values. Therefore, the equations are statistically significant and can be used to draw practical conclusions. The correlation coefficients for micro (r = 0.940) and small (r = 0.944) enterprises are sufficiently high, which indicates strong linear dependence of the production value on time.

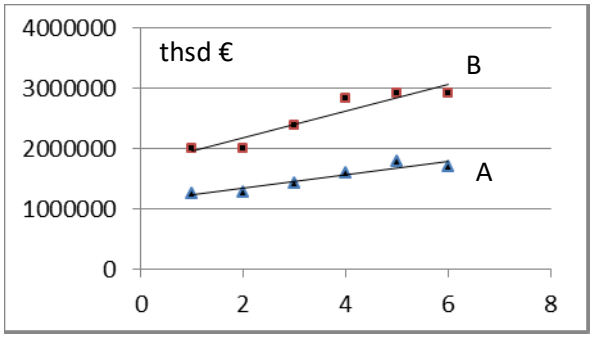


Fig. 3. Changes in the production value of micro (A) and small (B) enterprises, 2009 – 2014. The OX axis: 1 – 2009; 2 – 2010; ... 6 – 2014.

The databases of the CSB of Latvia provide information on the personnel costs of micro and small enterprises in the manufacturing and construction sectors. As it was expected, in the period under consideration from 2008 to 2014 changes in personnel costs were similar to that in the production value at the same time.

Thus, in 2009 due to the crisis personnel costs of micro-enterprises decreased by 29.2 % compared to 2008, and at the same period of time personnel costs of small enterprises decreased by 34.3 %. Since 2010, the growth of personnel costs has resumed in both sectors of small business (Fig. 4). Statistical data were used to calculate regression equations of changes in personnel costs in the sectors of small business in the period from 2009 to 2014 (Table 1). The following coefficients of determination were obtained: R^2 = 0.7902 and R^2 = 0.7363 for micro and small enterprises, respectively. These equations explain respectively 79 % of the variation in personnel costs for micro enterprises in the given period of time, and almost 74 % of the variation in personnel costs for small businesses. According to calculations, the actual values of the Fisher's criteria exceed the corresponding critical values. Therefore, the equations are statistically significant and useful for drawing practical conclusions. The following correlation coefficients were obtained: r = 0.8889 and r = 0.8581 for micro and small enterprises, respectively. This indicates strong linear directly proportional dependence of personnel costs on time in the period from 2009 to 2014.

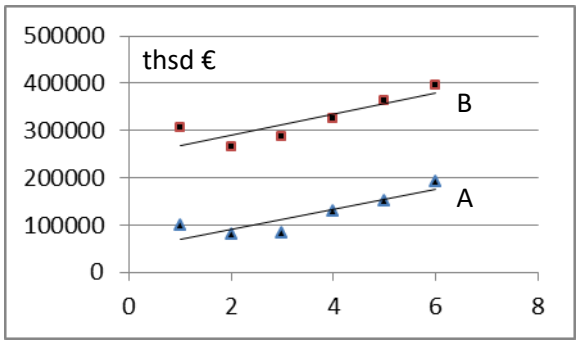


Fig. 4. Changes in personnel costs at micro (A) and small (B) enterprises, 2009 – 2014. The OX axis: 1 – 2009; 2 – 2010; ... 6 – 2014.

Due to the financial and economic crisis, the number of persons employed in small business decreased but in different ways at micro and small enterprises. For example, from 2005 to 2007, before the crisis, the number of persons employed by small enterprises had been increasing. But after 2008 it declined sharply – by 25.4 % in 2009. The growth of the number of persons employed by small enterprises has resumed since 2011. At the same time, in 2009 the number of persons employed by micro enterprises decreased by 4.3 % compared to 2008. In general, in the period from 2005 to 2014 the number of persons employed by micro enterprises changed insignificantly; despite the crisis, it even gradually increased (Fig. 5). The regression equation was used to estimate the number of persons employed by micro enterprises; the coefficient of determination was small R^2 = 0.4681 (Table 1). Although the obtained regression equation explains only about 47 % of the variation in the number of persons employed by micro enterprises, according to Fisher's exact test, the equation is statistically significant: $F_{act.} > F_{crit.}$, and can be used for drawing practical conclusions. Thus, the obtained equation reliably enough characterizes the current trends towards the growing number of persons employed by micro enterprises. The calculated correlation coefficient r = 0.6841 indicated a moderate degree of direct linear relationship between the number of persons employed by micro enterprises and time in the period under examination.

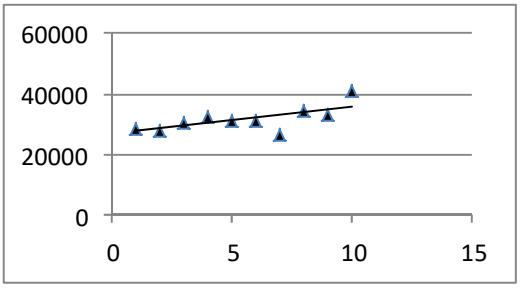


Fig. 5. Changes in the number of persons employed (the OY axis) by micro enterprises, 2005 – 2014. The OX axis: 1 – 2005; 2 – 2006; ... 10 – 2014.

Production value of micro and small businesses exerts quite a significant impact on gross domestic product (GDP) of Latvia. To determine the extent of this impact, the regression and correlation analysis of the relationship of these factors was performed using the data of the CSB of Latvia. The author used statistical data on GDP and the available data on the production value in the manufacturing and construction sectors for micro and small enterprises in the period of 2008–2014. The calculations revealed that between the production value of micro enterprises and GDP there was a positive direct linear relationship (Fig. 6).

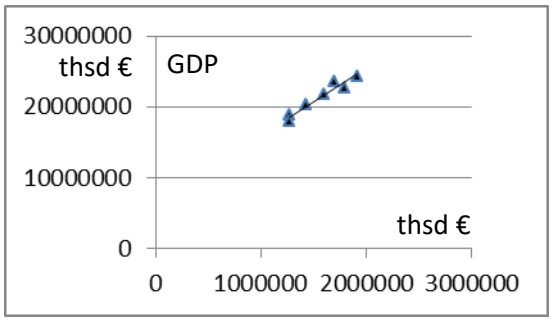


Fig. 6. The relationship between Latvia's GDP and the production value of micro enterprises, 2008 – 2014.

As the coefficient of determination R^2 was 0.9391, the approximation quality was very good (Table 1). Analysis of variance showed that the observed actual value of Fischer's criteria significantly exceeded a critical value. The obtained regression equation is statistically significant and can be used for practical conclusions. The calculated value of the correlation coefficient r = 0.9691 indicated a strong degree of linear relationship between the GDP and the production value of micro enterprises. The same situation was observed in relation to the impact of production value of small enterprises on GDP (Fig. 7). The coefficient of determination R^2 = 0.9633 indicated very good approximation quality (Table 1). The regression equation was also statistically significant according to Fisher's criterion: $F_{act} > F_{crit}$ and suitable for the analysis. The correlation coefficient r = 0.9815 also indicated a strong degree of linear relationship between

GDP and the production value of small enterprises. Thus, it can be stated that Latvia's GDP is closely correlated with the production of small and micro businesses, and, to a large extent, its growth depends on the success of small and micro enterprises.

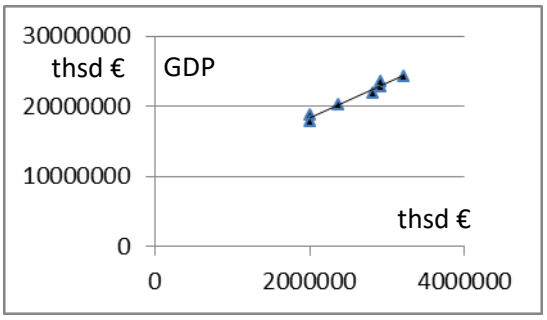


Fig. 7. The relationship between Latvia's GDP and the production value of small enterprises, 2008 – 2014.

The paper presents the study of changes in the amount of interest, which is the ratio of total production value of small businesses to Latvia's GDP in the period of 2008–2014. It was found out that on the eve of the financial crisis of 2008, the share of the total production value of small business to GDP was 21.14 %. In 2009, the share decreased by 3.73 %. In subsequent years, it began increasing. The regression equation obtained as a result of calculations showed directly proportional linear relationship (Fig. 8, Table 1).

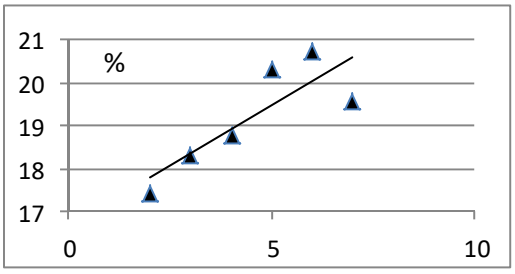


Fig. 8. Changes in the share (%) of production value of micro and small enterprises to Latvia's GDP, 2009 – 2014. The OX axis: 2 – 2009,…7 – 2014.

The coefficient of determination R^2=0.6990 indicated good enough approximation. Approximately 70 % of variation in the share of production value of small business to GDP is explained by the obtained equation. The observed actual value of Fisher's criterion exceeded the critical value. Therefore, the equation was suitable for trend analysis. The correlation coefficient r=0.8361 indicated a strong degree of direct linear relationship between the amount of interest and time in the period under examination. Therefore, it can be stated that the total production value of micro and small businesses is about 18–20 % of GDP in Latvia, and its value tends to rise. This indicator is significantly lower than in the developed EU countries, where the share of the production value of small business accounts for, on average, about 70 % of GDP.

In all countries, the development of small business helps reduce the unemployment rate. In order to establish the relationship between the level of unemployment in Latvia and the number of persons employed by micro and small enterprises, the author performed the regression and correlation analysis of the relationship between these factors in the period of 2005–2014. The increase in the total number of persons employed by small businesses was found to be quite significant and inversely proportional to the unemployment rate (Fig. 9, Table 1).

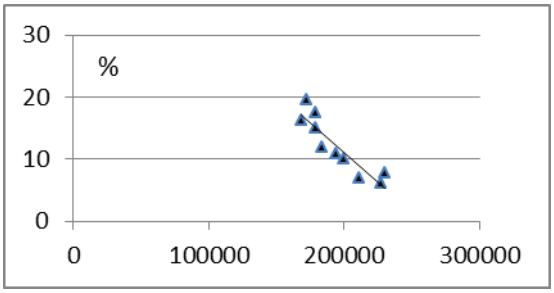


Fig. 9. The relationship between the unemployment rate and the total number of persons employed by micro and small enterprises, 2005 – 2014.

The coefficient of determination R^2=0.8290 indicated very good approximation quality. About 83 % of the variation in the unemployment rate caused by the change in the number of persons employed by small businesses was explained by the obtained regression equation. The observed actual value of Fisher's criterion was significantly greater than its critical value. Consequently, the obtained equation was suitable for analysis. The correlation coefficient r = - 0.9105 indicated a strong degree of linear inverse relationship between the level of unemployment and the number of persons employed by small businesses. Thus, the development of small business in Latvia will help reduce the unemployment rate, increase employment of population and facilitate the return of economic immigrants to Latvia.

Conclusions

Although a certain number of small businesses operate in Latvia, by the number of such enterprises per 1000 people Latvia lags behind the leading EU countries by almost 3 times. The global financial and economic crisis of 2008–2010 exerted a negative impact on small enterprises. Micro enterprises with up to 9 persons employed suffered this crisis more successfully than small businesses employing from 10 to 49 people. A number of micro enterprises and their turnover during the crisis fell to a much lesser extent in comparison with small enterprises. During the crisis, the production value and personnel costs fell in small businesses, but in micro enterprises these indicators were better. During the crisis, the number of persons employed by small enterprises fell more than in micro enterprises. The total number of persons employed by small businesses in Latvia, as a percentage of total employment in the country, lags behind that in the developed countries of the EU by more than 3 times. The same relationship holds for the share of production value of small business to Latvia's GDP – this share is 3 times less than in the developed European countries. Small business development in Latvia and increase in the number of persons employed by small

enterprises significantly reduce the unemployment rate in the country.

The comparison of the main statistical indicators of small business functioning in Latvia with that of the EU developed countries indicates that small business is not given due attention in Latvia and this causes it to lag. Opportunities of small business in Latvia are neither exhausted nor used to a sufficient extent. To accelerate the pace of economic development, eliminate the imbalance in the development of territories, implement innovations and fight against poverty, it is necessary to stimulate the establishment of new small enterprises. This should become one of the priority areas of economic development of the country and increase its competitiveness. Taking into account the limited resources and opportunities to support business in Latvia, it is necessary to identify the main development areas of small business in regions and provide targeted assistance to it.

References

Central Statistical Bureau (CSB) of Latvia. (2008). *Statistics of the Small Enterprises in Latvia,* vol. 1, 2. Riga.

Central Statistical Bureau of Latvia. (2016). Statistics Database. [revised 2016.07.25.], http://www.data.csb.gov.lv/Table.

Eurostat. (2016). Statistics Database. [revised 2016. 03. 15.], http://epp.eurostat.ec.europa.eu/portal/page/portal/european_business/...

McDonald, C.R. (1984). It's Time for Conference II. *Inc*, 7, p.16.

Siropolis, N.C. (1990). *Small Business Management. A Guide to Entrepreneurship*. Houghton Mifflin Company, Princeton, New Jersey.

U.S. Small Business Administration (1988). *The State of Small Business: A Report of the President.* U.S. Government Printing Office, Washington.

White House Commission on Small Business (1980). *Report to the President: American Small Business Economy: Agenda for Action.* U.S. Government Printing Office, Washington.

RECEIVED: 26 June 2016 **ACCEPTED: 20 October 2016**

Yuri A. Kochetkov is Dr.sc.ing., Professor. University study: Riga Polytechnic Institute (1966 – 1971), mechanical engineer. Post-graduation: Moscow Institute of Instrumental Equipment (1977 – 1981), Candidate of technical sciences (1982). 1993 – Dr. sc. ing. (Latvia). Yuri Kochetkov is Professor of Econometric in Baltic International Academy (Latvia). Also he is scientist in Mathematical and Information Technologies Institute of Liepaja University. Publications: 76 scientific papers and 3 patents, teaching aids and synopses – 5. Current research interests: social economical statistics, mathematical modeling and analysis of systems. Yuri Kochetkov is a member of Latvian Association of Statistics. Address: 4 Lomonosova St., LV-1019, Riga, Latvia. Phone: +37163480858, Fax: +37163480858, e-mail: Jurijs.Kocetkovs@rtu.lv

Elena Sventitskaya is Master of Business Administration (MBA), Doctoral student in Baltic International Academy (Latvia). University study: Baltic International Academy (2010-2012), MBA. Scientific interests are regional economy and development, small business. Address: 4 Lomonosova St., LV-1019, Riga, Latvia. Phone: +37129586758, Fax: +37163480858, e-mail: elenasventicka@inbox.lv

Vadyba
Journal of Management
2016, № 2 (29)
ISSN 1648-7974

THE EFFECTS OF CORPORATE SOCIAL RESPONSIBILITY ON CONSUMER DECISIONS IN HUNGARY

Ildikó Kovács
Budapest Business School, University of Applied Sciences, Hungary

Annotation
The significance of socially responsible consumption as well as the question of the knowledge and information that consumers may have about producers of consumer product are increasingly appearing in the literature. In the case of companies, responsible corporate operation and to examine how information could be transferred to consumers from companies have become key issues especially in the last decade.
Socially responsible consumption, which is the incorporation of social and environmental concerns by individuals in their consumption choices, is growing. The aim of this research is to verify the existence of different profiles of socially conscious consumers and to study their social representation of consumption.
KEY WORDS: CSR; socially responsible consumption; empirical study.

Introduction

Promoting corporate social responsibility (CSR) and sustainable consumption are parts of the European Sustainable Development Strategy. There are several programmes aiming at shaping the attitude of consumers for promoting sustainable consumption. Targets of these programmes can be facilitating conscious product choice and frugal consumption. Corporate social responsibility and conscious product choice can have a common effect towards sustainable consumption.

Nowadays, the socially responsible consumption reflects a set of values and actions of certain groups of consumers in the developed industrial countries. The ethical standards to be followed prevail in the purchasing decisions of the consumers who – beyond their personal interests – take into account the interests of the society, too. Therefore, these segment of consumers pay attention to the CSR activities of companies.

In our research, we have concentrated on two aspects: first the attitudes that Hungarian consumers have for the activities of socially conscious companies, and second we have examined if there are separate consumer segments that are receptive to certain areas of CSR.

Corporate social responsibility and consumption

The main idea of the corporate social responsibility (CSR) concept is that there are other roles of the companies in the society beyond manufacturing products, providing services and making profit. These roles include society and environmentally driven actions and commercial activities that increase the well-being of the community (Robins, 2005). However, the companies have to achieve these goals at the same time, one related to profit making and the other to social interests.

According to Rondinelli and Berry (2000), CSR has four levels:

"(1) Commercial self-interest: Adhering to all laws and regulations and selecting those activities that benefit stakeholders and communities directly contributes to profitability and competitiveness.

(2) Expanded self-interest with immediate benefits: Undertaking activities that go beyond normal business concerns to benefit stakeholders and communities in ways that also provide measurable short- and medium-term benefits to the company.

(3) Expanded self-interest with long-term benefits: Supporting community activities, such as education and training that will have important impacts on continuing business success.

(4) Promoting the common good: Supporting or participating in activities that improve conditions in the community, or for stakeholders with no expectation of direct tangible benefits to the company."

The proliferation of corporate social responsibility leads to a cohesive society and a sustainable economic system. Therefore, the European Commission has created a new definition of CSR as "the responsibility of enterprises for their impacts on society" (EU, 2011).

The EU also recognized the importance of consumer decisions: „Consumer attention to CSR-related issues has grown in recent years, but significant barriers remain, such as insufficient awareness, the need sometimes to pay a price premium, and lack of easy access to the information necessary for making informed choices. Some enterprises play a pioneering role in helping consumers to make more sustainable choices. The revision of the Sustainable Consumption and Production Action Plan may provide an opportunity to identify new measures to facilitate more responsible consumption" (EU, 2011).

In the last decade, due to regulations and market expectations – beside financial performance reports – statements on CSR have appeared in which the companies report on their social and environmental performance. Several researchers agree that CSR investments and attitudes will eventually help the

company to perform better economic performance. (Metaxas and Metaxas, 2010; Granek and Hassanali, 2005; Hall, 2000; Rondinelli and Berry, 2000).

Several researches argue that the most important stakeholders of the European companies are the employees and so they are the main target group of the CSR activities. Therefore, the CSR activities towards the consumers are of secondary importance and those aiming at the consumers are regarded to be rather PR activities. (Dawkins and Lewis, 2003)

Doane (2005) argues that CSR is not efficient because the companies imitate the CSR activities of other companies instead of finding their own pattern of CSR. Voluntary reporting of the companies would lead to the recognition of socially conscious companies and it would change the consumption pattern of them. So, the consumers drive the change of businesses to perform in a more sustainable manner. Doene is sceptic in this sense because of the imitation of other companies that makes CSR inefficient.

Socially responsible consumer

Definitions in the literature are not consistent in the content of social responsibility. Some sources argue that only environmentally conscious purchase and social responsibility are related to the concept of social responsible consumption while others say that reducing the volume of consumption should also be part of the responsible consumer behaviour.

The definition of socially responsible consumer and the importance of research in this area came up first in the seventies when Anderson and Cunningham separated the consumers with high social consciousness according to demographic and social-psychological characteristics in 1972. They express that the socially conscious consumers are consumers who consider not only their own satisfaction but they also take into account the social welfare when making purchase decisions.

Roberts (1996) defined the socially responsible consumer as "one who purchases products and services perceived to have a positive (or less negative) influence on the environment or who patronizes businesses that attempt to effect related positive social change". This definition assumes two dimensions: environmental concern and a more general social concern.

Although consumption in general is in itself harmful to the environment, even those who are committed to sustainable consumption recognize that reduction of consumption or additional costs in order to lower the environmental pressure are not likely (Láng, 2003).

Sustainable consumption is interpreted to mean consuming less and a kind of alternative or conscious consumption (Jackson, 2004). The authors express that welfare does not depend on the volume of consumption. The expenditure of consumers has more than doubled in the UK in the last thirty years, but life-satisfaction does not show a significant change (Donovan et al., 2003). Various previous researches argue that more and more consumers consider "green" and socially conscious consumption important (Vágási, 2000; Pakainé Kováts and Herczeg, 1999; Borsi, 1997).

Mohr et al. (2001) defined socially responsible consumer behaviour based on the concept of CSR. An approach to define CSR involves an attempt to list the major responsibilities of companies. According to Pepper et al., the pillars of sustainable consumption are as follows: pro environmental, pro social, and frugal (2009). Other researchers (McDonald et al., 2006) also argue the decrease of consumption and the „frugal lifestyle" (Lastoviczka et al., 1999). Webb et al. (2008) distinguish between three possible dimensions of socially responsible consumption: (1) purchases based on the corporate social responsibility activities of the companies, (2) recycling, (3) avoiding and reducing products harmful to the environment. Based on these dimensions, the Socially Responsible Purchase and Disposal (SRPD) scale has been developed. This scale measures four dimensions of responsible purchase: 1) influence of the companies' CSR performance on the purchases, 2) recycling activity of the consumers, 3) beside the traditional procurement criteria (price, availability, quality), other concerns related to responsibility emerge (e.g. environmental issues), 4) purchase criteria based on the environmental effects of the products.

Several researches argue that there is a gap between the attitude and behaviour and also between the values and actions (Young et al., 2010; Spaargaren and Koppen, 2011; Öbereder et al., 2011). Young et al. claim that the 'attitude–behaviour gap' or 'values–action gap' is present at 30% of consumers who are concerned about environmental issues very much but they do not realize this in their purchases. Companies should have an active role in turning consumers socially conscious. For more sustainable consumption patterns, consumers need new ideas and information. The producers and retailers of products have a responsibility in providing the consumers with information and orientation on the possibilities of green consumption. (Hume, 2010)

According to analyses of consumer attitude, there is positive motivation and willingness towards socially responsible companies but the actual consumption is lagging behind. Several researches, that include analyses of both attitude and consumption, have reached the same conclusion. (Devinney et al., 2006; Eckhardt et al., 2010). CSR still has a minor effect on consumption decisions (Mohr et al., 2001).

Previous researches on the effect of CSR on purchasing decisions

There are not too many researches in the literature on the effect of CSR on consumer decisions. Several researches reveal that consumers attach more and more importance to the consumption of responsible products and monitoring of CSR activities of the firms. (Carrigan and Attalla, 2001; Maignan, 2001). Increased attention on CSR has a considerable effect on purchases (Brown and Dacin, 1997; Sen and Bhattacharya, 2001; Mohr and Webb, 2005).

There is a considerable difference between the supply and demand sides of the market. On the supply side, firms are more and more engage themselves in CSR activities while on the demand side, consumers pay more attention to irresponsible corporate behaviour (Snider et al., 2003).

Irresponsible corporate actions have a greater impact on consumers' purchases than responsible behaviour (Biehal and Sheinin, 2007; Brown and Dacin, 1997; Marin and Ruiz, 2007; Bhattacharya and Sen, 2004).

MATERIAL AND METHODS

The aim of the survey was to analyse the attitude of Hungarian consumers to CSR. The survey was carried out in Hungary on a sample of 510 respondents. The responses were weighted according to regions, types of settlements, age, sex and level of education and therefore are representative for these variables. 11 variables of the research model contained Likert scale questions on consumer opinions about the socially responsible activities of the companies. Based on the survey, latent variables could be created about the description of themes of responsible consumption. The awareness of social responsibility was surveyed by nominal scale while the importance of its areas by ordinal scale. The survey contained the following personal characteristics: sex, age, age group, level of education and residence.

The age of respondents was between 18 and 69 years. The distribution of respondents according to age groups was as follows: 18-29 years (26.1%), 30-39 years (20.4%), 40-49 years (21.0%), over 50 years (32.5%). Bearing in mind the topic of the survey, a core aspect of the selection of respondents was that they should take part in the decisions related to purchase of goods and services. 46.9% of the respondents were men and 53.1% of them are women. Primary school was the highest level of education for 10.2%, vocational training school for 24.7%, secondary school for 40.2% and higher education for 24.3% of the respondents. The place of residence is Budapest for 12.6%, county towns for 17.6%, other towns for 28.3% and villages for 41.4%.

RESULTS AND DISCUSSION

Knowledge of the social responsibility of firms

The survey included a question of whether the respondents had heard of corporate social responsibility. 45% of respondents answered yes, while 55% of the answers were negative to this question. The following tables (number 1-4) contain the results of the survey concerning the knowledge of the respondents on the corporate social responsibility of the companies.

Table 1. Knowledge of the social responsibility of firms by gender (%)

	Men	Women	Total
Heard of it	34.2	54.8	45.1
Not heard of it	65.8	45.2	54.9
Total	100.0	100.0	100.0

Cramer's V=0.207, p=0.000

Table 2. Knowledge of the social responsibility of firms by gender by age groups (%)

	18–29 years	30–39 years	40–49 years	Over 50 years	Total
Heard of it	25.0	48.5	51.6	57.7	45.1
Not heard of it	75.0	51.5	48.4	42.3	54.9
Total	100.0	100.0	100.0	100.0	100.0

Cramer's V=0.280, p=0.000

Table 3. Knowledge of the social responsibility of firms by types of settlement (%)

	Budapest	County towns	Other towns	Village	Total
Heard of it	38.5	59.6	44.8	41.3	45.1
Not heard of it	61.5	40.4	55.2	58.7	54.9
Total	100.0	100.0	100.0	100.0	100.0

Cramer's V = 0.139, p=0.019

Table 4. Knowledge of the social responsibility of firms by education (%)

	Primary school	Vocational training school	Secondary school	Higher education	Total
Heard of it	42.9	40.4	44.8	63.2	45.1
Not heard of it	57.1	59.6	55.2	36.8	54.9
Total	100.0	100.0	100.0	100.0	100.0

Cramer's V=0.138, p=0.047

The possibility of influencing social values by purchases

In the following tables (number 5-8), the results of the survey are included concerning the possibility of influencing social values by purchases. 62% of the respondents answered positively while the rest was negative (23% because of lack of information and 15% because of pessimistic attitude).

Table 5. The role of purchases in the preservation of social values by gender (%)

	Men	Women	Total
Yes	56.0	67.7	62.0
No because of lack of information	27.4	19.5	23.3
No because these issues cannot be influenced by purchase	16.7	12.8	14.7
Total	100.0	100.0	100.0

Cramer's=0.121, sig=0.026

Table 6. The role of purchases in the preservation of social values by age groups (%)

	18–29 years	30–39 years	40–49 years	Over 50 years	Total
Yes	67.9	56.9	59.6	60.1	62.0

No because of lack of information	19.5	20.0	25.5	26.8	23.3
No because these issues cannot be influenced by purchase	12.6	23.1	14.9	13.1	14.7
Total	100.0	100.0	100.0	100.0	100.0

Cramer's=0.088, sig=0.258

Table 7. The role of purchases in the preservation of social values by types of settlement (%)

	Buda-pest	County towns	Other towns	Village	Total
Yes	43.5	65.2	66.9	62.7	62.0
No because of lack of information	38.7	21.3	17.3	23.6	23.3
No because these issues cannot be influenced by purchase	17.7	13.5	15.8	13.7	14.7
Total	100.0	100.0	100.0	100.0	100.0

Cramer's=0.116, sig=0.036

Table 8. The role of purchases in the preservation of social values by education (%)

	Primary school	Vocati-onal training school	Secon-dary school	Higher edu-cation	Total
Yes	64.5	54.6	65.2	59.6	62.0
No because of lack of information	20.3	29.9	22.7	25.0	23.3
No because these issues cannot be influenced by purchase	15.2	15.5	12.1	15.4	14.7
Total	100.0	100.0	100.0	100.0	100.0

Cramer's=0.103, sig=0.226

Specific corporate actions mentioned by the respondents

We have analysed the number of respondents mentioning a specific corporate act that is considered to be socially responsible. 64.3% of the respondents (328 persons) could give examples of particular company actions.

Most often responses were as follows:

- 34 cases referred to the support of certain social groups, e.g. support of children in need or sick,
- 32 respondents referred to the environmental aspects, e.g. support of the poor with energy-efficient products, using recyclable packaging materials and manufacturing products less harmful for the nature,
- raw materials or products manufactured in Hungary or locally mentioned by 13 respondents,
- support of sporting events appeared in 6 cases,
- other responses varied and cannot be classified among the former categories.

The responses to the survey were influenced by cause-related marketing campaigns of the survey period and the actions made and assistance given by certain companies in connection with a natural disaster (red mud spill at Kolontár). This could mean that the reason for so many people mentioning these actions is that these events were still very much in public consciousness.

In the survey, respondents gave their opinion on how their purchase decisions were influenced by the CSR activities. They ranked 4 possible behaviour types of the firms according to the effect of them on their purchases. Table 9 contains the main results of this question. The production of healthy products was the most influential to their choices followed by the employee satisfaction, the protection of environment and the support of people with shortages.

Table 9. Ranking the importance of the following areas in the purchase decisions (%)

	Help for the people in need	Environ-ment protection	Production of healthy products	Employee satis-faction
First choice	10.3	15.4	52.4	22.7
Second choice	13.1	41.2	23.6	24.1
Third choice	22.4	26.4	15.7	34.5
Fourth choice	54.2	17.0	8.3	18.7
Total	100.0	100.0	100.0	100.0

Consumer segments created according to the variables of CSR and their characteristics

According to the responses for the questions related to social responsibility of companies, the respondents have a positive attitude towards the responsible activities of companies (Table 10).

Table 10. Characteristics of the variables

	Mean	Std. Deviation	Variance
When possible, I buy from companies that take care of local products	4.40	0.85	0.72
When possible, I buy from companies that take care of environment	4.51	0.74	0.54
When possible, I buy from companies that take care of working conditions and health protection	4.72	0.53	0.28

When possible, I buy from companies that take care of local people	4.41	0.77	0.60
When possible, I buy from companies that are fundraiser and supporting	4.28	1.01	1.02
When possible, I buy from companies that take care of customer complaints	4.47	0.77	0.59
When possible, I buy from companies that recycle	4.28	0.99	0.98
When possible, I buy from companies with responsible behaviour	4.65	0.59	0.35
When possible, I buy from companies that take care of employees with disabilities	4.27	0.87	0.75
When possible, I buy from companies that take care of satisfaction of employees	4.47	0.77	0.60
When possible, I buy from companies that take care of working conditions	4.32	0.76	0.58

The analysis of social responsibility of the companies was carried out by factors of variables. According to Cronbach's alfa and Kolmogorov–Smirnov tests (these tests show the reliability of the scale), the variables were suitable for the conditions of factor analysis. The KMO test showed that the data were suitable for factor analysis (KMO=0.755). According to the Bartlett test, the correlation matrix was significantly different from zero (Sig=0.000). The communality of variables contributes to the explanation of factors at a strong or medium level. The total variance explained by the factors is 74.59%, which is acceptable.

Table 11. Factor structure matrix

	Social	Environ-mental	Emplo-yees	Custo-mers
Variance explained	37.8 %	15.0%	11.6%	10.2%
When possible, I buy from companies that take care of employees with disabilities	**0.823**	0.166	0.339	0.021
When possible, I buy from companies that are fundraiser and supporting	**0.816**	0.317	0.262	0.307
When possible, I buy from companies that take care of local people	**0.672**	0.236	0.293	0.467
When possible, I buy from companies that take care of local products	0.185	**0.904**	0.312	0.257
When possible, I buy from companies that take care of environment	0.397	**0.860**	0.274	0.312
When possible, I buy from companies that take care of satisfaction of employees	0.210	0.367	**0.876**	0.172
When possible, I buy from companies that take care of working conditions	0.536	0.147	**0.785**	0.221
When possible, I buy from companies that take care of customer complaints	0.242	0.291	0.197	**0.955**

Extraction Method: Principal Component Analysis.

Rotation Method: Promax with Kaiser Normalization.

Table 11 shows the factor structure. The Social factor has high coefficients in case of companies that take care of employees with disabilities and that are fundraiser and supporting. At the Environmental factor, both variables are important: the companies that take care of environment and of local products. The factor of Employees has high coefficients for the companies that take care of both employees' satisfaction and working conditions. The coefficient of the companies that take care of customer complaints is important for the Customer factor. Table 12 presents the correlation matrix between the factors.

Table 12. Component Correlation Matrix

Component	Social	Environ-mental	Emplo-yees	Custo-mers
Social	1.000	0.268	0.381	0.286
Environmental	0.268	1.000	0.297	0.306
Employees	0.381	0.297	1.000	0.204
Customers	0.286	0.306	0.204	1.000

Extraction Method: Principal Component Analysis.

Rotation Method: Promax with Kaiser Normalization.

Distinction between the CSR consumer groups by cluster analysis

In our research, we have tried to analyse whether the respondents can be grouped according to their characteristics. For this purpose, the data from factor analysis was used. The cluster analysis was carried out

with K-means clustering. As a result, 4 clusters were separated, which are described below.

The analysis of variance are presented in table 13. Description of the segments by their demographic characteristics is summarised in tables 14-17.

Cluster 1 – Socially sensitive and urban

Ratio in the sample: 16.7%.

This group mainly relates the social responsibility of the companies with the importance of social aspects. They consider taking care of the working conditions very important. They also consider the two other characteristics, fundraising and supporting the local people very much likeable. The group evaluates environment protection neutral while the satisfaction of employees gets lower scores and the customer relations higher scores than the average.

Most of the respondents in the group live in Budapest and in large cities; their age is typically over 40 and they have higher education.

Cluster 2 – Environmentalists

Ratio in the sample: 51.5%.

The group considers the manufacturing of environment friendly products (99.3%) and the use of local products (95.3%) essential. 87.1% of the respondents think that it is important to reuse materials. Social concerns are also important and the responsible behaviour with employees and customers is regarded to be valuable compared to other groups.

The respondents in the group mainly live in Budapest and in other major cities; 59.2% of them are women and the majority has secondary or higher education.

Cluster 3 – Neutrals

Ratio in the sample: 12.1%.

Social responsibility of the companies is considered to be less important in this cluster. The only environmental characteristic that is regarded to be important is the reuse and recycling of materials. Handling of customer complaints is of less or neutral importance for 81% of the respondents in this group.

The respondents in this group are close to the average sample population in terms of age structure. Respondents with secondary education and those living in small towns are overrepresented while there is an equal number of men and women in the cluster.

Cluster 4 – Working conditions in rural areas

Ratio in the sample: 19.7%.

Social concerns are of less importance in this group. Within social concerns, supporting the local people is regarded to be less important. Fundraising and supporting is considered to be neutral or less important for 57.4% which is under the ratio of other clusters. Satisfaction of employees receives the main attention in this cluster.

The typical respondent in this cluster is a man under 40 years with primary or secondary education and lives in a small town.

Table 13. Analysis of variance

	Cluster		Error		F	Sig.
	Mean	Df	Mean	df		
	Square		Square			
Social	98.034	3	0.430	510	228.239	0.000
Environ-mental	43.433	3	0.751	510	57.869	0.000
Employees	93.775	3	0.455	510	206.293	0.000
Consumers	99.934	3	0.418	510	238.874	0.000

Table 14. Description of clusters by types of settlement (%)

	Cluster 1 Socially sensitive and urban	Cluster 2 Environ-mentalists	Cluster 3 Neutrals	Cluster 4 Working conditions in rural areas	Total
Buda-pest	12.9	10.9	8.1	18.8	12.5
County towns	24.7	19.2	11.3	11.9	17.7
Other towns	23.5	21.5	46.8	39.6	28.5
Villages	38.8	48.3	33.9	29.7	41.3
Total	100.0	100.0	100.0	100.0	100.0

Cramer's V=0.151, sig=0.000

Table 15. Description of clusters by sex (%)

	Cluster 1 Socially sensitive and urban	Cluster 2 Environ-mentalists	Cluster 3 Neutrals	Cluster 4 Working conditions in rural areas	Total
Men	43.0	40.8	50.0	63.7	46.8
Women	57.0	59.2	50.0	36.3	53.2
Total	100.0	100.0	100.0	100.0	100.0

Cramer's V=0.178, sig=0.001

Table 16. Description of clusters by age (%)

	Cluster 1 Socially sensitive and urban	Cluster 2 Environ-mentalists	Cluster 3 Neutrals	Cluster 4 Working condi-tions in rural areas	To-tal
18–29 years	19.8	29.2	30.6	47.5	31.4
30–39 years	9.3	12.5	17.7	15.8	13.3
40–49 years	25.6	17.8	12.9	17.8	18.5
Over 50 years	45.3	40.5	38.7	18.8	36.8
Total	100.0	100.0	100.0	100.0	100.0

Cramer's V=0.140, sig=0.000

Table 17. Description of clusters by education (%)

	Cluster 1 Socially sensitive and urban	Cluster 2 Environ-menta-lists	Cluster 3 Neutrals	Cluster 4 Working conditions in rural areas	Total
Primary school	50.0	44.7	27.5	40.0	42.5
Vocational training school	20.9	17.8	33.9	14.0	19.5
Secondary school	20.9	24.6	32.2	33.0	26.5
Higher education	8.1	12.9	6.4	13.0	11.3
Total	100.0	100.0	100.0	100.0	100.0

Cramer's V=0.133, sig=0.008

Conclusions

In this research the attitudes related to the CSR activities of the firms was analysed on a representative sample of respondents in Hungary. The value structure of consumers is presented by factor analysis. The four factors are the social, environmental, employees and customers factors. The consumers were segmented according to these factors and their demographic characteristics. The segmentation was carried out by cluster analysis and the success of the classification was validated by a discriminant analysis.

In our research it is proved that it is possible to separate and describe those consumers who are receptive to certain areas of the CSR activities of companies. Four segments are discriminated: socially sensitive, environmentalists, neutrals and those who find the working conditions the most important. There is generally a positive attitude of the consumers to the socially responsible companies.

Decision makers in the business sphere more and more take into account the attitudes of consumers related to corporate social responsibility of the firms. It is a competitive advantage if a firm can identify consumers likely to respond to socially responsible corporate behaviour.

References

Anderson, W. T. JR. and Cunningham, W. H. (1972). *The Socially Conscious Consumer:* Journal of Marketing, 36 (3), 23-31.

Bhattacharya, C. B. and Sen, S. (2004). *Doing Better at Doing Good: When, Why and How Consumers Respond to Corporate Social Initiatives:* California Management Review, 47, 9-25.

Biehal, G. J. and Sheinin, D. A. (2007). *The Influence of Corporate Messages on the Product Portfolio:* Journal of Marketing, 71 (2), 12-25.

Borsi, K. (1997). *Zöld stratégiák – Green strategies:* Hungarian Journal of Marketing & Menedzsment, 31, 66-68.

Brown, T. J. and Dacin, P. A. (1997). *The Company and the Product: Corporate Associations and Consumer Product Responses:* Journal of Marketing, 61, 68-84.

Carrigan, M. and Attalla, A. (2001). *The myth of the ethical consumer – do ethics matter in purchase behaviour?:* Journal of Consumer Marketing, 18 (7), 560-577.

Dawkins, J and Lewis, S. (2003). *CSR in stakeholder expectations: And their implication for company strategy:* Journal of Business Ethics; May 2003; 44, ABI/INFORM Global, 185-193.

Devinney, T. M. et al. (2006). *The Other CSR: Consumer Social Responsibility:* Stanford Social Innovation Review, 70 (3), 299-326.

Doane, D. (2005). *Beyond corporate social responsibility: minnows, mammoths and markets:* Futures, 37, 215-229.

Donovan, N. et al. (2003). *Life Satisfaction: The State of Knowledge and Implications for Government, Discussion Paper*, Strategy Unit, Government UK psychology', Russell Sage Foundation, New York, p. 3-25.

Eckhardt, G. M. et al. (2010). *Why don't consumers consume ethically?:* Journal of Consumer Behaviour, 9 (6), 426-436.

EU (2011). *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – A Renewed EU Strategy 2011-14 for Corporate Social Responsibility:* COM(2011) 681 final, Brussels, 25.10.2011

Granek, F. and Hassanali, M. (2005). *The Toronto Region Sustainability Program: insights on the adoption of pollution prevention practices by small to medium-sized manufacturers in the Greater Toronto Area (GTA):* Journal of Cleaner Production, 14, 572-579.

Hall, J. (2000). *Environmental supply chain dynamics:* Journal of Cleaner Production, 8, 455–471.

Hume, M. (2010). *Compassion without action: Examining the young consumers consumption and attitude to sustainable consumption:* Journal of World Business, 45 (4), October 2010, 385-394.

Jackson, T. (2005). *Motivating Sustainable Consumption: A review of evidence on consumer behaviour and behavioural change, a report to the Sustainable Development Research Network*, January 2005

Láng, I. (2003). *A fenntartható fejlődés Johannesburg után – Sustainable development after Johannesburg:* Agroinform Kiadóház, p. 147.

Maignan, I. (2001). *Consumers' Perceptions of Corporate Social Responsibilities: A Cross-Cultural Comparison:* Journal of Business Ethics, 30 (1), 57-72.

Lastovicka, J. et al. (1999). *"Lifestyle of the tight and frugal":* The Journal of Consumer Research, 26 (1), 85-98.

Marin, L. and Ruiz, S. (2007). *"I Need You Too!" Corporate Identity Attractiveness for Consumers and the Role of Social Responsibility:* Journal of Business Ethics, 71, 245-260.

McDonald, S. et al. (2006). *Toward Sustainable Consumption: Researching Voluntary Simplifiers:* Psychology and Marketing, 23 (6), 515-534.

Metaxas, T. and Metaxas, M. (2010). *Corporate Social Responsibility in Europe: Denmark, Hungary and Greece:* Journal of Contemporary European Studies, 18 (1), 25-46.

Mohr, L. A. and Webb, D. J. (2005). *The Effects of Corporate Social Responsibility and Price on Consumer Responses:* Journal of Consumer Affairs, 39 (1), 121-147.

Mohr, L. A. et al. (2001). *Do Consumers Expect Companies to be Socially Responsible? The Impact of Corporate Social Responsibility on Buying Behaviour:* The Journal of Consumer Affairs, 35 (1), 45-72.

Öbereder, M. et al. (2011). *Why Don't Consumers Care About CSR?: A Qualitative Study Exploring the Role of CSR in Consumption Decisions, Empirical Paper:* Journal of Business Ethics, 104 (4), 449-460.

Pakainé Kováts, J. and Herczeg, J. (1999). *Ökotudatos üzleti magatartás – Ecoconscious business behaviour*. In: Gidai, E. et al. (Eds.), Magyarország az ezredforduló után. MTA Jövőkutatási Bizottság, Budapest.

Pepper, M. et al. (2009). *An examination of the values that motivate socially conscious and frugal consumer behaviours:* International Journal of Consumer Studies, 33, 126-136.

Roberts, J. A. (1996). *Will the Real Socially Consumer Please Step Forward?:* Business Horizons, 39 (1), 79-83.

Robins, F. (2005). *The Future of Corporate Social Responsibility:* Asian Business & Management, 4, 95-115.

Rondinelli, D. A. and Berry, M. A. (2000). *Environmental citizenship in multinational corporations: social responsibility and sustainable development – the two approaches of sustainability applied on micro level:* European Management Journal, 18, 70-84.

Sen, S. and Bhattacharya, C. B. (2001). *Does Doing Good Always Lead to Doing Better? Consumer Reactions to Corporate Social Responsibility:* Journal of Marketing Research, 38 (2) 225-243.

Snider, J. et al. (2003). *Corporate Social Responsibility in the 21st Century: A View from the World's Most Successful Firms:* Journal of Business Ethics, 48 (2), 175-187.

Spaargaren, G. and Kris Van Koppen, C. S. A. (2011). *Provider Strategies and the Greening of Consumption Practices: Exploring the Role of Companies in Sustainable Consumption*, In: The new Middle Classes, Springer Netherlands, 81-100., 306 p.

Vágási, M. (2000). *A fenntartható fogyasztás és a környezettudatos fogyasztói magatartás – Sustainable consumption and environmentally conscious consumer behaviour*: Hungarian Journal of Marketing and Management, 34, 39–44.

Webb, D. J. et al. (2008). *A Re-examination of Socially Responsible Consumption and its Measurement*: Journal of Business Research, 61 (2), 91-98.

Young, W. et al. (2010). *Sustainable consumption: green consumer behaviour when purchasing products*: Sustainable Development, 18 (1), 20-31.

RECEIVED: 26 June 2016 **ACCEPTED: 20 October 2016**

Ildiko Kovacs, PhD, Budapest Business School, University of Applied Sciences, Field of scientific research: sustainable consumption, consumer behaviour, corporate social responsibility H-1165 Budapest, Diósy Lajos utca 22-24., Hungary, E-mail: Kovacs.Ildiko@uni.bge.hu

Vadyba
Journal of Management
2016, № 2 (29)
ISSN 1648-7974

ANALYSIS OF MANAGEMENT CONSULTING METHODS BASED ON EMPIRICAL RESEARCH IN HUNGARY

Imola Józsa, Sergey A. Vinogradov, József Poór
Szent István University

Annotation
This publication tries to analyze the consulting methods and provides insights into a specific area and practice of the consulting work as well. The authors analyze characteristics of three typical ways of consulting processes, such as: Process consulting, Advisory consulting and Inquiry consulting. We can say that before the political changes at the end of the 1980's, in most Central and Eastern-European (CEE) countries, consulting service was rendered by sector research institutes controlled by the state or by different ministries. Consulting approaches in these countries were predominant similar to the school of scientific management. Consulting hardly existed at that time. Since changes in the regime's consulting linked to privatization, firm restructuring and development has been developing significantly in all countries. Consulting has become a significant development tool in this region (Poór, Gross, 2003). This topic should be mentioned, since we know and feel that consulting tasks play very important and increasing role in life of companies!
In each segment, the consulting tasks have already been required by effects caused by accelerating processes, changing internal and external conditions.
The market of consultancy is subject to an ever-increasing interest, both among consultants and the boarder professional public as well. The focus is often towards the size of the consultancy market, about which we have contradicting information, as different analysts describe differently the activities belonging under the "roof" of management consultancy (Kipping, Clarck, 2012).
This study consists of two main parts. In first part the authors give an overview on literature of fields of consultancy and on typical consultant methods. In second part, analysis based on the results of the survey of management consulting methodology will be presented.
Today we can say that all three typical ways of consulting processes: Advisory consulting, Process consulting, and Inquiry consulting, may be the key factors for success for effectiveness of companies (Brooks, Edwards, 2014)
It must be clear that management consulting has been changed during decades. This change has been very disruptive after global economic and financial crisis.
KEY WORDS: Consulting, Management Consulting, Human Resources, Process consultant, Inquiry consultant, Advisory consultant.

Introduction

A survey: *"Changing of Management consulting methods in Hungary - 2015"* has been conducted by the Management and HR Research Center of Szent István University in Hungary.

The respondents of the inquiry were only consultants. The research aims: the interviewers focused on the practical application of consultancy models.

Among other things, they tried to find the answer what types of practical methods using by the consultants, during their process of professional consulting work for the installation and successful implementation.
And they also wanted to know, whether the new consulting methods and techniques are, and how and which quality they can be appeared in the consulting practice.

Who is a consultant?

A consultant is "a person who provides remunerated professional help others. They can work in any area". (Biswas, Twitchell, 2006, pp. 6-7).
There is a special consultants group who has outstanding knowledge of some field and they can advice. When clients have entrusted the consultants, their task usually is not to solve everyday problems (Biswas, Twitchell, 2006, p. 63).
It requires developing new methods and theories to be achieved in practice. The actual work of the consultant begins with the link between the theory and practice.

Customers typically choose those consultants who has already got a "letter of recommendation", which means, they have already solved major tasks successfully, and offered such kind of problem-solutions to their clients, which solutions can not only be used successfully in the shortest period of time but with the highest safety as well. (Biswas, Twitchell, 2006, p. 64)

According to Herbst (1995, p. 48), the competent consultants do not tell the specific solution to their clients, but they elaborate it with them. In fact it is the fastest way to have it learnt by the clients, how to solve either alone similar problem or with less outside-help in the future.

Consultancy as a profession

This profession was not born today. Management consultancy (hereinafter referred to as consultancy) can look back upon nearly hundred years of history. As an independent venture, it was born in the US in the 1910's and 1920's. Today we can hardly find an area of business

life, which cannot be connected to some kind of consultancy business (Kipping, Clarck, 2012).

The modern consulting "has got" almost hundred years of history. But as an independent service industry has been significantly growing for the recent period. There is a strong correlation between the amounts spending on these areas and economic development (Gross, Poór, 2003).

In modern societies, freelance consulting companies have been willingly assigned by major enterprises, banks and some other organizations of the state bureaucracy to explore their problems, waiting for problem-solving solutions as well.

There is a belief about the consultants for a long time that this profession will be living well, when economic recovery occurs, and even then there is no problem in this sector at all, if there is a recession. After all, consultants are always needed. We can say that consulting profession is an integral part of not only the economic trends but business world as well. It is also important to know that there is development in consulting services. (Poór, 2005, p. 9)

In our opinion, on the basis of the character of their work, consultants can basically be put in the following three big groups (Brooks, Edwards, 2014):

- *Resource consultant*, who suggests solutions based on his expertise and experience and persuades clients about the correctness of these solutions and gives assistance in the implementation.
- *Process consultant,* who assists the client in searching for solutions with methods that facilitate and raise creativity of the client's employees, and therefore the clients themselves will be able to implement solutions.

Inquiry consultant, who builds relationships between consultants and clients which is more personal rather than merely professional. All of these changes in the client's requirements lead to the Inquiry Model of Consulting which meets the challenges of a more complex and uncertain world. Schein (2016/a) calls this approach as "Humble Consulting". Through intensive coaching and teamwork, it will be built a strong relationship between consultant and his client (Schein, 2016/b).

Table 1. Consulting models

Consultant Emphasis	The Advice Model	The Process Model	Inquiry Model
What is the Consultant's task?	Solve problem	Solve problem	Achieve the Client's desired outcome
What should the relationship between Consultants and Clients be?	Consultant transfers or delivers knowledge to Client	Consultant and Client work together on human relationships and organization dynamics	Consultant and Client are partners on technical and social/ human dimensions of change
Who is the expert?	Consultant is the expert brings knowledge and best practices	Consultant is a „helper" or process expert	Client and Consultant each bring different types of expertise to bear on achieving the outcome
How should the Client's capacity be increased?	Transfer knowledge in the form of product or service	Help clients learn to more effectively work together	Client and Consultant co-create knowledge needed to achieve the outcome
How much attention should the Consultant give to the uniqueness of each Client organization or community?	Low (knowledge transferable across contexts)	High	High

Source: prepared by the authors according to Brooks, Edwards (2014, p. 19.)

While other practices or professions trace their roots back several centuries, management consulting is less than 150 years old. We can find their early origins at the end of the 19th century. "Advisory practices" began in the 1860s in the United Kingdom.

Generally speaking, consulting is "a knowledge-based service, it can be sold and bought, but it cannot be dropped on your foot, and it cannot be displayed in a shop-window. „The service of consultant is often intangible, hard to store and/or transport, and difficult to demonstrate its advantages to potential clients" (Miles et al., 1999, p. 3).

In this respect of such services we need to highlight four important aspects in the following:

- Human capital and knowledge intensive,
- High degree of intangible activities and services,
- Difficulties in standardization,
- Intensive interaction between consultants and clients.

Typical roles of consulting process

In the consulting process, the consultant can fill two typical roles (Steele, 1975; Maister, 1993; Kubr, 1996; Niedereichholz, 1996; O'Mahoney, 2010; Kipping, Clarck, 2012):

- *Expert Resource Consultant*, who suggests solutions based on his expertise and experience discusses with the clients the correctness of these solutions and gives assistance in the implementation. Expert consultant transfer typically tacit knowledge. This role is very typical in information-benchmarking and design consulting. Drucker (1979) called as knowledge-provider the management consultant in his publication even in a quarter century ago.

Process/People consultant, who assists the client in searching for solutions with methods that facilitate and raise creativity of the client's employees; and therefore, the clients themselves will be able to implement solutions. The root of this approach goes back to Kurt

Lewin (1935). This role has traditionally been demonstrated by organizational development and change consulting (Schein, 1969 and 1987). The Process Consultant typically transfers tacit knowledge.

Analyzed problems and goals

1. Hypothesis: Based on the survey answers of the consultants, the statements about practical application of consulting models, such as: (Advisory consulting, Process consulting, and Inquiry consulting), can be classified *coherent groups*, which can facilitate to explore common features of consulting models and a summary of useful information obtained via survey analysis. (The H1 hypothesis is checked by the results of the principal component analysis).

2. Hypothesis: Based on expressed opinions of using consulting models, the consultants participating in this survey, can divide into clusters, in which certain advisory activities and tasks can be relatively made out uniform interpretations by the experts. (The H2 hypothesis is checked by the results of the cluster analysis).

3. Hypothesis: There is a significant difference between those respondents who considered the strategic consulting as the most typical consulting activities of their company, and those experts who considered other consulting activities, – in their clusters based on hypothesis H2. (The H3 hypothesis is checked by the result of the chi-square test).

The sample and methods: The questionnaires have been made via Internet. The group of respondents: the consulting companies operating in Hungary. The survey period: (01.15.2015-04.27.2015). The sampling method: random sampling.

The sample: N = 126 respondents can be rated, up to 185 persons. Respondents can give their e-mail address, in case they want to receive the results of the research, but normally the questionnaires have been made anonymously. We can see that for example the age can be a distinguishing criteria include, which can have group-forming attribution.

The questionnaires: There are 30+5 questions: 10 questions to Advisory consulting, 10 questions to Inquiry consulting, and another 10 questions to Inquiry consulting. +5 questions : how many years is he/she in this profession, the origin of his/her company ownership, number of the staff, how many consultants are there, what are the most typical consultant activities in their companies? The respondents answered to 30 questions by 5 grade *Likert scale* (from 1-absolutely disagree to 5-absolutely agree). There were multiple choice options in +5 questions. As an introduction, there were two questions is: gender and age interval.

The database: The Excel database has been introduced. However, these data we had to be "clean", because these ones were not all evaluable responses. For example there were some of the respondents who did not select the gender, the age, and what is more there were who did not sign the grade of the scale. That is why these ones have been removed from the database. Thus there are 126 evaluable questionnaires, which were worth working with them.

The methods: The SPSS statistical software package has been used for analyzes. The univariate statistical methods were not used, because these methods are good to examine one factor taken into context only. However, these methods are not suitable, when we want to examine number of factors can effect on one-another. The system context can analyze and describe by the multivariate methods.

It is considered to be a problem system-based approach.

In general the social phenomena are characterized by a large number of different correlated interrelated factors. During the examination of processes, in this case during the consulting processes, we have question about, whether there is a relationship of the manifestation of the processes and their characteristics. The multivariate analysis methods are more important among the procedures.

To explore the relationships, large number of sample must be analyzed.

The Principal Component Analysis model

When we use the Principal Component Analysis model (Szelényi, 2002), we examined the interaction between all the observational variables, with the assumption that the reason why we perceive close relationship between them or between certain groups of them, because these variables, or those ones pertaining to the same groups, do depend on varying but common (mostly fictitious) facts or causes. These are called *causative or background variables.*

Depending on the method used, the common background variables are called *principal components* (main factors) or simply *factors*. And we generally assume that these variables being already uncorrelated (independent), - compared to observational ones.

The investigation aimed at determining the main components or main factors is called *analysis of the principal components*.

In this case we suppose that the variance of the observational variables (the variability of their values) are fully explained by same number of background variables or principal components namely in such a way that a number $q < p$ of them can be chosen, which on the whole determine most of the variability in the observational variables (their variance), while the effect of the other variables keeps getting smaller and consequently they are negligible. (Szelényi, 2002)

The cluster analysis

When we use the cluster analysis, for example we examine, whether there are professional separated well-characterized groups of respondents, based on answers relating the consulting methods and techniques.

No sooner had we identified these groups, we concretize the hypotheses of the cross-tabbing analysis (1-3). For example, if the "customer-centric", the "process-oriented" and the "creative thinking" groups are well separated aspect to the gender / age groups / etc. The

groups formed the basis on investigative statement of the characteristics of the consulting models.

1. Hypothesis: verify the results of the principal component analysis.

2. Hypothesis: check the relevance of the results of the cluster analysis.

3. Hypothesis: was tested by the result of the chi-square test

Statistical results

The results: *"If one does not know what he/she wants to achieve, not to be surprised, if he/she achieves something else."* (Herbst, 1995, p. 76)

Output and analysis: Now let us have a look at the details of the output. Analyze the results obtained, and check the correctness of the hypothesis.

Result (H1):

According to the KMO (0.588) and Bartlett's test results ($p < 0.01$) the data are adequate to run the principal component analysis.

The results of principal component analysis: The first nine principal components considered to be significant, cumulative explaining ratio: 63.00%, which is said to be sufficient.

According to the respondents of the technical experts and based on the result of the principal component analysis, we can say that the typical statements of different consulting model have been formed mixed groups (Table 2.).

Table 2. Nine significant principal components (PCs) and their professional compositions

Number of principal component	The professional meaning of PCs	The composition of principal components	Explained variance (%)
1.	The necessity of process consulting and client's involvement	**1. The growth can be achieved by continuous learning and ability for changing and being renewed.** **2. The client can learn how he thinks about the problem and how he processes available data.** 3. The common knowledge of the consultant and client are necessary for achieving goals. **4. The consultant and client work together with issues of human resources and company operation** **5. The consultation process is characterized by cooperation, interaction, agreements for real problem solving.** 6. It is advantageous if the consultant and client collect and process information together. **7. The growth can be achieved by continuous learning and ability for changing and being renewed.**	11,66
2.	The role of consultant in moderation	*1. The client gets the value of growth via products or services.* *2. The consultant assists the process of solution in every case.* *3. In every case the clients accept the advice of consultant, concerning for changing, and they also want to realize it.* **4. The consultant accompanies the clients throughout all the process.**	8,44
3.	Dynamical knowledge and creativity	1. In this changeable and uncertain business environment the dynamic knowledge needed rather than static knowledge. 2. It is a creative construction process, where new knowledge has been generated by or for companies.	7,41
4.	Problem orientation	*1. In case of advisory consulting, the main task of the consultant is solving the problem.* *2. There is hierarchical link between the consultant and the client.* **3. The problem solving is in the centre of the process consulting.**	6,74
5.	Common diagnosis of the problem and application of advisory consulting	**1. Advisory consultant diagnoses the problem with his client.** *2. The 5-steps model of advisory consulting can be used for each customer as well.*	6,36
6.	Client orientation	**1. Services to clients is unique, and customized.** 2. The consultant's task is achieving the results/goals wanted by the clients.	6,30
7.	The cooperation of the consultant and client, and universal specificity of solutions of advisory consulting	**1. The consultant and client make together the steps of process and conditions.** 2. The consultant and client work as partners together, during the consulting process. *3. The solution is made by the advisory consultant, can be used in case in other problems as well.*	5,64
8.	The mediation of professional knowledge and good practice	*1. The consultant mediates his professional knowledge and good practice for clients.*	5,47
9.	Assistant-, or expert consultant	**1. The consultant plays helper or expert role during consulting process.**	4,98

Note: **Bold** = statements of process consulting model; *italic*= statements of advisory consulting model; underlined = statements of inquiry consulting model.

Source: Authors' calculations based on survey: „CONSULTING MODELS IN PRACTICE" (2015)

The conclusion is that the consulting activities are not based on a specific consultancy model by the consultants, but they apply mixed the different consulting techniques as well.

It is interesting that the statement of two different models (the process and inquiry consulting) give the professional information content of the example 6th principal component, these allegations have clearly

similar professional connotations, which means to focus on the clients' needs.

Result (H2):

Based on consultants' opinions of the function of the consulting models, the K-means clustering method has been chosen. The principal component coordinates were used to the cluster analysis (Table 3).

There were 127 respondents in the survey and 88 respondents fully completed and rated the consulting models. From the remaining 39 ones could not formed the principal component coordinates, so these experts were not included in the present study.

Table 3. The cluster averages (centroids) for standardized principal component coordinates using K-means clustering method for grouping respondents by their opinions for operation of consulting models

Number of the principal components	The professional compositions of principal components	Clusters		
		1	2	3
1.	The necessity of process consulting and client's involvement	-,0018	-,0684	,3241
2.	The role of consultant in moderation	,0662	,0097	-,2077
3.	Dynamical knowledge and creativity	,1578	,4913	-,9296
4.	Problem orientation	,6082	-,3796	-,0024
5.	Common diagnosis of the problem and application of advisory consulting	-,7167	,2939	,2428
6.	Client orientation	,2420	-,1523	,0260
7.	The cooperation of the consultant and client, and universal specificity of solutions of advisory consulting	,4137	,0037	-,5095
8.	The mediation of professional knowledge and good practice	,5847	-,2286	-,3831
9.	Assistant- or expert consultant	-,1607	,5669	-,6697
The number of elements of clusters		26	38	23

Source: Authors' calculations based on survey: „CONSULTING MODELS IN PRACTICE" (2015)

In case of the standardized principal component coordinates, the positive average value within a cluster indicate that the consultants of a certain cluster, agreed more with statements defining the professional information content of the examined principal component, compared to the other clusters. Opposite characteristics are being typical to clusters with negative centroid values.

The zero cluster centroid is approximately indicates that the consultants of that cluster gave an average rate to the statements via the main component, (which is not the same as the neutral, and indifferent). Based on the K-means cluster analysis formed as a result of three clusters can be characterized as follows (Figure 1):

Cluster 1: consultants being problem and customer-oriented, having professional knowledge and appreciating good practice;

Cluster 2: consultants having dynamic knowledge and importance of creativity, being helpful and advisory consultants;

Cluster 3: consultants being process consultants do not pay attention to dynamic knowledge and creativity.

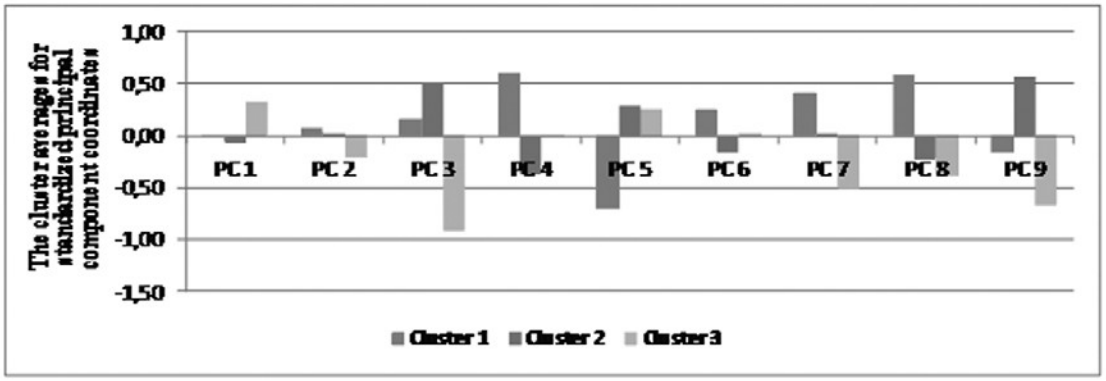


Fig. 1. The cluster averages for standardized principal component coordinates
Source: Authors' calculations based on survey: „CONSULTING MODELS IN PRACTICE" (2015)

It is interesting that based on the results of the cluster analysis we cannot speak about "distinct" problem-, and client-oriented consultants. The first cluster is a combination of both types of them.

Result (H3):

Based on the results of the chi-square test ($p < 0.01$) significant difference has been justified among those respondents that the strategic consulting of their company is considered as the most typical consultant activities and among experts checking other consulting activities in clusters (Figure 2).

Those consultants of enterprises who utilizing the possibilities of strategic consulting, can be significantly found in higher proportion in the first cluster and considerably in smaller proportion of the third cluster. Summarizing the typical things of theirs, we can say that these consultants are both problem- and customer-oriented, appreciating professional knowledge and good practice. There are relatively few ones among them preferring the process consulting.

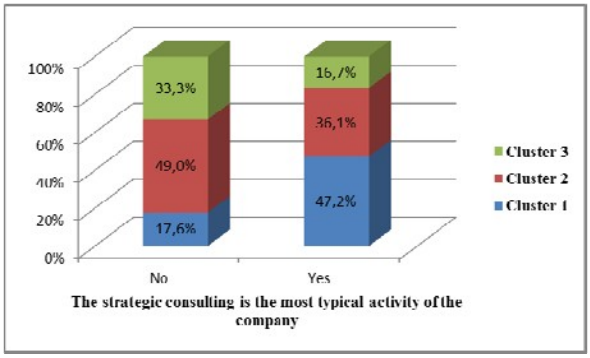


Fig. 2. The distribution of respondents by cluster affiliation for two groups of experts: who considered the strategic consulting as the most typical consulting activities of their company, and who considered other consulting activities
Source: Authors' calculations based on survey: „CONSULTING MODELS IN PRACTICE" (2015)

Conclusions

Based on the ratings given by the consultants, we can say that features of the operation of the consulting models in consultancy activities in practice, the consulting model types,- defined in theory-, are mixed.

Mostly the strategic consulting consultants are both problem- and customer-oriented; they appreciate better the professional knowledge and good practice.

Now the relationship between consultant and client has changed significantly**.** The consultants have to know much more about the methods and processes, than ever before!

The outlook is good for the growth of the consultancy business. In the future, management consultancy is going to be an integral part of such service offerings with consulting opportunities in information technology and outsourcing followed by operations, strategy, and human resources as well. Consultancy will remain a significant practice as asserting itself and more as a profession.

This analysis tried to highlight the major trends in consulting professio based on Survey in Hungary.
The limitations of the present investigation include the following:

- The sample is large enough from a statistical point of view, although disparities were found in the stratification of the organisations investigated. By this way, we mean that, within the whole sample, the number of respondents is not distributed as evenly as the consulting companies in the different sectors of this business activities.
- One of the biggest problems facing management research in emerging and transition countries lies in the difficulty of accessing respondents. Our efforts to use the web-survey method have not been very successful in these countries (Budhwar et al. 2010).
- This is an initial presentation of what promises to be an interesting long-term research project. More packaged comparisons of combinations of practices and executive perspectives, both across nations within the region and in comparison to other countries (such as Eastern, Western Europe and North America) are also potentially useful areas for further analysis.

References

Biswas, S., Twitchell, D. (2001). *Management Consulting: A Complete Guide to the Industry*, p.345. John Wiley and Sons, New York.

Brooks, A.K., Edwards, K. (2014). *Consulting in Uncertainty – The Power of Inquiry,* p. 176. Routledge, New York.

Drucker, P (1979): Why Management Consultant? In.: Zimmer, M, Smiddy H. (ed.), *The Evolving Science of Management*, p. 496. AMACOM, New York.

Herbst, H. M. (1995). *Positive Management* (In Hungarian), p. 121. Bole Publishing Ltd, Budapest.

Kipping, K., Clarck,T.(2012). *The Oxford Handbook of Management Consulting*, p. 656. Oxford University Press, Oxford

Kubr, M. (1996). *Management Consulting Guide to the Profession*, p. 904. International Labour Office, Geneva

Lewin, K. (1935). *A Dynamic Theory of Personality*, McGraw-Hill Book, New York.

Maister, D. (1993). *Managing The Professional Service Firm*, p. 376. Free Press, New York.

Miles, I., Coombes, R., Metcalfe, S. (1999). *Services and Innovation Background, Paper for the 6 Countries Programme Workshop*, 22-23 April, Manchester.

Niedereichholz, Chr. (1996). *Management Consulting*, (In German), R. Oldenburg, Munich.

O'Mahoney, J. (2010). *Management Consultancy*. Oxford University Press, Oxford.

Poór J. (2005). *Trends and Tendencies in management Consulting* (In Hungarian), p. 264. Akadémiai Kiadó, Budapest.

Poór J., Gross, A. (Eds.) (2003). *Management Consultancy in an Eastern European Content*, p. 184. Közgazdasági és Jogi Könyvkiadó – Kerszöv., Budapest.

Schein, H. E. (2016a). *Humble Consulting,* Berrett-Koehler Publishers, Oakland.

Schein, H. E. (2016b). *Interview with Ed Schein on Humble Consulting, Humble Inquiry and Leading with Humility.* Online: https://www.youtube.com/watch?v=Xv5mLNUmxSQ (Downloaded on August 14, 2016).

Schein, H. E. (1969). *Process Consultation*. Reading (MA), Addison-Wesley.
Schein, H. E. (1987). *Process Consultation*. Bd. 2 Reading (MA): Addison-Wesley.
Steele, F. (1975). *Consulting for Organizational Change*, University of Massachusetts Press, Amherst.
Szelényi L. (2002). Main Component Alysis and Cluster Analysis In: Szűcs I. (ed.): *Applied Statistics* (In Hungarian), pp. 405-447 and pp. 496-510. AGROINFORM Kiadó, Budapest.

RECEIVED: 15 May 2016 **ACCEPTED: 20 October 2016**

Imola Józsa. PhD Candidate in Doctoral School of Management and Business Administration in Szent István University (Hungary). Her scientific research is about the migration, working abroad, motivation, cultural differences, and integration as well. She also examines the HR-fields, foreign enterprises settled in Hungary, headquarters and subsidiaries. She has been awarded three degrees: the first one is in Information Technology (IT) Engineer (BSc) and she has got specialization in Technical Management, as part of this Engineer program.
She has also got another Bachelor's Degree in Communication and Media Sciences (BA) graded Excellent with Honors and a professional qualification of Business Communication Experts.
She has participated in Master's (MSc) Degree program in Management and Leadership as well, and she has been awarded a Master's Degree graded with Excellent with Honors, and a professional qualification of Economist in Management and Leadership.
And she has also got a specialization in Human Management and Organization Development, as a part of a Master's Degree program. Professional experiences: formerly she has been working as an insurance consultant and manager for several years in a MNC of an insurance sector in Hungary. She has been working as Personal Insurance Business Manager, Branch Manager and Business Unit Leader as well. jozsa.imola@gmail.com.

Sergey A. Vinogradov, PhD (in business and management), Associate Professor in Szent István University (Hungary), Faculty of Economic and Social Sciences, Institute of Economics, Law and Methodology. Head of the Department of Methodology for Economic Analysis. He is an author and co-author of more than 100 refereed papers in scientific journals, books, and conference proceedings. Current research interests: social economical statistics, actual problems of sustainable development in EU countries. , E-mail: Vinogradov.Szergej@gtk.szie.hu

József Poór, DSc, Professor of Management in Szent István University Hungary, and at Selye Janos University Komarno (Slovakia). He earned his PhD. from the Hungarian Academy of Sciences Budapest. He served as guest professor at five different US universities (PAMI-Honolulu, Bellermine-Louisville, EKU-Richmond, Saginaw-Michigan and CSU-Cleveland) and taught thirteen short summer semesters. He was senior manager (Managing Director, Country Manager and senior consultant) at different internationally recognized professional service firms (Mercer, HayGroup, Diebold) and at a private business school (International Management Center, Budapest). His scholarly publications have appeared in more than ten internationally referred journals. He wrote twenty five books and book-chapters in Hungarian, one book (Walter-Kluwer-Complex) and five book-chapters (Addison-Wesley, Chapman&Hall, Kogan Page, Prentice Hall and Routledge) in English and one book in Romanian alone or as co-author. poorjf@t-online.hu

Vadyba
Journal of Management
2016, № 2 (29)
ISSN 1648-7974

INTERREGIONAL DISPARITIES IN THE SLOVAK REPUBLIC AND THE CZECH REPUBLIC

Jana Masárová, Monika Gullerová
Alexander Dubček University of Trenčín, Slovakia

Annotation
Economic and social standard of any country depends on the performance of its regions. Disparities among regions are a natural phenomenon. They, however, should not exceed a certain level in order not to bring about problems in areas. There are regional disparities in both the Slovak Republic and the Czech Republic. The purpose of the paper is to examine and assess interregional disparities in the Slovak Republic and the Czech Republic in selected indicators in 2000 and 2014. Regional disparities are assessed on NUTS2 level. In order to examine regional disparities, economic performance indicators (gross domestic product per capita), indicators related to the situation in the labour market (employment rate, unemployment rate, long-term unemployment rate), education-related indicators (upper-secondary and post-secondary education, tertiary education), health-related indicators (life expectancy at birth, fertility rate and infant mortality rate) were selected. In the paper, the methods of analysis, comparison, synthesis as well as a standardized variable method were utilized. The research findings indicate that the best performing regions in both the Slovak Republic and the Czech Republic are those around capital cities. Pronounced disparities having been discovered between the Slovak and Czech regions were those related to GDP per capita and tertiary education indicators.
The paper was written under the VEGA project No. 1/0233/16 “Dimensions and factors of social and economic development of regions in Visegrad Four countries”.
KEY WORDS: regional disparities, gross domestic product, labour market, Slovak Republic, Czech Republic

Introduction

A sound economic performance of a country necessitates sustainable development of its regions. Sustainable development is achieved by using regional resources to make profit as well as by applying various instruments of regional and economic policy. Individual regions do not share the same pace of development over time, so their economic and social standards vary.

Uneven economic activities in individual regions may bring about minor or major economic and social disparities among regions. Interregional disparities are a natural phenomenon, but as stated by Viturka (2010), sustainable development of any society requires arising inequalities not to exceed a certain limit, i.e. they should be regulated and the principle of solidarity should be followed.

Disproportionate interregional disparities can be a source of problems in various areas. Koišová (2015) said that many countries try to settle differences between their regions by implementing their economic policy.

Kutscherauer et al (2010) define the regional disparities as differences of inequality of characters or processes which have a definite territorial location and which occur at least in two entities of territorial structures.

Havierniková and Janský (2014) maintained that the focus of economists on the issue of differences in socio-economic development of regions increasingly began to catch up in the context of the global economic crisis (30´s), especially after the World War II.

Sandberg and Meijers (2006) stated that trends in regional disparities have been a major issue in regional science for many decades and knowledge of ways to overcome such disparities has great importance for regional policy-making.

At present, regional disparities are viewed as a global problem – they can be observed in any country and efforts are made to eliminate or mitigate them. Disparities occur in almost all social areas, having an impact on a broad array of social and economic indicators. (Španková and Grenčíková, 2013)

As mentioned by Hošták (2014), the issues of regional development dynamics have recently caught attention of many scientists, practitioners and experts in public administration and regional development.

The performance of regions can be studied, comparing different indicators that characterize the status and development of some elements of the region life (economic, social, export performance, and others). Grmanová (2012, p. 80) emphasizes that in the analysis of regional disparities it is necessary to use indicators that are measurable, their characteristic is uniform and are an important representative of the studied phenomenon.

The essential precondition for eliminating regional disparities is to quantify their level. In order to tackle the problem, it is necessary to know the methodologies that allow us to obtain relevant data on the scope of regional disparities and to determine the how to reduce them by factors ways to reduce emissions. (Ivanová, 2013)

The main purpose of the paper is to examine and assess regional disparities in the Slovak Republic (SR) and Czech Republic (CR) by selected indicators in 2000 and 2014. In the paper, a region is defined as a territorial unit corresponding with NUTS2.

In order to assess regional disparities, the indicators on economic performance, labour market situation, education and health were selected.

The first indicator is the essential indicator of regional performance – gross domestic product (GDP). According to Eurostat (2016), gross domestic product at market prices is the final result of the production activity of resident producer units. In the paper, GDP at current market prices by NUTS 2 regions per inhabitant is used.

An important indicator determining the economic development is the labour market situation. Ivanová (2010, p. 22) maintained that labour market is sensitive to changes occurring within the economy of a given country as well as to processes occurring in the global economy due to the ever deepening international division of labour. The fundamental characteristics of the labour market are the employment and unemployment. From within the labour market, the following indicators were employed in the research: employment rate, unemployment rate and long-term unemployment rate. The employment rate of the total population is calculated by dividing the number of person aged 20 to 64 in employment by the total population of the same age group.

The unemployment rate is the number of people unemployed as a percentage of the labour force (total number of people employed and unemployed). The long term unemployment rate is the share of unemployed persons since 12 months or more in the total number of active persons in the labour market. Active persons are those who are either employed or unemployed. The indicators are based on the EU Labour Force Survey.

In order to carry out the research, the following health-related indicators were selected: life expectancy at birth, fertility rate and infant mortality rate. The life expectancy at birth is the mean number of years that a newborn child can expect to live if subjected throughout his life to the current mortality conditions (age specific probabilities of dying). The fertility rate is the number of children per woman - the mean number of children that would be born alive to a woman during her lifetime if: (1) she were to experience the exact current age-specific fertility rates; and (2) she were to survive from birth through the end of her reproductive life. The total fertility rate is obtained by summing the single-year age-specific rates at a given time. Infant mortality rate is the ratio of the number of deaths of children under one year of age during the year to the number of live births in that year. The value is expressed per 1,000 live births. (Eurostat, 2016)

With regard to the education, indicators as follows were selected:

- upper-secondary and post-secondary non-tertiary education (levels 3 and 4) – number of students enrolled in upper-secondary education and post-secondary non-tertiary education as a percentage of the population aged 15 to 24 years old in the region,
- tertiary education (levels 5 – 8) – number of students in tertiary education as a percentage of the population aged 20 to 24 years old in the region.

In the paper, the methods of analysis, comparison, synthesis and a standardized variable scientific method were utilized. The method of analysis was employed to analyse the regional disparities of the regions of the Slovak Republic and the Czech Republic. The method of comparison was used for comparing the regional disparities and general tendencies in the regions of the Slovak Republic and the Czech Republic. The method of synthesis was employed to summarize the findings and draw conclusions from the analysis.

The standardized variable method was employed to assess the Slovak and Czech regions. The method is one of the multi-criteria evaluation methods, i.e. it is the method considering several factors or criteria, and thus more effective in capturing the reality. Multi-criteria evaluation methods are used to examine multivariate statistical series. By using these methods, several indicators can be expressed by one synthetic (aggregate) indicator as a specific number. These methods can be used to evaluate and compare the level of several states or regions on the basis of various indicators.

The advantage of the standard variable method is that it takes into account the relative variability of indicators. The essence of the standard variable method is the transfer of various indicator values to a comparable shape – the so called standardized variable.

First, we calculate arithmetic means ($\bar{x}$) and standard deviations (s_x) for the evaluated variables:

Arithmetic mean:

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n} \qquad (1)$$

Standard deviation equals the square root of the variance:

$$s_x = \sqrt{(\frac{1}{n}\sum_{i=1}^{n}[(x_i -])[(\bar{x})]^2} \qquad (2)$$

Next, the original values of indicators (x_i) are transformed to a standardized variable ($x_{i,1s}$). The standardized variable is the value of the variable minus its mean, divided by its standard deviation:

$$x_{i,1s} = \frac{x_i - \bar{x}}{s_x} \qquad (3)$$

Regions with higher indicator value than the mean have a positive standardized variable. On the other hand, regions with indicator values lower than the mean have negative a standardized variable.

Explanatory notes:
x_i = Each data point *i*
n = File range (number of regions)
$\bar{x}$ = The average of all the sample data points
s_x = The standard deviation of all sample data points
$x_{i,1s}$ – The data point i standardized to 1s, also known as Z-Score.

Data are taken from the Eurostat databases.

Interregional disparities in Slovakia

There are currently four regions in the Slovak Republic (SR) that correspond to the NUTS2 level:

Bratislava Region, Western Slovakia, Central Slovakia, and Eastern Slovakia.

In the Slovak Republic, distinct interregional disparities can be observed. According to Habánik and Koišová (2011), regional disparities in the Slovak Republic are affected also by geography and potential of the region. Under these conditions, the regions acquire the status of marginal or developing regions. Marginal regions are characterized by a low level of transport equipment, technical and social infrastructure; rapid aging of the population, but on the other hand, this region has a natural wealth.

Pronounced disparities worsen the problems of peripheral areas, backward and peripheral regions, as well as the position of some of rural areas and socially deprived urban sites. (Michálek, 2012)

Interregional disparities in the Slovak Republic in 2000

The year 2000 was chosen as the base year in the research. Using the standardized variable method, NUTS2 assessment for selected indicators was calculated and the results are shown in Figure 1.

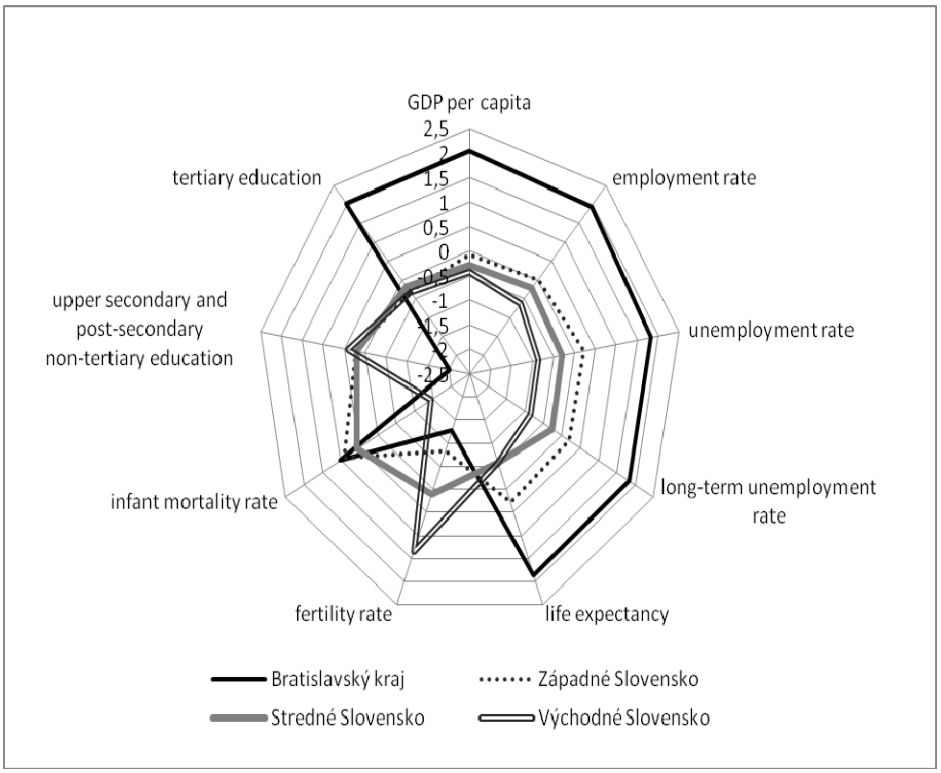


Fig. 1. Interregional disparities in Slovakia in 2000 (source: elaborated by authors, authors' calculations based on Eurostat data)

As seen in Figure 1, Bratislava region was the best performing region in the majority of the indicators examined in the paper. Fertility rate in Bratislava region reached a negative value. Fertility rate in Bratislava region is only 1.04 children per woman compared to 1.57 in Eastern Slovakia. Moreover, Bratislava region reached a negative value in the indicator of upper-secondary and post-secondary education. This is given by a large number of students in tertiary education. Bratislava region is followed by West Slovakia in the performance of almost all indicators, and the worst results were found in Eastern Slovakia.

Interregional disparities in the Slovak Republic in 2014

Additionally, NUTS2 assessment in selected indicators was performed for the year 2014. It is the last year when all of the indicators examined were available. The average GDP per capita amounted to EUR 4,100 in 2000, whereas the average GDP per capita rose to EUR 13,900 in 2014. The average employment was on the rise (from 56.3% to 62.7%), the unemployment rate fluctuated and dropped subsequently (2000: 19.1%, 2014: 11.5%); the long-term unemployment rate fluctuated as well and showed a downward trend subsequently (2000: 10.3%, 2014: 7.6%). Life expectancy at birth increased (from 73.3 to 77 years), the fertility rate fluctuated (2000: 1.30, 2014: 1.37), and the infant mortality rate went down (from 8.6 to 5.8). First, the percentage of students in upper-secondary and post-secondary education increased and dropped subsequently (2000: 73.5%, 2014: 70.2%), percentage of students in tertiary education increased from 10.3% to 21.1%. However, NUTS2 performances differ from the average values given. Therefore, their distinct assessment can be seen in Figure 2.

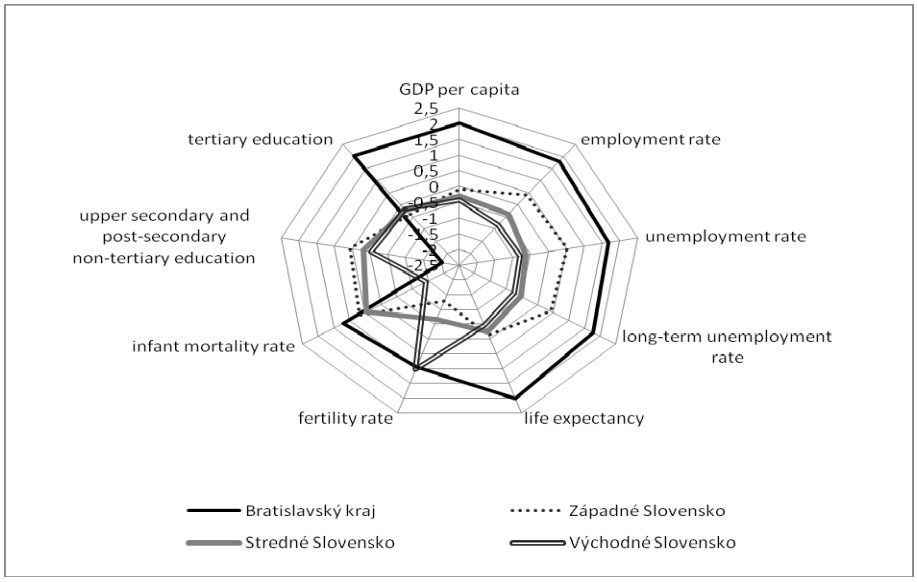


Fig. 2. Interregional disparities in Slovakia in 2014 (source: elaborated by authors, authors' calculations based on Eurostat data)

In 2014, the best results in all the indicators selected were again found in Bratislava region. Compared to 2000, there was a shift in fertility rate, which increased and reached the value of 1.48 children per woman, and thus being almost as high as fertility rate in Eastern Slovakia (1.49). The largest differences among Bratislava region and other Slovak regions were found in the following indicators: tertiary education (Bratislava region: 37.5%, Western Slovakia: 17.9%), GDP per capita (Bratislava region: EUR 33,900, Eastern Slovakia: EUR 9,600) and life expectancy at birth (Bratislava region: 78.7 years, Eastern Slovakia: 76.6 years). The worst results were found in the region of Eastern Slovakia.

Interregional disparities in the Czech Republic

There are eight regions in the Czech Republic (CR) that correspond to the NUTS2 level: Prague, Central Bohemia, Southwest, Northwest, Northeast, Southeast, Central Moravia, and the region of Moravia-Silesia. The region of Prague is the most developed region in the Czech Republic.

Interregional disparities in the Czech Republic in 2000

In the Czech Republic, there are also disparities among NUTS2 regions regarding the values for indicators examined. Using the standardized variable method, NUTS2 assessment for selected indicators was calculated and the results are shown in Figure 3.

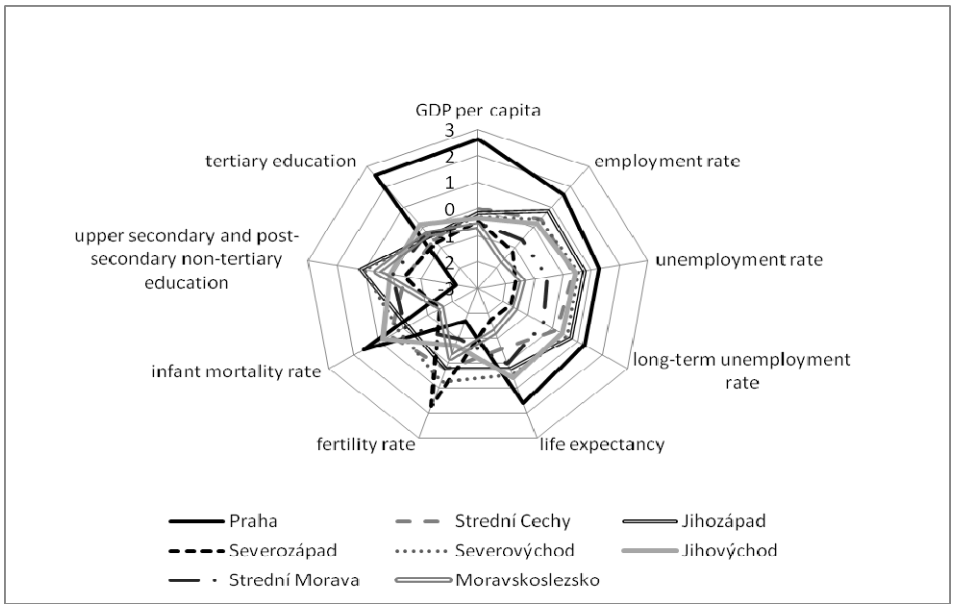


Fig. 3. Interregional disparities in the CR in 2000 (source: elaborated by authors, authors' calculations based on Eurostat data)

In 2000, the region of Prague was the best performing region in the majority of the indicators examined in the paper, except for two indicators (similarly as Bratislava region in the SR). Compared to other regions, markedly good results were found for the following indicators: GDP per capita (Prague: EUR 30,100, Northwest: EUR 10,900) and tertiary education (Prague: 40.5%, Northwest: 13.4%). The worst results regarding the selected indicators were achieved by the regions of Moravia-Silesia and Northwest.

2.2 Interregional disparities in the Czech Republic in 2014

Over the years 2000-2014, there were shifts in all the indicators under examination. Average GDP per capita went up (from EUR 6,500 to EUR 14,700), employment rate increased (from 64.9% to 70.2%), unemployment rate fluctuated and went down subsequently (2000: 8.8%, 2014: 5.0%), long-term unemployment rate fluctuated and went down subsequently as well (2000: 4.3%, 2014: 2.4%). Life expectancy at birth rose (from 75.1 to 78.9 years), fertility rate increased (from 1.15 to 1.53), infant mortality rate decreased (from 4.1 to 2.4). First, the percentage of students in upper-secondary and post-secondary education rose and dropped subsequently (2000: 74.5%, 2014: 71%), and the percentage of students in tertiary education increased from 11.5% to 22.2%. However, the indicator values calculated for individual regions differ from the average values, which can be seen in Figure 4.

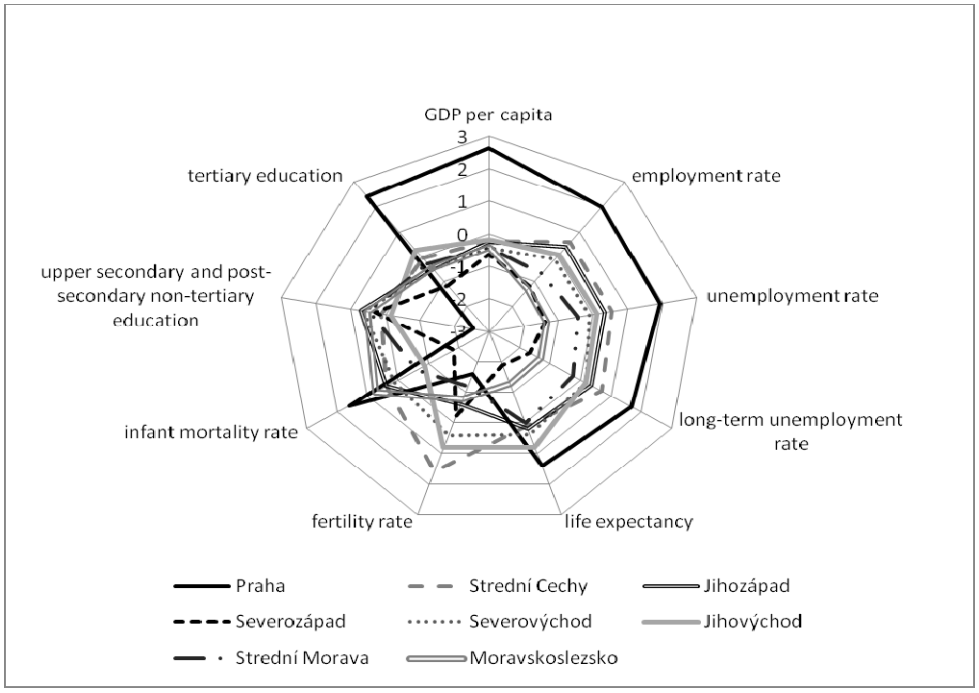


Fig. 4. Interregional disparities in the CR in 2014 (source: elaborated by authors, authors' calculations based on Eurostat data)

In 2014, the gap among the region of Prague and other Czech regions widened, especially in GDP per capita and tertiary education-related indicators. Moreover, labour market performance indicators were much higher in the region of Prague than in the remaining Czech regions. Compared to other regions, there was low fertility rate (1.45), and low percentage of students in upper-secondary and post-secondary education (57%), whereas the percentage in other regions is as high as 70%. In 2014, Northwest region was the worst performing region.

Comparison of regional disparities in the SR and CR

It follows from the comparison that the best performing regions are those around capital cities (Bratislava region, Prague). Both regions performed very well in all the indicators examined, except for the fertility rate and upper-secondary and post-secondary education. Based on the values for the indicators examined, it can be concluded that Czech regions performed better than Slovak regions with the only exception of GDP per capita: GDP per capita in Bratislava in 2014 amounted to EUR 33,900 compared to EUR 30,100 in Prague. In the Slovak Republic, poor results were found in infant mortality rate, whose value amounted to 10 in the region of Eastern Slovakia, which is mainly given by the high percentage of Roma citizens.

Based on the previous calculations, an overall assessment of NUTS2 regions in Slovakia and the Czech Republic in 2000 and 2014 was made. The overall assessment was made as the sum of values of the regions for each indicator. The results are illustrated in Figure 5.

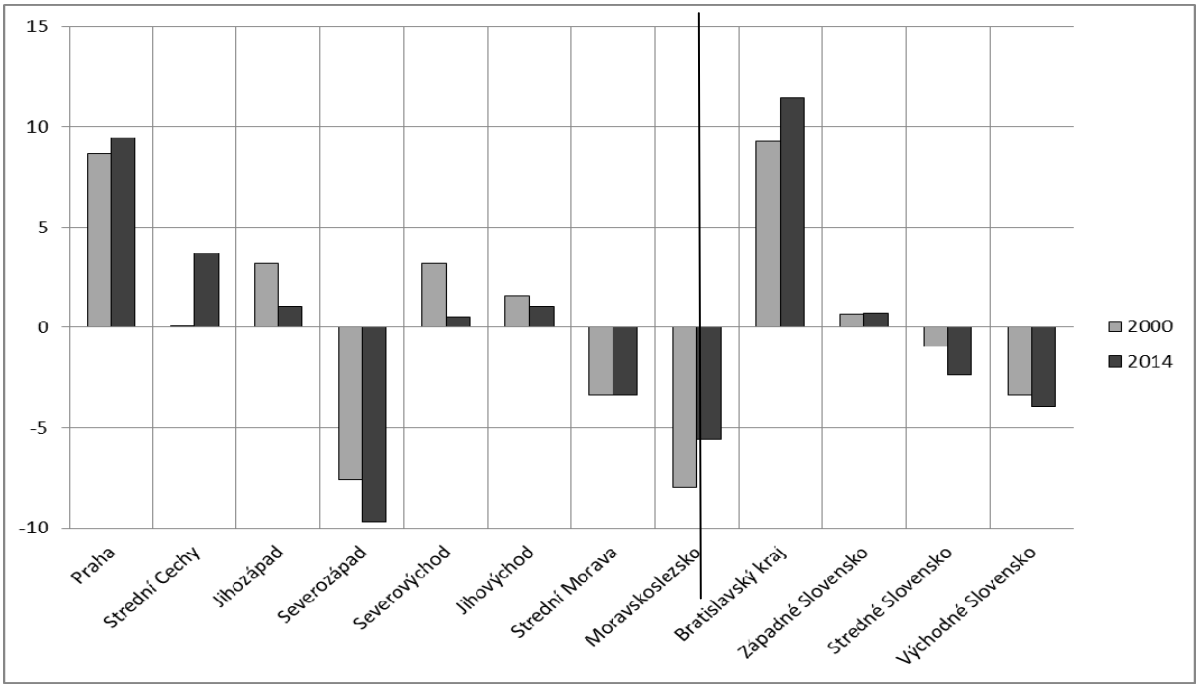


Fig. 5. Comparison of regional disparities in the SR and CR in 2000 and 2014 (source: elaborated by authors, authors' calculations)

In 2014, the gap among the region of Prague and other NUTS2 regions widened. Improvements were observed only in the region of Central Bohemia. The least performing were the regions of Moravia-Silesia, and particularly the region of Northwest, whose results even deteriorated in 2014.

In the Slovak Republic, there was a noticeable gap among Bratislava and other regions, which became even more evident in 2014. In addition to Bratislava region, only West Slovakia was positively assessed. Central Slovakia and Eastern Slovakia were negatively assessed, whereas their assessment even worsened in 2014.

Conclusions

Each region features distinct natural and economic conditions, which are differently made use of in terms of efficiency. Thus, regions vary in economic, social, environmental and other standards.

Concerning the interregional disparities in the Slovak Republic, Bratislava region was the best performing region in majority of selected indicators, excluding fertility rate and upper-secondary and post-secondary education. Bratislava region was followed by Western Slovakia, and the least performing region was Eastern Slovakia.

The largest differences among Bratislava region and other Slovak regions include tertiary education, GDP per capita, and life expectancy at birth.

In the Czech Republic, Prague was the best performing region, excluding fertility rate and upper-secondary and post-secondary education (as well as Bratislava region in the SR). The least performing were the regions of Moravia-Silesia and Northwest. Compared to other regions, markedly good results were found in GDP per capita and tertiary education. In 2014, the gap among the region of Prague and other Czech regions even widened.

It follows from the comparison of indicators that Czech regions performed better than Slovak regions (except for Bratislava region).

The research findings indicate that there are considerable differences in economic and social indicators both in the Slovak Republic and the Czech Republic. The best performing regions are those around capital cities. Other regions are less performing regions.

Disproportionate interregional disparities are not desired and should be mitigated through the tools of economic and regional policies. Otherwise, serious social unrest or political conflicts might occur. Thus, neglecting to address the issue of regional disparities would bring about problems that would affect the entire national economy.

References

Eurostat. (2016). *Regional statistics by NUTS classification*. [online]. [cit.: 2016-09-06] Available at: <http://ec.europa.eu/eurostat/data/database>.

Grmanová, E. (2012). Medziregionálne rozdiely v Slovenskej republike (Interregional Disparities in the Slovak Republic). *Faktory sociálneho a ekonomického rozvoja regiónov Slovenskej republiky (Factors of Social and Economic Development of Slovak Republic Regions).* Trenčín: FSEV TnUAD, p.79-85.

Habánik, J., Koišová, E. (2011). *Regionálna ekonomika a politika (Regional Economy and Policy).* Bratislava: Sprint dva.

Havierniková, K., Janský, B. (2014). The Evolution of Regional Disparities in the Slovak Republic. *Vadyba Journal of Management,* Nr. 2(25), pp. 133-138.

Hošták, P. (2014). Výskum dynamiky regionálneho rozvoja (Exploring the Dynamics of Regional Development). In:

Habánik, J. et al.: *Regionálna ekonomika a regionálny rozvoj (Regional Economy and Regional Development)*. Trenčín: TnUAD, p. 159-182.

Ivanová, E. (2010). Vplyv globálnej hospodárskej krízy na trh práce v SR (Impact of Global Economic Crisis on the Slovak Labour market). *Sociálno-ekonomická revue* (*Social and Economic Review)*. Vol. 8, No. 3 (2010), p. 22-26.

Ivanová, E. (2013). Regionálny rozvoj, regionálne disparity a metódy ich merania (Regional Development, Regional Disparities and their Measurement Methods). *Ekonomický rozvoj a ekonomická výkonnosť regiónov (Economic Development and Economic Performance of Regions).* Trenčín: TnUAD, p. 7-14.

Koišová, E. (2015). Research of selected indicators of regional development. *Institutional framework for the functioning of the economy in the context of transformation: Collection of scientific articles.* Montreal: Publishing House BREEZE, p. 246-250.

Kutscherauer, A. et al. (2010). *Regionální disparity v územním rozvoji České republiky – jejich vznik, identifikace a eliminace (Regional Disparities: Disparities in Country Regional Development – Concept, Theory, Identification and Assessment).* Ostrava: VSB-TU.

Michálek, A. (2012). Teoreticko-konceptuálne východiská výskumu priestorových a regionálnych disparít (Theoretical and Conceptual Bases of Space and Regional Disparities Research). *Acta Geographica Universitatis Comenianae*, Vol. 56, No. 1, p. 25-43.

Sandberg, K.- Meijers, E. (2006). *Polycentric development: panacea for regional disparities in European* countries? Response paper presented at 10th UNCECE Conference on Urban and Regional Research, May 22-23, 2006, Bratislava.

Španková, J. – Grenčíková, A. (2013). Regionálne disparity – príčiny a možné riešenia (Regional Disparities – Causes and Possible Solutions). *Aktuální otázky sociální politiky - teorie a praxe*. Vol..VII, No.1(2013), p.76-85.

Viturka, M. (2010). Regionální disparity a jejich hodnocení v kontextu regionální politiky. (Regional disparities and their evaluation in the context of regional policy). *Geografie*, Vol. 115, No. 2, p. 131-143.

RECEIVED: 22 May 2016 **ACCEPTED: 20 October 2016**

Jana Masárová. Philosophiae Doctor (Economics), Assistant Professor at Alexander Dubček University of Trenčín (Slovakia), Faculty of Social and Economic Relations, Department of Economy and Economics. e-mail: jana.masarova@tnuni.sk. Author and co-author of more than 70 scientific and research articles, published in Slovakia and abroad, author and co-author of textbooks and scientific monography. Fields of scientific interest: Macroeconomics, economic performance of states or regions, regional disparities, road infrastructure, insurance market.

Monika Gullerová. Philosophiae Doctor (Translatology), Assistant Professor at Alexander Dubček University of Trenčín (Slovakia), Faculty of Social and Economic Relations, Department of Social Sciences and Humanities. e-mail: monika.gullerova@tnuni.sk. Author and co-author of several research articles, published both in Slovakia and abroad.

Vadyba
Journal of Management
2016, № 2 (29)
ISSN 1648-7974

TOWARDS EUROPEAN UNION STRATEGIC SELF-MANAGEMENT

Stasys Paulauskas
Strategic Self-Management Institute

Annotation
EU is targeted to become smart, sustainable and inclusive growing community, which uses innovations as sustainable development engine. Nowadays EU faces significant governance problems related to contradiction between political and strategical self-management activities. Absent of long term scientifically grounded model of EU governance caused activation of politics as regressive social phenomenon and demagogy as method of political leadership. Growing not satisfaction of political governance requires to discover paths of its qualitative transition to next quality of social co-existence of people. Faced EU governance crisis experienced Strategic Self-Management Institute presents virtual models, which foreground logical transition of political governance to Strategic Self-Management. Virtual modelling methodology let's to construct virtual model of politics transition to strategic self-management, including its form, content and contradiction. Political governance should be replaced by constructive self-governance in each level of self-governance starting from a family till EU on the ground of human self-management cycle. Election of self-management operators should be replaced by constructive competitive selection of persons in courts. Politics should be disconnected from governance as it is stated in constitutions of many States. Adequate positioning of governance qualitative development in the history enabled to provide EU global peace strategy sustainable innovation, as peaceful and responsible way for integration and spread progressive ideas of sustainable development to overall World.
KEY WORDS: politics, demagogy, virtualics, virtual modelling, strategic self-management..

Introduction

European Union is targeted to become smart, sustainable and inclusive growing[1] community, which uses innovations as sustainable development engine. Scientifically grounded strategic self-management opens ways for increasing competitiveness and attractiveness, what enabled to enlarge this community until 28 member States. However, enlargement to East, Eurozone problems, refugees' invasion, etc. discovered lack of strategical programmes and tolls to assure efficient growth and peaceful integration. Contrary, in very short time the safety of EU was fell, Europe was returned to cold war conditions and armament competition. Advanced "black hole" was stopped to gravitate and disintegration processes began by Brexit – United Kingdom referendum decision to leave EU. The great EU governance crisis occurred (Angela Merkel, 2016). Necessity of changes in governance become evident.

Lack of strategic pats returned the search of decision to political level of governance. The new political movement DiEM25[2] was occurred targeted to make necessary democratisation changes seeking to avoid destruction of EU. Politologic approach to decision of the problem is not perspective in reason uncertainty of using terms and interests of talking and manifesting political parties. Politology and political activity lead EU to unlimited talks, manifestations, revolutions and finally – destruction.

Author of the article and his Strategic Self-Management Institute is working on governance sustainable innovations from 1985. Created methodology of virtual (previous – dialectical) modelling enabled in 1986 year to forecast destruction of USSR in 1991. Some similarities between USSR destruction and critical processes in EU are evident: a) stagnation of economy, b) growing discontent of people concerning governance, c) declaration to leave the union by the most developed countries – Baltic States in USSR and UK in EU. It's very important, that in case of USSR destruction from start in 1988 „Informal" movements in Baltic States till destruction of USSR in 1991 was only three years. In worse scenario some fall of EU could be rapid also.

Main hypothesis is that aged political governance and partocratic dictatorship culture is not appropriate for realisation of EU 2020 strategy and next efficient and peaceful integration of community. Large experience in self-management applications enables to propose to EU new approach and mean to save European Community trough qualitative transition of EU governance from politics to Strategic Self-Management.

Politics as qualitative kind of governance is still as alone form of management from ancient times till nowadays in all States of entire world. Uncertainty of subject and methods of politics, activities and declaration of politicians is frequently connected not to constructive management activity, but sometimes looks like rite and ceremonies without content. This social phenomenon meets increasing not satisfaction of people and criticism from point of view of healthy mind. Political science as politology operating in verbal mode is adequate to political uncertainty and its tries to describe activities and opinions of politicians and political parties. From

[1] EUROPE 2020 A European strategy for smart, sustainable and inclusive growth, http://ec.europa.eu/europe2020/index_lt.htm
[2] DiEM25, European movement for democratisation of Europe, https://diem25.org/

sociogenic[3] point of view, politics is still not positioned in time scale, isn't known it will be forever or it will be naturally developed to some more advanced form of governance in the future.

Modernisation of EU governance is discussing in quantitative mode in scales of more or less centralisation (federalism[4]) or decentralisation. EU strategic and operational governance depends of competence, political orientation and personal features of political leaders, which are changing permanently. Domination of political governance in EU level in Parliament, Council, Commission trough political representatives from member States reduces strategic self-management as constructive governance abilities. EU economic stagnation shows, that for turning up economic growth only qualitative changes in the governance is needed.

Author methodology of Virtualics is appropriate for model EU governance qualitative transition. This methodology is used for modelling of large number of development relations, starting from global till micro in "time-quality" scale.

Main subject of the article is to positioning the politics phenomenon in virtual „time - quality" scale in scope of its form, content, contradiction and moving forces and to provide possible scenarios of politics' transition to next quality - strategic self-management.

Main tasks are:

1. To construct politics' transition virtual model.
2. To define scope of strategic self-management features.
3. To provide EU global peace strategy sustainable innovation.

Virtual modelling of a governance qualitative transition

Uncertainty of political activity and terms are used for demagogy as method of governance from ancient time. Seeking to find "an angle in round room" it's necessary to change outlook from Politologic to Sociogenic. True human development trend should be cleaned from politological uncertainty.

A human is born to be free. However due to lack of self-governance abilities (knowledge, skills) it shares own freedom with other people (a manager, leader, etc.). Through history flow by increasing of self-governance abilities a human accepts three quality forms of self-governance: a) Autocratic (thesis), b) Democratic (antithesis) and c) Liberal (synthesis) (Fig.1.).

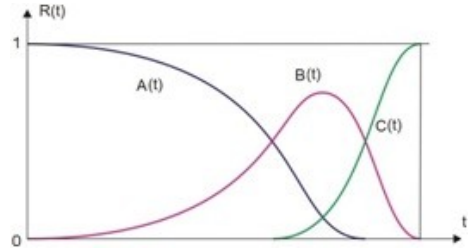


Fig. 1. Social relations' transition trichotomy (S.Paulauskas, 1985)

Each country could be placed in concrete time moment of such graph according to structure of reached governance culture. It shows, that all Humanity and each State passes stages of autocratic, democratic and liberal stages of governance culture.

In EU co-exists two quality stages of governance: a) political and b) democratic. The first is the official, the second - more as wishes now. Democratic governance has sense of Strategic Self-management and operates with measurable indicators in paradigm of Sustainable development. However, EU strategies as Lisbon and EU 2020 are more in wishes. Oligarchy with help of political parties are successful to keep aged oil, gas, nuclear and other danger and polluted technologies and stops progress of advanced solar, wind, electric vehicles, smart home and other advanced business. Oligarchy and partocracy leads stopping of progress, slowing economic growth, stagnation and disintegration of EU (Brexit, etc.).

According to Sociogeny, governance consist of 4 stages of human's self-management cycle: a) programming of an action (function of brain); b) decision-making (will); c) implementation (spine) and d) control (senses) (Fig.2). The operation of such cycle is changing trough history from autocratic leadership trough democratic self-management of a community to strategic self-management of a person. Autocratic governance has form of politics and its method is demagogy[5]. In kingdoms, dictatorships, partocracy strategic management isn't separated from personality of a King, dictator or political party. Selection of staff members is implementing by the leader personally.

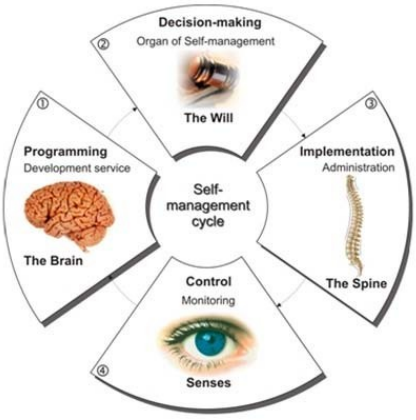


Fig. 2. Human Self-Management cycle (S.Paulauskas, 1979)

[3] Sociogeny (societas - society (*latin*); geny - origin, *greek*.) is science of origin and development of society, social relations (S.Paulauskas, 2016).

[4] Federalisation of the European Union, https://en.wikipedia.org/wiki/Federalisation_of_the_European_Union

[5] Demagogy – (Greek *dēmagōgía)* leadership of the people, http://www.dictionary.com/browse/demagogy

EU is on the way from autocracy (A) to democracy (D) now. Constitutions of many member states declares democracy as the state of society. However, this isn't fully right. Majority of EU States are governing by political parties, which placed their members in parliaments, government, municipalities, etc. Democratic principle of majority of votes in decision-making gives opportunity to leading political party or coalition to dictate own will in parliament and overall State. This mean, that between elections governance of a State becomes partocracy – dictatorship of won party or tis coalition.

Virtual model of political governance transition consists of three parts: the form $K_f(t)$, the content $K_c(t)$ and the contradiction H(t) (Fig.3). The form of governance is changing from outgoing verbal ($K_f(t)$) to rising quantifiable (Kf(t)). The content of governance is changing from demagogy($K_c'(t)$ to Strategic Self-Management (Kc(t)). Natural process of political innovation is going on trough contradiction between old form and new content H(t), which has form of resonance sinusoid. The pendulum oscillates as confrontation between conservative and innovative social groups until culmination (B), from which starts growth of new form – Strategic Self-Management. Conservative forces still make waves; which significance is reducing till disappearance in time point C.

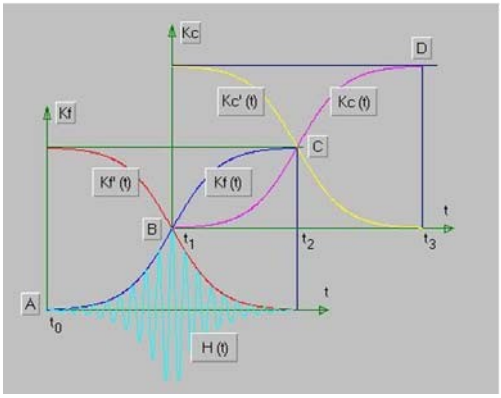


Fig. 3. Virtual model of qualitative transition (S.Paulauskas, 1985)

For assure accelerating economic growth, return gravitation and avoid destruction of EU is inevitable to replace the Economical paradigm by Sustainable Innovation culture. Economics was created as manual for hungry people. Biogenic demands are covered in EU. The second level of human demands - safety and health was actualised in EU now. So, a new manual - Sustainable Innovation paradigm of governance is needed. GDP as economic indicator of societies welfare should be replaced by full range life span of people. Human's immortality mechanisms are on desk of scientists. Let's forget Economics and start to learn Sustainable Innovation all.

No Politology, no Politics, no Demagogy, no Management, no Government, no Oligarchy, no Partocracy more. Only Strategic Self-management in each level of social organisation: family, block, village, town, district, region, State, Union, World… on the ground of human self-management cycle. Direct democracy should be contact - practical work together is only one mean for reliable and responsible vote for a member of self-governing organ - committee. Each self-management cycle should have and save own: Brain, Will, Spine and Senses. A life is permanent flow of innovations. Only sustainable innovations are acceptable for actual polluted and not equal World. This is my vision of DiEM25 till 2025.

European Community is the greatest project in human history. This advanced community attracts not with oil or gas, but with advanced Sustainable Innovation culture. Strategic Self-management approach will help to form and seek greatest United World target and equality for all people trough undisclosed income when wars will be stopped and weapons will be recycled to humans helping robots. No States, no borders - only free and happy humans will live in Sustainable World in 2050. It is inevitable.

Author and Strategic Self-Management Institute is working in such issues from 1980. Special methodology of Virtualics, Antrophogeny, Sociogeny and Technogeny were developed and applied during many sustainable innovation projects. It works.

Diagnosis: partocratic governance erosion

Sociogenic approach to DiEM25's seeking to democratise EU need to certain main terms. Hopefully this could give us at least half of success. Democracy is power of people. Power means abilities and opportunities to cover actualised demands of people.

In self-management cycle mean force of people in very specialised and high competence needed activities:

a) Programming of action - power to innovate;
b) Decision making - power to decide;
c) Implementing - power to implement;
d) Control - power to check validity of actions above.

Unfortunately, a crowd can't implement directly its power ambitions on democracy. Legislative frame on self-management cycle - Constitution and professional intermediaries - trusted specialists, are needed in service of people. Political parties started from "a barrel" as initiators and formers of ideology - ideas, approaches, targets, values, etc. Executors of people's will were professional employees. Rational mission of political parties was translation of people's needs and wishes into actions of employees.

Partocracy is power of political parties. Partocratic dictatorship is modification of autocracy, when not one monarch or dictator, but a group of people named as political party is dictating own will to all society for some years. Partocracy become possible, when political parties as cancer expanded their action sphere, occupied overall self-management cycle and replaced democracy. In majority of States' Constitutions partocracy isn't provided. Because constitutional norms must be applied directly, partocracy isn't constitutional and she is illegal (!).

Partocratic cancer was destroyed democracy as immune system of a society. Political demagogues and

layers occupied high professionalism required self-management positions parliaments, ministries, etc. Constructive State's development strategies were replaced by populist promises and demagogic shows. Young people were demotivated to seek professional career trough self-improvement in constructive activity, because only demagogy is needed for personal success in partocratic society. As result - intellectual abilities of government is reducing, what lead crime, corruption and disability to fight against international terrorism. Democracy is innovation engine, which assures creation and implementation of progressive novelties in all spheres of society's life. It's targeted to motivate people for creativity, to search, select and implement innovations into life of society. Properly operating democracy defines high speed of progress and welfare of a State.

Oligarchy is power of large business. It's antipode of democracy. Very rich old business isn't interested on progressive innovations, which ramp to lose markets, property and welfare. Aged oil, gas, nuclear power, weapon and other spheres of black business don't want to be replaced by wind, solar, electric vehicles, smart house and other progressive business activities. Hawing huge of money, they are able to take political parties into pockets, to stop progress and lead all World in economic stagnation and growing international confrontation. EU democratisation means at least return of political parties to "a barrel", restrict partocracy as illegal activity and recover democratic immunity by enabling rational, transparent and efficient operation of self-management cycle.

The key methodological achievement of EU is principle of Sustainable Innovation, which supports only innovations, which: a) guaranties less handy work; b) avoid pollution; c) prolongs full range life span of people and d) don't leave problems to next generations.

Democratisation of EU means creation and implementation of EU strategic Self-management programme:

a) EU Strategy till 2025 and 2050 year;
b) EU Constitution;
c) EU Self-Management system;
d) EU Financial mechanism.

Towards European Union Strategic Self-Management

Partocracy is guilty for stopped social progress in EU and World. Partition leads degradation, confrontation, wars, terrorism, climate change, etc. Synthesis of Strategic Self-management culture (SSMC) comes to change World development direction to Good deals. It's universal for each social level and it gives best opportunities for a social subject: person, group, community, World.

"Say, how you are self-improving - I will say, who are you". I see at least three historic self-improvement stages: a) Degrader (Not self- improving); b) Follower (Self-improving by following others); c) Innovator/Genius (Exceeding self-improvement). You can check your SSMC state trough answer to 25 questions of virtual tool iGenius, available in EN and LT languages.

SSMC is clever, efficient and peaceful. Stop to do impossible – to improve others! Start to improve yourself! Let's stop war and confrontation and invite each other in to permanent Olympic game on innovations and geniality on Good deals. It's God's wish.

But why SSMC is not so popular if it's so perfect? The biogenic level of human demands is guilty. Hungry people has limited time to forecast future and construct clever long term strategies. "Here and now" - this is the main principle of Homo Economicus, which seeks to cover biogenic demands in lowest spending of own time and energy. Hungry man can't think about self-improvement. It seeks to eat something quickly and a lot. "Après nous le déluge" (Louis XV of France).

EU isn't community of hungry people more. So, why it started to replace Economics by Sustainable development paradigm. However, it's enough complicated, danger and risky to be Genius surrounded by the hungry. Maybe UK will succeed on this :-) I don't think so. Genius is happy to shear SSMC. Let's do this. How to share SSMC as Good deal? In sport some strong regulations exist. So, SSM regulations should be defined in EU Constitution.

An obligatory condition in honour competition is equal opportunities to each participant. At first, this mean the same Universal Basic Income (UBI) to each person in community. Because competition on SSMC between genius and hungry person isn't honour and has low sense. I imagine, that UBI should be the same for each person in EU and it should include all social payments (pensions, support, etc.).

Let's install an Innovation engine in each social level. We should use very big reserve for growth – the Science, which usually isn't included in self-management cycles. A society looks like stupid man, which not used own brain in the own activity. The main innovation of EU organisation structure is collection of best innovation forces into Programming organ, which is responsible for preparing alternative development programmes. Decision-making organ – Parliament, Council, etc., is responsible for choosing and accepting the best alternative programme. Executing organ - Administration is responsible for assure implementation of accepted programme. State's Control institution should assure transparency of self-management cycle.

EU should be open for each country and person, who accepts SSMC Constitution. EU should give SSMC requirements to each candidate country on the basis of unlimited progress calendar. This enables to stop danger confrontation in Eurasian continent. Each candidate country will receive from EU home tasks for SSM self-improvement and will start to work. This is only one responsible way to stop cold war confrontation with Russia earlier as in 2025.

A bit later Homo Virtualis will come into World. A human consists of two substances: physical and virtual. Trough spending more and more time in Internet Humanity become Homo virtualis. Each person becomes as neuron in virtual brain of Humanity. Virtualisation of Humanity will be the main concern after 2025. Physical values, material property, weapons, wars, etc., will become less and less important and possible. Virtual

communities, virtual States, virtual EU and Virtual World will come into agenda of SSMC. Let's be the first!

EU Global Peace Strategy Sustainable Innovation

We, participants of Europe Democratisation Movement DiEM25, *representing* progressive people of Members States of European Union and Entire World,

Facing global economic stagnation and climate change, increasing international tension, religious intolerance, terrorism and return to cold war conditions,

Stating disability of European governance to assure high EU2020 strategic targets of sustainable development to do EU competitive and advanced community, assure further peaceful integration, efficient impact into solving of local conflicts, prevention of irrational migration and refugee flows,

Apologising, that EU democratic legislation and everyday activity was damaged by partocratic dictatorship and cheap populism, which was interrupted democratic self-management mechanisms and stopped sustainable innovations and development trough opened lobistic opportunities to freeze aged non sustainable technologies of oil, gas, nuclear and chemical business, which bothers advanced innovations of wind, solar, electric vehicles, smart houses, etc.

Assured, that only legal and transparently operating democratic self-management in all social levels: person, organisation, community, State, Union, World, is right way to turn European Union and entire world to sustainable growth and peaceful coexistence,

Defined, that Sustainable innovation is the most advanced methodology, which can assure rapid sustainable growth through: a) less handy work; b) avoiding pollution; c) prolongation of full range life span of people and d) don't giving problems to next generations and other countries.

Taking responsibility against all nations of European Union and Entire World.

Initiate European Global Pease Strategy:

1. To work out regulation of European Parliament and European Council on democratisation of governance in European community, in which universal transparently and efficiently operating democratic self-management mechanism and sustainable Innovation methodology will be assured.
2. To work EU Global Peace strategy till 2025 and 2050, in which European and Global sustainable integration and virtualisation will be planned.
3. To work out European Union Constitution for legislative framing of EU Global Peace strategy.
4. To establish EU strategic self-management through 4 stage cycle: a) EU Sustainable Innovation service, b) EU Parliament, c) EU Administration, d) EU Control, which members will be defined trough professional adequacy competition procedure by EU Constitutional court.
5. Creation of equal economic opportunities of exceeding self-improvement to each person in EU trough introduction of the same Universal Basic Income (UBI), coherent to robotisation level.

Conclusions

Politics and demagogy is governance quality of autocratic society, because it's grounded on voluntary leadership and dictatorship of a group (partocracy) of people against all society. European Union declares democracy, so, here is contradiction between declared democratic governance and real partocratic dictatorship.

EU governance verbal form should be replaced by quantifiable measurable indicators. This process is going on, when EU works in level of strategic self-management (EU 2020, etc.). Sustainable development paradigm is appropriate to quantifiable form of governance.

EU governance political content should be replaced by Strategic Self-Management in all levels of community on the ground of the best sample – human self-management cycle. Self-management coordinating and implementing persons should be elected by responsible people at each self-governance level. Each level Community elects and delegates representative to higher level of SSM. Political parties could exist free and act according to public law. They could form public opinion, initiate governance innovations equal as each citizen of EU member States.

EU strategic targets should be oriented to spread SSM culture in World's level trough attractive peaceful integration of wished countries on basis of open calendar of access EU. At this way EU brings disarming and peace to entire world. The poverty and diseases will be liquidated trough spreading Universal basic income to each citizen.

EU Global Peace Strategy sustainable innovation declaration is the frame for stop destruction and return to cold war. It opens smart and proud way for create united peaceful world of progress and happiness.

References

Atkinson, G., Dietz, S. & Neumayer, E. (2007). *Handbook of Sustainable Development*. Cheltenham: Edward Elgar Publishing. ISBN 978-1-84376-577-6

Baratta, Joseph P. (2004) *The Politics of World Federation.* Vol. 1: *The United Nations, U.N. Reform, Atomic Control.* Vol. 2: *From World Federalism to Global Governance*. Westport: Praeger.

Barnard, Catherine (2010). *The Substantive Law of the EU: The four freedoms (3rd ed.). Oxford: Oxford University Press. p. 447. ISBN 978-0199562244.*

Blackburn, W.R. (2007). *The Sustainability Handbook*. London: Earthscan. ISBN 978-1-84407-495-2.

Braungart, M., and W. McDonough (2002). *Cradle to Cradle: Remaking the Way We Make Things*. North Point Press.

George F. Simons, ed. (2002). *EuroDiversity (Managing Cultural Differences). Abingdon-on-Thames: Routledge. p. 110. ISBN 978-0877193814*

Cabrera, Luis (2010) *The Practice of Global Citizenship*. Cambridge: Cambridge University Press.

Culbertson, Ely (1949) [Book Review] 'The Preliminary Draft of a World Constitution, by the Committee to Frame a World Constitution,' *Indiana Law Journal* 24(3), 474-82.

Craig, Paul; De Burca, Grainne (2011). *EU Law: Text, Cases and Materials (5th ed.). Oxford: Oxford University Press. p. 15. ISBN 978-0199576999.*

Costanza, R., Graumlich, L.J. & Steffen, W. (eds), (2007). *Sustainability or Collapse? An Integrated History and*

Future of People on Earth. Cambridge, MA.: MIT Press. ISBN 978-0-262-03366-4.

Edwards, A.R., and B. McKibben (2010). *Thriving Beyond Sustainability: Pathways to a Resilient Society*, New Society Publishers.

Huesemann, M.H., and J.A. Huesemann (2011). *Technofix: Why Technology Won't Save Us or the Environment*, Chapter 6, "Sustainability or Collapse", New Society Publishers.

Jackson, T. (2011). *Prosperity without Growth: Economics for a Finite Planet*. Routledge.

James, Paul*;* Nadarajah, Yaso; Haive, Karen; Stead, Victoria (2012). *Sustainable Communities, Sustainable Development: Other Paths for Papua New Guinea. Honolulu: University of Hawaii Press.*

Komiyama, Hiroshi; Kraines, Steven Benjamin (2008). *Vision 2050: Roadmap for a Sustainable Earth. Berlin: Springer. ISBN 4-431-09430-X.*

Li, R.Y.M. (2011). *Building Our Sustainable Cities*. Illinois: Common Ground Publishing. ISBN 978-1-86335-834-7.

Liam Magee; Andy Scerri; Paul James; James A. Thom; Lin Padgham; Sarah Hickmott; Hepu Deng; Felicity Cahill (2013*). "Reframing social sustainability reporting: Towards an engaged approach". Environment, Development and Sustainability. 15 (1): 225–43.*

Makstutis, A., Paulauskas S., Smaliukiene R. (2008). Harmonous development of the State and Society, *Vadybos šiuolaikinės tendencijos. Collection of scientific works*. General Jonas Zemaitis military academey. *ISBN 978-9955-423-69-0. Vilnius, 20*08. –P.175-184.

Norton, B. (2005). *Sustainability, A Philosophy of Adaptive Ecosystem Management*. Chicago: The University of Chicago Press. ISBN 978-0-226-59521-4.

Paulauskas, S. (2016). EU Global Peace Strategy Sustainable Innovation, https://www.diem25.org/forum/viewtopic.php?f=36&t=9326

Paulauskas, S., Paulauskas A. (2008). The virtualics and strategic self-management as tools for sustainable development, *Technological and economic development of economy*, Baltic journal on sustainability, Vilnius Gedimino Technical university. 008. 14(1): –P.76–88.

Paulauskas, S. (2008). Sustainable security: the virtual approach, *Actual management tendencies*, Collection of scientific works. General Jonas Zemaitis military academy. ISBN 978-9955-423-69-0. Vilnius, 2008. –P.275-296.

Paulauskas, S. (2000). Democratic Self-Management. How to improve the Governance of the State Lithuania/ *Collection of articles.* Joint Stock Company "Eksponente". Klaipeda.

Paulauskas, S. (1999). Self-Management Dialectics. Theory, methodology models, *Monograph.* Klaipeda University. Klaipeda.

Paulauskas S. (1991) Dialectical Model of Democratic Revolution. "Lithuanian economy", Nr.8. p.24-25.

Paulauskas, S. (1989) Politology and Self-management. "Time and events", Nr.11, Vilnius.

Paulauskas, S. (1985) Dialectical World Outlook. "Science and Technique", Nr.11. p.24-26, Vilnius.

Rogers, P., K.F. Jalal, and J.A. Boyd (2007). *An Introduction to Sustainable Development*. Routledge.

Piris, Jean-Claude (2010*). The Lisbon Treaty: A Legal and Political Analysis (Cambridge Studies in European Law and Policy). Cambridge: Cambridge University Press. p. 448. ISBN 978-0521197922.*

William, C., Mitchell, Randy T Simmons. (2011). Beyond Politics. *Markets, Welfare and the Failure of Bureaucracy*, http://www.independent.org/publications/books/summary.asp?id=34

RECEIVED: 27 April 2016 **ACCEPTED: 20 October 2016**

Stasys Paulauskas, doctor of philosophy (applied sociology), professor, establisher and head of Public Institution Strategic Self-Management Institute (from 1991). Author and innovator of methodological systems Virtualics, Anthropogeny, Sociogeny, Technogeny, Strategic Self-management, Responsible Energy, Sustainable Innovation, which are applied to fields of education, maritime, ITC, energy, business, culture, etc. trough large scientific research and innovations and participation in international programmes of UNDP GEF, Leonardo da Vinci, Erasmus, Interreg IIIa, South Baltic and Baltic Sea region. Main specialisation is introduction of Strategic Self-Management in different levels of social organisations. Baltijos pr. 123-61 LT-93224 Klaipeda, Lithuania; +370 655 39295. ssi@eksponente.lt, www.eksponente.lt

Vadyba
Journal of Management
2016, № 2 (29)
ISSN 1648-7974

EVALUATION OF EXPORT EXPANSION IMPACT ON THE ECONOMIC GROWTH IN SUB-SAHARAN AFRICA

Alieu Gibba
Szent István University, Hungary

Annotation
There is no unanimity in the empirical and theoretical literature on the causal relationship between exports and economic growth. Hence, the article aims to investigate empirically how export determines and sustains economic growth in Sub-Saharan Africa using Angola, Cote d' Ivoire, Nigeria, and South Africa as case studies. The study employs the estimation of the Augmented Dickey Fuller (ADF), unit root, and Granger causality tests to examine the positive effects of export expansion and diversification to economic growth with the aid of a vector auto regression (VAR) model.
The empirical results indicate that the total export of the examined countries positively affects their economic growth (GDP) at a rate of 85.7%, 49.1%, 76.9%, and 87%, for Angola, Cote d' Ivoire, Nigeria, and South Africa respectively. The study suggests appropriate and progressive policies to be implemented in order to diversify and promote exports (including non-oil exports) and construct efficient service infrastructure to support and attract domestic and foreign investment.
KEY WORDS: Economic growth, export, infrastructure, investment, Sub-Saharan Africa.

Introduction

Export development and diversification play a critical role in Sub-Saharan Africa's economy, influencing the level of economic progress, the balance of payments, the balance of trade, and employment. Globalization, reduced tariff barriers, economies of scale, and lowered transport costs, are factors that have assisted export to become a bigger share of national income in Sub-Saharan Africa. Exports are a component of aggregate demand (AD) and growth in this component can create employment, increase AD and cause higher economic growth. The strength of exports has a significant role in determining the current account deficits of Sub-Saharan African countries likewise its relative competitiveness, quality and value added, exchange rate, and long run productivity.

There is no concord in the empirical and theoretical literature on the causal relationship between export expansion and economic growth (GDP). Therefore, this article explores empirically, how export expansion, diversification, and promotion determines economic progress in Sub-Saharan Africa using Angola, Cote d' Ivoire, Nigeria, and South Africa as examined sample countries. The study adopts the estimation of ADF, unit root, and Granger causality tests to investigate the positive effects of export development to economic wellbeing with the aid of a vector auto regression (VAR) model.

The empirical results indicate that the total export of the examined countries positively affects their economic progress and wellbeing (GDP) at a rate of 85.7%, 49.1%, 76.9%, and 87%, for Angola, Cote d' Ivoire, Nigeria, and South Africa respectively. The study suggested appropriate and progressive policies to be adopted in order to diversify and promote exports (including non-oil exports) and construct efficient service infrastructure to support and attract domestic and foreign investment to finance the balance of payment deficits. The structure of the article is sectioned as follows: Section 2 provides the theoretical and conceptual framework on the causal link between export expansion and economic growth (GDP) Section 3 elucidates the data, methodology, and empirical evidence. Conclusions and policy implications are presented in Section 4.

Theoretical and Conceptual Framework

In recent empirical and theoretical studies on economic growth, poverty alleviation, and the increasing issue of inequality in Africa and beyond, many literature have revealed the determinants / sources of economic growth for better productivity, which were aimed to improve the living standards of the Sub-Saharan African people. "There is available evidence that suggests that investment in public goods such as agricultural research, extension, and roads constitutes one of the most effective tools available for stimulating economic growth and poverty reduction" (Chiona et al., 2014). The achievement of economic growth and development is an important macroeconomic objective in all developed and developing countries. Furthermore, several studies revealed that export expansion is one of the main determinants of economic progress and development which plays a vital role in the reduction of the widespread poverty and inequality in sub-Saharan Africa. The economies of the Asian (especially the four Asian 3 tiger economies; South Korea, Hong Kong, Taiwan and Singapore) and Latin American countries were successfully transformed due to the important role that exports play in the process of economic growth and development (About-Stait, 2005).

Export is viewed as a major driver of economic growth due to its effects on foreign exchange earnings which enables a country to finance its unavailable imports, easing the balance of payment pressure, and creating job opportunities. Mah (2015) investigates the sources of economic growth in Tanzania since its market reforms in the late 1980s. The study adopts the application of the variance bounds co-integration test to economic growth, investment, exports, and aid flow into Tanzania using an error correction model (ECM). His findings reveal that export expansion in Tanzania leads to rapid economic progress due to the positive externalities and economies of scale involved. Since export expansion leads to economic growth, he further argued that the latter does not influence export development in Tanzania. Many researchers believe that sustainable economic growth depends on the ability of economies to create jobs and livelihoods on continuous basis. Some argue that this could be better implemented by private entities rather than state-owned enterprises in sub-Saharan Africa (Kuada, 2014).

It is a well-known fact that poverty alleviation through economic advancement is the fundamental objective of governments of Sub-Saharan African countries. This could be realized through sustainable economic progress and income distribution. For instance, in sub-Saharan Africa, the relationship between economic progress, poverty alleviation, and income distribution has been the major concern of their economies several decades ago. Okodua and Ewetan (2013) used the VAR model to examine the applicability of the Export-Led-Growth (ELG) hypothesis for Nigeria for the period 1970-2010. Their findings from the co-integration and Granger Causality tests did not support the ELG for Nigeria, but however, the authors recommended that government must diversify the product base of the economy, promote non-oil exports, and construct efficient service infrastructure to support private domestic and foreign investment.

A number of studies [as mentioned by Okodua and Ewetan, 2013], with mixed findings that explore the correlation between exports and economic progress in Nigeria include: Omisaki (2009), Chimobi (2010), and Alimi (2012). The relationship between export and growth could also depend on the country's level of economic progress (About-Stait 2005). Martin (1992) argues that export causes economic growth and development for some major economies including United States, United Kingdom, Germany, and Japan. Conversely, About-Stait (2005) and Arthar et al (2012), find no positive correlation and empirical evidence in support of the export-led hypothesis for Egypt and Pakistan respectively. A number of influential studies investigate the causal relationship between export and economic growth for developed countries, and conclude with empirical evidence in support of the export-led growth hypothesis (Lim, Chia and Man, 2009; Grossman, Rivera-Batiz, and Romer, 1991; Subasat, 2002; Martin, 1992; Boltho, 1996; Helpman, 1990; Awokuse, 2003).

Data, Methodology, and Empirical Evidence

This research collected data from secondary sources including the United Nations Statistics Division database (UNSD). The total export values and GDP of the four most striving Sub-Saharan African countries for a time period of 25 years (1990 – 2014) were collected to test empirically, the long run positive relationship between export expansion and the economic wellbeing of the observed (sample) countries from Sub-Saharan Africa using SPSS and E-views applications. The implications of the findings will have an impact on the rest of the Sub-Saharan Countries. The paper also employs a variety of analytical tools, including co-integration analysis, Granger causality tests, and unit root tests, combined with vector auto regression (VAR) model. The following VAR model was therefore considered for the estimation techniques:

$$\ln GDP(t) = \alpha 0 + \alpha 1 \ln EXPA(t) + \alpha 2 \ln EXPC(t) + \alpha 3 \ln EXPN(t) + \alpha 4 \ln EXPS(t) + \alpha 4 \ln INST + e(t)$$

Where, GDP denotes the gross domestic product. EXPA, EXPC, EXPN, EXPS and INST, represent total exports of Angola, Cote d' Ivoire, Nigeria, South Africa, and institutions respectively. GDP is considered to be the dependent variable while EXPA, EXPC, EXPN, EXPS and INST, are considered to be the independent factors. Well reformed and established inclusive political and economic institutions immensely contribute in economic transformation and have a direct positive effect on the overall economic growth (GDP) and vice-vers

Table 1. Results for Simple Time Series VAR Model for **Angola**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXPORTS	1.744353	0.058785	29.67338	0.0000
R-squared	**0.856615**	Mean dependent var		34.69320
Adjusted R-squared	0.856615	S.D. dependent var		16.87298
S.E. of regression	6.389149	Akaike info criterion		6.586257
Sum squared resid	979.7093	Schwarz criterion		6.635012
Log likelihood	-81.32821	Hannan-Quinn criter.		6.599780
Durbin-Watson stat	0.330745			

(**Source:** Own study based on the data from UNSD)

Table 2. Results for Simple Time Series VAR Model for **Cote d' Ivoire**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXPORTS	2.186293	0.051585	42.38238	0.0000

R-squared	**0.490866**	Mean dependent var	17.14040
Adjusted R-squared	0.490866	S.D. dependent var	2.852365
S.E. of regression	2.035265	Akaike info criterion	4.298307
Sum squared resid	99.41530	Schwarz criterion	4.347062
Log likelihood	-52.72884	Hannan-Quinn criter.	4.311830
Durbin-Watson stat	0.367426		

(Source: Own study based on the data from UNSD)

Table 3. Results for Simple Time Series VAR Model for **Nigeria**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXPORTS	3.742897	0.151435	24.71619	0.0000

R-squared	**0.768855**	Mean dependent var	161.0648
Adjusted R-squared	0.768855	S.D. dependent var	72.68705
S.E. of regression	34.94614	Akaike info criterion	9.984671
Sum squared resid	29309.59	Schwarz criterion	10.03343
Log likelihood	-123.8084	Hannan-Quinn criter.	9.998194
Durbin-Watson stat	1.510300		

(Source: Own study based on the data from UNSD)

Table 4. Results for Simple Time Series VAR Model for **South Africa**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXPORTS	3.970144	0.063031	62.98745	0.0000

R-squared	**0.869858**	Mean dependent var	239.6492
Adjusted R-squared	0.869858	S.D. dependent var	53.83256
S.E. of regression	19.42022	Akaike info criterion	8.809685
Sum squared resid	9051.482	Schwarz criterion	8.858440
Log likelihood	-109.1211	Hannan-Quinn criter.	8.823208
Durbin-Watson stat	0.399906		

(Source: Own study based on the data from UNSD)

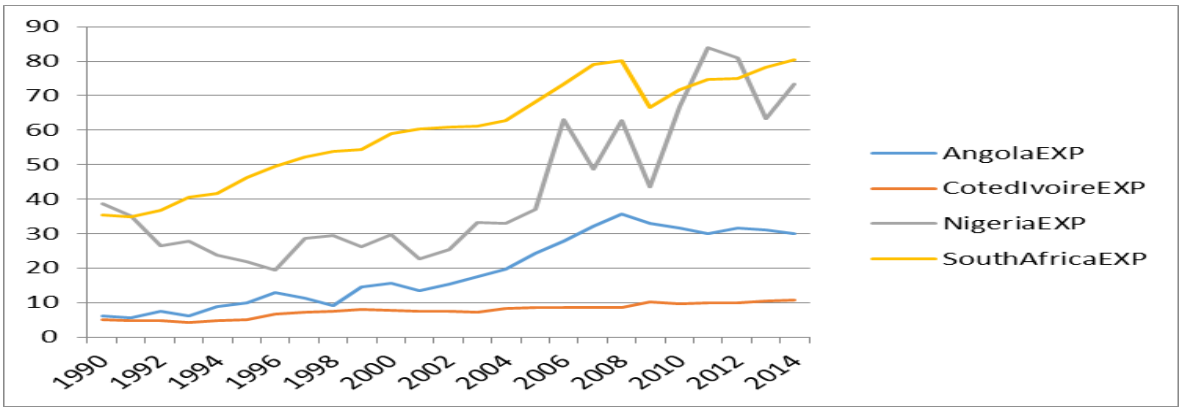


Fig. 1. Export performance of the examined countries from 1990 – 2014
(Source: Own study based on the data from UNSD)

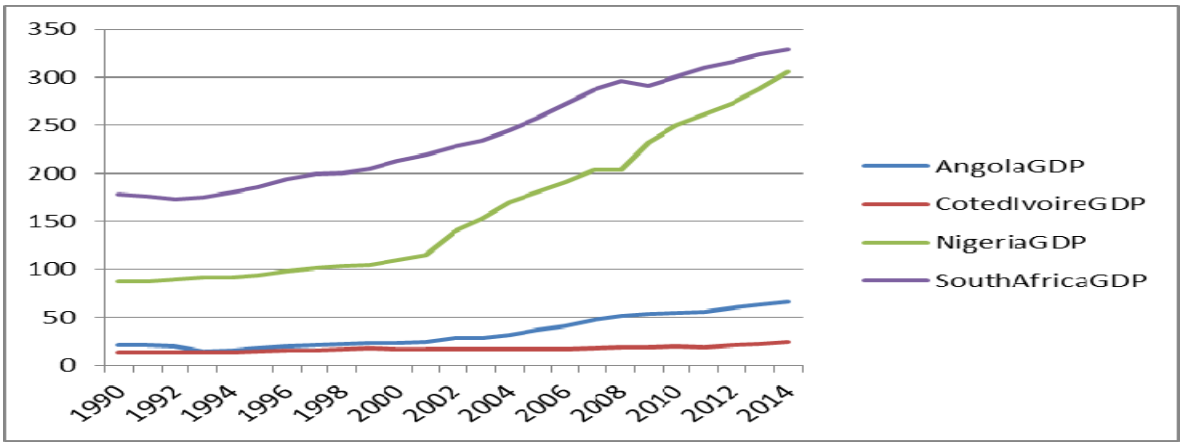


Fig. 2. GDP of the examined countries from 1990 - 2014
(**Source:** Own study based on the data from UNSD)

From table 1 to 4, it could be observed that the variables are stable [with positive coefficients] and due to this stability, the vector auto-regression (VAR) model was established because the p-value = 0.0000. The coefficients are reasonable because the examined variables can explain GDP at a rate of 85.7%, 49.1%, 76.9%, and 87%, for Angola, Cote d' Ivoire, Nigeria, and South Africa, respectively. Export diversification of the examined countries will greatly impact their economies due to the positive externalities involved. A structural or policy change in the economy might affect these results 5 - 10 years later, but right at this point, this is the situation. The findings from this research conform with the findings of Martin (1992); Lim, Chia and Man (2009); Grossman, Rivera-Batiz, and Romer (1991); Subasat (2002); Boltho (1996); Helpman (1990); and Awokuse (2003), which emphasize that export expansion is a good determinant of economic progress for the examined countries.

Generally speaking, the four countries' GDP are still increasing. South Africa's economic situation is performing better than others'. Nigeria's economy and export industry show visible improvement from 2000 to 2014. South Africa and Nigeria export increased after the 2008 financial tsunami. Angola's export drastically decreased due to the tsunami and some policy changes.

Conclusion and Policy Implications

The main purpose of this article was to test empirically how total export determines economic progress in Sub-Saharan Africa using Angola, Cote d' Ivoire, Nigeria, and South Africa as case studies. The study adopts the estimation of ADF, unit root, and Granger causality tests to examine the positive effects of export expansion and diversification using the vector auto-regression (VAR) model. The empirical results indicate that the total export of the examined [sample] countries positively affects their economic progress and wellbeing (GDP) at a rate of 85.7%, 49.1%, 76.9%, and 87%, for Angola, Cote d' Ivoire, Nigeria, and South Africa, respectively, which quite conforms with the studies of Martin (1992); Lim, Chia and Man (2009); Grossman, Rivera-Batiz, and Romer (1991); Subasat (2002); Boltho (1996); Helpman (1990); and Awokuse (2003).

Part of the policy implications of this research is that governments of the examined countries as well as those of the remaining Sub-Saharan Africa must adopt appropriate progressive policies to diversify the productive base of their economies. Non-oil exports should also be promoted and expanded in countries like The Gambia, Senegal, Mali, etc. Efficient service infrastructure should be constructed and there should be progressive policies to support domestic and foreign investment. The only way to sustain higher productivity, expand, and diversify exports in Sub-Saharan Africa is to improve the efficiency of resource utilization and to discover the factors affecting them.

References

About-Stait, F. (2005), Are Exports the Engine of Economic Growth? An Application of Cointegration and Causality Analysis for Egypt, 1977-2003. Economic Research Working Paper,No. 76, Tunis: African Development Bank.

Alimi, S. (2012), Is the Export-Led Growth Hypothesis Valid for Nigeria? Research Journal of Economics and Business Studies, 12(2), 8-14.

Arthar, I., Hameed, I. and K. Devi (2012), Relationship between Exports and Economic Growth of Pakistan. European Journal of Social Sciences, 32(3), 453-460.

Awokuse, T.O. (2004), Is the Export-Led Growth Hypothesis Valid for Canada? Canadian Journal of Economics, 36, 126-136.

Boltho, A. (1996), Was Japanese Growth Export-Led?. Oxford Economic Papers, 48, 415-432.

Chimobi, O.P. (2010), The Estimation of Long-run Relationship between Economic and Growth, Investment and Export in Nigeria. International Journal of Business and Management, 5(4); 215-222

Chiona, S., Kalinda, T., & Tembo, G. (2014). Stochastic Frontier Analysis of the Technical Efficiency of Smallholder Maize Farmers in Central Province, Zambia. *Journal of Agricultural Science*, *6*(10), 108.

Grossman, G.M. and E. Helpman (1990), Comparative Advantage and Long-Run Growth, American Economic Review, 80, 796-815.

Kuada, J. (2014). Economic growth and poverty alleviation in Africa – linking hard and soft economics. *African Journal*

of Economic and Management Studies, *5*(1), 2–8. http://doi.org/10.1108/AJEMS-03-2014-0016.

Lim, S.Y., Chia, R.C.I. and C.H. Mun (2009), Long-run Validity of Export-Led Growth: An Empirical Reinvestigation from Linear and Nonlinear Cointegration Test. Economics Bulletin, 30(2), 1182-1190.

Mah, J. S. (2015). Export Expansion and Economic Growth in Tanzania. *Global Economy Journal*, *15*(1), 173–185. http://doi.org/10.1515/gej-2014-0047.

Marin, D. (1992), Is the Export-Led Growth Hypothesis valid for Industrialized Countries? Review of Economics and Statistics, 74(4), 678-688

Okodua, H., & Ewetan, O. O. (2013). Econometric Analysis of Exports and Economic Growth in Nigeria. *Journal of Business Management and applied Economics*, *2*(3), 1-14.

Omisakin, O.A. (2009), Export-Led Growth Hypothesis: Further Econometric Evidence from Nigeria. Pakistan Journal of Social Science, 6(4), 219-223

Subasat, T. (2002), Does Export Promotion Increase Economic Growth? Some Cross-Section Evidence, Development Policy Review, 20, 333-349.

UNSD – National Accounts /http://unstats.un.org/unsd/snaama/dnlList.asp/Gambia. Accessed on: [01/05/2016]

RECEIVED: 1 June 2016 **ACCEPTED: 20 October 2016**

Alieu Gibba, PhD Candidate, Szent István University, Doctoral School of Management and Business Administration, Faculty of Economic and Social Sciences, Institute of Economics, Law and Methodology, Field of Scientific Research: Evaluation of Determinants of Economic Performance in Sub-Saharan Afrcia: Focusing on Exports and Efficiency in Agriculture, H-2100 Gödöllő, Páter Károly u. 1, Hungary, Fax: +3628410804, e-mail: agibba1@gmail.com

Vadyba
Journal of Management
2016, № 1(29)
ISSN 1648-7974

AN EMPIRICAL STUDY ON FACTORS OF ECONOMIC GROWTH IN THE GAMBIA: LESSONS FROM AGRICULTURE AND EXPORTS

Alieu Gibba*, Molnar Mark
Szent István University, Hungary

Annotation
Since the 1990s, The Gambia government has been committed to sustainable human development and improved living standards of the people of the country. During this period, the Government has established a number of strategies to achieve these objectives, including: Vision 2020, Millennium Development Goals, Poverty Reduction Strategies, and very recently, a Program for Accelerated Growth and Employment (PAGE); The Gambia's development strategy and investment program for 2012 to 2015.
This article examines the sources of rapid economic growth using The Gambia as a case study. It adopts the application of Augmented Dickey-Fuller (ADF) and Granger causality tests to determine the positive effects of export expansion, agricultural development, government spending on education, and foreign direct investment (FDI), using the Vector Autoregression (VAR) model. The empirical results indicate that the examined [independent] variables can positively determine Gambia's economic progress at a rate of 72.09%.
KEY WORDS: Agriculture, economic growth, education, export expansion, The Gambia.

Introduction

The Gambia is a small country in West Africa with an estimated population of 1.8 million in 2014. Despite the widespread poverty and slow economic advancement in Sub-Saharan Africa, the country is still committed in recording a satisfactory economic progress in the medium to long term in order to ensure improvement in the wellbeing of its population. It however made effective policy analysis, planning, programing, and monitoring for the economic sector to receive appropriate support. Moreover, it has been theoretically and empirically evidenced that quality education and skills acquisition have direct positive impact on economic advancement (Priya et al., 2015; Mercan & Sezer, 2014; Ahiakpor, 2013). Likewise investment and exports for economic growth (Mah 2015; Gui-Diby, 2014) and finally, agricultural development for higher productivity, income distribution, and poverty alleviation (Tomšík et al., 2015).

This article evaluates the main determinants of economic progress in The Gambia. It employs the application of Granger causality, unit root, and Augmented Dickey-Fuller (ADF) tests. Its main goal was to explore and analyze the main factors leading to economic growth and development which when achieved increases consumption and savings, thereby reducing poverty and inequality in the country, as well as in other Sub-Saharan African countries through the sound policy implications. What will happen to The Gambia economy when exports, foreign direct investment (FDI), gross capital formation, government spending on education, and agriculture are promoted? This article attempts to answer this question. The empirical results reveal that the examined [independent] variables can determine Gambia's economic growth at a rate of 72.09%. Total exports and agricultural development stand as the most outstanding determinants of economic advancement.

The structure of the paper is organized as follows: Section 2 provides the theoretical and conceptual framework on economic growth and development by focusing on the impact of export expansion, FDI promotion, government spending on education, and agricultural development for higher productivity. Section 3 elucidates the methodology and empirical evidence. Conclusions and policy implications are provided in Section 4.

Conceptual and Theoretical Framework

In recent empirical and theoretical studies on economic growth, poverty alleviation, and the increasing issue of inequality in Africa and beyond, many literature have revealed the determinants of economic growth for better productivity, which were aimed to improve the living standards of the African people. Furthermore, several studies revealed that export expansion is one of the determinants of economic growth and development which plays a vital role in the reduction of the widespread poverty and inequality in sub-Saharan Africa.

Mah (2015) explored the sources of economic growth using Tanzania as a case study since its market reforms in the late 1980s. The study adopts the application of the variance bounds cointegration test to economic growth, investment, exports, and aid flow into Tanzania using the error correction model. His results reveal that export expansion in Tanzania leads to rapid economic progress due to the positive externalities and economies of scale involved. Since export expansion leads to economic

growth, he further argued that the latter does not influence export development in Tanzania.

Many researchers believe that sustainable economic growth depends on the ability of economies to create jobs and livelihoods on continuous basis. Some argue that this could be better implemented by private entities rather than state-owned enterprises in sub-Saharan Africa (Kuada, 2014). It is a well-known fact that poverty alleviation through economic advancement is the fundamental objective of The Gambia government and the African economic development at large. This could be achieved through sustainable economic progress and income distribution. For instance, in sub-Saharan Africa, the relationship between economic progress, poverty alleviation, and income distribution has been the major concern of their economies several decades ago.

Yu et al. (2014) analyze the effects of the income growth and distribution on poverty reduction in rural part of China. Their study was meant to explore the situation and causes of rural income inequality using dynamic econometric model analysis and Gini coefficient decomposition. One of the main conclusions from the results of their study is that the income growth of China's rural residents was vital for the alleviation of rural poverty and inequality. The outcome of this particular research could be implemented by the African economies in order to eradicate poverty and inequality in all their ramifications.

Besides the effects of export expansion on the realization of higher GDP (economic growth), some researchers explored the positive effects of quality education for both men and women on economic progress in all societies especially in developing countries. Higher productivity is likely to emanate from more educated households and that changes in human capital and schooling years is related to the economic growth rate. Education and training lead to higher skills and expertise among workers for higher equilibrium level of output which eventually leads to higher consumption and savings. 'Poverty is analyzed through many factors including per capita income, distribution of assets and income, quality of government, its policies, and institutions related to education, health and other aspects of human development' (Oztunc et al. 2015: 350). The lack of good governance and inclusive economic and political institutions are the main reasons for the failure of many developing countries.

Spending on education is another determinant and important factor of economic progress in Sub-Saharan Africa. This part of the fiscal policy of the government immensely develops the human resources to increase the innovative capacity of the economy and knowledge base on latest technologies, hence, promotes sustainable growth (Lucas., 1988; Romer., 1990). Using structural equation modelling, Priya et al. (2015) investigate the causal relationship among education, economic growth, and fiscal policy in India at the aggregate level. Their study was aimed at analyzing the effects of spending in education for economic progress. The outcome of the study suggests that government spending on education is a key determinant of higher productivity.

Mercan & Sezer (2014) analyze the impacts of education expenditure on economic growth for the period 1970 – 2012 using Turkey as a case study. A positive and a significant relationship was found between education expenses and economic growth. They argue that the higher the level of education, the higher the productivity, which eventually affects the competitiveness of countries positively and facilitates trade openness. In their view, 'Differences in education level are one of the main reasons of economic performance differences between developed and developing countries' (Mercan & Sezer, 2014: 925). Consequently, one of the major challenges for the rapid development of sub-Saharan countries is the lack of access to quality higher education. As mentioned elsewhere, economic development can never be achieve without proper education, which yields quality and quantity labor required in the transformation process. The skills and knowledge cultivated through education develop modern manufacturing technologies and to transfer them to the production process.

Moreover, considering the importance of education and human capital advancement in fostering economic progress and development of less developed countries, Ahiakpor (2013) examines the vital role of human capital in Ghana's economic development using an endogenous growth model for the period 1960 - 2012. He found out that human capital development has a positive and significant effect on economic growth. In his view, '…. to boost human capital, a country has to invest more in education' (Ahiakpor, 2013: 30).

Foreign direct investment is usually seen as a significant determinant of economic performance in developing countries like The Gambia. For a country to maximize its efficiency and gains from FDI, it must has a well-functioning financial institutions. 'A country with a well-developed financial market gains significantly from FDI inflow' (Suliman & Elian, 2014: 219). Due to this fact, it is important to explore and compare the degree of merits foreign direct investment (FDI) has over domestic investment and vice-versa. Gui-Diby (2014) analyzes the impact of foreign direct investment (FDI) on economic growth in Africa based on a panel data for 50 African countries for the periods 1980 to 2009. According to the system generalized method of moment (SYS-GMM) estimators used, the study concluded that FDI has a positive significant effect on economic progress for the African countries.

The promotion of FDI in The Gambia and in the rest of the Sub-Saharan African countries will bring in the much-needed foreign exchange that can improve the countries' balance of payments position. Moreover, many researchers investigate the positive role and outcome of FDI geared towards economic development and efficiency (see Zeb et al., 2014; Suliman & Elian, 2014; Harada, 2015; and Volos et al., 2015).

The final part of the theoretical and empirical framework is to investigate the important role of agriculture in Africa's economic transformation for poverty alleviation and income distribution. Performing the comparative analysis through logarithmic regression and elasticity, Tomšík et al. (2015) investigate the relationship between GDP and GDP per capita in relation to the GDP value generated by agriculture and other sectors in selected sub-Saharan countries including The Gambia for a twenty-year period. Despite the fact that many Sub-Saharan

countries reached the modern type of economy with prevailing services in GDP composition, their study concluded that agriculture still dominates in most countries in terms of economic advancement, income distribution, and poverty eradication.

Furthermore, several theoretical and empirical studies stress on the contribution and importance of agricultural growth and institutional change for increasing employment, economic performance, and accelerating poverty reduction in Sub-Saharan Africa (see Bates & Block, 2013; Anderson & Bruckner, 2012; Pingali et al., 2014; Awokuse & Xie, 2015; Bahta et al., 2014; Monga & Lin, 2015).

Data, Methodology, and Empirical Evidence

Due to lack of access and financial resources in collecting primary data, this paper considers a number of secondary sources of data. These include: The United Nations Statistics Division (UNSD) database and The Gambia Bureau of Statistics (GBoS). Moreover, time series data was collected for the period 1970 to 2013 and a statistical software (E-views) was applied to different tests; ADF, Granger causality, Unit root, Forecasting, and Interpolation for the generation of the missing data. In order to reveal what can be used to explain the determinants of economic growth in The Gambia, this paper considers foreign direct investment (FDI), gross capital investment, total exports of goods and services, and agricultural development as inevitable factors that may affect its economic progress and development. The following VAR model is therefore considered for the estimation techniques:

$$GDP(t) = \alpha 0 + \alpha 1 FDI(t) + \alpha 2 CAPINVEST(t) + \alpha 3 EXP(t) + \alpha 4 AGRI(t) + e(t)$$

Where, GDP denotes the gross domestic product. FDI, CAPINVEST, EXP, and AGRI, represent foreign direct investment, gross capital investment, total exports of goods and services, and the amount of agricultural activities. GDP is the dependent variable while FDI, Capital Investment, Exports, and Agriculture, are considered to be the independent factors. If the level of a valid independent variable in the model would increase for instance, in 2016 with a certain amount, this would have a direct positive effect on the overall economic growth (GDP). Likewise, if there is a decrease in amount among the [independent] variables, there might be an economic shock which could result to scarcity, higher prices of goods and services, inequality, and crowding out of investments, which will eventually lead to low income per capita and GDP per worker.

Table 1. Results for Simple Time Series VAR Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXPGOOD	0.712369	0.121021	5.886346	**0.0000**
FDI	3.656347	2.408332	1.518207	0.1372
CAPITAL INVEST	1.612683	1.376568	1.171524	0.2487
AGRI	1.706182	0.225925	7.551994	**0.0000**
C	6.602690	6.046768	1.091937	0.2817

R-squared	0.747487	Mean dependent var	18.76744
Adjusted R-squared	**0.720907**	S.D. dependent var	70.94426
S.E. of regression	37.47931	Akaike info criterion	10.19440 (%)
Sum squared resid	53378.54	Schwarz criterion	10.39919
Log likelihood	-214.1796	Hannan-Quinn criter.	10.26992
F-statistic	28.12190	Durbin-Watson stat	1.573368
Prob(F-statistic)	**0.000000**		

(**Source:** Own study based on the data from UNSD)

From table 1, it could be observed that the variables are stable [with positive coefficients] and due to this stability, the Vector Autoregression (VAR) model was established because the p-value = 0.0000. The coefficient is reasonable because the examined variables can explain GDP at a rate of 72.09%. Total export and agriculture are significant but the other two variables are insignificant since their p-values are greater than 5% level of significance. A structural change in the economy might render these results obsolete 5 - 10 years later, but right at this point, this is the situation.

Table 2. Results for the Augmented Dicky-Fuller (ADF) Test (Variable Measurement with different lags)

Variable name	level	Lag							
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**
GDP	0	0.3427	0.3427	0.3427	0.3427	0.3427	0.3427	0.3427	0.3427
	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
FDI	0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	1	0.0007	0.0697	0.0697	0.0697	0.0007	0.0000	0.0000	0.0000
Investment	0	0.2735	0.2735	0.2735	0.2735	0.2735	0.2735	0.2735	0.2735
	1	0	0	0	0	0	0	0	0
EXP	0	0.446	0.446	0.446	0.446	0.446	0.446	0.446	0.446
	1	0	0	0	0	0	0	0	0
Agri	0	0.1631	0.1631	0.1631	0.1631	0.1631	0.1631	0.1631	0.1631
	1	0	0	0	0	0	0	0	0

(Source: Own study based on the data from UNSD)

The variables are calculated using the ADF test, and they are found to be stable with difference. Therefore, the variables with lag=0 were used to build VAR model.

Table 3. The Vector Error Correction Model's results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXPGOOD*(-2)	-0.356185	0.060510	-5.886346	**0.0000**
FDI*(-2)	-1.828173	1.204166	-1.518207	0.1372
INVEST*(-2)	-0.806341	0.688284	-1.171524	0.2487
AGRI*(-1)	-1.706182	0.225925	-7.551994	**0.0000**
C	6.602690	6.046768	1.091937	0.2817
R-squared	0.747487	Mean dependent var		18.76744
Adjusted R-squared	**0.720907**	S.D. dependent var		70.94426
S.E. of regression	37.47931	Akaike info criterion		10.19440
Sum squared resid	53378.54	Schwarz criterion		10.39919
Log likelihood	-214.1796	Hannan-Quinn criter.		10.26992
F-statistic	28.12190	Durbin-Watson stat		1.573368
Prob(F-statistic)	0.000000			

(Source: Own study based on the data from UNSD)

After comparing the simple VAR model and Vector Error Correction (VECM) model, the VAR model was preferred to VECM model because the model's coefficients are positive. It is close to The Gambia's economic environment which is a good factor in determining its future economic performance. Generally speaking, Gambia's economic situation is observed to be progressing based on the results. Although the world economy decreased in 2003 due to the Severe Acute Respiratory Syndrome (SARS) and in 2008 due to the European financial crisis, Gambia's export and agricultural development were increasing slowly and stably, and this could continue if progressive policies are implemented by the authorities.

Table 4. 10 Year Forecasting Results

Year	GDP	EXP	FDI	AGRI	INVESTM
2014	774899325	158415313	2.74	195122551	30.28
2015	752509984	140836848	2.31	191003459	33.97
2016	730120643	123258383	1.88	186884367	37.66
2017	707731301	105679918	1.45	182765275	41.35
2018	685341960	88101453	1.02	178646183	45.04
2019	662952619	70522988	0.59	174527091	48.73
2020	640563278	52944523	0.16	170407999	52.42
2021	618173937	35366058	-0.27	166288907	56.11
2022	595784596	17787593	-0.7	162169815	59.8
2023	573395255	209128	-1.13	158050723	63.49

(**Source:** Own study based on the data from UNSD)

Table 4. 10 Year Forecasting Results

Year	GDP	EXP	FDI	AGRI	INVESTM
2014	774899325	158415313	2.74	195122551	30.28
2015	752509984	140836848	2.31	191003459	33.97
2016	730120643	123258383	1.88	186884367	37.66
2017	707731301	105679918	1.45	182765275	41.35
2018	685341960	88101453	1.02	178646183	45.04
2019	662952619	70522988	0.59	174527091	48.73
2020	640563278	52944523	0.16	170407999	52.42
2021	618173937	35366058	-0.27	166288907	56.11
2022	595784596	17787593	-0.7	162169815	59.8
2023	573395255	209128	-1.13	158050723	63.49

(**Source:** Own study based on the data from UNSD)

As previously observed that total exports of goods and services and agricultural development could serve as the main determinants of economic progress in The Gambia, but base on the forecasting results, a drastic decline in total export of good and services is expected in 2023. Due this unfavorable situation regarding the GDP's main components, The Gambia government should revitalize the sector and take preventive measures in order to ensure efficiency in export promotion, expansion, and development. FDI as percent of GDP is also expected to decline drastically. In contradiction to this declension, the capital investment (both physical and human) is expected to earn a share of 63.5% of GDP in 2023.

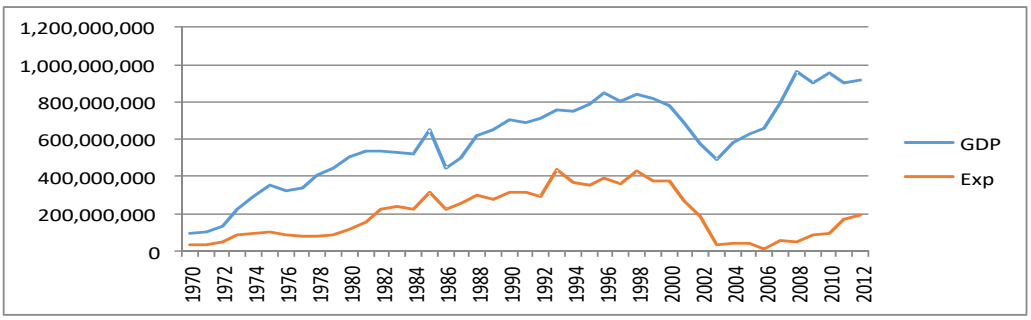


Fig. 1. Graphical Representation of the Relationship between GDP and Exports
(Source: Own study based on the data from UNSD)

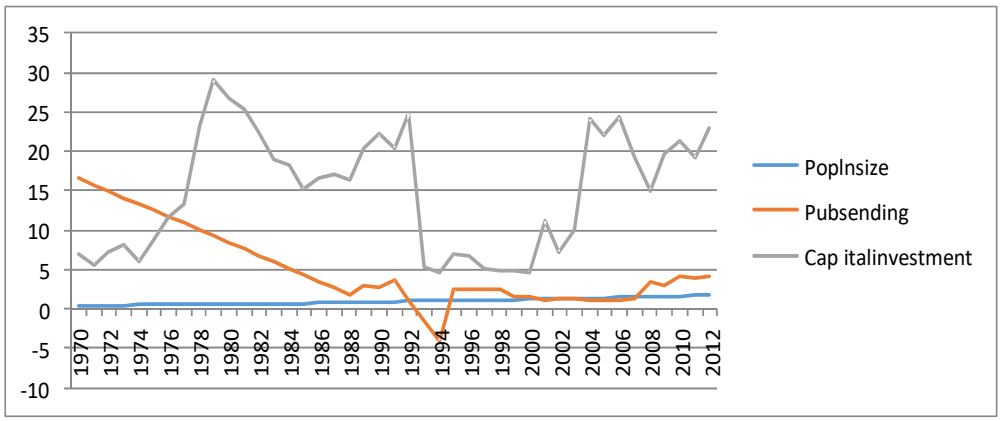


Fig. 2. Graphical Representation of the Relationship between Population Size, Public Spending on Education (as % of GDP), and Capital Investment
(Source: Own study based on the data from UNSD)

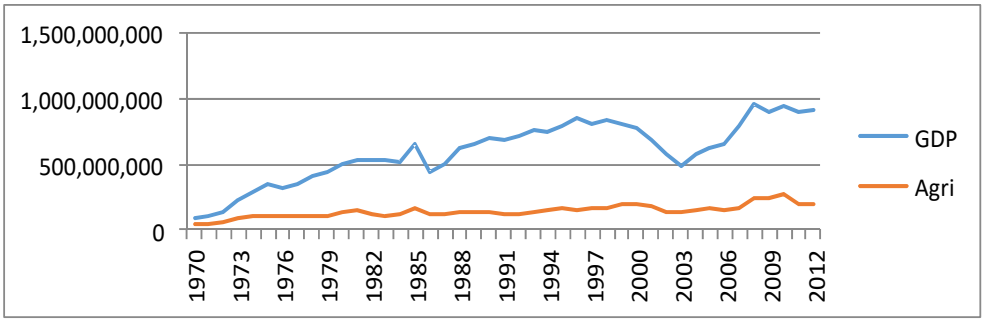


Fig. 3. Graphical Representation of the Relationship between GDP and Agriculture
(Source: Own study based on the data from UNSD)

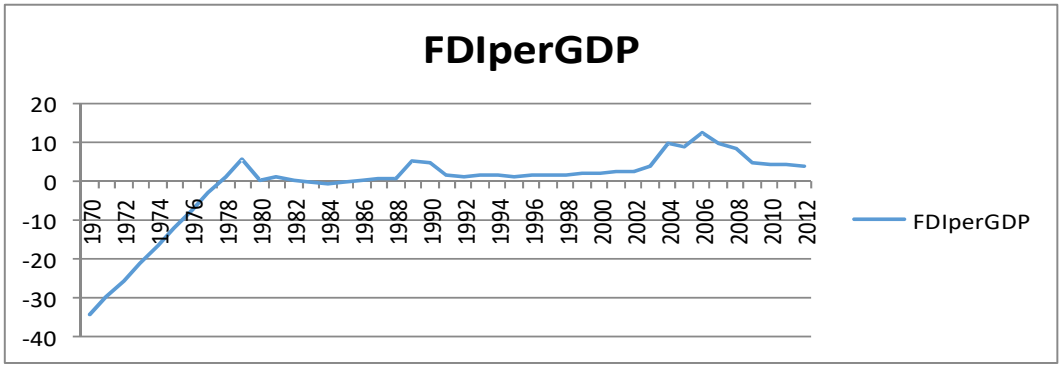


Fig. 4. Graphical Representation of FDI (% of GDP)
(Source: Own study based on the data from UNSD)

Conclusion and Policy Implications

The main objective of this paper was to reveal and examine the sources of rapid economic growth using The Gambia as a case study. It adopts the application of ADF and Granger causality tests to determine the positive effects of export expansion, agricultural development, government spending on education, and foreign direct investment (FDI), using the Vector Autoregression (VAR) model. The empirical results indicate that the examined [independent] variables can determine Gambia's economic progress at a rate of 72.09%. Total exports and agricultural development stand as the most outstanding factors of economic performance, which quite conforms with the studies of Mah (2015) and Tomšík et al. (2015), respectively. Presently, neither FDI nor gross capital investment is revealed to be the source or determinant of economic growth in The Gambia. Based on the forecasting results, the gross capital investment (both physical and human) and FDI are expected to earn a share of 63.5% and -1.13% of GDP in 2023 respectively. There should be progressive measures by the government in order to attract more foreign

investors. The provision of tax holidays for the new foreign investors is one of the available options.

Moreover, the main constraint of this research work was the unavailability of complete data. An interpolation technique was applied in order to generate the missing data on all variables. In light of the experience of The Gambia on export and agricultural development in realizing economic advancement, it would be vital for other developing countries in Africa to embark on export expansion and agricultural development policies such as goods market efficiency, export finance, good and durable infrastructure, labor market efficiency, innovation, technological readiness, market size, financial market development, and business sophistication.

References

Ahiakpor, F. (2013). Role of Human Capital in Economic Growth in Ghana. *International Journal of Economics & Business Studies*, *3*(2), 30–41.

Anderson, K., & Bruckner, M. (2012). Distortions to agriculture and economic growth in sub-Saharan Africa. *Policy Research Working Paper - World Bank*, (6206).

Awokuse, T. O., & Xie, R. (2015). Does Agriculture Really Matter for Economic Growth in Developing Countries? *Canadian Journal of Agricultural Economics/Revue Canadienne D'agroeconomie*, *63*(1), 77–99. http://doi.org/10.1111/cjag.12038.

Bahta, Y. T., Willemse, B. J., & Grove, B. (2014). The role of agriculture in welfare, income distribution and economic development of the Free State Province of South Africa: A CGE approach. *Agrekon*, *53*(1), 46–74. http://doi.org/10.1080/03031853.2014.887905.

Bates, R. H., & Block, S. A. (2013). Revisiting African Agriculture: Institutional Change and Productivity Growth. *Journal of Politics*, *75*(2), 372–1384. http://doi.org/10.1017/S0022381613000078.

Gui-Diby, S. L. (2014). Impact of foreign direct investments on economic growth in Africa: Evidence from three decades of panel data analyses. *Research in Economics*, *68*(3), 248–256. http://doi.org/10.1016/j.rie.2014.04.003.

Harada, T. (2015). Structural Change and Economic Growth with Relation-Specific Investment. *Structural Change and Economic Dynamics*, *32*, 1–10. http://doi.org/http://www.sciencedirect.com/science/journal/0954349X.

Kuada, J. (2014). Economic growth and poverty alleviation in Africa – linking hard and soft economics. *African Journal of Economic and Management Studies*, *5*(1), 2–8. http://doi.org/10.1108/AJEMS-03-2014-0016.

Lucas. R. (1988). On the mechanics of economic development. *Journal of Monetary Economics*. 22(1), 3-42.

Mah, J. S. (2015). Export Expansion and Economic Growth in Tanzania. *Global Economy Journal*, *15*(1), 173–185. http://doi.org/10.1515/gej-2014- 0047.

Mercan, M., & Sezer, S. (2014). The Effect of Education Expenditure on Economic Growth: The Case of Turkey. *Procedia - Social and Behavioral Sciences*, *109*, 925–930. http://doi.org/10.1016/j.sbspro.2013.12.565.

Monga, C., & Lin, J. Y. (2015). Agriculture, Growth, and Development in Africa. *The Oxford Handbook of Africa and Economics: Policies and Practices*. Oxford: Oxford University Press.

Oztunc, H., Zar Chi Oo, & Serin, Z. V. (2015). Effects of Female Education on Economic Growth: A Cross Country Empirical Study. *Educational Sciences: Theory & Practice*, *15*(2), 349–357. http://doi.org/10.12738/estp.2015.2.2351.

Pingali, P., Schneider, K., & Zurek, M. (2014). Poverty, Agriculture and the Environment: The Case of Sub-Saharan Africa. In J. von Braun & F. W. Gatzweiler (Eds.), *Marginality: Addressing the Nexus of Poverty, Exclusion and Ecology* (pp. 151–168). New York and Heidelberg: Springer.

Priya, K., Devi, M. K. K., & Nagarajan, S. (2015). Spending on Education Determinant of Economic Growth Using Using Structural Equation Modeling. *International Journal of Applied Engineering Research*, *10*(7), 17991–18005.Program for Accelerated Growth and Employment (PAGE 2012-2015): Available at http://eeas.europa.eu/delegations/gambia/documents/about_us/page_2012_2015_en.pdf.

Romer, Paul M. (1990). Endogenous Technological Change. *Journal of Political Economy, University of Chicago Press.* 98(5), 71-102.

Suliman, A. H., & Elian, M. I. (2014). Foreign Direct Investment, Financial Development, and Economic Growth: A Cointegration Model. *Journal of Developing Areas*, *48*(3), 219–243. http://doi.org/10.1353/jda.2014.0041.

Tomšík, K., Smutka, L., Lubanda, J.-P. E., & Rohn, H. (2015). Position of Agriculture in Sub-Saharan GDP Structure and Economic Performance. *Agris On-Line Papers in Economics & Informatics*, *7*(1), 69–80.

UNSD – National Accounts /http://unstats.un.org/unsd/snaama/dnlList.asp/Gambia

Volos, C. K., Kyprianidis, I. M., & Stouboulos, I. N. (2015). The Effect of Foreign Direct Investment in Economic Growth from the Perspective of Nonlinear Dynamics. *Journal of Engineering Science & Technology Review*, *8*(1), 1–7.Yu LeRong, Tang LiXia, & Li XiaoYun. (2014). Growth, inequality and poverty reduction in rural China. *International Journal of Agricultural Extension*, *2*, 49–56.

Zeb, N., Qiang, F., & Rauf, S. (2014). Role of Foreign Direct Investment in Economic Growth of Pakistan. *International Journal of Economics and Finance*, *6*(1), 32–38. http://doi.org/http://ccsenet.org/journal/index.php/ijef/issue/archive.

RECEIVED: 1 June 2016 **ACCEPTED: 20 October 2016**

*Corresponding Author**: Alieu Gibba,** PhD Candidate, Szent István University, Doctoral School of Management and Business Administration, Faculty of Economic and Social Sciences, Institute of Economics, Law and Methodology, Field of scientific research: Evaluation of Determinants of Economic Performance in Sub-Saharan Africa: Focusing on Exports and Efficiency in Agriculture, H-2100 Gödöllő, Páter Károly u. 1, Hungary, Fax: +3628410804, e-mail: agibba1@gmail.com

Dr. Molnar Mark, Ass. Prof., PhD, Szent István University, Doctoral School of Management and Business Administration, Faculty of Economic and Social Sciences, Institute of Economics, Law and Methodology, H-2100 Gödöllő, Páter Károly u. 1, Hungary, Fax: +3628410804, e-mail: molnar.mark@gtk.szie.hu

Vadyba
Journal of Management
2016, № 2 (29)
ISSN 1648-7974

INFLUENCE OF SELECTED FACTORS ON THE EFFICIENCY OF INSURANCE COMPANIES

Eva Grmanová
Alexander Dubček University of Trenčín, Slovakia

Annotation
The Czech insurance market has recently undergone major changes related mainly to the accession of the EU by the Czech Republic. It has become part of the Single European insurance market. This resulted in a stronger influence of globalisation and increased competition between subjects on the insurance market. One of the most important actors on the insurance market is commercial insurance companies. Their activities have a significant influence on the insurance market. It is the effort of the insurance companies to adapt to constantly changing conditions and growing competition. Therefore, it is important for them to pay attention to and seek ways of increasing their efficiency.
Our aim is to find out whether different groups of commercial insurance companies in the Czech Republic created according to their size have a statistically significant different average score of technical efficiency and whether the group of the largest insurance companies achieves the highest average score of technical efficiency and the group of the smallest commercial insurance companies achieves the lowest average score of technical efficiency. The score of technical efficiency is expressed by the non-parametric method of assessing efficiency – Data envelopment analysis. This method is based on linear programming and models analyze the efficiency of transformation of multiple inputs into multiple outputsRegression was used to determine dependence between the score of technical efficiency and selected indicators of size. As the values of the scores of technical efficiency are in the range $\langle 0,1 \rangle$, Tobit regression was used. In addition to these methods we used also: literature systematisation, comparative analysis, expert survey. By the Tobit regression, expression of the score of technical efficiency and regression analysis we concluded that "the number of insurance contracts" is important in terms of achieving efficiency. Insurance companies in the group with the highest number of insurance contracts achieved the highest average score of technical efficiency, but the group of the smallest commercial insurance companies did not reach the lowest average score of technical efficiency. Parameters of Tobit regression in each group for the indicator "number of employees" were statistically insignificant. Therefore, the number of insurance contracts is regarded as a more significant indicator in terms of efficiency of insurance companies.
KEY WORDS: insurance company; technical efficiency; score of technical efficiency; Data envelopment analysis; Tobit regression.

Introduction

Global financial crisis, recession and following stagnation of economic production and current problems with public finances inevitably change outer business environment (Vojtovič et al. 2014). Commercial insurance in the Czech Republic is part of the EU's commercial insurance system. The single insurance system established in the EU has affected many trends on the Czech insurance market. The influence of globalisation and internationalisation has become more prominent. There have been more significant changes in the management and direction of individual insurance companies. Changes have occurred also in the structure of insurance risks as well as of the offered services and products. In an effort to maintain and improve their position on the market, insurance companies began to significantly adjust their strategies and adapt to growing competition. And efficiency plays an important role here. The effort of every insurance company is to be constantly improving their efficiency despite the changing conditions. There are many factors that may affect it. In our article we focus on the influence of the number of insurance contracts and the number of employees on the efficiency of commercial insurance companies.

The problem of the scientific research: Do commercial insurance companies grouped by size have a different technical efficiency?

The aim of the article is to find out whether different groups of commercial insurance companies in the Czech Republic created according to their size have a statistically significant different average score of technical efficiency and whether the group of the largest insurance companies achieves the highest average score of technical efficiency and the group of the smallest commercial insurance companies achieves the lowest average score of technical efficiency. The size of insurance company we monitor according of the number of insurance contracts and of the number of employees.

The objects of analysis are commercial insurance companies associated in the Czech Insurance Association ("ČAP"). The Association unites 28 commercial insurance companies. Their share in the written premium is 97% (www.cap.cz). We excluded "HDI Versicherung AG, Organizační zložku" from the analysis because of negative values of operating costs. Thus, we analyse 27 commercial insurance companies. Indicators for expressing the score of technical efficiency as well as data on the number of insurance contracts and the number of employees in 2013 were taken from the sources of ČAP "Individual results of the members of ČAP". In addition to the non-parametric method for assessing efficiency – Data envelopment analysis, we used also the method applied in the analysis of the influence of environmental variables on the score of technical efficiency, but is still little used in the field of insurance.

The basic method for determining the dependence of variables is the Tobit regression.

The methods of the research: systematic literature, analysis, Data envelopment analysis, Tobit regression, comparative analysis, expert survey.

Theoretical background

Slovakia, the influence of environmental factors on efficiency is processed mainly in scientific papers and by the educational activities of Fandel. He deals mainly with the influence of different environmental factors on the score of technical efficiency in agriculture (Fandel 2001). Majorová (2006) has a similar sphere of interest. She applies various kinds of methods to measure the influence of environmental variables on the score of technical efficiency and compares the results. Efficiency of insurance companies expressed by Data envelopment analysis is currently being processed in scientific papers worldwide. Comprehensive comparative works focused on the results of individual studies are being created. Luhnen (2009) assessed 93 scientific studies evaluating the efficiency of insurance companies in several respects. He focused not only on the results but also on the main objectives and focus, methods, approaches to selection of inputs and outputs. Most scientific works deal with expressing technical efficiency and the most common method used to express the score of efficiency is Data envelopment analysis.

Non-efficiency of insurance companies may be caused by various factors. Fried et al. (1999) provides 3 different components of the inefficiency influence: managerial inefficiency, inefficiency of property and inefficiency arising from regulation. The influence of the operating system, organisational form, customer preferences and size on the inefficiency of risk and investment management is discussed by Yakob et al. (2014).

Several authors have dealt with the influence of size of insurance companies on their efficiency. Based on the analysis of 22 insurance companies in China in the years. Yao et al. (2007) conclude that small insurance companies are less efficient than large insurance companies. They assessed the size of insurance companies based on total assets and the number of employees. The same conclusions were formulated by Cummins and Zi (1997) in the analysis of 445 life insurance companies in the US in the period 1988-1992.

Methodology

There are several approaches to evaluating and comparing efficiency. In our analysis, we will focus on technical efficiency, which we will compare in the subjects analysed based on the score of technical efficiency. It will be necessary to divide the indicators into inputs and outputs. Inputs have negative preferences. Outputs have positive preferences. Technical efficiency means the subject's ability to achieve maximum outputs from its inputs. The score of technical efficiency can be expressed using several methods. In our analysis we will use a specialised modelling tool to assess efficiency – Data envelopment analysis. These models analyze the efficiency of transformation of multiple inputs into multiple outputs. They are non-parametric methods based on linear programming. The subjects analysed are called Decision making units (DMUs). The aim of DEA is to quantify the distance to the efficiency frontier for every DMU (Stancheva and Angelova 2008). In our analysis, we have used one of the basic DEA models – input-oriented BCC model.

We assume that we have n homogeneous DMU and we monitor m inputs x and s outputs y, then assuming variable returns to scale model expressing technical efficiency in input-oriented model has form

$$\min z = \theta_q - \varepsilon\left(\mathbf{e}^T\mathbf{s}^+ + \mathbf{e}^T\mathbf{s}^-\right), \quad (1)$$

$$\text{subject to } \mathbf{X}\boldsymbol{\lambda} + \mathbf{s}^- = \theta_q \mathbf{x}_q, \quad (2)$$

$$\mathbf{Y}\boldsymbol{\lambda} - \mathbf{s}^+ = \mathbf{y}_q, \quad (3)$$

$$\mathbf{e}^T\boldsymbol{\lambda} = 1, \quad (4)$$

$$\boldsymbol{\lambda}, \mathbf{s}^+, \mathbf{s}^- \geq \mathbf{0}, \quad (5)$$

where

$\boldsymbol{X}$ is inputs matrix, $\boldsymbol{Y}$ is outputs matrix

θ_q is score of technical efficiency for the q^{th} DMU and has value from $\langle 0,1 \rangle$, resp. $\langle 0\%,100\% \rangle$

$\boldsymbol{\lambda}$ is vector of weights, $\mathbf{s}^+, \mathbf{s}^-$ are matrix of slack variables (Jablonský and Dlouhý 2004).

Our paper is based on the Koopmans (1951) definition of efficiency. We consider a DMU technically efficient if the efficiency score is 1 and all slack variables are equal to 0.

The projected values for the inputs and outputs to achieve technical efficiency can be obtained in one of two ways

1. $\mathbf{x}_q' = \mathbf{X}\boldsymbol{\lambda}^*, \quad \mathbf{y}_q' = \mathbf{Y}\boldsymbol{\lambda}^*, \quad (6)$

where $\boldsymbol{\lambda}^*$ is the vector of optimal values of weights calculated by the model

2. $\mathbf{x}_q' = \theta_q^* \mathbf{x}_q - \mathbf{s}^{-*}, \quad \mathbf{y}_q' = \mathbf{y}_q + \mathbf{s}^{+*}, \quad (7)$

where symbols marked with * are vectors of optimal values of variables in the input-oriented BCC model.

Several methods are used to determine the influence of factors on technical efficiency expressed by the score of technical efficiency. In our analysis, we will use regression analysis. However, the score of technical efficiency, which is the dependent variable in the regression, has values in the range $\langle 0,1 \rangle$. It is therefore a limited dependent variable. Therefore, we will use the censored regression model called Tobit regression. The shape of the Tobit regression function with artificial variables X_2 X_3 X_4 and the dependent variable Y_i for n^{th} DMU is

$$Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \varepsilon_i, \; i=1,\ldots,n, \quad (8)$$

where if insurance company is in first group then X_{2i} =1, if insurance company is not in first group then X_{2i} =0, if insurance company is in second group then X_{3i} =1, if insurance company is not in second group then X_{3i} =0, if insurance company is in third group then X_{4i} =1, if insurance company is not in third group then X_{4i} =0, ε_i is random error.

Score of technical efficiency

At the beginning of the analysis, we expressed the basic descriptive statistics of the indicators, based on which we estimated the score of technical efficiency of the subjects analysed. The values of the descriptive statistics of inputs and outputs are shown in Table 1.
Next, we expressed the score of technical efficiency for all subjects analysed in the input-oriented BCC model. We used four indicators to express the score of technical efficiency. We used claims incurred and operational costs on the input side and premiums and revenues from financial investments on the output side. We used the EMS software to express the score of technical efficiency. In order to express the dependence of the score of technical efficiency and its size we divided insurance companies into four groups. In the first case, the sorting variable was the number of insurance contracts, in the latter case, the number of employees. Centre descriptive statistics for the number of contracts and the number of employees are shown in Table 2. Descriptive statistics of the score of technical efficiency according to the sorting variable "number of contracts" are shown in Table 3. Descriptive statistics of the score of technical efficiency according to the sorting variable "number of employees" are shown in Table 4. Next, we used Tobit regression with artificial variables. Parameters were expressed in the program Matrixer (http://matrixer.narod.ru).

Table 1. Descriptive statistics of the indicators
Source: own processing in Statistica according ČAP

	Mean (thousand Kč)	Median (thousand Kč)	Minimum (thousand Kč)	Maximum (thousand Kč)	Coef. of variat. (%)
Claims incurred	2925363	499853	6108	17377989	160.70
Operational costs	1119346	469802	43168	6003052	143.56
Premiums	4221475	1161864	57839	28849765	162.55
Revenues from financial investments	1055756	283428	7036	7820044	168.37

Table 2. Centre descriptive statistics - number of contract and number of employees
Source: own processing in Statistica according ČAP

	Mean	1st Quantile	2nd Quantile	3rd Quantile
Number of contracts	969211.9	74986	5715	1457580
Number of employees	494.4	48	110	698

Table 3. Descriptive statistics of the technical efficiency score (in subgroups according to number of contract)
Source: own processing in Statistica

	Mean	Median	Standard deviation
1st group	0.6941 (69.41%)	0.7072 (70.72%)	0.2053
2nd group	0.6755 (67.55%)	0.6310 (63.10%)	0.1988
3rd group	0.8079 (80.79%)	0.8857 (88.57%)	0.2096
4th group	1 (100%)	1 (100%)	0

It follows from the expression of the descriptive statistics of indicators that the variability of the indicators expressed by the coefficient of variation was relatively high. The greatest variability was
achieved by revenues from financial investments. The lowest variability was achieved by operating costs. The median was less than the arithmetic mean for all four indicators. I.e., more values have a value less than the arithmetic mean. It is evident from the expressed mean values of the number of contracts and the number of employees that the median is less than the arithmetic mean. Therefore, more values are less than the average. The expressed centre descriptive statistics were used to classify the subjects analysed into 4 groups. The first group included insurance companies with a number less than or equal to the 1st quantile. The second group included insurance companies with a number less than or equal to the 2 nd quantile and higher than the 1 st quantile. The third group included insurance companies with a number less than or equal to the 3 rd quantile and higher than the 2nd quantile. The fourth group included insurance companies with a number higher than the 3 rd quantile. It follows from the expression of descriptive statistics of the score of technical efficiency in subgroups according to the number of insurance contracts that the highest average score of technical efficiency was reached by insurance companies in the 4th group, i.e. insurance companies with most insurance contracts. Their average score of technical efficiency was 100%. The 3 rd group of insurance companies had the second highest average

score of technical efficiency. The third highest average score of technical efficiency was reached not by the second but by the first group. It follows from the expression of the descriptive statistics of the score of technical efficiency in subgroups according to the

number of employees that the highest average score of technical efficiency was reached by insurance companies in the 4th group, i.e. insurance companies with the highest number of employees. Their average score of technical efficiency was 92.79%. The third group of insurance companies had the second highest average score of technical efficiency. The third highest average score of technical efficiency was reached by the second group.

Tobit regression

The coefficient of correlation between the score of technical efficiency and the number of insurance contracts is 0.4456. The coefficient of correlation between the score of technical efficiency and the number of employees is 0.3734. Dependence tightness is not strong.

It follows from the results of the Tobit regression (Table 5) that the highest average score of technical efficiency had insurance companies in the group with the highest number of insurance contracts. Their average score of technical efficiency was 100%. The average score of technical efficiency for insurance companies in the third group was by 19.21% lower. The difference is statistically insignificant. The average score of technical efficiency for insurance companies in the second group was by 32.45% lower. The difference is statistically significant.

Table 4. Descriptive statistics of the technical efficiency score (in subgroups according to number of employees)
Source: own processing in Statistica

	Mean	Median	Standard deviation
1st group	0.6251 (62.51%)	0.5566 (55.66%)	0.1881
2nd group	0.7783 (77.83%)	0.8241 (82.41%)	0.2171
3rd group	0.8359 (83.59%)	0.8857 (88.57%)	0.1851
4th group	0.9279 (92.79%)	1 (100%)	0.1766

Table 5. Tobit regression parameters (Number of contracts)
Source: own processing in Matrixer

	Estimate	p-level
β (4th group)	1 (100%)	0
β_4 (3rd group)	-0.1921 (-19.21%)	0.0507
β_3 (2nd group)	-0.3244 (-32.44%)	0.0021
β_2 (1st group)	-0.3059 (-30.59%)	0.0033

Table 6. Tobit regression parameters (number of employees)
Source: own processing in Matrixer

	Estimate	p-level
β (4th group)	0.9279 (92.79%)	0
β_4 (3rd group)	-0.0920 (-9.20%)	0.3633
β_3 (2nd group)	-0.1496 (-14.96%)	0.1454
β_2 (1st group)	-0.3028 (-30.28%)	0.0058

The average score of technical efficiency of insurance companies in the first group was by 30.59% lower and this difference is statistically significant.

Very interesting is the result of the Tobit regression. It points out that the lowest average score of technical efficiency was not reached by insurance companies in the group with the lowest number of insurance contracts but by insurance companies in the second group.

It follows from the results of the Tobit regression (Table 6) that the highest average score of technical efficiency had insurance companies in the group with the highest number of employees. Their average score of technical efficiency was 92.79%. The average score of technical efficiency of insurance companies in the third group was by 9.20% lower. This difference was statistically insignificant. The average score of technical efficiency of insurance companies in the second group was by 14.96% lower. This difference was statistically insignificant. The average score of technical efficiency of insurance companies in the first group was by 30.28%. This difference was statistically insignificant.

Based on the estimation of parameters in each group and the p-values in Tobit regression, the indicator "number of insurance contracts" appears to be important for the Czech insurance market in terms of achieving efficiency. Parameters of Tobit regression in each group

for the indicator "number of employees" were statistically insignificant. Therefore, the number of insurance contracts is regarded as a more significant indicator in terms of efficiency of insurance companies.

Conclusion

The aim of the article was to find out whether different groups of commercial insurance companies in the Czech Republic created according to their size have a statistically significant different average score of technical efficiency and whether the group of the largest insurance companies achieves the highest average score of technical efficiency and the group of the smallest commercial insurance companies achieves the lowest average score of technical efficiency. The objects of analysis were commercial insurance companies associated in the Czech Insurance Association.

Using different methods - systematic literature, analysis, Data envelopment analysis, Tobit regression, comparative analysis, expert survey to express the score of technical efficiency and by the regression analysis we concluded that "the number of insurance contracts" is important in terms of achieving efficiency. Parameters of Tobit regression were statistically significant in case of the indicator "number of insurance contracts". Groups of insurance companies formed according to the number of insurance contracts have a statistically significant difference (except for the 3rd group). Insurance companies in the group with the highest number of insurance contracts achieved the highest average score of technical efficiency, but the group of the smallest commercial insurance companies did not reach the lowest average score of technical efficiency. Parameters of Tobit regression in each group for the indicator "number of employees" were statistically insignificant. Therefore, the number of insurance contracts is regarded as a more significant indicator in terms of efficiency of insurance companies. However, it is necessary to continue with the above analysis and focus on possible generalisations in this area.

Our analysis, however, has certain limitations. The above conclusions have been deduced from data of a particular market in a single year. If we wanted to generalise the results, we would have to monitor the data for a longer period of time. Likewise, the output sensitivity of the analysis for the indicators used must be taken into consideration. The selection of indicators is currently undergoing great controversy. Results of the analysis are sensitive to the choice of methods by which the score of technical efficiency is expressed. Further research and generalisations in this area could be of practical significance for insurance companies.

The article is part of the research project The insurance market and the efficiency of insurance companies 1/0208/14 financed by VEGA of the Ministry of Education of the Slovak Republic.

References

Cummins, J.D. and Zi, H. (1997). *Measuring Cost Efficiency in the US Life Insurance Industry: Econometric and Mathematical Programming Approaches.* Working Paper, The Wharton Financial Institution Centre, University of Pennsylvania.

ČAP. (2013). Individual Results of Members of ČAP in 2013. [revised 2016 09 01], www.cap.cz

Fandel, P. (2001). Environmental Factors in the Assessment of Efficiency in Agriculture. In Economic and management aspects of sustainable agriculture. [revised 2016 09 01], http://spu.fem.uniag.sk/cvicenia/ksov/fandel/05_Metody_a_modely_hodnotenia_efektivnosti/11%20-%20DEA_s_asymetrickou_informaciou/Literatura/Fandel-EnvironVAR.pdf

Fried, H.O., Schmidt, S.S., and Yaisawarng, S. (1999). Incorporating the Operating Environment Into a Nonparametric Measure of Technical Efficiency. *Journal of Productivity Analysis,* 12 (3), 249-267.

Jablonský, J. and Dlouhý, M. (2004). *Models for Efficiency Evaluation of Decision Making Units.* PROFESSIONAL PUBLISHING, Praha.

Koopmans, T. (1951). An Analysis of Production as an Efficient Combination of Activities. In T. Koopmans (ed.): *Activity Analysis of Production and Allocation, Proceedings of a Conference*. John Wiley, New York, 33–97.

Luhnen, M. (2009). *Efficiency and Competition in Insurance Markets*. Dissertation of the University of St. Gallen, Graduate School of Business Administration, Economics, Law and Social Sciences.

Majorová, M. (2006). Analysis of the Impact of Environmental Variables on Efficiency in Agricultural Production. [revised 2016 08 01], http://old.fem.uniag.sk/Martina.Majorova/files/majorova_vypoctova_ statistika_2006.pdf

Stancheva, N., Angelova, V (2008). Measuring the Efficiency of University Libraries Using Data Envelopment Analysis. In Mantri, J.K. *Research Methodology on Data Envelopment Analysis (DEA).* Universal Publisher Boca Raton, Florida.

Vojtovič, S. and Krajňáková, E. (2014). Enterprise Management in the Conditions of Economic Recession. In *SGEM Conference on Political Sciences, Law, Finance, Economics & Tourism. Conference Proceedings.* Volume IV. Sofia, 177-184.

Yakob, R., Yusop, Z., Radam, A., and Ismail, N. (2014). Two-Stage DEA Method in Identifying the Exogenous Factors of Insurers´ Risk and Investment Management Efficiency. *Sains Malaysiana,* 43 (9), 1439-1450.

Yao, S., Han, Z., and Feng, G. (2007). On Technical Efficiency of China's Insurance Industry after WTO Accession. *China Economic Review,* 18 (1), 66-86.

RECEIVED: 26 April 2016 **ACCEPTED: 20 October 2016**

doc. RNDr. Eva Grmanová, PhD. is docent at Alexander Dubček University of Trenčín, Faculty of Social and Economic Relations, Department of Economics and Economy, Slovakia, docent. Research interests: Econometrics, Statistics, Regional development and Regional policy. Carried out scientific research: Evaluating of the Efficiency of Commercial Insurance Companies in Slovakia and the Czech Republic by Data Envelopment Analysis Method, VEGA 1/0414/08. Current carry out scientific research: The Insurance Market and the efficiency of insurance companies VEGA 1/0208/14. Address: Eva Grmanová, Alexander Dubček University of Trenčín, Faculty of Social and Economic Relations, Študentská 3, 911 01 Trenčín, Phone: 0042132 7400423, E-mail: eva.grmanova@tnuni.sk

Vadyba
Journal of Management
2016, № 2 (29)
ISSN 1648-7974

PRO-CYCLICAL EFFECT ON CAPITAL ADEQUACY OF COMMERCIAL BANKS IN CHINA

Jing Li[1,2], Zoltán Zéman[2]
[1]Jiangxi University of Finance and Economics, China [2]Szent Istvan University, Hungary

Annotation
The procyclicality of the regulatory capital requirement in the aftermath of the international finance crisis have been paid a lot of attention by researcher and regulators. It is pointed out that the risk-sensitive capital requirement in Basel Accord II drives the problem of procyclicality which amplified the economic cycle fluctuation and made the banking system a shock amplifier while not a shock absorber. In this paper, on the basis of China's 16 major commercial banks in 2004-2014 panel data, the researcher analyzes the relationship between macro-economic cycle and capital adequacy ratio to test whether there exists procyclical effect or not within. The empirical result shows that the capital adequacy ratio changes have procyclical effect on China's commercial banks.
KEY WORDS: Capital adequacy ratio; pro-cyclical effect; pro-cyclicality; macro-economic cycle; Basel Accord II; panel data.

Introduction

After the global financial crisis in 2008, the procyclicality of the financial system have been paid a lots of attention by researcher and regulation. The Financial Stability Board's report (FSF 2008) defined procyclicality as "the mutually reinforcing ("positive feedback") mechanisms through which the financial system can amplify business fluctuations and possibly cause or exacerbate financial instability". When the market boom, the transaction prices lead to an overestimation of the value of the relevant product; when the market downturn, the transaction prices lead to an underestimation of prices of related products. This positive feedback mechanisms between the financial system and the real economy defined by FSB would enlarge boom and bust cycles, exacerbate cyclical fluctuations in the economy and lead to financial instability or enhanced (FSF 2008). If the economy and fluctuations in the economy to maintain a positive relationship, then there is pro-cyclical effect, otherwise the counter-cyclical effect exists.

The most typical manifestation of procyclicality is from the credit activities of financial institutions and promote the formation of the economic cycle or exacerbate cyclical fluctuations in the economy. When the economy is on the rise, the borrower's financial situation improved, the collateral value of the collateral rise, banks will usually expand credit issuing, leading to overheating of the economy. While when the economy entered a down cycle, the borrower's financial situation deteriorated, the collateral value has shrunk, bank credit contraction on prudent business principles, thereby further prolong and exacerbate the recession (FSF 2008; FSF 2009).

In the discussion on the procyclicality, one of the key point is about the procyclicality of the capital regulation in Basel Accord II. Based on the requirement of Basel Accord II, banks could adopt the standardized approach or internal rating approach to measure credit risk capital requirement. The standardized approach measure credit risk by external rating like rating from Moody, Standard & Poor's. While internal rating-based approach (IRB) applied some risk parameters to measure capital requirements, such as probability of default rating (PD), lost given default (LGD), exposure at default (EAD) and maturity (M) (Kashyap et al 2004). Those parameters are very sensitive to the risk, thus significantly improving the risk sensitivity of capital regulation. On the other hand, there is a positive correlation between risk sensitivity and procyclicality of capital regulation (Turner 2009). Increase of risk sensitivity must be accompanied by enhanced procyclicality if bank adopt IRB approach. When the economy is on the rise, the borrower's financial situation improved, their credit rating increases, resulting in lower PD, higher collateral prices and lower LGD of loan. Meanwhile the extraction ratio of loan commitments is reduced, credit conversion factor CCF is hence reduced, resulting in decline of EAD. When the economy entered a downward phase, the opposite is true (Gordy et al 2006). Under IRB approach, risk weight function was given by the regulatory authorities and the risk parameters are as input variables in risk weight function. So the procyclicality of these risk parameters directly converted to the procyclicality of risk weights and regulatory capital requirements, which means the regulatory capital requirements will fluctuate with the economic cycle movement.

Many scholars analyze procyclicality of regulatory capital from the theoretical and empirical perspectives. In this paper, based on China's 16 major commercial banks in 2004-2014 panel data, we analyze the relationship between macro-economic cycle and capital adequacy ratio, in order to probe into the issue whether there exist pro-cyclical effects of the capital adequacy ratio of China commercial banks.

This paper is organized as follows: Section 2 is literature review. Section 3 includes a brief introduction to methodology and the result of empirical study. Section 4 gives the conclusion.

Literature Review

In 1998, the Basel Committee revised the 1988 Capital Accord and formulated the New Capital Accord (Basel Accord II 2003). The discussions of procyclicality caused by Basel Accord II has widespread concerns and controversies in theory and practice. These correlated discussions on procyclicality of the new Capital Accord make Basel Committee decide to choose smoother risk weight function thus it can encourage banks to use the-cycle rating method to ease off a certain degree of its procyclicality. But the negative impact on the procyclicality of the new protocol on economic development may still exist.

After the international financial crisis in 2008, people have realized that the procyclicality of the financial system has deeply harmed financial stability and economic development. The external rules such as Basel Accord II, loan loss provision, fair value criterion and the interaction of internal factors between financial institutions have played a certain role in excessive credit growth and expansion of financial imbalances before the finance crisis as well as the sharp fall of the market, liquidity shortage and credit crunch after the crisis. Especially, the crisis exacerbated the panic selling and market liquidity shortages, hence followed by the formation of vicious circle: prices fall - the market value has shrunk - reduction of capital - sell - prices continue to fall - and liquidity shortage and credit crunch, which promoted the further spread of the crisis.

After a comprehensive analysis of the causes of the crisis the Financial Stability Forum submitted to the G7 finance ministers and central bank governors meeting for the reconstruction of the global financial system package in April 2008, it positioned the solutions of the pro-cyclical issues as an important aspect of strengthening macro-prudential supervision. It appeals to organize the relevant government departments, Basel Committee, Bank of International Settlements, CGFS, IMF, IOSCO, IASB and FASB and other international organizations to set up four specialized working groups to study regulatory capital supervision, loan loss provisions, incentives and pro-cyclical leverage and valuation management respectively. In February 2009, the IMF released IMF (2009), and De Larosiere et al (2009), Turner (2009), Panetta et al (2009) and Brunnermerier et al (2009) all analyzed the source of procyclicality of the financial system and its relationship with the Finance Crisis, then made suggestions on how to release the procyclicality of the financial system.

Demyanyk & Hermert (2008) point out that the outbreak of the US sub-prime mortgage crisis in the financial system is the consequence of over procyclicality. And the economic cycle converted into the most important systemic risk faced by the banking system. Aspachs et al (2006) found that in order to meet the regulatory capital requirements of the New Basel Accord, banks will adjust the size of loan more substantial in the face of external shocks, thereby increase the fluctuations of economic. Heid (2007) also analyzed the capital-induced lending cycles and pro-cyclical effect on the macro-economy and found that the capital buffer plays a crucial role in soothing the impact of the volatility of capital requirements.

Some of researchers analyzed this problem from the perspectives of methodology. Bernanke & Blinder (1988) modified IS-LM model to present the important relationship of money-demand shocks with credit-demand shocks during the 1980s. Tanaka (2002) developed the modified IS-LM model based on Bernanke & Blinder (1988). By assessing the impact of the New Basel Accord, researchers drew the conclusion that a rise in credit risk may lead to a sharper loan contraction and Basel II may reduce the effectiveness of monetary policy as a tool for stimulating output during recessions. Estrella (2004) built a dynamic model of optimal bank capital in which the bank optimizes the costs associated with failure, holding capital, and flows of external capital to examine the procyclicality of bank capital. And she pointed out several solutions to reduce this problem via the model.

Other scholars empirically studied the impact of procyclical between economic cycle and capital adequacy ratio. Ayuso et al(2004) applied the panel data of Spanish commercial and savings banks from 1986 to 2000, to obtain the result that economic cycles and capital adequacy ratio have a significant negative correlation, and this relationship is asymmetric. Jokipii & Milne (2008) used panel of accounting data from 1997 to 2004 to deduce that capital buffers of the banks in the EU15 have a significant negative co-movement with the cycle. For banks in the accession countries there is significant positive co-movement. Bikker & Metzemakers (2004) based their multinational study on 29 OECD countries, which showed that the risk of individual banks have weak relationship with economic volatility. Risk-weighted capital adequacy ratio under the New Basel Accord may not cause significant pro-cyclical effect.

Methodology

This paper proposed the model in Ayuso et al (2004) and Estrella (2004) to analyze the relationship between macro-economic cycle and capital adequacy ratio. By establishing isostatic adjustment model, we assumed that the dynamic adjustment of bank capital follows the formula below (Ayuso et al 2004). Firstly, we assumed:

$$K_t = K_{t-1} + I_t \quad (1)$$

Here, K_t is the capital of the bank at time T, K_{t-1} is bank capital levels in t-1 period. I are changes of the bank's total capital in period T, including retained earnings, the IPO and the number of shares repurchased.

Banks hold capital mainly from three types of motivation: First, to reduce the cost of financial distress; Second, to reduce the cost of external financing when capital insufficient; and third, to reduce the information asymmetry between shareholders and depositors (Berger et al 1995). We assumed that the holding cost of bank capital including these three elements, then it is:

$$Cost_t = (\alpha_t - \gamma_t)K_t + \frac{1}{2}\delta_t I_t^2 \quad (2)$$

Among the equation 2, α_t represents the risk - reward of capital, γ_t is the bankruptcy costs for banks (or regulatory penalties due to lack of capital), and δ_t is capital adjustment costs.

One important goal of banking operation is the cost minimization. Under the above assumptions, the optimization model is as below:

$$\begin{aligned} &MinE_t\left(\sum_{i=0}^{\infty} \beta^i \cos t_{t+i}\right) \\ &s.t. K_t = K_{t-1} + I_t \\ &Cost_t = (\alpha_t - \gamma_t)K_t + \frac{1}{2}\delta_t I_t^2 \end{aligned} \quad (3)$$

β is the discount rate, i is the year. After calculating the first-order derivative to cost, we can get:

$$I_t = E_t\left(\frac{1}{\delta_t}\sum_{i=0}^{\infty} \beta^i(\gamma_{t+i} - \alpha_{t+i})\right) \quad (4)$$

In this case, the bank costs are minimized. Then we substituted the equation 4 into equation 1, it is

$$E_t(K_t) = K_{t-1} + E_t\left(\frac{1}{\delta_t}\sum_{i=0}^{\infty} \beta^i(\gamma_{t+i} - \alpha_{t+i})\right) \quad (5)$$

After minus minimum regulatory capital requirements in both sides of equation 5, we obtain capital buffer. The overall expectations equal to actual observation plus random error term in equation 6:

$$(K - \bar{K})_t = (K - \bar{K})_{t-1} + E_t\left(\frac{1}{\delta_t}\sum_{i=0}^{\infty} \beta^i \gamma_{t+i}\right) - E_t\left(\frac{1}{\delta_t}E_t\sum_{i=0}^{\infty} \beta^i \alpha_{t+i}\right) + \varepsilon \quad (6)$$

Empirical Test and Results

Based on the above theoretical analysis, the main empirical test model is as follows:

$$Buf_{i,t} = \beta_0 + \beta_1 Buf_{i,t-1} + \beta_2 GGDP_t + \beta_3 ROA_{i,t} + \beta_4 NPL_{i,t} + \varepsilon_{i,t} \quad (7)$$

Here, explained variable Bufi,t represent excess capital adequacy ratio of bank i at time t. It is the real bank capital adequacy ratio minus the minimum regulatory capital requirement 8%, which reflects the part of banks holding capital without being subject to regulatory constraints. This part of capital would increase investor's confidence, as well as expand investment opportunities in the future (Jokipii, T.; Milne, A. 2008). In this paper, we mainly test how the macroeconomic cycle imposes impact on this variable.

There are 4 explanatory variables, (1) $Buf_{i,t-1}$ is the first order lag of Buf, which is used to estimate the adjustment costs of capital adequacy ratio. The greater β_1, the higher adjustment costs; (2) GGDP is GDP growth rate which stands for macroeconomic cycle here. It is the main factor we would test in this paper. If the regression coefficient β_2 is greater than 0, it means there exists a pro-cyclical effect between the economic cycle and the capital adequacy ratio; (3) ROA is bank profitability. The higher profitability means more retained earnings can be converted into capital, it also means higher quality of asset management and the overall risk is small on bank side. So it is assumed that the bank profitability and excess capital are in positive relationship; (4) NPL is non-performing loan, which is on behalf of the risk of assets here.

In this paper, we collected panel data of 16 major commercial banks in China from 2004 to 2014, which including five large commercial banks, eight joint-stock banks, and three city commercial banks. Data include capital adequacy ratio, return on assets (ROA), non-performing loan ratio (NPL) of these banks and the annual GDP growth rate of China. All the data are collected from WIND database.

Firstly, we draw the graph of the trend of annual GDP growth rate of China from 2004 to 2014 as shown in Figure 1.

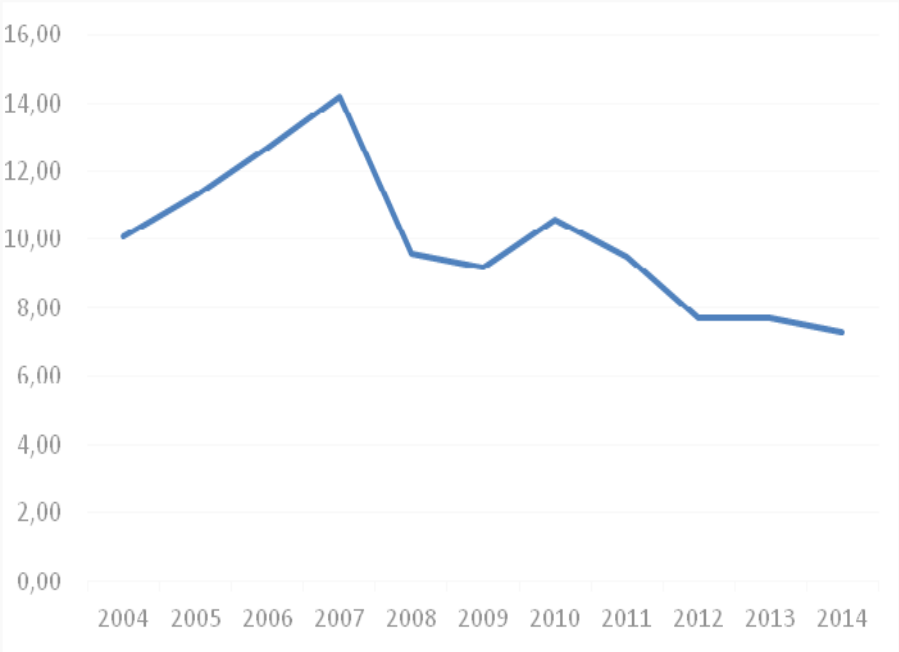


Fig. 1. Trend of Annual GDP Growth Rate of China from 2004-2014
(Source: WIND Database)

In this research, GDP growth rate are induced to stand for business cycles as mentioned before. From Figure 1, we can see the growth rate of GDP in China increased from 2004 to 2007 and decreased sharply after two years, then raised slightly from 2009 to 2010. After that, it declined steady. The changes of GDP growth rate show a movement of business cycle which we can applied in the analysis.

Table 1 shows the basic statistical descriptions of all the variables in equation 7.

Table 1. Basic Statistical Description of the Variables

Variable		Mean	Std. Dev.	Min	Max	Observations
Buf	overall	3.458977	3.494298	-9.47	22.67	N = 176
	between		2.151305	-0.7745456	7.766364	n = 16
	within		2.801155	-5.236477	18.36261	T = 11
Buf_{t-1}	overall	3.346125	3.62856	-9.47	22.67	N = 160
	between		2.342769	-1.276	8.244	n = 16
	within		2.826404	-4.929875	17.77212	T = 10
GGDP	overall	9.990909	2.048756	7.3	14.2	N = 176
	between		0	9.990909	9.990909	n = 16
	within		2.048756	7.3	14.2	T = 11
ROA	overall	0.9891477	0.3373135	0.02	1.72	N = 176
	between		0.1912601	0.6236364	1.29	n = 16
	within		0.2815853	0.1464204	1.520966	T = 11
NPL	overall	2.504091	4.138635	0.33	26.17	N = 176
	between		2.296214	0.7163636	10.38545	n = 16
	within		3.486688	-6.661364	19.92318	T = 11

(Source: Own construction)

Using Equation 7, linear multiple regression analysis has been tested by statistical software Stata, and we can get the following results of the relationships between the bank's excess capital adequacy ratio and GDP growth rates and other variables.

The test results of random-effects Generalized Least Squares regression at 10%, 5% and 1% confidence level has been shown in Table 2, Table 3 and Table 4.

Table 2. The Test Results of GLS Regression in 1% level

Random- effects GLS Regression				Number of observations = 160		
Group variable: Bank				Number of groups = 16		
R^2 : within = 0.4107				Obs per group: min =10		
between = 0.9314				avg =10		
overall =0.6040				max =10		
				Wald chi-square(4) = 236.41		
Correlation(u_i, x) = 0 (assumed)				Prob > chi-square = 0.0000		
	Coefficient	Std. Err.	Z	P > |z|	99% Confidence Interval	
Buf_{t-1}	0.5275485	0.0603546	8.74	0.000	0.3720854	0.6830116
GGDP	0.3794157	0.0878986	4.32	0.000	0.1530038	0.6058275
ROA	3.586031	0.7995008	4.49	0.000	1.526653	5.645408
NPL	-0.0333659	0.0573377	-0.58	0.561	-0.1810581	0.1143264
Constant	-5.350382	1.296441	-4.13	0.000	-8.689792	-0.2010973
Sigma_u	0					
Sigma_e	2.0737077					
rho	0	(fraction of variance due to u_i)				

(Source: Own construction)

Table 3. The Test Results of GLS Regression at 5% Level

Random- effects GLS Regression				Number of observations = 160		
Group variable: Bank				Number of groups = 16		
R^2 : within = 0.4107				Obs per group: min =10		
between = 0.9314				avg =10		
overall =0.6040				max =10		
				Wald chi-square(4) = 236.41		
Correlation(u_i, x) = 0 (assumed)				Prob > chi-square = 0.0000		
	Coefficient	Std. Err.	Z	P > |z|	95% Confidence Interval	
Buf_{t-1}	0.5275485	0.0603546	8.74	0.000	0.4092557	0.6458413
GGDP	0.3794157	0.0878986	4.32	0.000	0.2071375	0.5516938
ROA	3.586031	0.7995008	4.49	0.000	2.019038	5.153023
NPL	-0.0333659	0.0573377	-0.58	0.561	-0.1457458	0.0790141
Constant	-5.350382	1.296441	-4.13	0.000	-7.891359	-2.809405
Sigma_u	0					
Sigma_e	2.0737077					
rho	0	(fraction of variance due to u_i)				

(Source: Own construction)

Table 4. The Test Results of GLS Regression at 10% Level

Random- effects GLS Regression				Number of observations = 160		
Group variable: Bank				Number of groups = 16		
R^2 : within = 0.4127				Obs per group: min =10		
between = 0.9294				avg =10		
overall =0.6062				max =10		
				Wald chi-square(4) = 238.64		
Correlation(u_i, x) = 0 (assumed)				Prob > chi-square = 0.0000		
	Coefficient	Std. Err.	Z	P > |z|	90% Confidence Interval	
Buf_{t-1}	0.5343186	0.0602455	8.87	0.000	0.4352235	0.6334137
GGDP	0.3834441	0.0878248	4.37	0.000	0.2389852	0.5279029
ROA	3.575044	0.7946035	4.50	0.000	2.268038	4.882051
NPL	-0.0342572	0.0572449	-0.60	0.550	-0.1284168	0.0599023
Constant	-5.412109	1.293269	-4.18	0.000	-7.539348	-3.28487
Sigma_u	0					
Sigma_e	2.0683356					
rho	0	(fraction of variance due to u_i)				

(Source: Own construction)

As we can see from the empirical test results in Table 2, Table 3 and Table 4, the macroeconomic indicators GDP growth rate (GGDP) has significant impact on the commercial bank's excess capital adequacy ratio at confidence level 1% ,5% and 10%. The coefficient β_2 is positive, indicating that the capital adequacy rate of China's commercial bank have pro-cyclical effect. As we discussed before, pro-cyclical effect on the capital adequacy ratio means that, when the economic cycle goes up, the borrower's financial situation improved, their credit rating increases, resulting in lower PD, higher collateral prices and lower LGD of loan, the risk capital requirement decrease comparatively. With a constant capital holding in one period, the excess capital increase comparatively. This part of excess capital adequacy of commercial banks would been improved to support more substantial credit expansion, which will promote an upsurge of further economic development (Kashyap, A. K., Stein, J. C. 2004). While during the economic downturn, the level of capital adequacy would be reduced. Meanwhile, the financing cost of banks equity is higher, commercial banks have to shrink their balance-sheets and reduce the supply of credit which would exacerbate the cyclical fluctuations of the real economy (Estrella 2004). We could hereby reach the conclusion that when GDP growth increase per 1%, the average excess capital adequacy ratio will accordingly be increased by 0.379% in Table 2 and Table 3, by 0.383% in Table 4 respectively.

In addition, the table 2, 3&4 also show that the coefficient of $Buf_{i,t-1}$ are significantly positive at confidence level 1% ,5% and 10%. It demonstrates that the specification on dynamic adjustment model of capital adequacy ratio is reasonable. There is a significant positive correlation between the return on assets (ROA) and excess capital also, which indicates banks with higher profitability would have higher capital adequacy levels. NPL ratio increase would reduce excess capital ratios. It also shows that there is a negative correlation between the explanatory variables and NPL but the result is not significant here.

Conclusions

Bank capital adequacy ratio is the basic indicator to measure whether banks are in the stable operation. The level of capital adequacy ratio of a bank not only affects the ability of the bank issuing the credit, but also affects the ability to bear risk. The procyclicality of bank capital would lead to expansive fluctuations in the economic cycle which may cause higher risk to banking system and the whole economics.

In this paper, we empirically analyze the procyclicality of bank capital based on China's 16 major commercial banks in 2004-2014 panel data. By applied the model in Ayuso et al. (2004) and Estrella (2004), we run the random-effects GLS regression to analyze the relationship between macro-economic cycle and capital adequacy ratio. From the empirical results above, we can find a significant positive relationship between the excess capital adequacy ratio and macro-economic cycle which means there exists pro-cyclical effect in main banks of China.

References

Aspachs, O., Goodhart, C., Segoviano, M., Tsomocos, D., & Zicchino, L. (2006). Searching for a metric for financial stability. *SPECIAL PAPER-LSE FINANCIAL MARKETS GROUP*, *167*.

Ayuso, J., Pérez, D., & Saurina, J. (2004). Are capital buffers pro-cyclical?: Evidence from Spanish panel data. *Journal of financial intermediation*, *13*(2), 249-264.

Basel Accord II (2003). Basel II: The New Basel Capital Accord-third consultative paper. Basel Committee on Banking Supervision, Bank for International Settlements. [Retrieved January 1, 2016], <http://www.bis.org/bcbs/bcbscp3.htm>

Berger, A. N., Herring, R. J., & Szegö, G. P. (1995). The role of capital in financial institutions. *Journal of Banking & Finance*, *19*(3), 393-430.

Bernanke, B. S., Blinder, A. S. (1988). Credit money and aggregate demand. *American Economic Review,* 78(2), 435-439.

Bikker, J., & Metzemakers, P. (2004). Is bank capital procyclical? A cross-country analysis. *DNB Working paper 009*, Netherlands Central Bank, Research Department.

Brunnermeier, M. K., Crockett, A., Goodhart, C. A., Persaud, A., & Shin, H. S. (2009). *The fundamental principles of financial regulation* (Vol. 11). London: Centre for Economic Policy Research.

De Larosiere, J., Balcerowicz, L., Issing, O., Masera, R., Mc Carthy, C., Nyberg, L., Perez Onno Ruding, J. (2009).The High-Level Group on financial supervision in the EU, Brussels. European Commission.

Demyanyk, Y., & Van Hemert, O. (2008). Understanding the subprime mortgage crisis, Federal Reserve Bank of St. *Louis, February*, *29*.

Demyanyk, Y., & Van Hemert, O. (2011). Understanding the subprime mortgage crisis. *Review of Financial Studies*, *24*(6), 1848-1880.

Estrella, A. (2004). The cyclical behavior of optimal bank capital. *Journal of banking & finance*, *28*(6), 1469-1498.

FSF (2008). Addressing financial system procyclicality: a possible framework. Financial Stability Forum. [Retrieved January 20, 2016], <http://www.fsb.org/2009/04/r_0904e/>

FSF (2009). Report of the Financial Stability Forum on Addressing Procyclicality in the Financial System. Financial Stability Forum. [Retrieved January 20, 2016], <http://www.fsb.org/2009/04/report-of-the-financial-stability-forum-on-addressing-procyclicality-in-the-financial-system/>

Gordy, M. B., & Howells, B. (2006). Procyclicality in Basel II: Can we treat the disease without killing the patient?. *Journal of Financial Intermediation*, *15*(3), 395-417.

Heid, F. (2007). The cyclical effects of the Basel II capital requirements. *Journal of Banking & Finance*, *31*(12), 3885-3900.

IMF (2009). Lessons of the financial crisis for future regulation of financial institutions and markets and for liquidity management. International Monetary Fund, International Capital Markets Department. <http://www.imf.org/external/np/pp/eng/2009/020409.pdf>

Jokipii, T., & Milne, A. (2008). The cyclical behaviour of European bank capital buffers. *Journal of banking & finance*, *32*(8), 1440-1451.

Kashyap, A. K., & Stein, J. C. (2004). Cyclical implications of the Basel II capital standards. *Economic Perspectives-Federal Reserve Bank Of Chicago*, *28*(1), 18-33.

Panetta, F., Angelini, P., Albertazzi, U., Columba, F., Cornacchia, W., Di Cesare, A., ... & Santini, G. (2009). Financial sector pro-cyclicality: lessons from the crisis. *Bank of Italy Occasional Paper*, (44).

Tanaka, M. (2002). How do bank capital and capital adequacy regulation affect the monetary transmission mechanism?. *CESifo working paper series.*

Turner, A. (2009). *The Turner Review: A regulatory response to the global banking crisis* (Vol. 7). London: Financial Services Authority.

WIND Database. [Retrieved January 10, 2016], http://www.wind.com.cn/

Csaba Lentner (2015). The Structural Outline of the Development and Consolidation of Retail Foreign Currency Lending. *Public Finance Quarterly 60. (3)* 297-311.

Csaba Lentner (2015). Uncertainty Factors in National Economy Planning – International Effects and Hungary's Outlook Up to 2050. *Central European Political Science Review 16 (62).* 9-26.

RECEIVED: 13 May 2016 **ACCEPTED: 20 October 2016**

Jing Li. PhD student, Doctoral School of Management and Business Administration, Szent Istvan University (Hungary); Lecturer, Institute of Finance, Jiangxi University of Finance and Economics (China). The research field is: Financial risk management, Introcontrol of financial institution. Pater Karoly u. 1. H-2100, Godollo, Hungary. E-mail: Jasmine_intl@foxmail.com

Zoltan Zeman. PhD, Professor, Institute of Business Studies, Faculty of Economic and Social Sciences, Szent Istvan University, Hungary. Field of scientific research: Financial management, Controlling. Pater Kįroly u. 1. H-2100, Godollo, Hungary. E-mail: zeman.zoltan@gtk.szie.hu

Acknowledgement: This work is sponsored by China Scholarship Council

Vadyba
Journal of Management
2016, № 2 (29)
ISSN 1648-7974

THE STUDY ON INFLUENTIAL FACTORS OF SRID IN CHINA

Maohua Li[12], Zoltán Zéman[3], Bernadett Almádi[4]
1 Szent István University, Faculty of Economics and Social Sciences, Páter Károly utca 1. H-2100, Gödöllő, Hungary
2 School of Business, Xi'an Siyuan University, #28 Shui An Rd. Xi`an, China
3 Szent István University, Faculty of Economics and Social Sciences, Institute of Business Studies, Páter Károly utca 1. H-2100, Gödöllő, Hungary
4 Szent István University, Faculty of Economics and Social Sciences, Department of Quality managament , Páter Károly utca 1. H-2100, Gödöllő, Hungary

Annotation
The term "corporate social responsibility" became popular in the 1960s and has remained a term used indiscriminately by many to cover legal and moral responsibility more narrowly construed (De George, Richard T, 2011, p.121). Nowadays, with the development of Chinese economy, this concept has been accepted by Chinese. Especially from the beginning of the 21st century, Chinese government and companies pay more and more attention on CSR. They have made some laws and regulations on CSR and social responsibility information disclosure (SRID). This paper tries to find the influential factors of SRID in China from companies themselves. As we know, external causes become operative through internal causes, but internal causes contribute to the principal aspect. As a result, we found that LA(logAsset), ROA(Return on Assets), ROE(Rate of Return on Common Stockholders' Equity), CR(Current Ratio), LR(Liability-assets Ratio), PE(P/ E ratios) are the internal factors of SRID in China. In order to look for these factors, this study uses correlation analysis and multiple variables linear regression analysis.
KEYWORDS: CSR, SRID, influential factors, China, regression analysis.

Introduction

With the development of market economy, enterprise plays a very important role in economic development. Enterprise is the creator of social wealth (Chell, Elizabeth, 2007, p.8); however, many problems occur because of the enterprise's profit policy, such as environmental pollution, non-protection of workers' rights, the invasion of consumers' interest.

The conflict between the desire of human being and the limited resources is becoming more and more serious. Facing all these problems, we found that the corporate social responsibility (CSR) is becoming more and more important.

With the globalization of world economy, we should consider more about the importance of enterprises in the world economy not only from the regional and profitable view (Intriligator, Michael D, 2004, p.488). And we should pay more attention on the CSR, such as environment pollution, community service, power utility and so on.

Due to the problems mentioned above, and to fix the problems of resource and society, the government requires the enterprise especially the listed companies to report the information on the CSR frequently by law. This paper, based on national and international literature, researches on the factors of social responsibility information disclosure (SRID), and sets the Chinese listed companies from Shenzhen Stock Exchange and Shanghai Stock Exchange as samples (Sóvágó, L., Gácsi, R., etc., 2014, p.24).

In order to understand the current situation of SRID and the problems of CSR report, we use correlation analysis and linear regression analysis to get down research on the CSR report.

Significance

Based on the Chinese listed companies from Shenzhen and Shanghai Stock Exchange, and according to the CSR theories and CSR report, the paper has a very distinguished significance in theory and practice. The main significance of this study is to help to understand the quality of social responsibility information disclosure in China, further more to improve the status quo of SRID in China.

This study uses social, economical and financial methods to focus on the factors of SRID in China, so this can help the following scholars to innovate in SRID and CSR theory. At the same time, this paper uses Chinese listed companies as empirical samples, so this study can provide some advice for Chinese government and Chinese companies to better their government and solve the problems of SRID and CSR.

The results of the study can help listed companies to fulfil the CSR and SRID better and even can help to regulate the actions of the listed companies in China.

Research structure and methods

In order to find the factors of SRID in China, this study contains 3 research steps. Firstly, this study uses descriptive analysis to make research on the change trend of the variables.

Secondly, we use correlation analysis to test the relation between the independent variables and dependent variable that we select. Thirdly, regression analysis is used to research on the relation between independent and dependent variables to find the really factors on the SRID.

The total research structure is shown in figure 1.

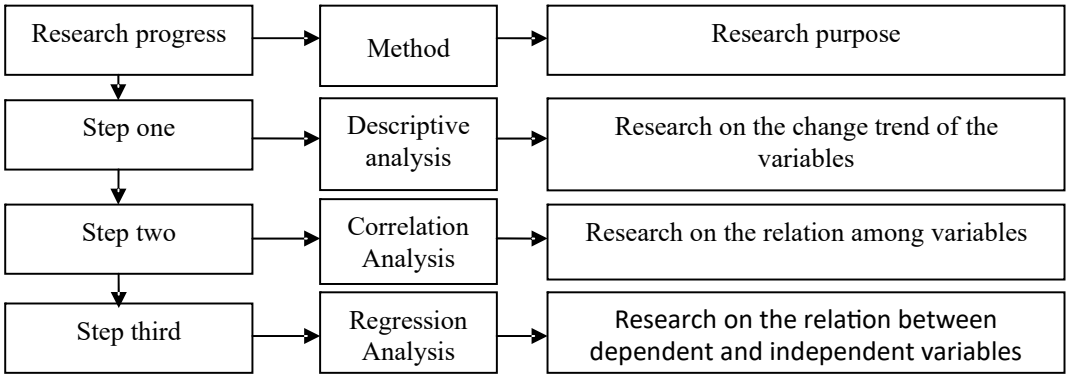


Fig. 1. The research structure

The selection of variables

On the selection of dependent variable, Li (2016, p38), through the method of the oral theme encoding technology, the frequency analysis, the reliability test etc., establishes the SRID evaluation framework of agricultural enterprises in China (table 1). And Li (2016, p. 23) uses AHP method to weight the evaluation framework.

According to Li (2016, p.23), the SRID evaluation framework of agricultural enterprises consists of four elements and 12 specific indicators. Details are shown in table1 below:

Table 1. SRID evaluation framework

First-Level	Second-Level	Third-Level
SRID Evaluation Framework A	Content quality B_1	Objectivity C_{11}
		Correctness C_{12}
		Credibility C_{13}
	Total quality B_2	Relevance C_{21}
		Completeness C_{22}
		Sufficiency C_{23}
	Expression quality B_3	Definition C_{31}
		Intelligibility C_{32}
		Conciseness C_{33}
	Effectiveness quality B_4	Timeliness C_{41}
		Adaptability C_{42}
		Testability C_{43}

Source: Own construction

This study uses this framework to evaluate the listed companies in China, use the final score as the dependent variable. In order to let 4 researchers to evaluate the listed companies in China separately and uses AHP method to get the weights, and we use the Ranking CSR Ratings by Lingrun Company, which is the authoritative third-party CSR rating agency in China. CSR reports ranking by Lingrun company contains ESG ranking (environment, society, government), service for CSR investors and so on.

The ratings by Lingrun Company is very good, however, the ratings only concerns the actions and activities by the listed companies, and the evaluation framework built by Li talks about the quality of SRID.

This study considers both of them, so we use the weight of the content quality (B2) in Li's evaluation framework and the ratings by Lingrun Company.

All the results are shown in table 1.

$$SC = Score \times B_2 \qquad (1)$$

SC: The final score of the listed companies

Score: Ranking CSR ratings by Lingrun Company

B2: The weight calculated according to the framework

Table 2. CSR reports ranking by Lingrun Company (partial)

No	Industry classification	Stock code	Enterprise	Rank	Prediction	Score	Weight	SC
1	Insurance	601318	Ping An	AA	positive	78.71	0.98	77.14
2	Mining	601088	Shen Hua	AA	positive	78.49	0.78	61.22
3	Medicine	600196	Fosun Pharma	AA	positive	76.14	0.85	64.72
4	Finance	601398	ICBC	AA-	positive	72.38	0.95	68.76
5	Transportation	601111	Air China	A+	positive	71.92	0.66	47.47
6	Estate	000002	Vanke	A+	positive	71.06	0.88	62.53
7	Insurance	601601	CPIC	A+	stable	70.06	0.63	44.14
8	Finance	600000	SPDB	A	stable	68.7	0.98	67.33
9	Finance	601998	CITIC	A	positive	68.14	0.79	53.83
10	Mining	601857	CNPC	A	positive	67.06	0.58	38.89

Source: http: //www.rksratings.com/

The select of independent variables, this study concerns four main parts of the listed companies, which are the scale of the companies, the financial performance of the companies, the pressure of leadership in companies, the development of companies. This study uses logAsset (LA) stand for the scale of the companies. In order to reflect the financial performance of the companies, we use ROA and ROE as two of the independent variables. Regarding the pressure of leadership in companies, this article uses current ratio (CR) and liability-assets ratio (LR). At last, this study uses P/E ratio to reflect the development of companies. All the details of independent and dependent variables are shown in the table 3.

Table 3. The description of variables

variables	Encode	Definition
The SRID score	SC	SC=Score*B2
Company scale	LA	logAsset=log(total assets)
Financial performance	ROA	ROA=Net income / total assets
	ROE	ROE = Net income / equity
Leadership pressure	CR	CR=current assets/ current liabilities
	LR	LR=total liabilities/ total assets
P/E ratio	PE	P/E ratio=price per share / earnings per share

Source: Own construction

Samples and data

The samples in this study are the listed companies in Shenzhen and Shanghai stock exchanges. We use their financial reports to calculate independent variables, and we use the ranking CSR rating by Lingrun Company and the weight given by our four researchers to calculate the dependent variable. In order to ensure the reliability of the research result, we remove some companies such ST companies and companies whose financial reports are incomplete, and at last we get 324 research samples. The descriptive analysis of the research samples are shown in table 4.

Table 4. Number of companies in the sample

Exchange place	Shanghai	Shenzhen	Total
Number	153	171	324

Source: Own construction

In order to reflect the whole situation of Chinese SRID and CSR, we select as many company types as we can, so the descriptive analysis of the industry category is shown in table 5.

Table 5. The descriptive analysis of the industry category

Industry category	Samples
Farming	24
Mining	31
manufacturing	132
Food	41
Clothing	44
furniture	25
Electronic information	8
Retail and others	19
Total	324

Source: Own construction

Correlation analysis

In order to test the correlation between the independent and dependent variables, we first use the SPSS 22.0 to do correlation analysis. Correlation analysis helps us to find the direction and strength of the correlation between the SRID and the factors of the companies. After processing the SPSS 22.0, the results are shown in table 6.

Table 6. The Correlations among the variables

		SC	LA	ROA	ROE	CR	LR	PE
SC	Pearson Correlation	1						
	Sig. (2-tailed)							
LA	Pearson Correlation	0.803	1					
	Sig. (2-tailed)	0.436						
ROA	Pearson Correlation	0.957**	0.209	1				
	Sig. (2-tailed)	0.000	0.222					
ROE	Pearson Correlation	0.973**	0.121	0.367**	1			
	Sig. (2-tailed)	0.000	0.483	0.000				
CR	Pearson Correlation	0.845*	0.423**	0.326	0.301	1		
	Sig. (2-tailed)	0.039	0.000	0.052	0.074			
LR	Pearson Correlation	-0.780**	0.412*	0.342**	0.470**	0.496**	1	
	Sig. (2-tailed)	0.000	0.013	0.000	0.000	0.002		
PE	Pearson Correlation	0.943**	0.863	0.379**	0.245**	0.198	0.210**	1
	Sig. (2-tailed)	0.000	0.816	0.000	0.000	0.248	0.000	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Own construction

As the correlation analysis shows, results are shown in table 6. We can see that there is a strong and positive relation between dependent variable (SC) and independent variables. All Pearson correlations are greater than 0.7, and some them is significant, that is the relation between PE and of them are greater than 0.9, such as the ROA, ROE and LA (0.863), but the significance is 0.816 which means PE. From table 6, we can also see that relations between the relation is not significant. These tell us the variables independent variables are not very strong, and most of we selected are suitable for the regression analysis. their Pearson correlations are less than 0.5. Only one of

Regression analysis

This article aims to find the real factors of SRID from all the independent variables, so we use all the independent variables and the dependent variable to construct the regression analysis model. The model is shown in the following formula.

$$SC=\partial_0+\partial_1 LA+\partial_2 ROA+\partial_3 ROE+\partial_4 CR+\partial_5 LR+\partial_6 PE+\varepsilon \quad (2)$$

SC: Final Score of SRID

LA: logAsset

ROA: Return on Assets

ROE: Rate of Return on Common Stockholders' Equity

CR: Current Ratio

LR: Liability-assets Ratio

PE: P/ E ratios

This study uses the multiple variables linear regression analysis of SPSS 22.0 to look for the real factors of the SRID. After the analysis, the results can be seen in table 7 and table 8.

Table 7. Model Summary[b]

Model[b]	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.952[a]	.906	.912	21.21465

a. Predictors: (Constant), LA, ROA, ROE, CR, LR, PE

b. Dependent Variable: SC

From table 7, we can see that the total function can explain the major variance (more than 90%) of the economic development. For the model, R^2=0.906, which means that 90.6% of the variance of SC can be explained by the model. The adjusted R^2 is 0.912, which means that the regression equation fits our research data well. And the standard error of the estimate is 21.21465, which means that the prediction of the total function is of accuracy. So the models fit the actual situation of the nation in China, and then we continue with the multiple variables linear regression analysis.

This paper uses SPSS 22 software, puts the sample data into the model, and uses multiple variables linear regression models to estimate. The results are as follows (Table 8)

Table 8. Coefficients[a]

Model		B	t	Sig.
1	(Constant)	1.138	2.23	.000
	LA	2.120	1.04	.061
	ROA	1.503	3.43	.001
	ROE	1.340	3.12	.000
	CR	1.930	2.67	.044
	LR	-5.269	-2.11	.031
	PE	3.912	3.86	.000

a. Dependent Variable: SC

From table 8, we can conclude that the significance of most variables is less than 0.05 which means they are the factors of SRID. However, the p-value of LA (logAsset) is greater than 0.05, which means that the function of total assets on the SRID is not so significant. And the t-value of LA is less than 1.5, which means that the function of total assets on the SRID cannot last for long time. According to both of these, we remove the LA from the potential factors of SRID.

As the financial performance of companies, the p-values of ROA and ROE are near to 0, which mean the function of financial performance on the SRID and CSR is highly significant. The t-values of them are more than 3, which means the function of financial performance on the SRID and CSR can last for long time, so they should be selected as the factors of the SRID.

The p-values of CR (Current Ratio) and LR (Liability-assets Ratio) is less than 0.05, which means the function of debt-paying ability on SRID is significant. However, they are near to 0.05, which means, they are acceptable but not highly significant. The t-values of them are higher than 1.5, which tells us that the function of them are not for short time and can be used as the factors of SRID.

The p-value of PE (P/ E ratios) is 0, which means the function of PE on the SRID is highly significant. And the t-value is greater than 3, which tells us the function of company development on SRID is for long time, so the PE is the factor of SRID.

Conclusions

As the appearance of many environmental problems, food problems in China, our government, enterprises and media started focusing on the CSR and the CSR and SRID is a hot topic for scholars. Due to this, this paper wants to use some of Chinese listed companies as research sample, and use correlation analysis, linear regression analysis of SPSS 22.0 to look for the factors of SRID in China. Through our research, we found that ROA(Return on Assets), ROE(Rate of Return on Common Stockholders' Equity),CR(Current Ratio),LR(Liability-assets Ratio),PE(P/ E ratios) are the factors of SC(Final Score of SRID).

The financial performance of company has a positive relation with SRID. For a better financial performance, the company wants this performance to be continued, so they would like to embrace more social responsibilities and disclosure more information of CSR.

The debt-paying ability has a complicated relation with SRID. For CR(Current Ratio) is positive and LR(Liability-assets Ratio) is negative, which means short-term debt-paying ability has a positive relation and long-term debt-paying ability has a negative relation. To some degree, this tells us that some of Chinese listed companies are taking social responsibilities only for short-term profit not for long-term benefit, so they care more about short-term debt-paying ability.

The development of listed companies has a positive relation with SRID, which means the realization of the CSR relies on the development of listed companies. This also proves the theory that company is the creator of social wealth.

Acknowledgements

This work is sponsored by China Scholarship Council. At last, I want to thank anonymous referees for their constructive feedback.

References

Chell, E. (2007). Social enterprise and entrepreneurship towards a convergent theory of the entrepreneurial process. *International small business journal*, 25(1), 5-26.

De George, R. T. (2011). Business ethics. India: *Pearson Education Press*.

Intriligator, M. D. (2004). Globalization of the world economy: Potential benefits and costs and a net assessment. *Journal of Policy Modeling*, 26(4), 485-498.

Maohua, L., Zéman, Z. (2016). Study on the SRID evaluation framework of agricultural enterprises in China. *Visegrad journal on bioeconomy and sustainable development*, 5(1), 36-40.

Maohua, L., Zéman, Z. (2016). The application of AHP in SRID evaluation framework of Chinese agricultural enterprise. *Hungarian agricultural engineering*, 30(2), 17-27.

Sóvįgó, L., Gįcsi, R., Bįrczi, J., Czeglédi, C., Hajós, L., Zéman, Z.(2014). The effects of and risk management related to the credit crunch in Hungary. *Banking sector*, 22(7), 22-26.

RECEIVED: 13 June 2016 **ACCEPTED: 20 October 2016**

Maohua Li. PhD Student in Doctoral School of Management and Administration of Szent István University. His research is on the corporate social responsibility, banking system. Up to now, he has published several articles on CSR and banking system. He is a CMA in USA and has been a lecturer for 5 years in China. E-mail: maohua.li@qq.com

Zoltan Zeman. PhD, Associate Professor, Institute of Business Studies, Faculty of Economic and Social Sciences, Szent Istvan University, Hungary. Field of scientific research: Financial management, Controlling. Pater Karoly u. 1. H-2100, Gödöllo, Hungary. E-mail: zeman.zoltan@gtk.szie.hu

Bernadett Almádi. Assistant lecturer, Szent István University Faculty of Economics and Social Sciences Department of Quality Management, Field of scientific research: mushroom growing and economic issues. H-2100 Gödöllő, Páter Károly utca 1, e-mail: almadi.bernadett@gtk.szie.hu

Vadyba
Journal of Management
2016, № 2 (29)
ISSN 1648-7974

KINETIC ENERGY HARVESTING USING PIEZO ELETRIC MATERIALS

Deivydas Žvirblis, Artur Valiavko, Andrius Čeponis, Vilma Matulienė
Vilnius College of Technologies and Design

Anotation
Kinetic energy harvesting transducers is the most promising low power energy sources. Such technologies gives opportunity ensure lifetime power supply for low power systems i.e. networks of wireless sensors, wearable electronics and electronics for monitoring of physiological parameters. The most attractive kinetic energy harvesting technology is piezoelectric energy harvesting. Piezoelectric transducers are cheap, have simple construction and low operation costs in comparison with other kinetic energy harvesting technologies. This paper represents experimental investigation of bimorph with brass beam. Experimental investigations of the beam were performed in order to obtain electrical and electromechanical characteristics i.e. voltage versus resistance load, current versus resistance load characteristics. Moreover characteristics of beam angle inclination versus voltage were investigated. Analysis of the obtained data showed that proposed prototype could be employed as power supply of low power electronics.
KEY WORDS: energy harvesting, piezo electrical materials, kinetic energy devices, low power devices.

Introduction

Energy harvesting from ambient has high potential to use kinetic energy for power supply. Kinetic energy sources can be anything that have periodic motion. For example vibrations of machines, motion of human walking, vibrations of buildings and etc. [1] Therefore, such technology gives opportunity obtain lifetime power supply for various low power electronics and devices with wireless data transfer. [2]

The most common transducers for kinetic energy harvesting is electromagnetic, electrostatic, triboelectric and piezoelectric transducers. In comparison with piezo electric transducers electromagnetic, electrostatic and triboelectric transducers has low power density and complex constructions. In addition to this electrostatic transducers should has external power source.[3,4] These, disadvantages has negative impact for practical applications, on the other hand piezoelectric energy harvesting transducers are more promising due to high power density, simple construction and low cost of producing.[5]

In general, piezoelectric kinetic energy harvesting device is cantilever beam with one or two piezoelectric layers. In most cases, cantilever beam is excited by host motions of and as a result strains are inducted in piezoelectric layers and generates an alternating voltage across electrodes placed on an active layers of the device [6]. Constructions of the bimorph and unimorph are given in Fig. 1

The main disadvantage of cantilever beams as energy harvesting systems is effective mechanical energy conversion possible only at specified excitation frequency. In line with this can be said that the most effective energy conversion will be archived only at resonance of natural frequency of the beam and host vibrations.[7]

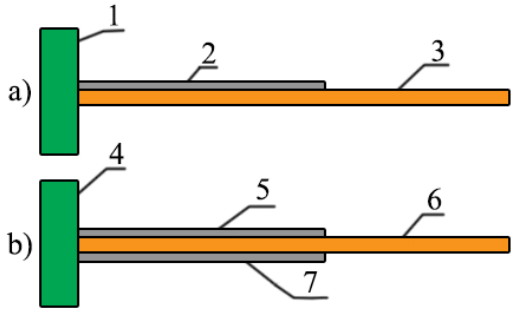


Fig. 1 Construction of the cantilever beams; a – unimotph; b – bimorph; 1, 4 - host structure; 3,6 – supporting beam; 2,5,7 – piezoceramic

Many authors investigated possibility wideband frequency energy harvesting by employing comb -type systems based on different cantilever beams. (Fig. 2) Such construction of the systems ensures possibility harvest kinetic energy with different frequencies of the motion.

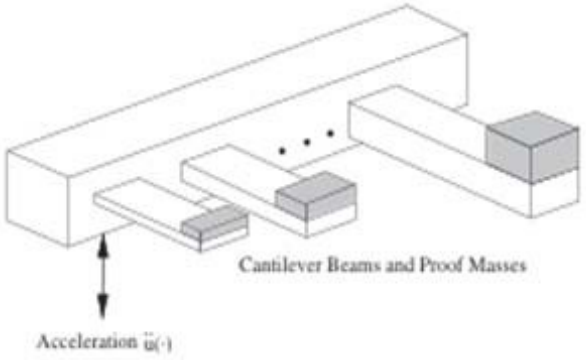


Fig. 2 Comb – type kinetic energy harvesting system for wideband excitation frequencies

This paper represent experimental investigation of the cantilever beam based on the bimorph. Goal of the investigation was indicate level of the electrical outputs generated by designed beam. Experimental investigation was carried out with two types of the electrical interfaces i.e. based on the general purpose diodes and Shottky

diodes in order to indicate the best rectifier for generated voltage.

Piezoelectric phenomena and materials

There are two main types of synthetic piezoelectric materials i.e. piezo ceramics like Lead Zirconate Titanate (PZT) and piezopolymer like Polyvinylidene Fluoride (PVDF). The models of each material are given in Fig.3 and Fig.4, respectively.

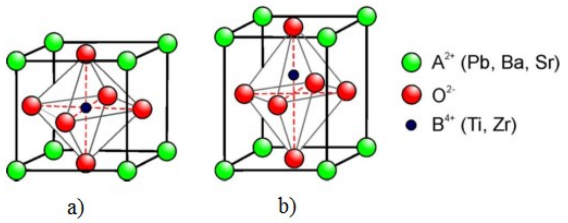


Fig. 3 Model of the PZT; a – above curie point; b – below Curie point.

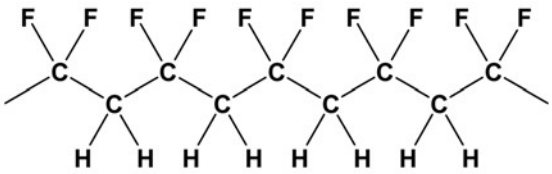


Fig. 4 Model of the PVDF

Piezo ceramics and piezo polymers are unique due to ability to convert mechanical energy to the electric charge, this means that by straining piezo ceramic material, electrical potential will be generated on the surface of the material. Moreover piezo material could act like two-sided transducer. i.e. convert strain to electrical potential as shown in Fig. 4, or convert electrical potential to strain as shown in Fig. 5.

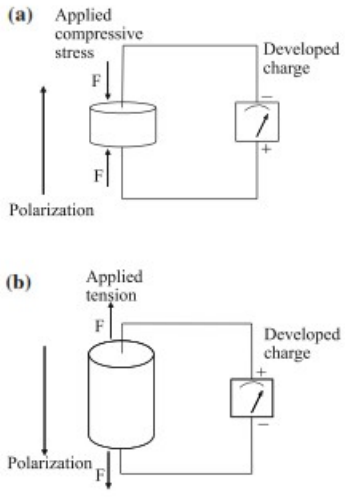


Fig. 5 Direct piezo-effect; a – at applied compressive stress; b – at applied tension

Direct piezoelectric effect is characterized by the charge which is accumulated on the surface of the piezoelectric materials when they are strained or stressed by mechanical forces.

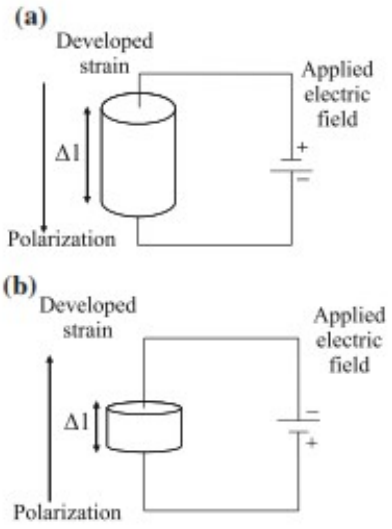


Fig. 6 Inverse piezo-effect at applied electrical field

Inverse piezoelectric effect is characterized by the inducted deformations of the material. These deformations is caused by applied electric field to piezoelectric material.

The mechanical and electrical behavior of the piezoelectric material can be modeled by strain-charge form equations as given below.

$$S = [s]_E \cdot T + [d]^t \cdot E \qquad (1)$$

$$D = d \cdot T + \varepsilon_T \cdot E$$

where S –is strain inducted in material; D – charge – density displacement; s_E – is compliance matrix of the material; T – is stress inducted in material; d^t - piezoelectric coefficients for the material; E – electric field; d is piezoelectric coupling terms; ε_T – permittivity of the material.

In summary of this chapter can be concluded that the generated electrical charge is directly related to strain applied to piezoelectric material. In line to this can be said that generated electrical outputs are directly linked to mechanical characteristics of the energy harvesting system. So, according to this can be said that strain should be improved at energy harvesting system in order to obtain higher energy conversion coefficient.

Experimental investigation

Experimental investigation was performed in order to investigate electrical characteristics of the designed cantilever beam. For this purpose was made prototype of the beam. View of the prototype is given in Fig. 7.

Prototype of the kinetic energy harvesting system consist of seismic beam (Fig.7 – 1). Seismic beam acts as vibration amplitude amplifier. It is made of cooper tube with length 350 mm, piezoelectric buzzer with two piezo ceramic layers (Fig.7 – 2), diameter of it is 50 mm. Piezo ceramic layer has diameter 29mm, thickness 0.3mm of each layer. Clamping beam was made of cooper tube as seismic beam and has 10 mm length.

Fig. 7. Prototype of the kinetic energy harvesting system; 1 – seismic beam; 2 – piezoelectric buzzer; 3 – clamping beam

Experimental investigation was performed by employing experimental setup. Schematic is given in Fig. 8.

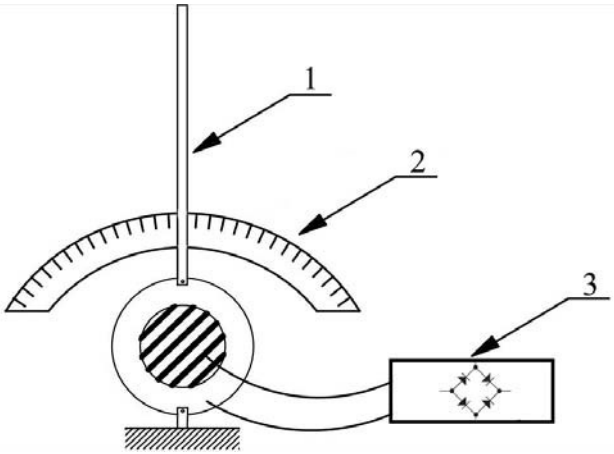


Fig. 8. Schematic of the experimental setup; 1 – energy harvesting system; 2 – protractor; 3 – electrical circuit

As shown in Fig. 8 experimental setup consist of protractor (Fig.8 – 2) who was used for measurement of the beam inclination angle. Electrical circuit (Fig. 8 – 3) was used for rectifying of the generated voltage and measurement of it.

Two types of the electrical circuits were used. First one was based on general purpose diodes 1N4007 as shown in Fig. 9 - a. Second one was based on Shottky diodes 1N5819G as shown in Fig. 9 – b.

In the proposed circuit diodes D1 – D4 acts as full bridge rectifier, capacitor C1 was employed as energy storage device and R1 acts as variable resistance load. Ammeter and voltmeter was used for measurements of the electrical characteristics.

Firstly voltage versus resistance load characteristics was investigated. Results of the investigation are given in Fig. 10.

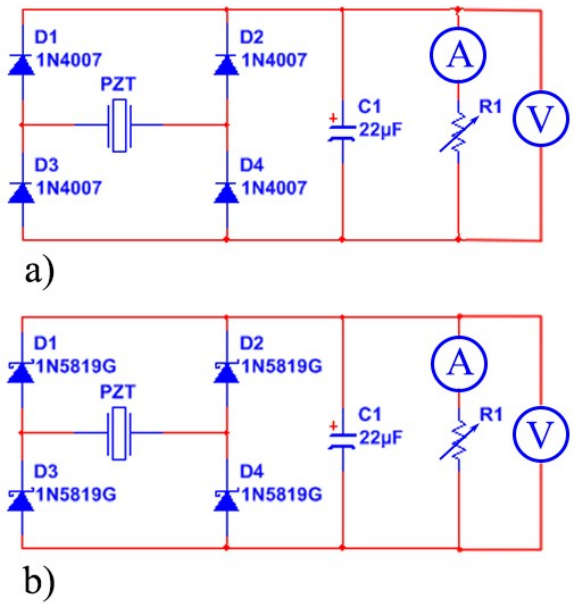


Fig. 9 Electrical circuits used for investigation; a - with general purpose diodes 1N4007; b – with Shottky diodes 1N5819.

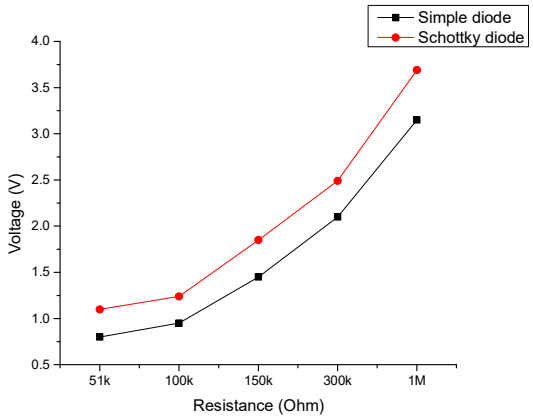


Fig. 10 Voltage versus resistance load characteristics

Analysis of the Fig. 10 showed that generated voltage has higher level with Shottky diodes based electrical circuit. This difference is caused by lower voltage losses in Shottky diodes in comparison with general purpose diodes. Difference in voltage level at each resistance load is approximately 0.3V. The highest voltage was obtained at resistance load 1MΩ and it was equal to 3.8V.

In this stage of the investigation can be concluded that Shottky diodes are more suitable for energy harvesting system due to lower voltage losses during voltage rectifying.

Next stage of the investigation was dedicated to Current versus resistance load characteristics. Results of the investigation are given in Fig. 11.

Analysis of the current - resistance load characteristic showed that general purpose diodes has positive impact to generated current. Current value is higher more than 2 times on the 51kΩ in comparison with Shottky diodes. Moreover was noticed that impedance marching of the power source and load was obtained on 300kΩ resistance load. Marching of the impedance revealed that Shottky

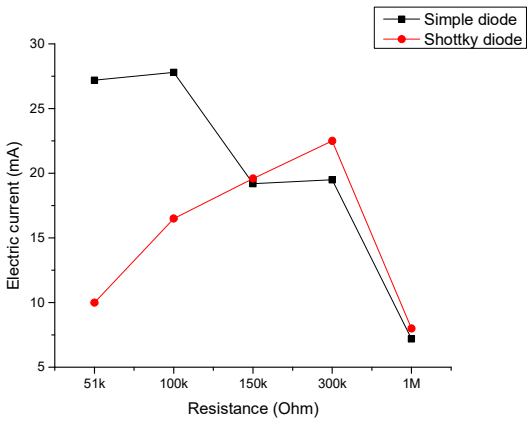


Fig. 11. Current versus resistance load characteristics

diodes has positive impact to generated current during impedance marching i.e. current was higher more than 8mA at such conditions.

In summary of this part of the investigation can be concluded that general purpose diodes are more suitable for energy harvesting when impedance of the power source and resistance load does not comply. On the other hand Shottky diodes are more effective when impedance is matched. In line with these conclusions circuit with Shottky diodes was chosen for further investigation.

Next stage of the investigation was dedicated to voltage - beam inclination characteristics. Investigation was performed with three different beam inclination values i.e. 15°, 25° and 30°. For beam inclination measurements protractor was used as shown in Fig.8. For voltage rectifying was chosen electrical circuit based on Shottky and general purpose diodes, resistance load was set to 300kΩ. These characteristics of the circuit was made with strict respect to previous investigations. For each case were performed five experiments. Results of the investigation are given in Fig. 12

Analysis of the obtained characteristics revealed that voltage generated by energy harvesting system has direct link to inclination angle. It is caused by liner behavior of the piezo electric materials and it can be noticed from equation 1. Results of the maximum voltage values analysis are given in Fig. 12.

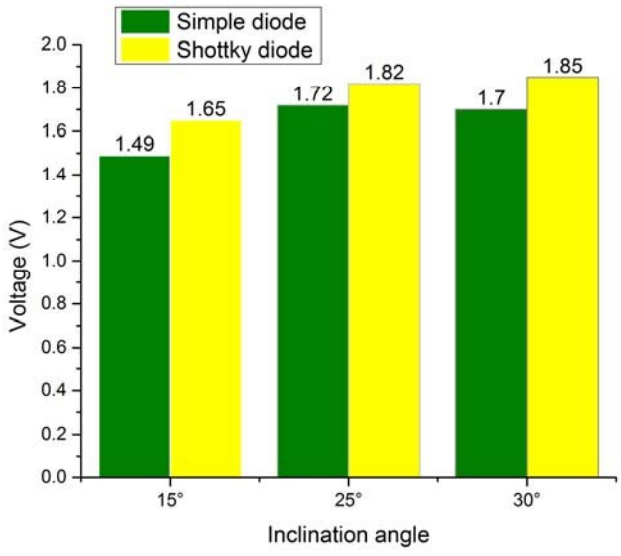


Fig. 12 Results of the maximum voltage analysis

Obtained maximum voltage values showed that the mots optimal inclination angle for designed energy harvesting system is 25°. Difference in generated voltage values at 25° and 30° is slight.

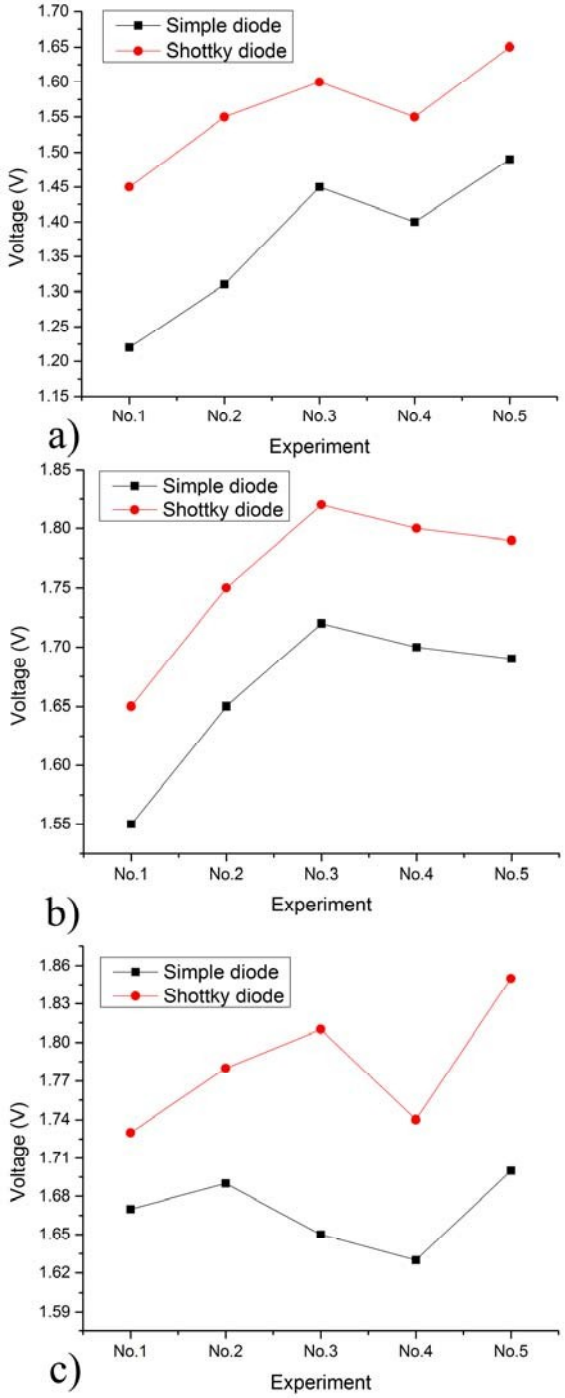


Fig. 12 Voltage - beam inclination characteristics; a – beam inclination 15°; b – beam inclination 25°; c – beam inclination 30°

Conclusions

Experimental investigation of the piezoelectric kinetic energy harvesting system based on the buzzer was performed. Study revealed that there is direct link between strain level at the piezo ceramic and electrical outputs. Experimental investigation showed that an altering voltage rectifying is more effective by employing Shottky diodes i.e. loses are less by 0.15 – 0.2V in comparison with general purpose diodes. Analysis of the

voltage - beam inclination characteristics showed that optimal inclination angle for proposed system is 25°.In the end can be concluded that obtained voltage levels are suitable for low power electronics and devices with wireless data transfer, therefore so it can be summarized that proposed kinetic energy harvesting system can be used as power supply for various low power devices.

References

D.J. Inman, S. Priya. (2009). *Energy Harvesting Technologies*. Springer Science + Business Media, New York. DOI 10.1007/978-0-387-76464-1

S.Roundy, P. Kenneth, Wright, J.M.Rabaey. (2004). *Energy Scavenging for Wireless Sensor Networks*, Springer Science + Business Media, New York. DOI 10.1007/978-1-4615-0485-6

T.J. Kazmierski., S. Beeby. (2011). *Energy Harvesting Systems*. Springer Science + Business Media, New York. DOI 10.1007/978-1-4419-7566-9

D.Spreemann, Y. Manoli. (2012). *Electromagnetic Vibration Energy Harvesting Devices*. Springer Science + Business Media, New York. DOI 10.1007/978-94-007-2944-5

A.Erturk, D.J. Inman. (2011). Piezoelectric energy harvesting, John Wiley and Sons.

N. Elvin, A. Erturk. (2013). *Advances in energy harvesting methods*, Springer Science+Business Media New York, DOI 10.1007/978-1-4614-5705-3

F. Lu, H.P. Lee, S.P. Lim. (2003). Modeling and analysis of micro piezoelectric power generators for micro-electromechanical-systems applications. *Smart Materials and Structures*. Vol.13. Issue.

RECEIVED: 16 April 2016 **ACCEPTED: 20 October 2016**

Deivydas Žvirblis, Vilnius Collage of Technologies and Design,Department of electrical engineering, Student of the study program “Renewable energy”. Field of scientific research: Alternative energy sources; E – mail: deivydas.zvirblis@tf.vtdko.lt

Artur Valiavko, Vilnius Collage of Technologies and Design, Department of electrical engineering, Student of the study program “Renewable energy”. Field of scientific research: Alternative energy sources; E – mail: artur.valiavko@tf.vtdko.lt

Andrius Čeponis, Vilnius Collage of Technologies and Design, Dep artment of electrical engineering, lecturer, Field of scientific research: Piezoelectric devices and systems; E – mail: a.ceponis@vtdko.lt

Vilma Matulienė, Vilnius Collage of Technologies and Design, D epartment of electrical engineering, lecturer, Field of scientific research: Piezoelectric devices and systems; E – mail: v.matuliene@vtdko.lt

Vadyba
Journal of Management
2016, № 2 (29)
ISSN 1648-7974

THE ROAD INFRASTRUCTURE AS A DETERMINANT OF THE ENTREPRENEURIAL ENVIRONMENT DEVELOPMENT IN THE CZECH REPUBLIC REGIONS

Koišová Eva[1], **Waldemar Gajda**[2]
[1] *A. Dubček University of Trenčín,* [2]*Warsaw Management School*

Annotation
In the connection with the regions development, the road infrastructure is considered as a factor which affects the economic and social development characteristics of the regions. It is possible to reduce regional disparities gradually by enhancing and improving quality of the road infrastructure and this way to contribute to entrepreneurial environment improvement. In the paper, we are dealing with the road infrastructure and its effect on the selected indicators of the entrepreneurial environment such as: GDP and the number of economic subjects (enterprises) in the Czech Republic. For the need of analysis, we use data on all three researched factors from the time series 2010 - 2014. The aim of this paper is to analyse the development of the road infrastructure, GDP and economic subjects of the regions in the Czech Republic and to quantify the dependency power between the road infrastructure, GDP and the economic subjects. For the purpose of the research, we have chosen administrative approach to structure regions according to NUTS III classification. The strong correlation between the road infrastructure and GDP has not been confirmed in all observed regions as well as the effect of the road infrastructure and the number of economic subjects. We used methods of time series analysis, variation coefficient, correlation coefficient, comparison and synthesis.
KEY WORDS: region, road infrastructure, entrepreneurial environment, GDP, economicsubjects.

Introduction

There are still non-unified opinions of economists and geographers on the effect of the road transport on the development of the regions. Some of them consider the road transport as a catalyzer of the economic development. Other group of authors (Rephann 1993, Banister a Berechman 2001, Marada, Květoň, Vondráčková 2006) understands it as necessary, however not sufficient condition of this development. Whitelleg (1994) came to the similar conlusions in his work. According to him, the causal relationship between good road connection and economic success of the region does not exist. On the contrary, Polish author Rosik (2004) brought interesting work analysing theories of the regional development from the road infrastructure perspective. According to this author, in some theories such as the theory of balanced and unbalanced development the road infrastructure is the central point.

From the creation of favourable entrepreneurial environment perspective, the road transport plays its irreplaceable role. The success of the enterprise is mostly determined by the environment in which enterprise operates. It does mean what conditions exist for the development of entrepreneurial activities in a given surroundings. Therefore, economics realize their infestations in the road transport with the aim to increase availability of enterprising also in less developed regions which have the high rate of unemployment and by this way to strengthen competitiveness of the region.

The road infrastructure, as a part of the transport infrastructure, contributes to the social and economic development of the region as well as it helps to increase quality of the entrepreneurial environment, because it helps to interconnect regions, places, people and economics (Patarasuk 2013). According to Masárová and Šedivá (2013), the road infrastructure is considered as one of the cornerstones for achievement of the economic growth, the increase of competitiveness and the society prosperity, the improvement of the social status of citizens and the increase of employment. The improvement of the road network increases availability, mobility and decreases distance, travelling costs and travel time. Havierniková and Janský (2014) in their work, except other authors, researched the task of the road infrastructure in the area of the regional development and regional disparities.

In the connection with the regions development, the road infrastructure is considered as factor which affects the economic and social development characteristics of the regions. Therefore, it is possible to reduce regional disparities gradually by means of enhancing and improving quality of the road infrastructure (Masárová and Koišová 2015). Stephan (1997), in his research work, pointed to strong correlation between the road infrastructure and created product in German manufacturing industry at the level of federal states. According to him, differences in the road infrastructure are one of the factors explaining differences in productivity between production in eastern and western countries of Germany.

Goals and methods

The aim of this article is to analyse development of the road infrastructure, GDP and economic subjects in the regions of the Czech Republic and to quantify the strength of dependency between the road infrastructure, GDP and economic subjects. In the paper, for the need of

analysis, we use data on all three researched factors from the time series 2010 - 2014 such as road infrastructure, economic subjects and gross domestic product have been available. The length of the time series was determined based upon available data on researched factor economic subjects where data on all regions were not available. Other factor was regional GDP where year 2015 data were not available. We used data base of the Czech was Statistical Office and Ředitelství silniční dopravy Českej republiky (ŘSD ČR).

For the purpose of the research, we selected administrative approach to structure regions according to NUTS III classification. In the Czech Republic (ČR), NUTS III regions are these: Central Bohemia, South Bohemia, Plzeň, Karlovy Vary, Ústí nad Labem, Liberec, Hradec Králové, Pardubice, Vysočina, South Moravia, Olomouc, Zlín, Moravia-Silesia and Prague.

In order to determine relative variation, the variation coefficient is used. It is the ratio of standard deviation and the arithmetic mean expressed in percentage.

$$V_x = \frac{\sigma}{\bar{x}} \quad (1)$$

In order to quantify dependency strength between researched factors, we used correlation coefficient which measures strength of statistical dependency between two quantitative variables. It does not express causal-consecutive relationship of variables, but it explains to which extent one, respectively more phenomenons (independently variable values) invoke effect on dependent variable. We use Pearson correlation coefficient.

$$r = \frac{\sum (x-\bar{x})(y-\bar{y})}{\sqrt{\sum (x-\bar{x})^2 \sum (y-\bar{y})^2}} \quad (2)$$

Where *x,y* are random variables. We calculate them from *n* matched values (x_i, y_i) measured on *n* randomly selected units. Correlation coefficient *r* has values from range *(-1; 1)*.

Analysis of the selected factors of the entrepreneurial environment

In the following part, we will be observing development of the selected factors such as road infrastructure (specifically expressways and motorways), gross domestic product and economic ubjects (enterprises). In order to determine disparities in development of the the selected factors, we will observe also variation coefficient.

Road infrastructure

Expressways and motorways have special status in the economy development. There are dedicated for transport connection between important centers of state and international importance and to connect to motorway network of the neighbouring states. They copy routes of the biggest transport load, and at a certain conditions take significant part of the transportation from parallel lower level roads. They are marked as superior road infrastructure (Masárová and Šedivá 2013). In the connection with the entry of the Czech Republic into the EU, it was payed a big attention to the roads which were part of the Trans-European Transport Network.

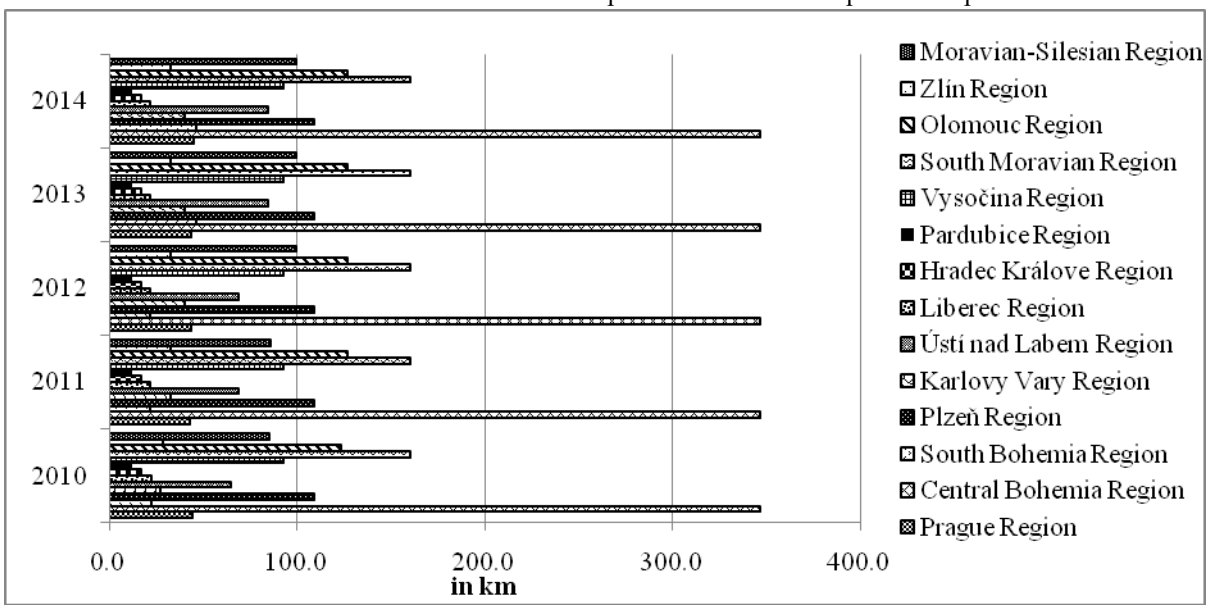


Fig. 1. Development of the length of motorway and expressways together in the Czech Republic
Source: Processed based upon RSD ČR data

The longest expressways and motorways network is in the Central Bohemia Region 346.3 km in all observed time series. We observed significantly the lowest length of the motorways and expressways in the Pardubice (12 km) and Hradec Králové Region (16.8 km). It is necessary to note, that there are no expressways in the Vysočina and Plzeň Region and there are no motorways in the Liberec and Karlovy Vary Region.

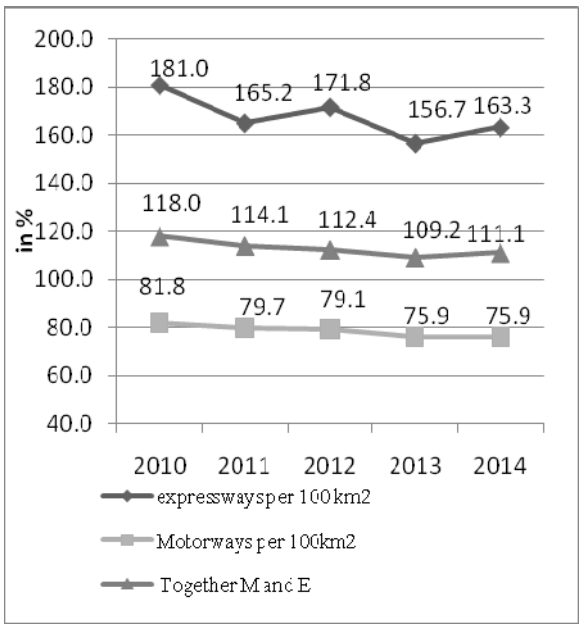


Fig. 2. Variation coefficient of amenities of ČR regions with road communications (%) Source: Processed based upon RSD ČR data

In order to calculate variation coefficient, we calculated the length of expressways and motorways per 100 km^2 of the region area. From the Figure 2 it follows that the highest variability is in the area of expressways in the regions in the Czech Republic. It was decreased from 181 % in 2010 to 163.3 % in 2014. The motorways variability is slightly lower but still very high. Also in the case of motorways, it was bigger decrease of disparities as well as in the case of expressways from 81.8 % in 2010 to 75.9 % in 2013 and 2014. The variability of the overall length of the road communications ranges from 118 % in 2010 to 109.2 % in 2013 when the lowest disparities were recorded.

Gross Domestic Product per capita

The entrepreneurial environment, but mainly entrepreneurial activities are also affected by the development of the gross domestic product which is a main macroeconomic indicator which evaluates economic rank of the state as a whole as well as its regions. GDP increase is transitioned into a larger amount of finance available for a new established enterprise.

Tab. 1. Development GDP per capita in the Czech Republic in Kč, Source: Processed based upon ČSÚ data

Region	2010	2011	2012	2013	2014
The Czech Repubic	375,921	383,218	384,575	387,900	404,843
Prague Region	811,822	808,490	803,559	807,486	829,168
Central Bohemia Region	333,680	345,593	348,294	347,177	369,335
South Bohemia Region	317,054	319,614	326,066	331,474	343,817
Plzeň Region	346,460	353,547	345,375	361,465	384,101
Karlovy Vary Region	269,200	272,823	270,953	270,921	276,941
Ústí nad Labem Region	298,627	301,370	301,682	300,926	309,564
Liberec Region	287,144	293,619	298,671	300,639	315,209
Hradec Králove Region	327,441	330,297	331,871	333,658	356,040
Pardubice Region	308,768	320,213	305,082	312,191	327,545
Vysočina Region	300,530	315,793	322,618	326,186	334,994
South Moravian Region	353,185	361,063	370,535	385,622	397,233
Olomouc Region	285,621	296,099	299,335	299,515	314,478
Zlín Region	313,138	323,620	323,256	329,349	359,354
Moravian-Silesian Region	311,598	328,364	331,321	323,090	337,741

From Table 1 it follows that the highest GDP per capita is in the Prague Region where it reached value of 829,168 Kč per capita. The lowest GDP per capita was reached in the Karlovy Vary Region in 2010 amounted to 269,200 Kč per capita, but in 2014, it increased approximately by 3% compared to 2010.

In the whole observed time series none of the regions reached half of GDP of the smallest region which is the Prague Region. The South Moravia Region was nearest to this value in 2014.

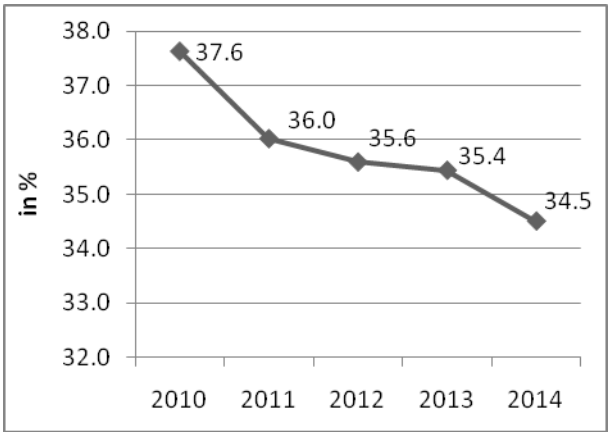


Fig. 3. Variation coefficient GDP (%)
Source: Processed based upon ČSÚ data

We can state that there are not high values of variation coefficient in the Czech Republic which means low disparities in GDP development. We can positively evaluate this fact. The biggest disparities in GDP development per capita were in 2010, but these were developing favourable gradually, and at the end of the observed period 2014 were decreased up to the level of 34.5 % yet. The Czech Republic within the Visegrad Group is the most powerful economy which is also supported by low regional disparities of GDP.

The number of economic subject

Qualitative entrepreneurial environment is an important factor of economic development. Therefore, on the present, the entrepreneur development represents general concept for central and local governments as economic development factor especially in stagnant parts of the country. According to Czech Statistical Office, economic subjects are business companies, cooperatives, state enterprises, natural persons as sole traders, self-sufficient farmers and other private entrepreneurs. In Table 2, we can see development of the number of economic subjects in the Czech Republic according to regions.

Again, we can observe the highest number of economic subjects again in the Prague Region where we recorded 557,736 subjects in 2014. In 2012, in the Central Bohemia Region we recorded 323,025 economic subjects. It is the second region with the highest number of economic subjects in the whole observed period.

Tab. 2. The number of economic subjects in the Czech Republic, Source: Processed based upon ČSÚ data

	2010	2011	2012	2013	2014
The Czech Repubic	2, 637,551	2,703,444	2,727,654	2,694,737	2,733,459
Prague Region	506,273	529,377	544,840	540,360	557,736
Central Bohemia Region	307,761	317,598	323,025	314,688	319,758
South Bohemia Region	155,762	158,543	160,091	159,363	160,786
Plzeň Region	144,632	147,419	147,750	141,202	142,307
Karlovy Vary Region	82,322	83,396	83,103	76,802	76,602
Ústí nad Labem Region	176,422	178,718	179,126	172,030	173,415
Liberec Region	117,230	118,766	119,908	114,472	115,262
Hradec Králove Region	132,423	134,689	135,372	133,970	135,019
Pardubice Region	112,121	114,072	115,333	115,116	116,363
Vysočina Region	103,510	105,185	106,578	107,395	108,800
South Moravian Region	283,202	291,162	294,308	295,523	300,204
Olomouc Region	136,229	138,970	135,201	137,119	138,347
Zlín Region	134,374	136,725	138,269	138,197	138,832
Moravian-Silesian Region	245,290	248,824	244,750	248,500	250,028

We can see the lowest values in the Karlove Vary Region where we can also observe unfavourable development because in 2014 the number of the economic subjects decreased from 83,396 in 2011 to 76,602 in 2014.

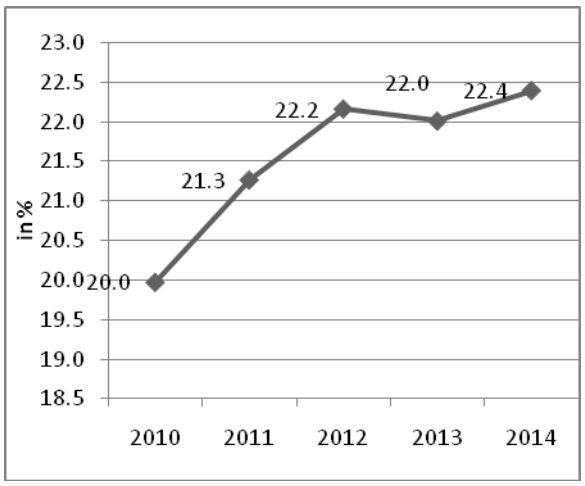


Fig. 4. Variation coeffcient of the economic subjects (%) Source: Processed based upon ČSÚ data

In order to calculate variation coefficient, we calculated the value per 1,000 citizens. Variation coefficient had lower values in 2010, but its development was unfavourable. The value of the coefficient is increasing which causes that disparities are increasing also. In the Czech Republic mainly the Karlove Vary Region contributed to the disparities increase in the observed factor.

Evaluation of the dependency between road infrastructure and GDP per capita

In order to quantify strength of dependencies between the road infrastructure and GDP, we used correlation coefficient. In order to calculate these indicators, we calculated measured values of independent variable i.e. the road infrastructure per 1000 citizens and dependent variable i.e. GDP is stated per capita.

Based upon calculated correlation coefficients, we can state, that we recorded strong direct dependency in the Prague and South Bomehia Region. It results from this, that the more the road infrastructure is increasing in the region, the more GDP is increased. In the Liberec and South Bohemia Region, we recorder strong negative correlation. In these regions, increasing of the road infrastructure does not contribute to the increasing of the regional GDP, but contrariwise it leads to its decreasing. The road infrastructure of the Prague, South Bohemia and slightly of Zlín and Vysočina Regions contributes to the improvement of the entrepreneurial environment.

Table 3. Correlation coeffcients. Source: Own processing

Region	**Prague Region**	**Central Bohemia Region**	**South Bohemia Region**	**Plzeň Region**	**Karlovy Vary Region**	**Ústí nad Labem Region**	**Liberec Region**
Correlation coefficients	0.89294	-0.67639	0.853965	0.003141	0.492678	-0.18594	-0.91849
Region	**Hradec Králove Region**	**Pardubice Region**	**Vysočina Region**	**South Moravian Region**	**Olomouc Region**	**Zlín Region**	**Moravian-Silesian Region**
Correlation coefficients	-0.29587	0.270255	0.518392	-0.85522	0.151835	0.554911	0.013168

Evaluation of dependency between the road infrastructure and the number of economic objects

In order to calculate these indicators, we calculated measured values of independent variable i.e. the road infrastructure per 1,000 citizens and dependent variable i.e the number of economic subjects per 1,000 citizens in the region.

We measured the strong direct dependency between the road infrastructure and the number of economic subjects in the Zlin and Pardubice region. The more the road infrastructure is increased in the region, the more it influences the number of economic objects in that region. The strong indirect dependency is in the South Moravia Region and slight indirect dependency is in the Olomouc and Karlovy Vary Region.

Table 4. Correlation coefficients. Source: Own processiong

Region	**Prague Region**	**Central Bohemia Region**	**South Bohemia Region**	**Plzeň Region**	**Karlovy Vary Region**	**Ústí nad Labem Region**	**Liberec Region**
Correlation coefficients	0.383397	-0.06838	0.495739	0.0928	-0.40517	-0.26124	0.220235
Region	**Hradec Králove Region**	**Pardubice Region**	**Vysočina Region**	**South Moravian Region**	**Olomouc Region**	**Zlín Region**	**Moravian-Silesian Region**
Correlation coefficients	0.0567	0.798051	0.528604	-0.96282	-0.48631	0.891115	0.45257

Conclusions

The development of the entrepreneurial environment depends on the economic surroundings of the subject. In the paper, we analysed three factors which determine economic surroundings such as the road infrastructure, GDP and the number of economic subjects in Czech Republic regions. The road infrastructure is one of the factors which significantly affects economic and social development and prosperity of the regions. Expressways and motorways have special status in the regional development.

Based on the road transport analysis, we can state that the longest motorways and expressways network is in the Central Bohemia Region and we also have recorded significantly the lowest length of the motorways and expressways in the Pardubice Region. We have found out, by the research of the variation coefficient, that the highest variability in the road infrastructure equipment of the Czech Republic regions was in 2010. Since 2010 it decreased in 2013 from 118 % to 109 % and in 2014 it slightly increased. Other researched factor was GDP per capita in the particular Czech Republic regions. We have selected this indicator due to the fact that GDP is the main macroeconomic indicator. The Prague Region shows the highest values in the whole observed period. Other regions did not even reach 50 % of the GDP per capita value of the best region. The Prague Region belongs to the most developed EU regions. GDP variation coefficient shows that the biggest GDP per capita development disparities were in 2010, but these were developing gradually and favourably and at the end of the observed period they even decreased. The highest number of the economic subjects is in the Prague and Central Bohemia Region, whilst the lowest number s is in the Karlovy Vary Region. Even though the variation coefficient has the lowest values, its development points out disparities increasing in the development of the economic subjects.

By evaluating the dependency between the road infrastructure and GDP per capita, we came to a conclusion that there is strong direct dependency in the Prague Region and the South Bohemia Region where the increase of the road transport affect the GDP per capita development favourably. The Liberec and South Moravia Region show negative dependency. In these regions, the increase of the road infrastructure does not contribute to the increase of regional GDP, but on the contrary, it leads to its decreasing. Measuring dependency between the road infrastructure and the number of economic subjects, we identified strong direct dependency between the road infrastructure and the number of economic subjects in the Zlín and Pardubice Region. The more the road infrastructure is increasing in the region, the more it will affect the number of the economic subjects in the region. The strong indirect dependency is in the South Moravia Region whilst slight indirect dependency is in the Olomouc and Karlovy Vary Region.

To summarize, we can state that the Czech Republic within the Visegrad Group is the most powerful economy with moderate and low regional values of disparities.

References

Banister, D., Berechman, Y. (2001) Transport Investments and the Promotion of Economic Growth, 2001, *Journal of Transport Geography* 9/2001, pp. 209-218.

Czech Statistical offis: Available: https://vdb.czso.cz

Havierniková, K., Janský, B., (2014), The evolution of regional disparities in the Slovak Republic. *VADYBA*, Vol. 25 (2014), Issue 2, pp.133-138.

Marada, M., Květoň, V., Vondráčková, P. (2006) Železniční doprava jako faktor regionálniho rozvoje, *Národohospodářsky obzor 4/2006*, Eonomicko-správní fakulta MU, Brno, pp. 51-59, ISSN 1213-2446

Masárová, J., Koišová, E. (2015) Road infrastructure in the regions of Sovak republic and Czech republic,

In: *Knowledge for Market Use 2015: Women in Business in the Past and Present*: International Sciene Conference Proceedings. Olomouc: Societas Scientiarum Olomucensis II, 2015. ISBN 978-80-87533-12-3. pp.608-618

Masárová, J., Šedivá, M. (2013) The road infrastructure in Slovak republic. Available: http://pernerscontacts.upce.cz/31_2013/Masarova.pdf. In: *Perner´s contacts*, ISSN 18 01-674X. - Roč.8, č. III (2013), pp.113-124

Patarasuk, R. (2013) Road network connectivity and land-cover dynamics in Lop Buri province, Thailand. *Journal of Transport Geography*, 28 (2013), pp. 111–123.

Rephann, T.J. (1993) *Highway Investment and Regional Economic Development: Decision Methods and Empirical Foundations.* Urban Studies – 30/ No. 2, University of Glasgow, Glasgow, pp. 437-450.

Rosik, P. (2004) Infrastruktura transportu jako czynnik rozwoju regionalnego, *Zeszyty Studiów Doktoranckich,* Akademia Ekonomiczna w Poznaniu, Wydział Ekonomii, 19, 45–66.

Available: http://www.katbank.ae.poznan.pl/_p/P.Rosik.pdf [online]

ŘSD ČR: Ředitelství silnic a dálnic České Republiky. Available: https://www.rsd.cz/wps/portal/web/rsd/Silnicni-databanka

Whiteleg, J., 1994: Roads, jobs and the economy. Greenpeace, London. In: Kurfürst, P., 1999: *Jak dálnice (ne)prospívají regionálnímu rozvoji,* CS dopravní klub, Brno. Available: http://dopravniklub.ecn.cz/texty_dalnice.shtml [online]

RECEIVED: 14 April 2016 **ACCEPTED: 20 October 2016**

Ing. Eva Koišová, PhD., Department of Economy and Economics, Faculty of Social and Economic Relations, Alexander Dubcek University of Trencin, Studentská 3, 915 50 Trenčín, Slovakia. Position: Assistant Professor. Mail: eva.koisova@tnuni.sk.
She is an authoress of many scientific publications and papers issued domestically and abroad (Czech Republic, Lithuania, Turkey, Bulgaria, Poland, UK and Canada). The area of scientific interest is Regional economy and development, finance and enterprise financing and Finance and currency.

Waldemar GAJDA, dr inż., doktor nauk ekonomicznych. Rector. Warszawska Szkoła Zarządzania – Szkoła Wyższa ul. Siedmiogrodzka Address. 3A 01-204 Warszawa, Phone. +48 885 888 788 E-mail. waldgaj@vp.pl

Reikalavimai autoriams, norintiems publikuoti savo straipsnius

Mokslinio žurnalo „Vadyba“ steigėjas yra Lietuvos verslo kolegija. Nuo 2002 m. leidžiamame žurnale spausdinami Technologijos, Socialinių mokslų bei Fizinių mokslų tematikos straipsniai. Pagrindinis mokslinio žurnalo straipsnių bei atliktų mokslinių tyrimų uždavinys – išryškinti problemas ir pateikti galimus jų sprendimo būdus regiono viešosioms ir privačioms organizacijoms. Straipsniai gali būti tiek empirinio, tiek ir teorinio pobūdžio.

Redakcijai pateikiami straipsniai privalo būti originalūs, ankščiau niekur nepublikuoti. Draudžiama šiame žurnale išspausdintus straipsnius publikuoti kituose leidiniuose.

Bendri reikalavimai

- Redakcinei kolegijai pateikiami straipsniai privalo būti profesionaliai suredaguoti, be rašybos, skyrybos ir stiliaus klaidų. Straipsniuose turi būti naudojama mokslinė kalba.
- Straipsniai rašomi anglų kalba.
- **Straipsnio apimtis 6–8 puslapiai** (tik porinis puslapių skaičius).
- Straipsnio struktūra turi atitikti moksliniams straipsniams būdingą struktūrą. Jame turi būti išskirtos tokios dalys:

1. Straipsnio **pavadinimas**. Straipsnio **autorius, Institucija**, kurią atstovauja autorius. Straipsnio autoriaus **elektroninis paštas**.
2. **Anotacija** su pagrindiniais žodžiais ta kalba, kuria rašomas straipsnis. Anotacija turėtų trumpai apžvelgti straipsnio turinį, nurodyti per kokią prizmę bus analizuojama problema. Anotacijos tekstas turi būti aiškus ir glaustas. **Anotacijos apimtis turi sudaryti ne mažiau arba lygiai 2000 spaudos ženklų.**
3. **Pagrindiniai žodžiai –** tai žodžiai, kurie išreiškia svarbiausius nagrinėjamos temos požymius. Penki ar šeši straipsnio pagrindiniai žodžiai privalo būti įtraukti į Lietuvos Nacionalinės M. Mažvydo bibliotekos autoritetingų vardų ir dalykų įrašus. Ar pagrindinis žodis yra įtrauktas į šį sąrašą, galima pasitikrinti bibliotekos elektroninėje svetainėje adresu: <http://aleph.library.lt/F/UYSMKM4NY8C9H33SP6PV8F2585NQU59CEEBJVCYCA3HUQNQCR5-31681?func=find-b-0&local_base=LBT10>, „paieškos lauke“ įvedus „Tema, dalykas (lit)“ (lietuvių kalba) ir „Tema, dalykas (eng)“ (anglų kalba).
4. **Įvadas**, kuriame suformuluotas mokslinio tyrimo tikslas, aptarta nagrinėjamos temos problema, aktualumas ir jos ištirtumo laipsnis, išskiriamas tyrimo objektas, uždaviniai bei tyrimo metodai. Analizė – straipsnio medžiaga. Straipsnio poskyriai *nenumeruojami.*
5. **Analizė – straipsnio medžiaga**. Straipsnio poskyriai *nenumeruojami.*
6. **Išvados**. *Nenumeruojamos.*
7. **APA (American Psychological Association) metodinių reikalavimų pavyzdžiai**

Šaltinių citavimo pavyzdžiai

Citata trumpesnė negu 2 eilutės:

Anot tyrėjos, „studentams sunku perprasti APA reikalavimus“, tačiau tyrėja nenagrinėja konkrečių mpriežasčių (Jones, 1998, p. 199).

Citata ilgesnė negu 2 eilutės:

Jones tyrimas rodo:

Studentams sunku perprasti APA metodinius reikalavimus, ypač rašantiems pirmą darbą, kuriame reikia nurodyti šaltinius. Šie sunkumai gali kilti ir dėl to, kad daugeliui studentų nesiseka susirasti metodinių reikalavimų aprašo arba jie drovisi prašyti pagalbos darbo vadovo. (p. 199)

Citatos perfrazavimas:

Anot Jones (1998), APA metodiniai reikalavimai citatų šaltiniams yra sunkiai perprantami tiems, kurie juos taiko pirmą kartą.

APA metodiniai reikalavimai citatų šaltiniams yra sunkiai perprantami tiems, kurie juos taiko pirmą kartą (Jones, 1998, p. 199).

Literatūros sąrašo sudarymo pavyzdžiai

Cituojamas vieno autoriaus šaltinis:

Berndt, T. J. (2002). Friendship quality and social development. *Current Directions in Psychological Science, 11*, 7-10.

Cituojamas autorių kolektyvas (3-7 autoriai):

Kernis, M. H., Cornell, D. P., Sun, C. R., Berry, A., Harlow, T., & Bach, J. S. (1993). There's more to self-esteem than whether it is high or low: The importance of stability of self-esteem. *Journal of Personality and Social Psychology, 65*, 1190-1204.

Cituojama iš numeruoto periodinio šaltinio:

Scruton, R. (1996). The eclipse of listening. *The New Criterion, 15*(30), 5-13.

Cituojama iš žurnalo:

Henry, W. A., III. (1990, April 9). Making the grade in today's schools. *Time,* 28-31.

Cituojama iš knygos:

Autorius, A. A. (Leidimo metai). *Pavadinimas: Paantraštė*. Vieta: Leidykla.

Cituojama iš vėlesnių leidimų:

Helfer, M. E., Keme, R. S., & Drugman, R. D. (1997). *The battered child* (5th ed.). Chicago, IL: University of Chicago Press.

Cituojama iš internetinių šaltinių:

Autorius, A. A., autorius, B. B. (publikacijos data). Pavadinimas. *Internetinio šaltinio pavadinimas, numeris/tomas* (jeigu yra). Paimta iš http://www.someaddress. com/full/url/

PASTABA. Išsamiau apie APA stiliaus metodinius reikalavimus žr. OWL, Purdue for a complete listing of sources and formats, http://owl.english.purdue.edu/owl/resource/560/01/

8. Autorių trumpas CV, kurį sudaro: autoriaus vardas, pavardė. Mokslinis laipsnis. Darbovietė. Pareigos. Mokslinių tyrimų kryptis. Adresas. Telefonas. Kita informacija apie autorių. Autorių CV turi sudaryti **ne daugiau kaip 3000 spaudos ženklų**.

Reikalavimai straipsnio surinkimui ir sumaketavimui

- Straipsniai turi būti parengti MS Word programa A4 formato lapuose.
- Dokumento paraštės: viršuje – 2,0 cm, apačioje – 2,0 cm, kairėje – 2,0 cm ir dešinėje – 2,0 cm.
- Straipsnio tekstas: mažosiomis raidėmis lygiuojamas pagal abu kraštus, dydis – 10 pt, šriftas – Times New Roman, pirma pastraipos eilutė įtraukta 0.5 cm.
- Straipsnio pavadinimas: didžiosiomis raidėmis, kairėje, dydis – 14 pt., **Bold**.
- Autoriaus vardas, pavardė: mažosiomis raidėmis, kairėje, dydis – 12 pt., **Bold**.
- Institucijos pavadinimas: mažosiomis raidėmis, kairėje, 10 pt., *Italic*.
- Elektroninis paštas: mažosiomis raidėmis, kairėje, 10 pt., *Italic*.
- Anotacijos: teksto dydis – 8 pt, pavadinimas – 10 pt, **Bold**. Po paskutinio pagrindinio žodžio taškas nededamas.
- Skyrių pavadinimai: mažosiomis raidėmis, kairėje, dydis – 11 pt., **Bold**.
- Žodis *literatūra* – 10 pt, literatūros sąrašas – 9 pt dydžio.

- **Paveikslai** ir **diagramos** turi būti aiškūs, brėžiniai – sugrupuoti į vieną objektą.

Lentelės ir **schemos** turi būti sunumeruotos, ir turėti pavadinimus.

1. Lentelių pavadinimai rašomi virš lentelės centre.
2. Paveikslų pavadinimai rašomi po paveikslu centre.

Pateiktas tekstas papildomai redaguojamas nebus.

PASTABA. Patogu naudotis parengtu straipsnio šablonu.

Requirements for the authors, who want to publish their articles

The founder of a scientific journal "Vadyba / Journal of Management" is Lithuania Business University of Applied Sciences. Since 2000, the journal publishes technology, social sciences and physic sciences-related articles. The main goal of the scientific journal articles and conducted research is to emphasize the problems and present possible solutions for the public and private organizations of the region. The articles can be both empirical and theoretical.

The submitted articles must be original, previously unpublished. It is prohibited to publish the articles of this journal in other publications.

General requirements

- Articles submitted to the Editorial Board must be professionally edited, without spelling, punctuation and style errors. The articles must use scientific language.
- Articles shall be written in English.
- **The article shall be up to 10 pages long. The last page should take at least half a page, i.e. about 2/3 of the page.**
- The structure of the article must have a structure of a scientific article. It must contain the following:

1. The **title** of the article. Article's **author, institution**, which the author is representing. **E-mail** of the author of the article.
2. **Abstract** with the main words in the language of the article. The Abstract should briefly cover the contents of the article; specify the aspect of how the problem will be analyzed. The text of the Abstract must be clear and concise. **The Abstract must contain at least 2000 characters.**
3. **Keywords –** these are the words that express the most important features of the topic. Five or six keywords of the article must be included in the Lithuanian National M. Mazvydas library records of authoritative names and subjects. It is possible to check if the keyword is included in this list in the website of the library: <http://aleph.library.lt/F/UYSMKM4NY8C9H33SP6PV8F2585NQU59CEEBJVCYCA3HUQNQCR5-31681?func=find-b-0&local_base=LBT10>, by specifying the "topic, subject (lit)" (in Lithuanian) and "topic, subject (eng)" (in English) in the search field.
4. **Introduction**, which formulates the purpose of the scientific study, discusses the question of the study, its novelty and degree of research, specifies the object of the study, objectives and methods.
5. **Analysis – article material**. The sub-sections of the article are *unnumbered.*
6. **Conclusions**. *Unnumbered.*
7. **References.** *Unnumbered.* References in the body of the article should be cited in parenthesis by indicating the surnames of the authors and year, e.g. (Cooper 1994), (Cleland J.; Kaufmann, G. 1998). If an internet source does not have an author, the link is placed only in the main text in parenthesis. Letters "p" and "pp" are not written next to the pages.
8. Examples of referencing:

Books

Valackienė, A. (2005). *Crisis Management and Decision-making*. Technology, Kaunas.

Berger, P. L., Luckmann, Th. (1999). *The Social Construction of Reality.* Pradai, Vilnius.

Journal articles

Boyle, T. (2003). Design principles for authoring dynamic, reusable learning objects. *Australian Journal of Educational Technology*, 19(1), 46–58.

Book articles

Curthoys, A. (1997), History and identity, in W. Hudson and G. Balton (eds), *Creating Australia: Changing Australian history*, 25 - 84. Allenn and Unwin, Australia.

Web documents

Wiley, D. A. (2003). Learning objects: difficulties and opportunities. [Retrieved March 18, 2009], <http://opencontent.org/docs/lo_do.pdf>.

Statistical information and web resources

Lithuanian Emigration Statistics. (2009). Statistics Lithuania to the Government of the Republic of Lithuania. [Retrieved February 16, 2009], <http://www.stat.gov.lt/lt/news/view/?id=6819&PHPSESSID=5b1f3c1064f99d8baf757cde1e135bc0>.

9. **Summary** with **the keywords** is written in English. **The summary should include at least 3000 characters.**
10. Short CV of the authors, which consists of: name, surname of the authors. Degree. Work. Occupation. Research direction. Address. Telephone. Other information about the author. The author CV must include **up to 3000 characters**.

Requirements for the outline and layout of the article

- The articles must be written in MS Word A4 pages.
- Document margins: top – 2 cm, bottom – 2 cm, left – 2 cm and right – 2 cm.
- Full text: in lowercase letters, aligned to both margins, size – 10 pt, font – Times New Roman, first line of the paragraph indented by 0.5 cm.
- Title of the article: in capital letters, left alignment, size – 14 pt., **Bold**.
- Author's name, surname: in lowercase letters, left alignment, size – 12 pt., **Bold**.

- Institution name: in lowercase letters, left alignment, 10 pt., *Italic*.
- E-mail: lowercase letters, left alignment, 10 pt., *Italic*.
- Abstracts: text size – 8 pt, title – 10 pt, **Bold**. A full stop is not put after the last main word.
- Section names: lowercase letters, left alignment, size – 11 pt., **Bold**.
- Word *Literature* – 10 pt, literature list – 9 pt.

- **Figures** and **diagrams** must be clear, schemes – grouped into a single object.

Tables and **schemes** have to be numbered and titled.

1. Table titles are written above the table in the centre.
2. Figure names are written under the figure in the centre.

The text will not be further edited.

NOTE. It is obligatory to use the prepared template for the article.

Klaipėdos universiteto leidykla

Vadyba 2016’2(29). Mokslo tiriamieji darbai

Klaipėda, 2016

SL 1335. 2016 11 04. Apimtis 14 sąl. sp. l. Tiražas 50 egz.
Išleido ir spausdino Klaipėdos universiteto leidykla
Herkaus Manto g. 84, 92294 Klaipėda
Tel. 8~46 39 88 91, el. paštas: leidykla@ku.lt