

JOURNAL   
of Applied Economic Sciences



Volume X  
Issue 6(36)

Fall 2015

|        |             |
|--------|-------------|
| ISSN-L | 1843 - 6110 |
| ISSN   | 2393 - 5162 |

## Editorial Board

### Editor in Chief

PhD Professor Laura **GAVRILĂ** (formerly ȘTEFĂNESCU)

### Managing Editor

PhD Associate Professor Mădălina CONSTANTINESCU

### Executive Editor

PhD Professor Ion Viorel MATEI

### International Relations Responsible

Pompiliu CONSTANTINESCU

### Proof – readers

Ana-Maria Trantescu–*English*

### Redactors

Andreea-Denisa Ionițoiu

Cristiana **Bogdănoiu**

Sorin **Dincă**

Faculty of Financial Management Accounting Craiova  
No 4. Brazda lui Novac Street, Craiova, Dolj, Romania



European Research Center of Managerial Studies in Business Administration

<http://www.cesmaa.eu>

Email: [jaes\\_secretary@yahoo.com](mailto:jaes_secretary@yahoo.com)

Web: <http://cesmaa.eu/journals/jaes/index.php>

## **Editorial Advisory Board**

Claudiu ALBULESCU, University of Poitiers, France, West University of Timișoara, Romania  
Aleksander ARISTOVNIK, Faculty of Administration, University of Ljubljana, Slovenia  
Muhammad AZAM, School of Economics, Finance & Banking, College of Business, Universiti Utara, Malaysia  
Cristina BARBU, Spiru Haret University, Romania  
Christoph BARMEYER, Universität Passau, Germany  
Amelia BĂDICĂ, University of Craiova, Romania  
Gheorghe BICĂ, Spiru Haret University, Romania  
Ana BOBÎRCĂ, Academy of Economic Science, Romania  
Anca Mădălina BOGDAN, Spiru Haret University, Romania  
Jean-Paul GAERTNER, l'Institut Européen d'Etudes Commerciales Supérieures, France  
Shankar GARGH, Editor in Chief of Advanced in Management, India  
Emil GHIȚĂ, Spiru Haret University, Romania  
Dragoș ILIE, Spiru Haret University, Romania  
Cornel IONESCU, Institute of National Economy, Romanian Academy  
Elena DOVAL, Spiru Haret University, Romania  
Camelia DRAGOMIR, Spiru Haret University, Romania  
Arvi KUURA, Pärnu College, University of Tartu, Estonia  
Rajmund MIRDALA, Faculty of Economics, Technical University of Košice, Slovakia  
Piotr MISZTAL, Technical University of Radom, Economic Department, Poland  
Simona MOISE, Spiru Haret University, Romania  
Marco NOVARESE, University of Piemonte Orientale, Italy  
Rajesh PILLANIA, Management Development Institute, India  
Russell PITTMAN, International Technical Assistance Economic Analysis Group Antitrust Division, USA  
Kreitz RACHEL PRICE, l'Institut Européen d'Etudes Commerciales Supérieures, France  
Andy ȘTEFĂNESCU, University of Craiova, Romania  
Laura UNGUREANU, Spiru Haret University, Romania  
Hans-Jürgen WEIBACH, University of Applied Sciences - Frankfurt am Main, Germany

# JOURNAL

of Applied Economic Sciences

## ***Journal of Applied Economic Sciences***

Journal of Applied Economic Sciences is a young economics and interdisciplinary research journal, aimed to publish articles and papers that should contribute to the development of both the theory and practice in the field of Economic Sciences.

The journal seeks to promote the best papers and researches in management, finance, accounting, marketing, informatics, decision/making theory, mathematical modelling, expert systems, decision system support, and knowledge representation. This topic may include the fields indicated above but are not limited to these.

Journal of Applied Economic Sciences be appeals for experienced and junior researchers, who are interested in one or more of the diverse areas covered by the journal. It is currently published quarterly with three general issues in Winter, Spring, Summer and a special one, in Fall.

The special issue contains papers selected from the International Conference organized by the European Research Centre of Managerial Studies in Business Administration ([www.cesmaa.eu](http://www.cesmaa.eu)) and Faculty of Financial Management Accounting Craiova in each October of every academic year. There will prevail the papers containing case studies as well as those papers which bring something new in the field. The selection will be made achieved by:

Journal of Applied Economic Sciences is indexed in SCOPUS [www.scopus.com](http://www.scopus.com), CEEOL [www.ceeol.org](http://www.ceeol.org), EBSCO [www.ebsco.com](http://www.ebsco.com), RePEc [www.repec.org](http://www.repec.org) databases.

The journal will be available on-line and will be also being distributed to several universities, research institutes and libraries in Romania and abroad. To subscribe to this journal and receive the on-line/printed version, please send a request directly to [jaes\\_secretary@yahoo.com](mailto:jaes_secretary@yahoo.com).

# *Journal of Applied Economic Sciences*

ISSN-L 1843 - 6110

ISSN 2393 – 5162

## Table of Contents



|   |  |         |
|---|--|---------|
| 1 | <b>Josef KAŠÍK, Petr ŠNAPKA</b><br>Modelling a System of Evaluation of the Efficiency of the Course of a Group Decision-Making Process   | ...815  |
| 2 | <b>Natalia Yurievna SANDAKOVA</b><br>Regional Development based on Target Adaptation of a Transport Infrastructure to Innovative Changes   | ... 837 |
| 3 | <b>Radovan BAČÍK, Richard FEDORKO, Róbert ŠTEFKO</b><br>The Analysis of Significant Common Attributes of Websites in the Context of the Most Prestigious World Universities  | ...848  |
| 4 | <b>Ivan Stepanovich SANDU, Mikhail Yakovlevich VESELOVSKY, Elena Ivanovna SEMYONOVA, Alma Irgibaevna DOSHCHANOVA, Alexander Vladlenovich FEDOTOV</b><br>Innovative Aspects of Development of the Customs Union under the New Economic Conditions: Problems and Prospects | ...855  |
| 5 | <b>Giacomo DI FOGGIA, Ugo ARRIGO</b><br>Network Industries Economics. A Comparison of Rail Infrastructures Output in Key European Countries  | ...863  |
| 6 | <b>Olga SANZHINA, Davaasuren AVIRMED, Valentina BAZHENOVA, Olga KAUROVA, Margarita NAMHANOVA</b><br>The "Chinese Model" of the Economy. Analysis of Reforms and Development Trends   | ...877  |
| 7 | <b>Miriám ŠEBOVÁ, Daniela PETRÍKOVÁ</b><br>Impact of Municipality Size on Economic Performance. Evidence from Slovakia   | ...885  |
| 8 | <b>Tamara TEPLOVA, Tatiana SOKOLOVA</b><br>Bond Liquidity Indicators. Can New Thomson Reuters Indices Explain Difference in Bond Returns?  | ...897  |



|    |   |         |
|----|---|---------|
| 9  | Dashi Dashanimaevich TSYRENOV, Irina Sergeevna MUNKUEVA,<br>Elena Buyantuevna DONDOKOVA, Bayanzhargal Balzhinimaevich SHARALDAYEV,<br>Lyubov Anikeevna GORYUNOVA<br>Statistical Research on Spatial Differentiation of the Innovation System<br>of the Russian Federation | ...914  |
| 10 | R. AMUDHA, Cresenta Shakila MOTH A, S. SELVABASKAR, R. ALAMELU, S.T. SURULIVEL<br>Investors' Perspicacity of Risk Associated with Gold Exchange Traded Fund in India  | ...923  |
| 11 | Konstantin ASATUROV, Tamara TEPLOVA, Christopher A. HARTWELL<br>Volatility Spillovers and Contagion in Emerging Europe  | ...929  |
| 12 | Ján SIDOR<br>Diagnoses Related Group System in Slovakia   | ... 946 |
| 13 | Jeeranun KHERMKHAN, Surachai CHANCHARAT<br>Performance of Minority Data in Financial Distress Prediction Models: Application<br>of Multiple Discriminate Analysis, Logit, Probit and Artificial Neural Network Methods  | ...954  |
| 14 | Hari BABU, Gurpreet KAUR<br>Influence of Socio-Economic Profile and Agents on Awareness Levels of Health<br>Insurance Plans in Punjab. A Study  | ...961  |
| 15 | Irina NIKOLAEVNA SYCHEVA, Natalya NIKOLAEVNA KUZMINA<br>Elena SERGEYEVNA PERMYAKOVA, Irina ANDREEVNA SVISTULA<br>Labor Theory of Value in the Methodology of Researching Economic Systems   | ...973  |
| 16 | Kehinde Adekunle ADETILOYE, Abiola Ayopo BABAJIDE, Victoria Abosede AKINJARE<br>Market Concentration and Investment Efficiency among Publicly Quoted Petroleum Marketing<br>Companies in Nigeria  | ...980  |

## Modelling a System of Evaluation of the Efficiency of the Course of a Group Decision-Making Process

Josef KAŠÍK

VŠB-Technical University of Ostrava, Czech Republic  
[josef.kasik@vsb.cz](mailto:josef.kasik@vsb.cz)

Petr ŠNAPKA

VŠB-Technical University of Ostrava, Czech Republic  
[petr.snapka@vsb.cz](mailto:petr.snapka@vsb.cz)

### Abstract:

*In this paper, the authors present a proposed model for the evaluation of the efficiency of the course of a group decision-making process. It is a proposal for the structure and the ties between the elements of a model system and an analysis of its behaviour. Based on knowledge of the elements of the model and their ties and behaviour, it is possible to assess the efficiency of the course of the induced group decision-making process. In reaction to the identified reality, it is then possible to propose and implement any correction in its course, in order to bring the course into correspondence with the model-derived effective behaviour of the system describing the course of a group decision-making process. By publishing these ideas, we wanted to stimulate discussion on the issues of analysed evaluation of the efficiency of implemented group decision-making processes, with the possibility of searching for ways to raise the level of efficiency achieved.*

**Keywords:** group decision-making process, efficiency, system structure and behaviour, perceived difference of opinions, group cohesiveness

**JEL Classification:** M12, M54, J53

### Introduction

Our investigation is oriented toward the creation of a model system for the evaluation of the efficiency of the course of a decision-making process, with a focus on the group decision-making process (decision-making in a group acting as a team). The style of decision-making also has a group character. The implementation of a group decision-making process within a company is expedient to initiate in the event of the occurrence of fulfilment and interconnection of certain preconditions (factors) associated with the conditions of the course of this process - see e.g. models by Vroom and Yetton (1973) and Vroom and Jago (1988). It involves, for example, a combination of the following conditions (factors) and their links: factor-wise, a high quality decision is required, as the head manager does not have sufficient information and expertise on their own to make a high quality decision, the objectives, methods of solution of the problem and even the criteria for their evaluation are not known, and the head manager is not able to obtain the information for their determination on their own; the decision made must be accepted by subordinates in terms of its feasibility, and remaining unknown is the probability of whether the decision will be accepted by the subordinates and whether the subordinates (co-workers) of the head manager are oriented to fulfilling the company objectives. Under the conditions above (their status and links), it is representatively rational and to think in a group decision-making style.

## Conclusion and further research activities

Since decision-making is the most important component continuous function of the decision-making process, which is connected with all of the other component structural functions of this process, it appears to be important to monitor and evaluate the efficiency of the course of the decision-making process. That means evaluate (determine) the level of this efficiency, analyse the weaknesses in its course with the possibility of determining the measures for their solution, and thus achieve growth in the efficiency of the course of the decision-making process (processes) within business entities, thereby also increasing their efficiency in their business activities.

Our research (whose content is presented in brief in this paper) also contributes to this what may be said to be strategic objective in the area of company management, and the necessity of continuing research work on this model system and the application of the gained insights in practice is evident.

In the following, we want to define, at least briefly, further directions in the orientation of research activities:

- By publishing our research considerations and insights, we want to initiate further discussion about the complexity of the model system we have presented for the evaluation of the efficiency of the course of the group decision-making process, along with obtaining further information, ideas to enhance the quality and functionality of the proposed model system, with the possibility of its further improvement, etc.
- Carrying out primary research in companies related to the measurement of the level of individual variables of the constructed model system, together with obtaining data to verify the possibility of quantifying the level of efficiency of the course of the group decision-making process.
- Verification of the anticipated target behaviour of the model system for the analysis of the level of efficiency of the course of the group decision-making processes in companies.
- Determination of bounds for the levels of individual variables in the model that will ensure the attainment of the desired level of efficiency of the course of the group decision-making process (group decision-making style).
- Investigating and formulating measures leading to the desired growth in the efficiency of the course of group decision-making processes in companies.

It has already been pointed out that decision-making is the most important component continuous function of a complex management process. This component function (process) is applied in all sequential component functions of this complex process. This means that the efficiency of the decision-making process in organizations significantly affects the level of efficiency of the complex management process implemented by managers in organizations, and thus the level of performance of these organizations in all their functional areas. The examination and solution of the problems of the decision-making processes, with a target orientation of increasing their efficiency, is therefore of fundamental importance. Through their research activities, the authors of this paper are also striving to contribute in this sense.

## Acknowledgement

This paper was supported within Operational Programme Education for Competitiveness – Project No. CZ.1.07/2.3.00/20.0296.

## References

- [1] Adair, J. (2013). *Decision Making and Problem Solving (Creating Success)*. Kogan Page.
- [2] Aguado, D., Rico, R., Sánchez-Manzanares, M., Salas, E. (2014). Teamwork Competency Test (TWCT): A Step Forward on Measuring Teamwork Competencies. *Group Dynamics*, 18(2): 101-121.
- [3] Belbin, R.M. (1985). Management teams, why they succeed or fail. *Bulletin of the British Psychological Society* 38: A1-A1.
- [4] Belbin, R.M. (1993). A reply to the Belbin team-role self-perception inventory. *Journal of Occupational and Organizational Psychology*, 66: 259-260.
- [5] Bhunan, N., Rai, K. (2004). *Strategic Decision Making – Applying the Analytic Hierarchy Process*. Springer – Verlag.
- [6] Clarkson, G.E., Simon, H.A. (1960). Simulation of individual and group behaviour. *American Economic Review* 50:920-932.



- [7] Daft, R.I. (2012). *Management*. South Western.
  - [8] Drucker, P.F. (1967). The Effective Decision. *Harvard Business Review*, 45(1): 92-98.
  - [9] Festinger, L. (1999). Social communication and cognition: a very preliminary and highly tentative draft. In Harmon-Jones, E., Mills, J. (Eds.) *Cognitive dissonance: Progress on a pivotal theory in social psychology*. American Psychological Association, Washington, pp 355-379.
  - [10] Forsyth, D.R. (2010). *Group Dynamics*. Wadsworth Cengage Learning.
  - [11] Gil, F., Rico, R., Alcover, C.M., Barrasa, Á. (2005). Change-oriented leadership, satisfaction and performance in work groups: Effects of team climate and group potency. *Journal of Managerial Psychology* 20(3/4): 312-328.
  - [12] Hicks, M.J. (2004). *Problem Solving and Decision Making*. Cengage Learning EMEA.
  - [13] Proctor, T. (2010). *Creative Problem Solving for Managers: Developing Skills for Decision-Making and Innovation*. Routledge.
  - [14] Rico, R., Sánchez-Manzanares, M., Gil, F., Gibson, C. (2008). Team implicit coordination processes: a team knowledge-based approach. *Academy of Management Review*, 33(1): 163-184.
  - [15] Saaty, T.L. (2000). *Fundamentals of Decision Making and Priority Theory with the Analytic Hierarchy Process*. RWS Publications.
  - [16] Simon, H.A. (1997). *Administrative Behaviour*. New York.
  - [17] Šnapka, P., Kašík, J. (2012). A Simplified Model of an Interaction Dynamics in Work Groups. *Journal of Applied Economic Sciences*, Volume VII, 3(21): 302-311.
  - [18] Šnapka, P., Kašík, J. (2013). Decision-making Process and Consensus Formation. *Journal of Applied Economic Sciences*, Volume VIII, 4(26): 512-525.
  - [19] Vroom, V.H., Jago, A.G. (1988). *The New Leadership: Managing Participation in Organizations*. Prentice Hall.
  - [20] Vroom, V.H., Yetton, P.W. (1973). *Leadership and Decision Making*. University of Pittsburgh Press.
- \*\*\* Institute of Leadership and Management (2007). *Solving Problems and Making Decisions*. Elsevier.

## Regional Development based on Target Adaptation of a Transport Infrastructure to Innovative Changes

Natalia YURIEVNA SANDAKOVA

[ns2005@yandex.ru](mailto:ns2005@yandex.ru)

Federal State Educational Institution of Higher Professional Education  
East Siberia State University of Technology and Management, Russia

### Abstract:

*This article proposes a differentiated approach to the choice of regional strategies for the development of transport systems, due to the high differentiation of regions by existing and future cargo and passenger transportation, excellent geographical and climatic features, different population density. The author presents an approach based on the matrix "innovative improvement index of the transport system in the region" - "index of the regional development level", which justifies the direction of innovative improvement of transport systems, proposes the implementation typology of regional strategies for innovative improvement of the transport system. The concept "innovative transport system of the region" has been introduced. In contrast to existing approaches, it is formed based on implementation of the results of the scientific and technological progress, it provides consolidation of innovative features of system elements and represents a new level of transport systems aimed at solving problems of regional social and economic development. It is also a basis for the expansion and development of transport infrastructure in the region in the context of innovative changes in the economy. The role of innovative changes in the transport infrastructure of the region is determined. The author examines the mechanism of pre-active adaptation of the transport infrastructure to innovative changes of the economy, which consists in search determining the objectives and forming alternative scenarios for the transport infrastructure development, which ensures strategic effectiveness of the social and economic development of the region.*

**Keywords:** socio-economic development of the region, transport infrastructure, innovative transport system.

**JEL Classification:** L91, O18, P25.

### Introduction

Socio-economic development of the region is directly linked with the development and operation of a highly efficient transport system, which, in turn, should create favourable conditions for the continuous transport process with positive dynamics of development. Given that each region has different potential and strategic directions, innovative improvement of the transport system will be different.

In this article, the author answers the questions: What development strategy options of the transport system can be implemented in different types of regions? What is the place of innovative changes in the transport infrastructure? What is an innovative transport system? What is the mechanism of socio-economic development of regions based on target adaptation of the transport infrastructure to identified contradictions in development of the region? What are the formation stages of an innovative transport system in the region?

## Conclusion

The author would like to thank the international scientific community, the business community, as well as the administrative structures of the region for their assistance in the preparation and for their interest in this work. Special thanks to the East Siberian State Technological University, with the means of which this article has been prepared.

Further research on this topic will be aimed at developing the organizational and managerial mechanism of introducing innovative transport systems into a regional transport infrastructure, at assessing the effect of the innovative transportation system on the social and economic development of the region, at elaborating the development strategy for the transport infrastructures of the regions with low population density and large territories.

## References

- [1] Akkof, R., Emery, F. (1974). *On target-oriented systems*. Moscow: Soviet Radio.
  - [2] Ansoff, I. (2009). *Strategic Management. Classic Edition*. Saint-Petersburg: Piter.
  - [3] Casti, J. (1982). *Large systems: connectivity, complexity, catastrophes*. Moscow: Mir.
  - [4] Chuprov, S. (2012). *Sustainability management of production systems: theory, methodology, practice. Second Edition, revised and enlarged*. Irkutsk: BSUEL. ISBN 978-5-7253-2467-9.
  - [5] Denisov, A., Kolesnikov, D. (1982). *The theory of large control systems: a manual for students*. Leningrad: Energoizdat.
  - [6] Drucker, P. (2008). *Classic works on management – Classic Drucker*. Moscow: Alpina Business Books.
  - [7] Gerlovin, I. (1990). *Fundamentals of the unified theory of all interactions in matter*. Leningrad: Energoatomizdat.
  - [8] Mesarovich, M., Mako, D., Takahara, I. (1973). *Theory of hierarchical multilevel systems*. Moscow: Mir.
  - [9] Meskon, M., Albert, M., Hedourk, F. (1998). *Fundamentals of Management: Translation from English; under the editorship L.I. Evenko*. Moscow: Delo LTD.
  - [10] Porter, M. (2007). *Competitive Strategy: Methodology for Analyzing Industries and Competitors: translation from English*. Moscow: Alpina Business Books.
  - [11] Sadovsky, V., Yudin, E. (Eds.). (1969). *Research on the general systems theory: Collection of translations*. Moscow: Progress.
  - [12] Sandakova, N. (2013). Substantiation of regional strategies of innovative improvement of the transport system in the region. *World discoveries. Economics and innovative education, Moscow, 8(44)*.
  - [13] Sandakova, N. (2014). The innovative transport system – as a condition for development of the region. *2W0200-LSJ (Life Science Journal), 4Life, 11(11)*. Retrieved July 23, 2014, from [http://www.lifesciencesite.com/ljs/life1111s/149\\_26183life1111s14\\_660\\_663.pdf](http://www.lifesciencesite.com/ljs/life1111s/149_26183life1111s14_660_663.pdf)
  - [14] Sandakova, N. (2015). *Transport infrastructure in the region: methodology and practice of formation: monograph*. Moscow: Publishing house "Vash poligraphichesky partner". ISBN 978-5-4253-0821-4.
  - [15] Suslov, V. (2003). *Economic development aspects of the Russian transport strategy: Scientific report. Russian Academy of Science. Sib. Branch, Institute of Economics and Industrial Engineering*. Novosibirsk: IEIE.
  - [16] Zainetdinov, R. (2005). Synergetic analysis of the innovation cycles in science, engineering and technology. *Cycles. Proceedings of the VII International Conference, Stavropol, SKGTU, 1*.
- \*\*\* Decree of the Government of the Russian Federation No. 1734-p. "The transport Strategy of the Russian Federation for the period up to 2030". (2008, November 22). Official Gazette of the Russian Federation dated December 15, 2008, No. 50, Art. 5977.

- \*\*\* *Government Decree of the Russian Federation No. 1120-p "Strategy of socio-economic development of Siberia until 2020". (2010, July 5). Official Gazette of the Russian Federation dated August 15, 2010, No. 33, Art. 4444.*
- \*\*\* *Government Decree of the Russian Federation No. 319 "State program of the Russian Federation "Development of a transport system". (2014, April 15). Meeting of the legislation of the Russian Federation on May 5, 2014 No. 18 (part III). Art. 2165.*
- \*\*\* *The RF Government Decree No. 848 (edition of 28/04/2015) "The federal target program "Development of Transport System in Russia (2010-2020)". (2001, December 5). Official Gazette of the Russian Federation dated December 17, 2001, No. 51.*

## The Analysis of Significant Common Attributes of Websites in the Context of the Most Prestigious World Universities

Radovan BAČÍK

University of Presov, Faculty of Management, Slovakia  
[Radovan.Bacik@unipo.sk](mailto:Radovan.Bacik@unipo.sk)

Richard FEDORKO

University of Presov, Faculty of Management, Slovakia  
[Richard.Fedorko@unipo.sk](mailto:Richard.Fedorko@unipo.sk)

Róbert ŠTEFKO

University of Presov, Faculty of Management, Slovakia  
[Stefko@unipo.sk](mailto:Stefko@unipo.sk)

### Abstract:

*The aim of the article is to describe specificities of using e-marketing tools on the websites of selected internationally important institutions of higher education. The article summarizes the theoretical basis of Internet marketing, focusing on higher education institutions. Based on the research the article describes the current state of the use of e-marketing tools by the websites of the selected internationally important institutions of higher education. In addition, the article also provides the technical point of view on the issue. Another aim of the article is to evaluate the opportunities this issue brings for marketers and it also shows its pitfalls.*

**Keywords:** e-marketing, website, higher education institutions, top universities

**JEL Classification:** M30, M31.

### Introduction

Online environment offers organizations a wide range of promo possibilities, easy dissemination of information about products, services or brand. Online environment represents an undeniable advantage and strong communication channel. It should be emphasized that funds invested in online marketing activities are negligible compared to other forms of promotion, and online advertising is accessible continuously. Targeting in the online marketing is much more direct than conventional methods. The high degree of interaction helps to build good relationships with customers, from this perspective Internet has introduced new types of communication rules in field of marketing that generates new dimension between customers and organizations through efficient relations affecting primarily reputation and image of the organization. The individual components of the marketing mix and online communication are areas that are very closely linked which significantly helps to promote new products and services, reach out to new target groups of customers and also helps to build a positive image. This form of communication has certain positive characteristics such as precise targeting, personalization, interactivity, usability of multimedia content, and easy efficiency measurability at relatively low cost (Šoltés 2013, Šoltés 2015, Szabo *et al.* 2013; Castro *et al.* 2004).

These facts appear to be crucial from the viewpoint of their utilization in business sphere marketing activities, as well as in academic environment. There are authors who presents the opinion that institutions of higher education should be presented more outward, like it is with corporate brands (Pudlo and Gavurová 2012, 2013, Schüller and Chalupský 2012). According to the authors as Whelan & Wohlfeil (2006) or Maringe & Carter (2007) academics and managers of higher education institutions have to consider the marketing not as an outside idea imported from the business world, but as both a suitable logic and system for building up a higher education sector which meets the needs of home-based and international customers.

In relation to this topic, numerous authors specialise in e-marketing communication tools, where the main focus is on website evaluation, e.g. Nielsen (2000), Bauer and Scharl (2002), Khan (2013). Their research focuses on the possibilities of the use of e-marketing tools for marketing communication and enhancing the quality of websites as well. Higher education institutions marketing is becoming increasingly debated issue. We meet with the opinion of the authors (Kaplan and Haenlein 2010, Krombholz *et al.* 2012; Durkasree and Ramesh 2011, Carlos and Rodrigues 2012), that marketing does not belong to this field, since comparing institutions of higher education to profit-seeking organizations is, at least, unethical. On the other side there is an opinion that

has explicitly positive attitude and argues in favour of marketing management of organizations. The development of the society and the development of management and marketing training of organizations caused greater awareness about the marketing among public and also private institutions of higher education.

We can agree, that higher education institutions are focusing primarily on providing services similar to other market subjects, where the students represent the customers who realise their buying decisions, it is the choice of an educational institution based on available information, as well as the image (Shanka, Quintal and Taylor 2006).

The current image of a higher education institution is commonly based on its earlier reputation and at the same time displays relative stability. For this reason, change can only be effectuated by long-term and patient work. The image is influenced by subjective and also objective characteristics of the selected higher education institution. In case of objective features, their change is very complicated (Světlik 2009). In many cases, it requires increase in the marketing budget (Michalski 2014).

Notional physical distance is overcome in environment of the Internet with ceaseless communication using organisation website and other tools of e-marketing (Belch and Belch 2007, Keegan and Green 2008). We can find many authors concentrate on these issues, such as Hew and Cheung (2013), Rahimnia & Hassanzadeh (2013), Gray *et al.* (2013), Krombholz *et al.* (2012), Durkasree and Ramesh (2011), Michalski (2010) and Kaplan and Haenlein (2010), Bauer and Scharl (2002).

Based on the above and on research carried out in this field, the aim of this paper is to describe the findings of the research aimed to identify common significant attributes of the websites of few internationally important higher education institutions as well as to describe the findings of the analysis focused on technical implementation of their web sites.

## Conclusion

It is common that the quality of higher education institutions is not sufficiently manifested in their marketing activities, as is the case of the Internet environment. We agree with author Štefko (2003) that many researches increasingly point to the fact that high quality and respected higher education institution is mainly the product of a good management that is not afraid to change established stereotypes and also understands the institution as an entity which has to be efficient and active in field of marketing.

It should be emphasized that in the context of the research we identified a greater number of common attributes shared by surveyed websites. The reason for their absence among the most important factors is the fact that their character is highly generic / generally applicable when creating a website. It is mainly about design and content elements such as horizontal navigation menu identified in 80% of educational institutions or the presence of the search option in the top right corner of the web page, which was identified in 95% of surveyed websites and so on. The opportunities offered by online Internet environment to educational institutions generally represent the creative possibilities of using a wide variety of marketing tools which, in conjunction with the website, can be characterized as a cost-effective. Furthermore there is the possibility of immediate progress monitoring, and its management in real time. These facts push the online environment of the Internet as a medium to the fore against traditional media and forms of advertising. Internet thus becomes undeniable tool in building a positive image and reputation of any organization.

## Acknowledgement

This article is one of the partial outputs under the scientific research grant VEGA 1/0857/15 "Research of economically significant factors of perception of reputation and its dominant contexts in relation to the success in the processes of e-commerce and e-marketing on the Slovak Virtual Market".

## References

- [1] Bauer, C., Scharl, A. (2002). Quantitative Evaluation of Web Site Content and Structure, *Internet Research: Electronic Networking Applications and Policy*, 10(1): 31-43. doi: 10.1108/10662240010312138
- [2] Belch, G.E., Belch, M.A. (2007). *Advertising and Promotion: An Integrated Marketing Communications Perspective* (7<sup>th</sup> Ed.). Sydney: McGraw-Hill.
- [3] Carlos, V. S., Rodrigues, R. G. (2012). Web site quality evaluation in Higher Education Institutions, *Procedia Technology*, 5: 273-282. DOI: 10.1016/j.protcy.2012.09.030
- [4] Castro, V., Marcos, E., Caceres, P. (2004). A User Services-oriented Method to Model Web Information Systems. In Zhou, X. et al. (Eds.) *Conference Proceedings: 5<sup>th</sup> International Conference on Web Information System Engineering – WISE*. (pp. 41-52), Australia: Brisbane. DOI: 10.1007/978-3-540-30480-7\_6
- [5] Durkasree, P., Ramesh, M. (2011). Service Quality in Online Marketing: Customers Centric Analysis, *Perspectives of Innovations, Economics & Business*, 7(1): 27-34. DOI: 10.15208/pieb.2011.06
- [6] Gray, R. et al. (2013). Examining social adjustment to college in the age of social media: Factors influencing successful transitions and persistence, *Computers & Education*, 67: 193-207. DOI:10.1016/j.compedu.2013.02.021
- [7] Hew, K.F., Cheung, W.S. (2013). Use of Web 2.0 technologies in K-12 and higher education: The search for evidence-based practice, *Educational Research Review*, 9: 47-64. DOI: 10.1016/j.edurev.2012.08.001
- [8] Kaplan, A.M., Haenlein, M. (2010). Users of the World, Unite! The Challenges and Opportunities of Social Media, *Business Horizons*, 53(1): 59-68. DOI:10.1016/j.bushor.2009.09.003
- [9] Keegan, W.J., Green, M. (2008). *Global Marketing*. Sydney: Prentice Hall.
- [10] Khan, R.H. (2013). Marketing Education Online: A Case study of New Zealand Higher Education Institutions, *Procedia - Social and Behavioral Sciences*, 103: 637-646. DOI:10.1016/j.sbspro.2013.10.382
- [11] Krombholz, K., Merkl, D., Weippl, E. (2012). Fake Identities in Social Media: A Case Study on the Sustainability of the Facebook Business Model, *Journal of Service Science Research*, 4(2): 175-212. DOI: 10.1007/s12927-012-0008-z



- [12] Maringe, F., Carter, S. (2007). International Students' Motivations for Studying in UK HE: Insights into the Choice and Decision Making of African Students, *International Journal of Educational Management*, 21(6): 459-475, DOI: 10.1108/09513540710780000
- [13] Michalski, G. (2010) Planning optimal from the firm value creation perspective. Levels of operating cash investments, *Romanian Journal of Economic Forecasting*, 13(1): 198-214.
- [14] Michalski, G. (2014). Value maximizing corporate current assets and cash management in relation to risk sensitivity, *Polish firms case, Economic Computation and Economic Cybernetics Studies and Research*, 48(1): 259-276, DOI: 10.2139/ssrn.2442862
- [15] Nielsen, J. (2000). *Designing Web Usability: The Practice of Simplicity*. Indianapolis: New Riders Publishing.
- [16] Pudło, P., Gavurová, B. (2012). Experimental learning in higher education, using simulation games as learning tool. In *SGEM 2012: 12<sup>th</sup> International Multidisciplinary Scientific GeoConference: conference proceedings*. (pp. 1093-1100), Bulgaria: Albena. DOI: 10.5593/SGEM2012/S23.V3009
- [17] Pudło, P., Gavurová, B. (2013). Experimental teaching methods in higher education - practical application. In *SGEM 2013: 13<sup>th</sup> International Multidisciplinary Scientific Geoconference: Ecology, Economics, Education and Legislation*. (pp. 423-428), Bulgaria: Albena. DOI: 10.5593/SGEM2013/BE5.V2/S22.010
- [18] Rahimnia, F., Hassanzadeh, J.F. (2014). The impact of website content dimension and e-trust on e-marketing effectiveness: The case of Iranian commercial saffron corporations, *Information & Management*, 50(5): 240-247. DOI:10.1016/j.im.2013.04.003
- [19] Shanka, D.T., Quintal, V., Taylor, R. (2006). Factors Influencing International Students' Choice of an Education Destination – A Correspondence Analysis, *Journal of Marketing for Higher Education*, 15(2): 31-46. doi: 10.1300/J050v15n02\_02
- [20] Szabo, K., Šoltés, M., Herman, E. (2013). Innovative Capacity and Performance of Transition Economies: Comparative Study at the Level of Enterprises, *E+M Ekonomie a Management*, 16(1): 52–68.
- [21] Schüller, D., Chalupský, V. (2012). Marketing Communication Management of Higher Education Institutions, *Acta Universitatis Bohemicae Meridionales*, 15(2): 61-69.
- [22] Světlík, J. (2009). *Marketing ověřeniškoly*. Praha: Wolters Kluwer.
- [23] Šoltés, V., Gavurová, B. (2013). Application of the cross impact matrix method in problematic phases of the Balanced Scorecard system in private and public sector, *Journal of Applied Economic Sciences*, 8(1): 99-119.
- [24] Šoltés, V., Gavurová, B. (2015). Modification of Performance Measurement System in the intentions of Globalization Trends, *Polish Journal of Management Studies*, 11(2): 160-170.
- [25] Štefko, R. (2003). *Akademické marketing ověinštrumentárium v marketing uv ysokejškoly*. Bratislava: R. S. Royal Service.
- [26] Whelan, S., Wohlfeil, M. (2006). Communicating Brands through Engagement with 'Lived' Experiences, *Brand Management*, 13(4/5): 313-29. doi:10.1057/palgrave.bm.2540274

\*\*\* VSI Technologies. 2014. Academy, available at: <http://site-analyzer.com/en/academy>

\*\*\* Webometrics. 2015. Methodology, available at: <http://webometrics.info/en/Methodology>



## Innovative Aspects of Development of the Customs Union under the New Economic Conditions. Problems and Prospects

Ivan Stepanovich SANDU

All-Russia Research Institute of Agricultural Economics of the Federal Agency of Scientific Organizations, Moscow, Russia  
[consult46@bk.ru](mailto:consult46@bk.ru)

Mikhail Yakovlevich VESELOVSKY

State Institution of Higher Academic Education of Moscow Region "Financial Technology Academy", Moscow Region, Russia

Elena Ivanovna SEMYONOVA

Federal State-Funded Educational University of Higher Professional Education Russian State agrarian Correspondence University, Moscow Region, Russia

Alma Irgibaevna DOSHCHANOVA

All-Russia Research Institute of Agricultural Economics of the Federal Agency of Scientific Organizations, Moscow, Russia

Alexander Vladlenovich FEDOTOV

State Institution of Higher Academic Education of Moscow Region Financial Technology Academy, Moscow Region, Russia

### Abstract.

*This article examines the impact of economic integration on national economies of the Customs Union. Scientific works of both domestic and foreign authors were reviewed and analyzed for this purpose. The study showed that in a globalized economy, the regional economic integration is an important factor in strengthening the interaction and interdependence of countries in the regions, which resulted in the national economy moving to a new level of development. The positive and negative effects of integration are revealed. The rationale for the development of innovative ways of integrating the economies of the Customs Union member states and forming a single economic space is provided. The experience of successful integration associations of the world and the prospects of development of relations between the member states in the format of the Eurasian Economic Union allow to consider the integration potential as a significant positive factor in economic development in the long term. The authors conclude that integration contributes to the formation of an effective model of adaptation to geo-economic changes occurring in the global economy and helps coordinate the participation of countries in solving global economic problems. Favorable prospects for increasing the global competitiveness of the Eurasian Economic Union in the field of innovation and investment policy are due to the presence of a potentially large market of the Union, existing technical structure, common tasks of reform to modernize the economy and strategy of development of industrial enterprises and production. Based on the analysis, the priorities of further deepening of the integration process of the three countries under the conditions of building the Customs Union were identified*

**Key words:** integration, the Customs Union, innovative development, competitiveness of national economies.

**JEL Classification:** F15.

### Introduction

The novelty of this work is determined by the fact that the processes of integration in the world economy are today one of the basic laws of the development of economic relations, but at the same time one of the main ways to increase the problems caused by globalization. Benefits, which are resulting from the integration and incorporation of economic potentials of the states with the aim to obtain the effect of the development of national economies, allow to build an entirely new strategy for economic and trade cooperation, largely restore the broken bonds and create new mechanisms of interaction, which would correspond to the modern geopolitical realities (Atarov and Sandu 2014).

International experience shows that integration contributes to the formation of an effective model of adaptation to geo-economic changes taking place in the global economy and helps coordinate the participation of countries in solving global economic problems. Favorable prospects for increasing the global competitiveness of the Customs Union member states in the field of innovation policy are determined by the presence of potentially capacious market of the Community, the current technical structure, the common tasks of reforms aimed at the modernization of the economy, the development strategy of industrial enterprises and productions.

The need for modernization of the economy is closely linked to innovations, which ensure the quality of investments (Romanova and Noskova 2014, Noskova and Romanova 2014). The central task of the Customs Union member states is the formation of a new innovation policy that would integrate scientific, technical, economic, financial and organizational capacities of the countries in the field of innovation.

The task of this work was to validate the innovative aspects of development of the Customs Union under the new economic conditions, evaluate the prospects of development of the Customs Union member states and define the priorities for cooperation between Russia, Belarus and Kazakhstan in the process of deepening integration processes.

## Conclusion

The phenomenon of integration is of particular importance in today's globalized world economy and general liberalization of economic policy. The integration makes it possible not only to expand markets, reduce transport and customs costs, but also to stand together against external threats of various kinds, combine different resources to implement large and strategically important projects and reforms.

The emergence of trade effects and the development of investment cooperation are only the first steps in the development of integration processes in the Customs Union member states. And, therefore, the integration between the member states of investment cooperation should be expanded to other areas. So, an important direction (and of the most priority in the long-term prospect) must be the integration of scientific and technological potential. Implementation of joint scientific and technological projects, the integration of the Russian, Belarusian and Kazakhstan's sectors of research may be much more important by its significance than just the development of mutual trade. A high significance should be given to the qualitative development of innovative, scientific, technical, financial and other relationships between the countries of investment cooperation – these are just the first steps in the development of integration processes in the Customs Union member states.

## References

- [1] Adyasov, I. (2010). The Customs Union: first results. *News agency "Regnum"*. 18.11.2010. Retrieved from <http://www.regnum.ru/news/polit/1347504.html>
- [2] Baliev, A. (2013). *Building machines together. The Customs Union will have industrial clusters*. Retrieved from <http://www.rg.ru/2013/10/29/klaster.html>
- [3] Enin, Yu.I. (2012). Formation of a single scientific, educational and production space in a Eurasian economic integration. *Eurasian Economic Integration*, 2(15), 43-51.
- [4] Ikonnikov, A. (2009). No turning back? *Center of Asia*, 9(9).
- [5] Mansurov, T. (2013). Eurasian integration: experience, problems and trends. *Econ. Strategy*, 1, 611.
- [6] Muzaparova, L. (2011). The Customs Union and the Single Economic Space: Opportunities and Prospects. *Russia and the New States of Eurasia*, 3: 19-26.
- [7] Nikolaeva, I.P. (2006). *World economy* (3<sup>rd</sup> Ed., rev. and add, pp. 510). Moscow: Unity-Dana.
- [8] Sarsembekov, N. (2013). The Customs Union and the Single Economic Space of Russia, Belarus and Kazakhstan as a factor in increasing the role of human capital in the industrial innovation development of the CIS. *International Affairs*, 1: 171-175.
- [9] Temirbekova, A.B., Uskelenova, A.T., Boluspaev, S.A., Aldarbergenov, N.A. (2015). The impact of integration on the competitiveness of the national economy. *Integration Practice of EEI*, 1(26): 95-118.
- [10] Jarosiewicz, A., Fischer, E. (2015). *The Eurasian Economic Union is The Eurasian Economic Union – more political, less economic*. Centre for Eastern Studies. Retrieved from <http://www.osw.waw.pl/en/publikacje/osw-commentary/2015-01-20-eurasian-economic-union-more-political-less-economic>
- [11] Atarov, N.Z., Sandu, I.S. (2014). Economic Aspects of Assessing the Effectiveness of Foreign Trade Activity of Electronic Industry. *World Applied Sciences Journal*, 29(4): 581-584.
- [12] Wisniewska, I. (2013). Eurasian integration Russia's attempt at THE economic unification of the post-Soviet area. *OSW Studies*, 44: 12-15.
- [13] Viner, J. (1950). *The Customs Union Issue*. New York: Carnegie Endowment for International Peace.
- [14] Meade, J. (1953). *Problems of Economic Union*. Chicago: University of Chicago Press.
- [15] Aghion, Ph., Harmgart, H., & Weisshaar, N. (2010). *Fostering growth in CEE countries: a country-tailored approach to growth policy*. European Bank for Reconstruction and Development, Working Paper, 118.
- [16] Ryzhenkova N.E., Sandu, I.S., Veselovsky, M.Y., Solovyov, A.Y. (2014). Economic aspects of innovation-oriented market economy formation. *Life Science Journal*, 11(12): 242-244.

- [17] Troshin, A.S., Sandu, I.S., Kupriyanov, S.V., Stryabkova, E.A., Saldanha, H.F.D. (2014). Role and place of economic mechanism in modern conditions. *Life Science Journal*, 11(10s): 487-490.
- [18] Shuchun, W., Qingsong, W. (2014). The Silk Road economic belt and the EEU –rivals or partners? *Central Asia and the Caucasus*, 3, 5-8.
- [19] Noskova E., Romanova I. (2014). Developing the methods of studying the processes which determine the changes in the goods market conditions. *Life Science Journal*. 11(7s): 302-305
- [20] Romanova, I.M., Noskova, E.V. (2014). Methodological tools in studying the impact of cultural differences on consumer behavior. *Actual Problems of Economics*, 9(159): 333-343.

\*\*\* Agreement on the Customs Union Commission dated 06.10.2007 Retrieved from <http://www.tsouz.ru/About/KTS/Pages/37.aspx>

\*\*\* *Knowledge Assessment Methodology 2012* (KAM 2012). Retrieved from [www.worldbank.org/kam](http://www.worldbank.org/kam)

## Network Industries Economics. A Comparison of Rail Infrastructures Output in Key European Countries

Giacomo DI FOGGIA

Department of Business Administration Finance, Management and Law  
University of Milano-Bicocca, Italy  
[giacomo.difoggia@unimib.it](mailto:giacomo.difoggia@unimib.it)

Ugo ARRIGO

Department of Business Administration Finance, Management and Law  
University of Milano-Bicocca, Italy  
[ugo.arrigo@unimib.it](mailto:ugo.arrigo@unimib.it)

### Abstract

*Infrastructure is widely recognized as a key ingredient in a country's economic success. However many issues surrounding infrastructure management are not well analysed. This paper assesses the performance of rail infrastructures management. Focusing on key European countries this study monitors the factors directly related to the effective allocation of resources. Results suggest that the outperforming system is the Swedish, characterised by reduced cost, and the German, marked by significant scale economics. The Italian case follows these two. The expenses for running the Spanish infrastructure are relatively low but this advantage is outweighed by weak traffic. If on one hand the cost of the British network appears to be above the average, on the other hand it is compensated by the intensive use of the network. The French infrastructure presents an average production cost along with moderate productivity; a remarkable average loading makes up for this performance gap. Main limitations stem from the fact that the railway industries and their development greatly differ across European countries since the infrastructure were built on national bases. This study serves as an entry point to further assessments and evaluation of the efficacy of policies regarding the management of rail infrastructures in Europe.*

**Keywords:** rail infrastructure, productivity, utilities regulation, transportation, network industries.

**Jel Classification:** L2, L92.

### Introduction

In the early and mid-twentieth century, many countries, especially in the developing world, sought to provide utility services by forming state-owned monopolies. Restructuring the industry generally involves the separation of the potentially competitive portions of the sector from the non-competitive or natural monopoly portions and the guarantee that non-discriminatory access of rivals to the non-competitive portions, which should be considered essential facilities. This separation of competitive from non-competitive may be accomplished through structural separation, functional separation, or unbundling. Railway companies used to exercise both infrastructure and transport services in almost all of the European countries. This structurally rigid supply, exacerbated by a series of other factors, started at the same time of/as the development of the EU railways and lasted until the Swedish reform process through which the separation began, i.e. 1988. In such market conditions the output corresponded to levels of traffic. Although scholars have considered a variety of regional models relating to infrastructure productivity, in many cases these models are formulated without taking into consideration spatial interactions (Kelejian and Robinson 1997). Therefore, reliable and comparable information on the cost and output of the rail networks is essential. We develop this idea in detail in an effort to determine what kind of improvements are called for, to analyse how other infrastructure managers achieve their performance levels, and, to provide policy makers with consistent information.

More specifically this study reconstructs comparable industrial and economic data for measuring the productivity and cost of rail infrastructure networks over a five year period. The key industrial data used for this paper are: rail network length (tracks), distance (train-km) and the traffic unit transported, whether measured in terms of passenger-km or ton-km. The indicators stem from analysis focused on six key European rail infrastructure networks as per extension and traffic levels i.e. Germany (DE), France (FR), Great Britain (UK), Italy (IT), Spain (ES) and Sweden (SE). Despite significant regional variation both between and within different markets, most of the data are comparable. Our results suggest two outperforming networks: Sweden and Germany, the Italian case is ranked third. Figures coming from the Spanish, British and French cases show mixed results. Although this paper used different types of information to reach its conclusions and the terms of reference were adequate, major challenges, especially of data availability was faced. The foremost benefit of this

analysis is to support decision making by providing facts and judgements about the efficiency, effectiveness, and thus sustainability of the rail infrastructure management in Europe. Such information is crucial for fine-tuning existing or planning new policies and for setting governmental priorities and allotting resources.

The remainder of the paper is organized as follows: In the first section, we discuss the output and productivity of rail infrastructure networks. We then discuss the methodology for calculating the unit costs of railway networks. This is followed by a survey of total cost, unit cost and productivity of rail infrastructure managers, our assessment follows, and we conclude with a discussion of implications.

## Concluding remarks

The last decade has seen significant developments in the liberalisation and deregulation of the railway industry in Europe. One characteristic has been vertical disintegration and the separate regulation of previously state-owned companies.

This study has focused on the measurement of the quality of rail infrastructure managers' policies, infrastructure output and productivity. The objectives of the benchmarking have been targeted to determine what and where improvements are called for and to analyse the determinants of high performance levels in those organisations that have been shown to maintain high quality standards in their service delivery. That is why this paper has found it worthwhile to reclassify, using homogeneous criteria, the income statements of six European rail infrastructure managers. In an effort to fine-tune the analysis the paper has also rebuilt the traffic data in these countries in order to compute productivity and cost indicators for the rail infrastructure networks.

The results, based on indicators of unit cost, suggest that the two most productive rail networks are in Sweden, with a network that is efficiently managed leading to reduced cost, and Germany, which has a network characterised by significant rail traffic, which is then able to improve productivity and to bring down the unit cost.

The Italian case is ranked third among the six networks and is also to be considered the only rail infrastructure in which traffic and productivity have increased while the production cost has decreased. The remaining three networks show mixed results. The cost of the Spanish rail network is relatively low but this advantage is eroded by weak traffic. Great Britain has a rail infrastructure that is fairly expensive in terms of production cost and this factor is only partially offset by an intense circulation.

The French network, finally, has a production cost in line with the average, along with a productivity below the average in terms of trains per km of rail track and where only a higher average train load can rebalance this situation. Sweden deserves some additional considerations being that it has been shown to be the most sustainable in this study, and is therefore considered the benchmark for all the others. Being that the low Swedish network cost is only partly offset by the productivity of the network, one lower than the European average, Sweden is a case of high interest that should be investigated in depth to verify how the mentioned performance stems from an organisational model unique in Europe.

The Swedish model is characterised by (i) public management that is integrated with the management of the road network by the public agency named Trafikverket; (ii) outsourcing of line maintenance where maintenance services are assigned via an efficient system of tenders; and (iii) flexible organizational structure. The strong performance of the Italian infrastructure was made possible both by the reduction of production cost and through an increase in traffic, particularly in the liberalised segments. The above statements also provide support for policy. The incentive for managers to pursue activities that reduce costs will depend on the rewards that they receive from any cost reduction. The higher the benefit of any cost reduction the higher (and socially desirable) the incentives to pursue activities that reduce costs, and vice versa. This paper has political implications for regulatory bodies since it has provided pieces of information to serve them in issues such as the regulation according to objective criteria to improve performance. On the basis of the results obtained, regulatory bodies are supported in establishing clear and consistent objectives through a strategy of growth, investment and repercussion that the services provided generate on the general wellbeing.

## References

- [1] Åhrén, T., Parida, A. (2009). Maintenance performance indicators (MPIs) for benchmarking the railway infrastructure: a case study. *Benchmarking: An International Journal*, 16(2): 247-258.
- [2] Arrigo, U., & Di Foggia, G. (2013). Schemes and Levels of State aid to Rail Industry in Europe: Evidences from a Cross-Country Comparison. *European Journal of Business and Economics*, 8(3): 14–20. DOI: [ejbe.v8i3.410](https://doi.org/10.1080/17513758.2013.8410)
- [3] Arrigo, U., Di Foggia, G. (2014). Theoretical and viable charging models for railway infrastructure access. An European survey. *Management Research and Practice*, 6(2): 5–24.
- [4] Cantos, P., Maudos, J., (2001). Regulation and efficiency: the case of European railways. *Transportation Research Part A*. 35, 459–472. DOI: [10.1016/S0965-8564\(00\)00007-0](https://doi.org/10.1016/S0965-8564(00)00007-0)
- [5] Carlton, D.W., Perloff, J.M. (1994). *Modern industrial organization*. NY: Harper Collins.



- [6] Davies, S.W., Coles, H., Olczak, M., Pike, C., Wilson, C. (2004). The benefits from competition: some illustrative UK cases. DTI Economics Paper No. 9.
- [7] de Hauteclocque, A., (2013). *Vertical de-integration and single market integration in the European Union: an incomplete transition*, in: Market building through antitrust: long-term contract regulation in EU electricity markets. Edward Elgar Publishing. ISBN: 9780857937735. DOI:10.4337/9780857937742
- [8] Di Foggia, G., Lazzarotti, V. (2014). Assessing the link between revenue management and performance: insights from the Italian tourism industry. *Measuring Business Excellence*, 18(1): 55–65. DOI: 10.1108/MBE-11-2013-0059
- [12] Friebel, G., Ivaldi, M., Vibes, C., (2003). Railway (De)regulation: a European efficiency comparison. *Economica* 77, (305): 77–91. DOI: 10.1111/j.1468-0335.2008.00739.x
- [13] Gibson, S. (2003). Allocation of capacity in the rail industry. *Utilities Policy*, 11(1): 39-42. DOI: 10.1016/S0957-1787(02)00055-3
- [14] Kelejjan, H.H., Robinson, D.P. (1997). *Infrastructure productivity estimation and its underlying econometric specifications: a sensitivity analysis*. Papers in Regional Science, 76(1): 115-131. DOI: 10.1111/j.1435-5597.1997.tb00684.x
- [15] King S.P. (1998). *Principles of price cap regulation*. In Infrastructure regulation and market reform: Principles and Practice, 46-54. Arblaster, M. & Jamison, M. ed. Canberra, Australia: ACCC and PURC.
- [16] Knieps, G. (2012). *Competition and the railroads: A European perspective* (No. 142). Freiburg: Institut für Verkehrswissenschaft und Regionalpolitik.
- [17] Laffont, J.J. (1994). The new theory of regulation ten years after. *Econometrica*, 62: 507–537. doi: 10.2307/2951658
- [18] Lakshmanan, T. R. (2011). The broader economic consequences of transport infrastructure investments. *Journal of Transport Geography*, 19(1): 1-12. doi:10.1016/j.jtrangeo.2010.01.001
- [19] Lin, P. (2006). Strategic spin-offs of input divisions. *European Economic Review*, 50(4): 977-993. doi:10.1016/j.euroecorev.2004.12.001
- [20] Link, H. (2013). Unbundling, public infrastructure financing and access charge regulation in the German rail sector. *Journal of Rail Transport Planning & Management*, 2(3): 63–71. DOI:10.1016/j.jrtpm.2013.02.002
- [21] Matsushima, N. (2009). Vertical mergers and product differentiation. *The Journal of Industrial Economics*, 57(4): 812-834. doi:10.1111/j.1467-6451.2009.00402.x
- [22] Matsushima, N., Mizutani, F. (2014). How Does Market Size Affect Vertical Structure When Considering Vertical Coordination? Application to the Railway Industry. *Pacific Economic Review*, 19(5): 657-676. DOI: 10.1111/1468-0106.12088
- [23] Mitusch, K., Brenck, A., Peter, B., Czerny, A., Beckers, P. (2011). *Ökonomische Grundstzfragen zur Ausgestaltung einer Anreizregulierung der Eisenbahninfrastruktur*. Study on behalf of the BNA (Bundesnetzagentur – Federal Utilities Agency), Bonn.
- [24] Mizutani, F., & Uranishi, S. (2013). Does vertical separation reduce cost? An empirical analysis of the rail industry in European and East Asian OECD Countries. *Journal of Regulatory Economics*, 43(1): 31-59. DOI:10.1007/s11149-012-9193-4
- [26] Quinet, E. (1997). *Full social cost of transportation in Europe*. In The Full Costs and Benefits of Transportation (pp. 69-111). Springer Berlin Heidelberg. DOI: 10.1007/978-3-642-59064-1
- [27] Trail, K.E. (1991). *Optimal regulation: the economic theory of natural monopoly*, MIT Press Books.
- [29] Urdános, M., Vibes, C. (2013). Regulation and cost efficiency in the European railways industry, *Journal of Productivity Analysis*, 39(3): 217–230. DOI: 10.1007/s11123-012-0284-0
- [30] Zoeteman, A. (2001). Life cycle cost analysis for managing rail infrastructure. *European Journal of Transport and Infrastructure Research*, 1(4): 391-413.



- \*\*\* OECD. (2014). Factsheet on how competition policy affects macro-economic outcomes (pp. 1–31). Paris. Retrieved from <http://www.oecd.org/daf/competition/2014-competition-factsheet-iv-en.pdf>
- \*\*\* UIC - International Union of Railways. (2008). Lasting Infrastructure Cost Benchmarking (LICB), LICB Summary Report UIC C 2006/12/15. Retrieved from [http://www.uic.org/IMG/pdf/li08C\\_sum\\_en.pdf](http://www.uic.org/IMG/pdf/li08C_sum_en.pdf)

## The "Chinese Model" of the Economy. Analysis of Reforms and Development Trends

Olga SANZHINA

East Siberia State University of Technology and Management, Russia  
[okhaikh@mail.ru](mailto:okhaikh@mail.ru)

Davaasuren AVIRMED

Institute of International Research, Mongolian Academy of Sciences, Mongolia

Valentina BAZHENOVA

East Siberia State University of Technology and Management, Russia

Olga KAUROVA

East Siberia State University of Technology and Management, Russia

Margarita NAMHANOVA

Buryat State University, Russia

### Abstract

*The article describes the whole long period of reform of the economic system of the People's Republic of China, which has led to the emergence of the "Chinese model" of the economy. The periods of the planned economy and market economy in China were highlighted and analyzed by stages. The period from 1949 to 1978 was considered a "period of the planned economy" of China, where four phases were distinguished. The problem areas of the planned economy period were highlighted according to the following parameters: internal environment, state enterprises, and state policy. The period from 1978 to the present is described in the article as a period of market economy, where three phases are distinguished. The authors consider the basic most important events in chronological order, both in political and in economic terms, which made it possible to generalize the experience of reforms and give an answer to a question of what the "Chinese model" of the economy is. The approach proposed by the authors allowed to identify and justify the individual directions of the "Chinese model" of the economy and to identify their characteristics and potential for use in other countries. The analysis of the periods and stages of China development makes it possible to state that the "Chinese model" of economy is unique and is a model of flexibility in governance, which combines centralized management and market mechanism.*

**Key words:** economic reform, government regulation, Chinese economic model.

**JEL Classification:** P11, P21.

### Introduction

Economic reform and the "policy of openness" held in China for the past 30 years has made it possible for China economy to achieve great progress. The question arises: what is the "Chinese model" of economy? What features of the economic reforms should be considered, what conclusions can be made on the basis of experience of the reforms for a sufficiently long period of time?

After the founding of the PRC, there have been several economic reforms in the country. The analysis shows that it is quite difficult to distinguish specific stages of development of the PRC economy, and the opinions often diverge in various studies, as it is difficult to adopt a common standard for a certain period. In general, the approach is applied where historical periods in the economy of the whole society are distinguished on the basis of the change in the mode of production, and the decisive factor in the allocation of a certain stage is often the transformation of the national economy. "In addition, the political event and a special "movement" is also often a turning point in the development of the economy" (Juan Chzhilyan 2005), for example, the Chinese Cultural Revolution.

The analysis shows that the "Chinese economic model" covers four main development trends that are interdependent. In the literature, these trends are presented as separate models (Juan Chzhilyan 2005), but if we take a look at the Chinese model of economy as a whole, it is better to treat these components as "development trends". The authors have attempted to critically analyze the existing trends.

### Method

In this article, the main method of research was the historical analysis of the process of reform of the economic system in China for the last half of the past century. In this, transformations are analyzed taking into account the peculiarities of the approaches of Chinese researchers and economists to defining certain categories

of the economic system, which contributes to the elucidation of the general trend of specific steps of the economic reform to strengthen the economic system with the specific nature of China.

In the study of the features of the theoretical concept of the PRC national economy, the authors proceed from the fact that the concept of reform was based on three points (Wei Xi Hong, 2004):

- continued political foundations of society;
- consideration of national specificities;
- verification of the theory of reforming the economy through business practices.

The specifics of the Chinese theoretical platform are to combine modern market economic concepts with the current interpretation of the political economy legacy of Karl Marx and Vladimir Lenin. The focus of the theory of political economy in the PRC is on the analysis of the social aspects of development of the national economy.

The Chinese scholars and ideologists of economic reforms are Dan Honsyun, Xu Tszoshe, Tsai Zhentsyun, Xu Tszytse, Tsai Zhentsyun, Luyu Xuan, Liu Guoguang, Liu Tszunsyu, Peng Neytyan, Song Tao, Sun Ju, Wu Dakun, Wu Chzhenkuy, Chen Xiaoxing, Ho Chzhentsin, Cheng Syushen *et al.* Chinese scientists conducted a comparative study of the economies of several countries at the beginning of the process of reforming the economy. Therefore, China's reform is based on a comparative analysis of the evolution of the sectors of the economy of various countries to determine the parity of their development (Wei Xi Hong 2004).

Simultaneously, in the framework of world economic relations, the Chinese scientists have carried out an analysis of the development of national economies, and their results were compared to highlight the positive factors that improve economic development rates and accelerate the country's movement to the level of advanced countries of the world (Wei Xi Hong 2004).

## Conclusion

We have tried to retrospectively examine and analyze the whole long process of reform in the People's Republic of China in this article. The analysis of the periods and stages of development of China makes it possible to state that the "Chinese model" of economy is unique and is a model of flexibility in state governance, which combines centralized management and the market mechanism.

Naturally, negative aspects are also shown in the process of functioning. State intervention in the economy often crosses certain limits of market regulation, market mechanisms stop working, and the province's economy cannot ensure the normal development of the region, which leads to debt bondage of the regional economy from the center (Di 2010). The excessive state intervention in the economy is particularly felt in comparing various regions of the country; thus, the main regions of China are in a socialist regime, while regions such as Hong Kong, Taiwan and Macao, due to the current political causes, are developing as the free markets. Thus, the direct state intervention in the market economy has become one of the reasons for the dependence of the provinces' economy from the center.

The main task of the new reform is the transformation of the "Chinese model" of economy into the system, and work in this area is just beginning, which makes it possible to adjust, modify the "Chinese model" and as a consequence, assign it a new path of development. The "Chinese model" of economy remains topical and interesting for the economies of all countries of the world. On the basis of generalization of the historical experience, by studying and analyzing the contradictions arising in the course of practice, the "Chinese model" of the economy can be improved, adapted and applied in other countries.

## Acknowledgement

The team of authors shows appreciation to Mr. Wen Yuzhu, a colleague from the Shenyang State Technological University, for help in preparing this article.

## References

- [1] Chzhichin, Sh. (2003). *Economic development and regulation in East Asia*. Beijing: Publishing House Knowledge of the World.
- [2] Chzhilyan, J. (2005). Features of the model of development of China's economy. *Economy study – China*, 6.
- [3] Di, L., 2010. Scope of regulation by the Chinese government. *Bulletin of Changchun University*, 7.
- [4] Haypin, M. (1993). Analysis of the East Asian model: the meaning and the apocalypse. *Study of Southeast Asia*, 2.
- [5] Izhan, Zh. (2010). Analysis of inter-regional and global economic integration relations. *Bulletin of Renmin University of China*, 9.
- [6] Keynes, J.M. (2007). *The General Theory of Employment, Interest and Money*, Moscow: Eksmo.
- [7] Sanzhina O.P. and Yuzhu W. (2012). Retrospective analysis of reforms in China. *Bulletin of the Siberian State Aerospace University named after M.F. Reshetnev*, 3(43): 202-204.
- [8] Sanzhina, O.P., Yuzhu, W. (2012). "Chinese model" of the economy: the features and trends of development. *Bulletin of the East Siberia State University of Technology and Management*, 2(37): 125-128.
- [9] Van Guanchan (2008). *China's economy and finance development in the globalization process*. Beijing: China Finance.
- [10] Xi Hong, W. (2004). Comparative analysis of the transition to a market economy in Russia and China, PhD thesis, Moscow State University of Economics, Statistics and Informatics, Moscow.
- [11] Xin, J. (2007). Regulation of China in the transitional period. *Bulletin of the Southwestern University of Finance and Economics*, 6.
- [12] Yiming, L. (2006). *Study of macroeconomic regulation and control*. Chengdu, the Publishing House of the Southwest University of Finance and Economics.
- [13] Zedong, M. (1956). Report "On The Ten Great Relationships".

\*\*\* Annual statistical reporting of China, (1977). Beijing: *China Statistics*, pp: 50, 57, 364

- \*\*\* Proceedings of Deng Xiaoping, Volume 2, Article 152, (1994). Beijing, "People's Publishing House".
- \*\*\* Proceedings of Li Fuchun, Article 167, (1992). Beijing, "People's Publishing House".
- \*\*\* Report of the China government "About the first five-year plan in the development of the national economy", 1952.
- \*\*\* EREPORT.RU (2015). *Chinese economy. The structure of the Chinese economy*. Date Views: 15.08.2015 from [www.ereport.ru/articles/weconomy/china2.htm](http://www.ereport.ru/articles/weconomy/china2.htm)
- \*\*\* EREPORT.RU, (2015). The growth rate of China's GDP, %. Date Views: 21.08.2015 from [www.ereport.ru/stat.php?razdel=country&count=china&table=ggecia](http://www.ereport.ru/stat.php?razdel=country&count=china&table=ggecia)
- \*\*\* The World Bank "The East Asian Miracle: Economic Growth and Public Policy", 1995. Beijing, Publishing House of Finance and Economy of China, pp: 28-3L.
- \*\*\* Website of the State Bureau of Statistics of China. Date Views 20.08.2015 [www.stats.gov.cn](http://www.stats.gov.cn)

## Impact of Municipality Size on Economic Performance. Evidence from Slovakia

Miriam ŠEBOVÁ

Technical university of Košice, Faculty of Economics  
Department of Regional Science and Management

[miriam.sebova@tuke.sk](mailto:miriam.sebova@tuke.sk)

Daniela PETRÍKOVÁ

Technical university of Košice, Faculty of Economics  
Department of Theory of Economics

[daniela.petrkova@tuke.sk](mailto:daniela.petrkova@tuke.sk)

### Abstract:

*In the last 50 years, amalgamation processes have been carried out in most European countries with the aim of consolidating the settlement structure. The main targets of such reforms have been the cost advantages as well as the effort to improve the quality of public services. The Slovak Republic belongs to one of the countries with the most dispersed municipalities within Europe, where 67% municipalities have a population of 1,000 or under. This paper deals with the impact of a municipality's size on its economic performance. It summarizes the results from empirical studies and also includes an analysis of selected financial indicators in municipalities of various sizes in Slovakia. The results confirm the impact of a municipality's size on its economic performance.*

**Keywords:** economies of scale, municipalities, amalgamation, public services, economic performance.

**JEL Classification:** H71

### Introduction

The settlement structure in Slovakia is one of the most dispersed within the EU member states and is marked by a large number of small municipalities. During socialism between 1950 and 1989, the number of municipalities in Slovakia was reduced from 3,344 to 2,698. After 1990, major fragmentation took place and the number of municipalities was increased to its current 2,891. Almost 67% of the municipalities have a population of less than 1,000 and they only represent 17% of the total population. (Statistical Office of Slovak Republic, 2014) In contemporary Europe, only several countries have not initiated the amalgamation of small economically inefficient municipalities such as the Czech Republic and France. Between 2002 and 2005, administrative and fiscal decentralization took place in Slovakia. A communal reform was also planned and should have resulted in territorial amalgamation although this has yet to be implemented. While decentralization has created a basic financial framework for the development of governmental competences of municipalities, further development has been limited by the atomized settlement structure.

Generally, small municipalities have a problem to produce real tax incomes as they depend to a certain degree on the balancing and transfer from central budgets. This is reflected through the low efficiency of local public services and high administrative costs. However, there is a different situation in Slovak towns. In towns (According to Slovak legislation, town means a municipality with a population of more than 5,000. Currently, there are 138 towns out of 2,891 municipalities) more public services are provided and there is the added pressure of effective provision. However, empirical studies have suggested that the economies of scale may not be a clear result of the amalgamating processes. Thus, it is very complicated to determine the optimum size of a settlement unit.

The aim of this paper is to analyze the economic performance of small municipalities in Slovakia. The paper is divided into two parts. The first part contains a summary of the theoretical knowledge about the optimum size of local governments and economies of scale. The second part contains the outputs of analyzes in the Slovak Republic.

## Conclusion

It is evident from the empirical studies that the desirable economies of scale are not clear in the case of territorial amalgamation. Yet, in spite of that, the positive effects of municipal reform have been presented and particularly with respect to improving the quality of public services. The analyzed theoretical and empirical studies show that the criticism is based mainly on the following. Firstly, every self-governmental unit is a dynamic, complex and unique system from the aspect of its social and economic characteristics. It is not only the number, but also the structure of the population, the climatic and other geographical conditions. Therefore, it is difficult to determine the optimum size of local governments on a general basis for the whole national territory. Furthermore, there are different production functions for each type of public service and the „plant-specific“ effects. In view of this, when the amalgamation process is prepared in Slovakia, it will be required to carry a qualitative analysis as well as a quantitative one.

In terms of the selected financial indicators, the financial conditions in various sized municipalities have been analyzed. Thus, the size of a municipality affects its economic performance. From the analysis of indicators, it can be seen that better values of the monitored indicators in larger size categories of municipalities were found. In the researched group of 145 municipalities in Košice with a population of between 0 and 10,000, financial and tax power rose with a rising number in the population while the rate of self-financing fell. This is due to a higher share of transfers and subsidies for the transferred competences in larger municipalities. The rate of subsistence was apparently not dependent on the size of the population and the debt capacity was clearly higher in the larger municipalities. The same applied for the gross and net asset power. The detailed review of the values in the selected size categories of the municipalities revealed relatively positive results for all indicators in the group of municipalities with a population above 1,000. Thus, it can be assumed that the critical level with low performance parameters is the municipalities with a population below 1,000.

The analysis has confirmed that smaller municipalities have bigger problems with efficiency and have insufficient funds for the reproduction of their assets. This is reflected in the values of the capital incomes and expenditure of such municipalities. Their low credibility and little possibility to raise funds for their development activities represent a serious problem for these municipalities. This is connected with lower quality public services. From the foregoing, it is clear that the number of municipalities in Slovakia will have to be reduced. Thus, the issue of municipal reform in Slovakia is increasingly serious because the low economic efficiency of small municipalities affects the competitiveness of the whole Slovak economy.

## Acknowledgement

The paper was supported by project VEGA 1/0454/15: Redefining of regional development - the shift towards more resilient regions.

## References

- [1] Bel, G. (2012). Local Government Size and Efficiency in Capital Intensive Services: What Evidence is There of Economies of Scale, Density and Scope? [*International Center for Public Policy Working Paper 12-15/2012*]. Andrew Young School of Policy Studies. George State University.
- [2] Bikker, J. A., Linde, D. (2015). The Optimum Size of Local Public Administration. [U.S.E. Discussion Paper Series] No. 05/2015. Tjalling C. Koopmans Research Institute. Utrecht School of Economics. Utrecht University
- [3] Blom-Hansen, J., Houlberg, K., Serritzlew, S. (2011). Scale effects in local government? Evidence from local government amalgamations in Denmark. [Paper presented at the XX NORKOM conference in Gothenburg, Sweden, November 24- 26.] 2011[online] [http://gu.se/digitalAssets/1350/1350762\\_scale-effects-in-local-govnmnt-k-houlberg.pdf](http://gu.se/digitalAssets/1350/1350762_scale-effects-in-local-govnmnt-k-houlberg.pdf)
- [4] Blom-Hansen, J. (2012). Local Government in Denmark and the 2007 Municipal Reform. In: *Rethinking local government: Essays on municipal reform*. Antti Moisio (ed.) Government Institute for Economic Research. Helsinki, p. 43 – 82.
- [5] Bönisch, P., Haug, P., Illy, A., Schreier, L. (2011). Municipality Size and Efficiency of Local Public Services: Does Size Matter? [IWH-Discussion Papers]. No 18/2011. Halle Institute for Economic Research.



- [6] Byrnes, J., Dollery, B. (2002). Do Economies of Scale Exist in Australian Local Government? A Review of the Empirical Evidence. [Working Paper Series in Economics]. No. 2002-2. University of New England. School of Economics. 23 p. ISSN 1442 2980.
- [7] Callanan, M., Murphy, R., Quinlivan, A. (2014). The Risks of Intuition: Size, Costs and Economies of Scale in Local Government. *The Economic and Social Review*, 45(3): 371–403
- [8] Černěnko, T. (2012). Efektívnosť miestnej samosprávy. In: Šebová a kol.: *Aktuálne koncepty ekonomiky a riadenia samospráv*. Technická univerzita v Košiciach. Ekonomická fakulta. p. 28-76.
- [9] Dobranská, J., Šebová, M. (2012). Ekonomické aspekty hospodárenia obcí s rôznym počtom obyvateľov. Ekonomická fakulta, Technická univerzita v Košiciach. 71 p.
- [10] Dollery, B., Fleming, E. (2006). A Conceptual Note on Scale Economies, Size Economies and Scope Economies in Australian Local Government, *Urban Policy and Research*, 24: 271-282.
- [11] Dollery, B., Byrnes, J., Crase, L. (2008). Australian Local Government Amalgamation: A conceptual Analysis Population Size and Scale Economies in Municipal Service Provision. *Austral-asian Journal of Regional Studies*, 14(2): 167-175.
- [12] Dollery, B., Crase, L. (2004). Is bigger local government better? An evaluation of the case for Australian Municipal Amalgamation Programs. *Urban Policy and Research*, 22: 265-275.
- [13] Dugasová, B. (2012). Finančná a daňová sila obcí na Slovensku. *Teoretické a praktické aspekty manažmentu a ekonomiky samosprávy. Konferencia*. Košice: EkF TU, 2012 s. 1-5.
- [14] Hamalová, M., Štangová, N., Belajová, A., Majorošová, M., Knežová, J., Filip, S. (2010). Veľkosť miestnych samospráv verzus a efektívnosť poskytovaných služieb. *Ekonomický a sociálny rozvoj Slovenska*, Bratislava ISBN 978-80-970495-4-6
- [15] Hemmings, P. (2006). Improving public-spending efficiency in Czech regions and municipalities, 2006.31 p. [online] <http://ideas.repec.org/p/oec/ecoaaa/499-en.html>
- [16] Hirsikoski, A. (2007). Municipal amalgamation in Finland- the process in the Salo region so far, 2007. [online] <http://egpa-conference2011.org/documents/PSG5/Kettunen.pdf>
- [17] Christoffersen, H., Bo Larsen, K. (2007). Economies of scale in Danish Municipalities: Expenditure effects versus quality effects, 2007, *Local government studies*, 33(1): 77-95.
- [18] Klimovský, D. (2009). O možných riešeniach fragmentovanej lokálnej sídelnej štruktúry. *Acta Politologica*, 1(2): 182-213. ISSN 1803-8220. Dostupné na internete: [www.acpo.cz](http://www.acpo.cz).
- [19] Lotz, J. (2006). Municipal mergers and economies of scale, some Danish evidence. OECD workshop on Efficiency of sub-central spending
- [20] Mckinlay, D. (2006). Local government structure and efficiency : [A report prepared for Local Government New Zealand], [online] <http://www.waitakere.govt.nz/havsay/pdf/royalcommission/localgovernmentstructure/efficiency.pdf>
- [21] Moisis, A. (2001). On local government spending and taxation behaviour. Effect of population size and economic condition. [online] <http://www.extranet.vatt.fi/Lpf2001/-Members/Docs/Moisio.doc>
- [22] Neubauerová, E. (2006). Nadväznosť komunálnej reformy na proces fiškálnej decentralizácie v podmienkach Slovenskej republiky, [online] [http://kvf.vse.cz/storage/1180481996\\_sb\\_neubauerov.pdf](http://kvf.vse.cz/storage/1180481996_sb_neubauerov.pdf)
- [23] Nižňanský, V., Cibáková, V., Rafaj, P., Hamalová, M., Filip, S. (2009). Benchmarking slovenských miest 2004-2008, *Komunálne výskumné a poradenské centrum, n.o. Piešťany*. Vysoká škola ekonómie a manažmentu verejnej správy v Bratislave.
- [24] Slack, E., Bird, R. (2012). Merging Municipalities: Is Bigger Better? *Rethinking local government: Essays on municipal reform*. Antti Moisis (ed.). Government Institute for Economic Research. Helsinki.
- [25] Soukopová, J., Nemeč, J., Matějová, L., Struk, M. (2014). Municipality Size and Local Public Services: Do Economies of Scale exist? *The NISPACEE Journal of Public Administration and Policy*. Vol VII. No. 2. Winter 2014/2015



- [26] Swianiewicz, P. (ed.) (2010). Territorial Consolidation Reforms in Europe. *Local Government and Public Service Reform Initiative*. Open Society Institute–Budapest.
- [27] Swianiewicz, P. (ed.) (2002). Consolidation or fragmentation? *The size of local governments in Central and Eastern Europe*, OSI/LGI, ISBN 963-9419-45-1
- [28] Šebová, M. (2012). Úspory z rozsahu v samospráve obcí. *Šebová a kol.: Aktuálne koncepty ekonomiky a riadenia samospráv*. p. 7-27. Technická univerzita v Košiciach. Ekonomická fakulta. ISBN978-80-553-1264-4
- [29] Takáč, I. (2006). Efektívnosť využívania majetku miestnej samosprávy na podnikateľské účely. *Vybrané otázky agrárneho práva Európskej únie III*. [elektronický zdroj], zborník vedeckých príspevkov z medzinárodnej vedeckej konferencie, Nitra, november 2006: Slovenská poľnohospodárska univerzita, S. 102-110. ISBN 80-8069-812-0
- [30] Žárska, E. (2007). Komunálna ekonomika a politika. Bratislava: EKONÓM, ISBN 978-80-225-2293-9
- \*\*\* Štatistický Úrad SR (Statistical Office SR) (2010). Veľkostné skupiny obcí Slovenska v číslach, ŠÚSR, [online] [http://portal.statistics.sk/files/Odbory/odb\\_410/el\\_publicacie/velk\\_skup\\_obci\\_2010.pdf](http://portal.statistics.sk/files/Odbory/odb_410/el_publicacie/velk_skup_obci_2010.pdf)
- \*\*\* Vláda SR (Government SR) (2004). Komunálna reforma. Materiál pre verejnú diskusiu. Bratislava, [online] [http://www.komunal.eu/subory/komun\\_ina\\_reforma.pdf](http://www.komunal.eu/subory/komun_ina_reforma.pdf)
- \*\*\* OECD (2006). Workshop proceedings the efficiency of sub-central spending, [OECD network on fiscal relations across levels of government], [online] <http://www.oecd.org/dataoecd/57/60/38270199.pdf>
- \*\*\* European Committee on Local and Regional Democracy (2009). Workshop Economies of Scale Resulting From Increasing The Size Of Local Authorities: What Evidence? Strasbourg, 26 November 2009. [online] <https://wcd.coe.int/ViewDoc.jsp?id=1547355&Site=COE>

## Bond Liquidity Indicators: Can New Thomson Reuters Indices explain Difference in Bond Returns?

Tamara V. TEPLOVA

Faculty of Economics

National Research University «Higher School of Economics», Moscow, Russian Federation

[toma@sani-k.ru](mailto:toma@sani-k.ru)

Tatiana V. SOKOLOVA

Faculty of Economics

National Research University «Higher School of Economics», Moscow, Russian Federation

[sokol-t@yandex.ru](mailto:sokol-t@yandex.ru)

### Abstract

*The rapidly growing Russian national currency bond market is demonstrating attractive yield levels after global crisis 2008-2009. A significant share of ruble bond issues has relatively low trading volume, so liquidity risk is of particular importance for potential investors.*

*This article provides an analysis of theoretical approaches to the construction of bond liquidity integral indices and reviews existing practice in the Russian market. First, it compares methodologies of Russian investment banks (Trust, Gazprombank, Zenith and others) and a new cyclic algorithm introduced by Thomson Reuters Agency (TRLI 2015). In empirical part of our research Thomson Reuters' integral indices of bond liquidity (weighted and non-weighted) are tested in the context of explaining the difference in yields of 1118 Russian national currency bonds outstanding (including government, municipal and corporate bonds). The multi-factor cross-sectional regression analysis results show that the influence of both Thomson Reuters liquidity indices on Russian bond yields is fairly stable. Duration and S&P rating also exert stable influence on bond yields. The non-weighted liquidity index has better explanatory power than the weighted one.*

**Keywords:** Russian bond market, liquidity indices, bond returns, YTM

**JEL Classification:** G12

### Introduction

Liquidity of a financial asset is an important characteristic determining its investment attractiveness (Chen *et al.* 2007, Chordia *et al.* 2005, Schultz 2001, Tychon and Vannetelbosch 2005). Depending on an asset liquidity level an investor faces certain risks of loss in the situation demanding immediate trading position closure. For instance, there may be financial losses in case an asset sale price turns out to be lower than the price at which it was purchased, even if its median price for the day or certain period considered is even higher than the price of initial purchase. Traditionally this risk of suffering losses in trading due to low liquidity is called liquidity risk. As may be expected the lower the liquidity of an asset the higher is the yield investors demand to compensate for this risk. The investigatory task arises from the fact that liquidity is a very multilateral concept and providing a quantitative integral index for ranking assets (bonds, in our case) by their liquidity is far from easy. In this article we shall compare such bond liquidity indices that are already presented in literature and used by practical analysts in investment companies, as well as analyze new liquidity index, offered by Thomson Reuters analysts for Russian market, in its explanatory potential for differences in bond returns (yield to maturity, YTM).

Our motivation is related to the fact that different investment companies develop their own techniques for bond liquidity indices. A wide range of original techniques is considered in academic literature. The question 'which approach does better explain differences in bond returns?' is open to discussion.

The objective of our research is to test new Thomson Reuters' integral indices of bond liquidity in the context of explaining the differences in bond returns (YTM) in the Russian market. This paper is organized as follows. Literature review is given in Section 2. Investment companies' approaches to building integral liquidity indices for the Russian bond market are compared in Section 3. Section 4 introduces hypotheses of our research and describes empirical methodology and data. Regression analysis results are given in Section 5 and 6. Finally, our conclusions are presented.

### Literature review. Previous researches regarding bond liquidity indices

Liquidity is a complex characteristic of financial assets. Some papers are devoted to equity markets (Amihud *et al.* 2005). Most specialists underline its general property - rapid transformation of asset into money. The less time it takes to strike a deal, the more liquid the asset is. But this is only the first approach towards

understanding this complex issue (Longstaff *et al.* 2005). The second matter is forming a system of indices or one integrative index to measure assets' liquidity (in our research it will be bonds) for solving a variety of problems.

Following Pastor and Stambaugh (2003) we spell out four following projections in liquidity: time, trading volume, costs and price of an asset. Specifying liquidity characteristics allows us to put forward the following definition: bond liquidity means the ability to buy or sell this or that bond in relatively big quantities (considering specific features of any given market) at a price close to the market one and without significant influence of transactions on this price.

Comprehension of qualitative sense of four projections outlined allows us to propose quantitative measures for collating assets with respect to their liquidity. Depth shows possible trading volume without seriously affecting the price; tightness is connected with transaction costs and shows the distance between transaction prices and median market ones; resiliency reflects speed at which prices reach new equilibrium level after strong fluctuations caused by effecting major transactions; immediacy registers time necessary for transaction settlement. Each of projections presented is matched with a set of indices calculated, as a rule, on the basis of intra-day data of deals and "blotter" condition.

However, calculating liquidity indices within the framework of projections specified does not constitute the final step for assets' ranking. Further, transformation from quantitative to qualitative form is required to assign valid meaning to indices' values.

Recognizing trade turnover as key liquidity index has its traps, at some periods high turnovers cannot be the foundation for considering an issue liquid. Thus trading volumes may also be high in periods of low liquidity, for instance, in times of market recession and high price volatility. Moreover, we need to consider that high securities turnover is observed in periods preceding disclosure of information about companies' incomes due to speculative demand. Díaz (2006) shows that high relative market turnover index reduces risk premium for bonds.

The number of transaction for a definite period is the simplest liquidity index widely used in practice (Eltra invest company 2007, Micex rules for liquidity index calculation 2003, 2009 (Russia)). Big transaction numbers imply good trading activity and high liquidity (Biais 2007; Lawrence 2006). On the other hand, transactions volumes in highly volatile periods may increase even under low bond liquidity. The problem with this index is that, similar to trade turnover, it may signify both high liquidity and high market volatility. Han and Zhou (2006) showed strong correlation of this index with other liquidity indicators describing bond characteristics: issue volume, coupon rate, time after issue, time before redemption. So far as Russian market is concerned, there is practically positive correlation between the number of transactions at government bonds market and trading turnover.

Another popular liquidity index is the number of missing prices (Lesmond 2005) and zero-yield days (or simply "zeros"). Dokhod investment company (Russia) uses proportion of trading days over a security to overall number of days in circulation as the basic liquidity indicator (Table 1).

The next index traditionally characterizing potential investor costs is bid-ask spread. Amihud and Mendelson (1991) found positive correlation between bid-ask spread and bonds yield. But bid-ask spread index also has its limitations in practical use. Firstly, this index is good at diagnosing situation for small transactions volume, since big-scale transactions are, as a rule, conducted in negotiation mode and are, therefore, not reflected in recorded spreads. Secondly, big spreads are typical for volatile periods with increasing uncertainty about bond price. For example spreads tend to get narrower in periods preceding disclosure of important information about the issuer.

Hui-Heubel ratio collates the difference between maximum and minimum prices over 5 last days and turnover coefficient over the same period (Sarr and Lybec 2002). We also meet such indices as: price volatility, Martin index, etc. (Aitken 2005; Rinaldo 2001).

If analysts choose only one liquidity characteristic there is no need for transformation, since index values can be directly interpreted by liquidity level scale. A number of works support the position of choosing one key liquidity indicator and rank assets by it exclusively (Crabbe and Turner 1995, Dimson and Hanke 2004, Kempf and Uhrig-Homburg 2000, Chordia *et al.* 2000, Alonso *et al.* 2004). Russian Dokhod investment company estimates liquidity level by trading frequency index: the ratio of trading days over a security to overall number of trading over a period considered, while Trust investment bank (Russia) has developed its own liquidity indicator based on weighting quote volumes according to their bid-ask spreads.

Chen *et al.* (2007) analyze influence of liquidity on corporate bond returns. They use Bloomberg and Datastream data to construct three different liquidity indicators: bid-ask spread, an indicator of zero liquidity costs (zero return method) and an indicator of transaction costs (LOT model). The sample consists of 4000 US high-quality and high-yield bonds. Results show that there is a significant causal relationship between corporate bond

return (YTM) and three liquidity indicators: bonds with lower liquidity have higher spreads. Also, Chen *et al.* (2007) analyze dynamics of liquidity levels and bond spreads. Results of panel regression analysis (9 years) show that liquidity explains more than half of variation in corporate bond yield spreads.

Chung and Hung (2010) build a semiparametric model for government and corporate bonds (from 1997 to 2005, weekly data). They take difference between average yields of 'recently issued' and 'more mature' bonds as liquidity proxy. Convertible bonds and bonds with rating BB- and less were excluded from the sample. The objective of their research was to test explanatory power of liquidity in bond yield spreads.

Fewer studies are devoted to analysis of influence of bond liquidity on their yields in emerging markets. Usually authors investigate US market and underestimate perspectives of emerging markets analysis. It is worth noting that the level of liquidity is directly related to the level of market development. Becaert *et al.* (2007) analyze 19 emerging markets from 1993 to 2003. They use a number of liquidity indicators: their own integral liquidity index, trading volume turnover (total trading volume to total capitalization of securities), the number of days with zero trading volume. Indonesia market characterizes by the least level of liquidity (the maximal number of days with zero trading volume).

Lepone and Wong (2009) investigate factors explaining differences in bond yield spreads in Australia's market (from 2003 to 2007). The explanatory variables were similar to those chosen in (Collin-Dufresne 2001) for the US market. They construct SFF (standardized fund flows) liquidity indicator on the base of inflows in bond funds. SFF shows bond fund capital growth rate (the more capital growth rate, the more is the level of liquidity). Their regression model explains 60% of variation in bond spreads, but liquidity indicators have no significant influence on bond spreads in Australia's market. This result is contrary to previous studies.

Tarek (2009) analyzes relationship between corporate bond price and liquidity level for Tunisian market from 2004 to 2008. Liquidity level is measured as natural logarithm of issue volume (in mln dinars). Average bond duration is 2.5 years (from 0.2 to 5 years), issue volume varies from 2.3 to 3.4 mln dinars. Each year from the issue date reduces bond spread (between yields of corporate and government bond) by 2.5%, which corresponds to one of the hypotheses. But increase in issue volume by 1 mln dinars leads to increase in bond spread by 10%, this positive relationship contradicts to the other hypothesis.

Dick-Nielsen *et al.* (2012) propose their own liquidity index. They analyze not only influence of liquidity on bond yields, but also elasticity measure and its dynamics in crisis periods. The sample comprises noncallable nonconvertible corporate bonds without put option and with fixed coupon from 2005 to 2009. By the principal component analysis Dick-Nielsen *et al.* (2012) defined the most significant indicator explaining bond yield spread – influence of deals on price. This indicator was first included in integral liquidity index. Then other factors were included in the integral liquidity index: transactions costs and their standard deviation.

Houweling *et al.* (2005) consider different proxies to measure euro corporate bond liquidity (including issued amount, yield volatility, age, listed, etc.). Other sources of risk (interest rate, credit risk, maturity and rating differences) also were controlled. Houweling *et al.* (2005) confirmed significant liquidity premia in bond return for eight liquidity proxies.

Aussenegg *et al.* (2015) analyze monthly excess returns for 23 Euro-denominated corporate bond indices and propose a new specification for bond asset pricing models. They also examine term and default risk factors and liquidity risk. They demonstrate different sensitivities of risk factors before and after recent financial crisis.

## Conclusion

The Russian bond market is one of the biggest in the world by stock exchange trading volume (95% on exchange trading, \$184 billion on the end of 2014). Yield levels in the Russian bond market in 2014-2015 looked attractive to investors, given low return rates in the European and American markets (in euro and dollars). One of the important risk factors that prospective investors should consider is the difference in bond liquidity. Another factor of risk is currency risk.

Liquidity is significantly different for government, municipal and corporate bonds. The share of bond issues with zero trading volume is high (340 from 1118 bond issues in March 2015). Our study analyzes several liquidity projections which can rank differently bond issues when constructing an integral liquidity indicator. Practices of major Russian investment companies in the bond market are compared. The empirical part of this investigation is devoted to testing of the explanatory power and the comparison of the two liquidity indices (the cyclic algorithm) proposed by Thomson Reuters analysts to Russian investors in 2015.

Based on our multi-factor linear regression analysis, we can conclude, that the influence of variables built in liquidity ratios is fairly stable. The objective of our research is to test new Thomson Reuters' integral indices of bond liquidity (TRLI 2015) in the context of explaining the differences in bond returns (YTM) in the Russian market. Among trade volume variables indices based on overall volume (main mode and negotiation deals mode) are preferable. On the whole they exert positive influence on *YTM*. If Thomson Reuters Liquidity Indices are non-zero, the bigger they are, the lower the *YTM*. This fact corresponds to our research expectations and earlier studies. Thus, the first hypothesis is confirmed.

One of the paradoxical results of our research is that bond's *YTM* is lower under zero liquidity ratio. It may be caused by the influence of some unaccounted-for factors both on liquidity and on *YTM*. It follows that zero-liquidity bonds (observations) form a separate group (separate cluster for analysis).

In the Russian bond market, duration and S&P rating also demonstrate stable influence on *YTM* (influence of duration is significantly negative in all regressions). *YTM* values in rating category 0 (AAA, BBB, BBB-) do not differ from those in category 1 (BB+). In other categories *YTM* is higher though differences from category 3 (BB-) are statistically insignificant in some regression model specifications.

The second hypothesis is confirmed: TR indices - *Liq* and *Liq\_w* have different explanatory power. We come to the conclusion that *Liq* index explains the difference in *YTM* of Russian national currency bonds better than the weighted integral index *Liq\_w* (over both samples, one including zero liquidity observations and the other excluding them). It should be noted that although *YTM* decreases with the growth of liquidity, it is lower under zero liquidity than under positive one (this result is paradoxical).

Results of our research of Russian bond market coincide with the results of Amihud and Mendelson (1991), Houweling *et al.* (2005), Dick-Nielsen *et al.* (2012): the liquidity factor significantly affects bond returns (*YTM*) and bonds with less liquidity have a risk premium. Similarly, Chen *et al.* (2007) as well as Ericsson and Renault (2006) show bond illiquidity to be positively correlated with default risk and overall bond volatility.

The new result of our investigation is that bonds with zero liquidity form a special cluster. Contribution of our paper is that we first tested explanatory power of new Thomson Reuters' bond liquidity indices (TRLI) for a large sample of bonds outstanding in the Russian market (1118). The sample includes corporate, government and municipal bonds. The regression analysis results show that the influence of both Thomson Reuters liquidity indices on bond yields is fairly stable.

## References

- [1] Aitken, M., Comerton-Forde, C. (2005). Do reductions in tick sizes influence liquidity? *Accounting & Finance*, 45 (2): 171–184.
- [2] Amihud, Y., Mendelson H. (1991). Liquidity, Maturity, and the Yields on U.S. Treasury Securities. *Journal of Finance*, 46 (4): 1411–1425.
- [3] Amihud, Y., Mendelson, H., Pederson L. (2005). Liquidity and Asset Prices. *Foundations and Trends in Finance*, 1 (4): 269–364. <http://dx.doi.org/10.1561/0500000003>
- [4] Alonso, F., Blanco, R., del Río, A., Sanchis, A. (2004). Estimating Liquidity Premia in the Spanish Government Securities Market. *European Journal of Finance*, 10 (6): 453–474.
- [5] Aussenegg, W., Goetz L., Jelic, R. (2015). Common Factors in the Performance of European Corporate Bonds – Evidence before and after the Financial Crisis. *European Financial Management*, 21(2): 265-308.



- [6] Becaert, G., Harvey, C., Lundblad, C. (2007). Liquidity and Expected Returns: Lessons from Emerging Markets. *The Review of Financial Studies*, 5: 1783-1831.
- [7] Biais, B., Declerk F. (2007). Liquidity, Competition and Price Discovery in the European Corporate Bond Market. Working paper, Toulouse School of Economics. 37 pp.
- [8] Chacko, G. (2006). Liquidity Risks in the Corporate Bond Markets. Working paper, Harvard Business School. 24 pp.
- [9] Chen, J. (2005). Pervasive Liquidity Risk and Asset Pricing, Technical report, Columbia Business School. 23 pp.
- [10] Chen, L., Lesmond, D., Wei J. (2007). Corporate Yield Spreads and Bond Liquidity. *Journal of Finance*, 62: 119–149.
- [11] Chordia, T., Sarkar, A., Subrahmanyam, A. (2005). An Empirical Analysis of Stock and Bond Market Liquidity. *Review of Financial Studies*, 18: 85–129. <http://dx.doi.org/10.1093/rfs/hhi010>
- [12] Chordia, T., Roll, R., Subrahmanyam, A. (2000). Commonality in Liquidity. *Journal of Financial Economics*, 56(1): 3–28.
- [13] Chung, H., Hung, M. (2010). Liquidity spreads in the corporate bond market: Estimation using a semi-parametric model. *Journal of Applied Statistics*, 37: 359–374.
- [14] Collin-Dufresne, P., Goldstein, R.S., Martin, J. (2001). The determinants of credit spread changes. *Journal of Finance*, 56: 2177–2207.
- [15] Díaz, A., Merrick, J., Navarro, E. (2006). Spanish Treasury Bond Market Liquidity and Volatility pre- and post- European Monetary Union. *Journal of Banking and Finance*, 30: 1309–1332.
- [16] Dick-Nielsen, J., Feldhutter, P., Lando, F. (2012). Corporate bond liquidity before and after the onset of the subprime crisis. *Journal of Financial Economics*, 103: 471-492.
- [17] Dimson, E., Hanke, B. (2004). The expected illiquidity premium: Evidence from Equity Index–Linked Bonds. *Review of Finance*, 8: 19–47. <http://dx.doi.org/10.1023/B:EUFI.0000022156.50605.a6>
- [18] Ericsson J., Renault O. (2006). Liquidity and Credit Risk. *The Journal of Finance*, 61(5): 2219-2250.
- [19] Han, S., Zhou H. (2006). Nondefault Bond Spread and Market Trading Liquidity. Working paper, Federal Reserve Bank, 35 pp.
- [20] Houweling, P., Mentink A., Vorst T. (2005). Comparing possible proxies of corporate bond liquidity. *Journal of Banking and Finance*, 29: 1331–1358.
- [21] Kempf, A., Uhrig–Homburg, M. (2000). Liquidity and its impact on bond price. *Business Review*, 52: 26–44.
- [22] Korajczyk, R., Sadka, R. (2007). Pricing the Commonality across Alternative Measures of Liquidity. Technical Report, Northwestern. 41 pp.
- [23] Lawrence, E., Piwowar, M. (2006). Secondary Trading Costs in the Municipal Bond Market. *The Journal of Finance*, 61(3): 1361–1397.
- [24] Lepone, A., Wong, B. (2009). Determinants of Credit Spread Changes: Evidence from the Australian Bond Market. *Australian Accounting Business and Finance Journal*, 2: 26-35.
- [25] Lesmond, D. (2005). Liquidity of Emerging Markets. *Journal of Financial Economics*, 77: 411–452.
- [26] Longstaff, F., Mithal S., Neis E. (2005). Corporate Yield Spreads: Default Risk or Liquidity? New Evidence from the Credit–Default Swap Market. *The Journal of Finance*, 60: 2213–2253.
- [27] Nashikkar, A., Mahanti, S., Subrahmanyam, M., Chacko, G., Mallik, G. (2008). Latent Liquidity: A New Measure of Liquidity, with an Application to Corporate Bonds. *Journal of Financial Economics*, 88(2): 272–298.
- [28] Pastor, L., Stambaugh, R. (2003). *Liquidity Risk and Expected Stock Returns*. *The Journal of Political Economy*, 111(3): 642-685.

- [29] Ranaldo, A. (2001). Intraday Market Liquidity on the Swiss Stock Exchange. *Financial Markets and Portfolio Management*, 15(3): 309–327.
- [30] Sarr, A., Lybec, T. (2002). Measuring Liquidity in Financial Markets. Working paper WP/02/232, IMF. 64 pp.
- [31] Schultz, P. (2001). Corporate Bond Trading Costs And Practices: A Peek Behind the Curtain. *Journal of Finance*, 56(2): 677—698.
- [32] Tarek, C. (2009). Default, Liquidity and Credit Spread: Empirical Evidence from Structural Model. *The Icfai University Journal of Financial Risk Management*, VI(2): 45-60.
- [33] Teplova, T., Sokolova, T. (2014). Post-Crisis Tendencies in the Bond Market. *Finance and Credit*, 25(601): 2-15, (in Russian).
- [34] Tychon, P., Vannetelbosch, V. (2005). A model of Corporate Bond Pricing with Liquidity and Marketability Risk, *Journal of Credit Risk*, 1: 1–36. <http://dx.doi.org/10.1111/j.1540-6261.2005.00797.x>
- \*\*\* Dokhod Analyst Report (Bonds) [in Rus.] (2007). 15 p. <http://www.dohod.ru/ik/analytics/bonds/>
- \*\*\* Dokhod Methodology of Bond Liquidity Measurement (2006). 2 p. <http://www.dohod.ru/ik/analytics/bonds/methodology.pdf>
- \*\*\* Eltra Invest Company Analyst Report (2007). <http://www.eltrast.ru/>
- \*\*\* Financial Stability Report. (2007). Bank of England. London: Park Communications Ltd, 66 p.
- \*\*\* Financial Stability Review / European Central Bank. (2007). [www.ecb.int/pub/pdf/other/financialstabilityreview200706en.pdf](http://www.ecb.int/pub/pdf/other/financialstabilityreview200706en.pdf)
- \*\*\* Gazprombank Indicators of Bond Market (2015). [http://fmlab.hse.ru/data/2015/10/09/1077605698/GBP\\_Tech\\_Indicator\\_20150430%281%29.pdf](http://fmlab.hse.ru/data/2015/10/09/1077605698/GBP_Tech_Indicator_20150430%281%29.pdf)
- \*\*\* Gazprombank Methodology of Liquidity Measurement (2012). 5 p. [http://www.gazprombank.ru/upload/iblock/613/gpb\\_liquidity%20indicator.pdf](http://www.gazprombank.ru/upload/iblock/613/gpb_liquidity%20indicator.pdf)
- \*\*\* Micex Report for Bond Market Liquidity [in Rus.] (2003). [http://old.micex.ru/off-line/analyticsdocs/review\\_612.doc](http://old.micex.ru/off-line/analyticsdocs/review_612.doc)
- \*\*\* Micex Rules for Index Calculation. (2009). 16 p. <http://moex.com/>
- \*\*\* NOMOS Bank Analyst Report. Ruble Bonds Liquidity Rating. (2005). <http://bonds.finam.ru/comments/item104B7/default.asp>
- \*\*\* Renaissance Capital Analyst Report. Ruble Bonds: Where Does Liquidity Live? [in Rus.] (2006). 24 p. [http://st.finam.ru/ipo/comments/Liquidity\\_analysis\\_13July%281%29.pdf](http://st.finam.ru/ipo/comments/Liquidity_analysis_13July%281%29.pdf)
- \*\*\* TRUST Bank Analyst Report (Bonds). Liquidity Measurement – A New Approach. (2007). 30 p. <http://data.cbonds.info/comments/28525/Likvid.pdf>
- \*\*\* Zenith Bank Analyst Report (Bonds). Liquidity Measurement (2009). <http://www.zenit.ru/rus/investment-banking/analytical-support/index.wbp>

## Statistical Research on Spatial Differentiation of the Innovation System of the Russian Federation

Dashi DASHANIMAEVICH TSYRENOV  
Buryat State University, Ulan-Ude, Russia  
[dashi555@mail.ru](mailto:dashi555@mail.ru)

Irina SERGEEVNA MUNKUEVA  
Buryat State University, Ulan-Ude, Russia  
[mishka81@yandex.ru](mailto:mishka81@yandex.ru)

Elena BUYANTUEVNA DONDOKOVA  
East Siberia State University of Technology and Management, Ulan-Ude, Russia  
[dondokovae60@mail.ru](mailto:dondokovae60@mail.ru)

Bayanzhargal BALZHINIMAEVICH SHARALDAYEV  
East Siberia State University of Technology and Management, Ulan-Ude, Russia  
[baikal\\_garant@mail.ru](mailto:baikal_garant@mail.ru)

Lyubov ANIKEEVNA GORYUNOVA  
East Siberia State University of Technology and Management, Ulan-Ude, Russia  
[lugorian@mail.ru](mailto:lugorian@mail.ru)

### Abstract

*Global changes in the production technologies of goods and services are connected with the development of the innovation system. Spatial differentiation plays an important role for the Russian Federation. It is associated with the inhomogeneous distribution of economic activity and the historically formed structure of the economy, which ultimately determine the inhomogeneity of the economic space and in the spatial differentiation of the innovation system as well. A presented method for evaluating and analysing the structure of the innovation system by region confirms a significant inhomogeneity of the Russian Federation subjects in terms of expenditures on technological innovations of organizations. The article presents the application areas of statistical tools for levelling the impact of economies of scale of the regions with excess expenditures. We proposed measures aimed at overcoming adverse conditions and barriers for the transition of the national economy to the knowledge-model within the innovation system.*

**Key words:** innovation system, knowledge economy, post-industrial society, spatial differentiation.

**JEL Classification:** O32, D83, O14.

### Introduction

Modernization and innovation development are crucial directions, the directions that determine changes in the socio-economic system of the Russian Federation. It is the state of the innovation system that determines the efficiency of the national economy, creates potential possibilities and determines long-term horizons of growth and development of the region' economy at the regional level. The potential of the innovation system becomes a determining factor in the creation of new and unique products and services, technologies and management practices, which in turn serves as a basis for increasing the competitiveness of economic subjects. (Potapov and Atanov 2010)

The development of an innovative system is associated with social and economic development of the society, features of the demographic situation in the country. Development and implementation of measures aimed at improving the innovation system should be based on the analytical model that allows getting the long-term forecast for the given parameters of development. Drawing up the analytical model of the innovation system requires a high-quality statistical data, development of the data processing technology, accounting for spatial features of the innovative development by the RF regions. In this regard, elaboration of the statistical research methodology for the status and development of the innovation system, as well as spatial differences, specific to the subjects of the Russian Federation, which influence the long-term sustainability of the system, becomes particularly relevant.

A peculiarity of the Russian Federation, which must be taken into account, when carrying out a statistical research on the innovation system, is the incomparability of the conditions for the social and economic development of individual areas: natural and climatic conditions, availability of natural resources, transport accessibility. (Sadykova and Ochirova 2014)



Specified circumstances contribute to the urgency of finding ways to implement the strategy of innovations production and to improve the competitiveness of economic entities and regions based on that, which ultimately would lead to a decrease in the spatial differentiation by regions in terms of the innovation system development.

Application of the "innovation" concept became widespread in the transitional economy of Russia. The application of the concept is associated with the designated concept of related notions: innovative solution, innovation process, innovation system, innovation etc. Modern theorists and practitioners of economics commonly refer to innovations as to the final result, which is implemented as: 1) new or improved product or service; 2) new or improved technological process. On the contrary, western researchers adhere more to the process approach more often. (Baranova 2012) From the point of view of the "result" approach, the term "innovation" is identical to the term "innovative product". On the contrary, from the point of view of the process approach, an innovation activity is an implementation of practical steps in the areas related to achieving innovation goals, i.e. introduction of new goods or services into production. It is also important to note that in its essence both of them are a process, however, it is the process of innovation that serves as a result of innovation activity. (Slepneva 2013)

At an early stage, the result of the innovation process is primarily new unique knowledge (which is implemented as fundamental, basic technologies). At the next stage, a prototype or a trial model serves as a result of the innovation process. At the third, final stage, the result of innovation is the documentation that provides the state registration of intellectual property rights for single or mass production. Thus, each company is not only interested in selling the created unique product or service, but also in the ability to use the results of the innovation process by selling these results as a commodity. (Beck 1992)

We selected specific features of the innovation activity that underpin the innovation system: uncertainty in the future and a related time lag between the creation and application of innovations; discrepancy between public and private effects; asymmetry of information, available to researchers, potential investors, consumers; substantial investment risks; strict requirements to recruitment and the state of a quality management system. It is important to note that peculiarities of the innovation activity may differ even for enterprises, operating in the same industry or in the same area. A part of enterprises is engaged exclusively in innovation projects (including the development and introduction of a new product or service); others mainly make changes to existing products or services, manufacturing operations and processes.

## Conclusion

Innovative activity of economic entities and their potential opportunities are important subjects for identification and analysis. At the level of the regional economy, there is a number of problems that are associated, primarily, with the presence of significant spatial differentiation of the innovation system of the Russian Federation.

Objective reasons associated with the inhomogeneous distribution of economic activity, historically formed economic structure, which ultimately determine the inhomogeneity of the economic space, underpin the differentiation of the RF subjects in terms of the innovation system development.

It is determined that the innovation activity features are the following: uncertainty in the future and a time lag between the creation and application of innovations, which arises from the former; discrepancy between public and private effects; asymmetry of information, available to researchers, potential investors, consumers; substantial investment risks; strict requirements to recruitment and the state of a quality management system.

The presented method for evaluating and analysing the structure of the innovation system by region confirms a significant inhomogeneity of the Russian Federation subjects in terms of expenditures on technological innovations of organizations. To ensure proper distribution of the studied indicator, its values are converted by taking logarithms. The value of  $\chi^2$  - criterion, calculated for the hypothesis on the correspondence of the test indicator distribution to the lognormal distribution, is in the confidence region. Converted values of the indicator correspond to the normal distribution law.

The proposed method for regions classification allows obtaining the distribution values of the expenditure indicator of technological innovation, in accordance with the normal law, that is, taking into account the differentiation of regions with median expenditures to a greater degree. The centre of statistical grouping shifted from the average to the median value. The impact of the economies of scale of regions with excess expenditures is levelled.

The resulting classification of regions allows us to formulate proposals for further development of the innovation system of the Russian Federation at the regional level, taking into account the unique features inherent in each subject.

We determined basic contradictions and problems on the way to further development of the innovation system and construction of the Russian model of the knowledge economy. We proposed measures aimed at overcoming adverse conditions and barriers for the transition of the national economy to the knowledge-model within the innovation system. It is noted that such and similar state actions will contribute to further expansion of the innovation system.

## Acknowledgement

The work was carried out as part of the research work No. 3790 within the basic part of the state task of the Ministry of education and science of the Russian Federation in the field of scientific activity on the instructions No. 312/2015 for 2015. This work was supported by the BSU grant for young scientists 2015.

## References

- [1] Antohonova, I.V. (2014). Research on the regularities of territorial transformations in the recent economic history of Russian regions. *Issues of Statistics*, 9: 36-40.
- [2] Atanov, N.I., Potapov, L.V. (2013). The tendency in the socio-economic development of the Republic of Buryatia among 83 subjects of the Russian Federation. *Bulletin of the Buryat Scientific Centre of the Siberian Branch of the Russian Academy of Sciences*, 4: 178-184.
- [3] Badlueva, M.P., Ayurzanayn, A.B. (2015). The role of creative economy in the development of the socio-economic system in the region in modern conditions. *Bulletin of the Buryat State University*, 2(1): 30-39.
- [4] Baginova, V.M., Nikolaeva, A.G. (2012). The cluster approach in the strategy of innovative regional development. *Bulletin of the Tambov University. Series: Humanities*, 3(107): 49-53.
- [5] Baranova, E.S. (2012). The ratio of categories in innovations research. *Bulletin of the Trans-Baikal State University*, 2: 125-128.
- [6] Beck, N. (1992). *Shifting Gears: Thriving in the New Economy*. Toronto: Harper Collins Publishers.
- [7] Belomestnov, V.G. (2012). Innovative industrial policy of the region. *Economics, Statistics and Informatics. Bulletin of ERO*, 3: 19-22.

- [8] Chikov, M.V. (2013). The institutional mechanism of interaction between the government and large corporations as a factor in their innovative behaviour. *Bulletin of the Tomsk State University. Economics*, 1(21): 47-54.
- [9] Egorova, S.V., Osodoeva, O.A., Vanchikova, E.N. (2014). The methodical approach to the assessment of regional economic development. *Proceedings of the St. Petersburg State University of Economics*, 4: 65-72.
- [10] Garicano, L. (2000). Hierarchies and the Organization of Knowledge in Production. *Journal of Political Economy*, CVIII, 874-904.
- [11] Khokhlova, O.A. (2005). The methodological aspect of the study on structural changes in the economy of the region. *Regional Studies*, 4: 83-99.
- [12] Munkueva, I.S. (2014). Knowledge as the most productive resource of the innovation economy. *Bulletin of the Buryat State University*, 2: 26-28.
- [13] Potapov, L.V., Atanov, N.I. (2010). Modernization, innovation and strategizing of the spatial development of the Russian economy. *Spatial Economics*, 4: 154-162.
- [14] Sadykova, E.T., Ochirova, G.Y. (2014). Resource assessment of the innovative potential of the region. *Fundamental Research*, 12-8: 1712-1716.
- [15] Saktoev, V.E., Haltaeva, S.R. (2011). State innovation policy: implementation mechanism. *Russian Entrepreneurship*, 4-2: 26-30.
- [16] Slepneva, Y.V. (2013). Assessment of the innovative development conditions of the regions. *Creative Economy*, 2: 119-125.
- [17] Tsyrenov, D.D. (2014). Assessment of the cognitive potential of the regional economy under the conditions of the knowledge economy. *Fundamental Research*, 3-4: 805-809.
- [18] Tsyrenov, D.D., Biliktueva, G.D. (2014). Statistical evaluation development of the cognitive asymmetry of the Siberian Federal District regions by the human capital level. *Scientific Bulletin of Omsk*, 3(129): 51-54.
- [19] Verkhovets, O.A., Puzina, N.V. (2007). Innovation activity of enterprises (on the example of the Omsk region). *ECO*, 3: 112-122.
- \*\*\* Information Society Commission. (2002). Building the Knowledge Society – report to government. Dublin: Information Society Commission.

## Investors' Perspicacity of Risk Associated with Gold Exchange Traded Fund in India

R. AMUDHA

School of Management, SASTRA University, Thanjavur  
[amudha@mba.sastra.edu](mailto:amudha@mba.sastra.edu)

CRESENTA SHAKILA MOTHA

Training and Placement, SASTRA University, Thanjavur  
[cresenta@sastra.edu](mailto:cresenta@sastra.edu)

S. SELVABASKAR

School of Management, SASTRA University, Thanjavur  
[selvabaskar@mba.sastra.edu](mailto:selvabaskar@mba.sastra.edu)

R. ALAMELU

School of Management, SASTRA University, Thanjavur  
[alamelu@mba.sastra.edu](mailto:alamelu@mba.sastra.edu)

S.T. SURULIVEL

School of Management, SASTRA University, Thanjavur  
[surulivel\\_st@yahoo.com](mailto:surulivel_st@yahoo.com)

### Abstract

*In India, Gold is a preferred asset for its liquidity and appreciation in value. It can also be used against inflation and this glittering metal provides stable returns and easy marketability to the investors. Though conventional investment options like jewellery, gold bars and coins still exist, the people also prefer GETF. Gold Exchange Traded Funds (GETF) is another effective way to invest in the yellow metal and it is safest investment than all others. Primary data were collected from the investors who are already trading in equity shares and Gold ETFs and the secondary data were collected from NSE website for ranking the companies based on their NAVs and offers gold exchange traded fund (GETF). The investors' behaviour on GETF is analysed by using tools like percentage analysis and Chi – Square Test. The study has also focused on the risk associated with return based on the Beta value and risk measuring tools like Sharpe ratio, Treynor ratio and Jensen – Alpha Measure. From the analysis, it is found that the investors are willing to purchase gold in the form of jewels, gold bars and others from retailers only, even though they are not much aware about the purity and other risks involved in the same. When purchasing gold in the form of jewels, gold bars, the investors may lose their value for money at the time of purchase and also during exchange. The investors who invest their money in gold for their future purposes are willing to invest in GETF. Finally, it is concluded that the investors may invest in GETF for their additional investment with the mutual fund companies which offers this type scheme by creating proper awareness about GETF to the investors.*

**Key words:** Exchange Traded Fund (ETF), Gold, Gold Exchange Traded Fund (GETF), Net Asset Value (VAN).

**JEL Classification:** G11, G20

### Introduction

Exchange traded funds (ETF) can be dealt in stock exchanges like common stocks and it facilitates the investors with the diversification of a mutual fund. ETFs are not directly sold to the investors and it is issued as a sponsor of underlying assets which are known as creation units. These units are bought by the authorised participants, known as market makers, specialist or institutional investors and place them in a trust. These authorised participants divide these creation units into ETF shares. These ETF shares will have a legal claim over the assets in the creation unit and then ETF shares are dealt in the secondary market at a premium or a discount to its actual worth. The distinction between the ETF and a unit of an open-ended mutual fund is that the units of ETF can be traded during market timings and units can be sold short like other securities.

In India, gold is treated as not only a precious metal but also it has emotional connectivity. India is one of the largest consumers of gold. In India, Gold is a preferred asset for its liquidity and appreciation in value. It can also be used against inflation and this glittering metal provides stable returns and easy marketability to the investors. Though conventional investment options like jewellery, gold bars and coins still exist, the people also prefer GETF. Gold Exchange Traded Funds (GETF) is another effective way to invest in the yellow metal and it is safest investment than all others. In comparison with asset classes, gold is considered the most powerful investment as it responds to the rates of inflation and exchange rate fluctuations. Investing gold through ETF is the best decision to be made by the investors because these funds can be traded closely with the price of physical gold without the carrying cost of physical gold. Every ETF unit consist of gold weight of one gram in a

demat form. Gold ETF can be invested by an investor by having an online trading account with any registered broker.

#### Literature review

Saranya *et al.* (2014) have revealed that GETFs help the investors to invest in 99.5% pure gold which are listed in stock exchanges and one unit of fund represents one gram of gold. James M. Poterba and John B. Shoven (2002) have concluded that ETFs provide tax paying investors a way of having a widened range of stocks that carry returns compared to low-cost index funds. Prashanta Athma and Mamatha (2013) have stated that ETFs exhibit an improved performance when compared with Index funds showing an enhanced potential for ETFs. Leonard Kostovetsky (2003) has revealed that ETFs are suited for large investors and these can be better utilised by long-term retail investors. Lixia Wang and Iftikhar Hussain (2010) have stated that GETF is preferred because of its security in storage, convenience in transaction and transparency in transactions. Fuhr (2001) has stated that ETFs are prosperous type of securities which helps the investors to deal the portfolio basically and quickly in a one transaction. Lin *et al.* (2006) have revealed that ETFs provides the benefits of diversification in portfolio without in high transaction costs to the investors. Ferri (2007) has said that ETFs are dealt as similar to stocks through registered brokers on a stock market. Swathy M. and Krishna Reddy B. (2014) have stated that GETF are having higher market share compared to Equity ETFs and they have also suggested that the investors should aim to receive the benefits of portfolio diversification by investing in ETFs. Prashanta Atma and Mamatha B (2012) have revealed that investors are more attracted by GETFs because of its low costs, tax efficiency and similarity to stock's features. Senthil Kumar *et al.* (2012) have found that the modern investors are purchasing gold ingots or they trade in e-gold. They have also stated that gold is the proven asset diversifier in the investment portfolio which in turn decreases the risk of the general portfolio by and large.

### Suggestion and conclusion

The unpredictability in prices of gold is not as much of as compared to the equities market which inspires assurance in the mindset of the investors to possess gold confirming it to be a well-built asset category. The investors may invest in Quantum Gold ETF fund, because every fund has 1gram of gold as 1 unit but Quantum fund is having an half gram of gold as 1 unit, thus can be easily bought and sold in the market. Quantum Gold ETF expense ratio is low when compared to other funds. Only the few mutual fund companies offer the Gold ETF's in the market and there are more number of mutual fund companies will emerge in future offer in India. Gold ETF will be a safe investment rather than buying the gold in physical form as they have to face some problems like wastage, service charge, tax and security. Initiatives are to be taken by the Mutual Funds companies offering Gold ETFs, Government, SEBI and the Members of the Stock Exchanges to create awareness among the investors.

From the observation on gold exchange traded fund (GETF) in India, the investors are willing to purchase gold in the form of jewellery, gold bars and others from retailers only, even though they are not much aware about the purity and other risks involved in that. When buying of physical gold is compared with GETF, investors may lose their value for money at the time of purchase and also during exchange. The investors who are investing their money in gold for their future purposes are willing to invest in GETF. Finally, it is found that, the investors may invest in GETF for their additional investment if the mutual fund companies offer this type scheme by creating proper awareness about GETF to the investors.

### Acknowledgement

The authors would like to thank Mr. M. Ganesan, Research Student, School of Management, SASTRA University, Thanjavur, India for his incredible contribution in data collection.

### References:

- [1] Ferri, A.R. (2007). Defining ETFs, *The ETF Book All You Need to know about Exchange Traded Funds*, p XVII.
- [2] Fuhr, D. (2001). Exchange Traded Funds: A Primer, *Journal of Asset Management*, 2(3): 260-273.
- [3] Poterba, J.M., Shoven, J.B. (2002). Exchange Traded Funds: A new investment option for taxable investors, NBER working Paper No. 8781, February 2002.
- [4] Kostovetsky, L. (2003). Index mutual funds and Exchange traded funds, *The Journal of Portfolio Management*, 29(4): 80-92.
- [5] Lin, C.C., Chan, S.J., Hsu, H. (2006). Pricing efficiency of exchange traded funds in Taiwan, *Journal of Asset Management*, 7(1): 60-68.
- [6] Lixia, W., Iftikhar H. (2010). Gold Exchange Traded Funds: Current Developments and Future Prospects in China, *Asian Social Science*, 6(7): 119-125.
- [7] Prashanta, A., Mamatha B. (2013). Index Funds vs. ETFS in India – A comparative study, *International Journal of Research in IT, Management and Engineering*, 3(5): 55-62.
- [8] Prashanta, A., Mamatha B. (2012). ETFs Vs Index funds in India: Growth and progress, *Arth Prabandh: A Journal of Economics and Management*, 1(4): 54-65.
- [9] Saranya, P.B, Vimala Sand Saranya R. (2014). A study on Gold ETFs performance in India, *Indian Journal of Applied Research*, 4(6): 1-4.
- [10] Senthil Kumar K, Vijayabanu, C., Amudha, R. (2012). An evidence-based investigation into the implications of socio-economic factors for private investment decision-making in the context of India, *Investment Management and Financial Innovations*, 9(1): 126-136.
- [11] Swathy, M., Krishna Reddy B. (2014). An evaluation of exchange traded funds, Osmania University. <http://hdl.handle.net/10603/40042> (Accessed on 7-7-15)

\*\*\* [http://portal.amfiindia.com/NavHistoryReport\\_Frm.aspx](http://portal.amfiindia.com/NavHistoryReport_Frm.aspx) (Data fetched from Nov – 2010 to Mar – 2014)



## Volatility Spillovers and Contagion in Emerging Europe

Konstantin ASATUROV  
Department of Finance  
National Research University – Higher School of Economics  
[kgasaturov@edu.hse.ru](mailto:kgasaturov@edu.hse.ru)

Tamara TEPLOVA  
Department of Finance  
National Research University – Higher School of Economics  
[toma@sani-k.ru](mailto:toma@sani-k.ru)

Christopher A. HARTWELL  
Department of International Management  
Kozminski University  
[chartwell@kozminski.edu.pl](mailto:chartwell@kozminski.edu.pl)

### Abstract:

*What is the relationship between the two largest emerging financial markets of Eastern Europe, Russia and Poland, and how do they impact the region's stock markets? The purpose of this paper is to examine the role of these two countries in regional volatility by examining their effect on two separate phenomena: financial volatility, defined here as long-term interrelations, and contagion, a more short-term phenomenon. Utilizing bivariate DCC-GARCH modeling, this paper estimates long-term volatility spillover effects and short-term contagion effects and their origins during several periods of financial crisis in the Central and Eastern European region. Our results show that the long-term impact of volatility in the Russian market is much more substantial than that of Poland in Central and Eastern Europe, with this disparate impact corresponding to each country's level of market capitalization. Additionally, our results show that Russia served as a source of short-term contagion for neighboring countries during its banking crisis in 2004 and during the Russian stock market fall in 2008. Poland had comparatively less effect on the region during the Global Financial Crisis. Moreover, the entrance of Poland into the European Union in May 2004 had no impact on stock markets in the region in terms of enhancing contagion.*

**Keywords:** DCC- GARCH, volatility spillovers, contagion, Poland, Russia.

**JEL Classification:** C58, E44, G01, G15.

### Introduction

Long-term interaction amongst, and short-term contagion between, global financial markets appears to have increased in recent years, mainly due to the greater integration of real economies via international trade and labor and capital market liberalization. Early research on financial volatility showed the existence of these interrelationships between international and local equity markets (including King and Wadhvani 1990; Hamao, Masulis and Ng 1990; Neumark, Tinsley and Tosini 1991; Von Furstenberg and Jeon 1989) using techniques such as cross-correlations analysis (Lin, Engle and Ito 1994) or cointegration analysis (Richards 1995). Later extensions to this work utilized more sophisticated volatility modeling techniques including vector autoregression (VAR) or generalized autoregressive conditional heteroskedasticity (GARCH) models, as well as focusing on the integration of developed country markets or discrete groupings of countries. In particular, work such as Liao and Williams (2004) and Booth and Ciner (2005) found that German markets are a key source of volatility for European financial markets, while US volatility affected nearly all global stock markets, including the UK (Tanizaki and Hamori 2009) and the rest of Europe (Dhesi and Xiao 2010).

However, much of the attention paid to the issue of market integration has focused exclusively on volatility spillover effects in-between developed markets (Liao and Williams 2004, Syriopoulos 2007, Theodossiou and Lee 1993, Karolyiet and Stulz 1996) with a comparatively less (but still robust) emphasis on the transmission of volatility from developed to developing economies (recent work includes Chiang, Jeon and Li (2007) for a comprehensive analysis of spillover from mature to emerging markets, Booth and Ciner (2005) and Martinez and Ramirez (2011) for research focused on Latin America).

To our knowledge, there are far fewer pieces that apply the same econometric rigor to testing volatility and contagion between emerging markets (Cho and Parhizgari (2008) and Barassi, Dickinson and Le (2012) are notable exceptions that touch on this issue, while Syllignakis and Kouretas (2011) is of special interest to us). Noting this hole in the literature, this paper aims to expand our knowledge of financial markets linkages to examine the integration between emerging markets that display similar attributes to the developed-developing



dynamic proven elsewhere. In particular, we examine the financial linkages created by the two largest emerging markets in Eastern Europe, Poland and Russia, and their effects on the financial space in Central and Eastern Europe. Our main hypothesis is that Russia and Poland, as the markets with the biggest capitalization in this geographic region, should behave in the same manner as large and distant developed markets, acting as a source of volatility and contagion for other, smaller markets in the area. This hypothesis has been somewhat tested before in the extant literature for Russia (Syllignakis and Kouretas 2011), but work incorporating Poland is non-existent.

A second key contribution of this paper builds on Hamao *et al.* (1990) and Kaminsky and Reinhart (2008) to model volatility spillover effects and contagion as two separate phenomena with very different time-frames. In our estimation, volatility spillover effects reflect *long-term* stable links between various markets, or the reflection of interconnections that already have been built over time. Conversely, contagion effects are symptomatic of *short-term* effects, induced by exogenous economic shocks and possibly unrelated to prior interactions. Our analysis will thus focus on the identification of the two separate effects based on their time component, and provide a deeper understanding of the effects of Poland and Russia in the region. Moreover, the data we employ here stretches throughout several crisis periods, allowing us to examine after-crisis links, expanding previous research results regarding volatility transmission. Here as well, we are not aware of any prior research that explores these two separate phenomena in the context of Russia and Poland.

For this exercise, we follow from a wealth of prior literature devoted to contagion effects, including those on stock markets (Forbes and Rigobon 2002), currency markets (Nagayasu 2001), bonds and derivatives markets (Gravelle, Kichian and Morley 2006; Tai 2003) and different types of markets, particularly, among stock and currency markets within one country and on a global scale (Dungey, Fry, Gonzalez-Hermosillo and Martin 2006; Ito and Hashimoto 2005). However, in trying to evaluate contagion effects, researchers find difficulties in specifying the correct test for identification of these effects; this is mainly due to the fact that market correlations are strongly linked to volatility correlations, which can intensify due to increasing market variance during turmoil periods, but do not indicate a real reinforcement of the underlying links between markets. Methods of identifying contagion effects proposed in the previous literature are diverse, with the most popular being cross-correlation analysis (Longin and Solnik 1995), univariate GARCH and volatility interconnections analysis (Theodossiou and Lee 1993; Karolyi and Stulz 1996), probit and logit models (Eichengreen, Rose and Wyplosz 1996), conditional correlation calculation (Forbes and Rigobon 2002, Corsetti, Pericoli and Sbracia 2005), and Markov regime-switching models (Fratzscher 2003, Mandilaras and Graham 2010). Another econometric stumbling block encountered is that, even having quantitatively estimated contagion effects, previous work has been hampered by an inability to define which market is a source of contagion and which has its own internal sources of volatility.

Our own work (Asaturov and Teplova 2014) has already touched upon volatility spillover effects among key international markets, including in emerging Europe. In this previous work, we estimated the key sources of volatility of globally, which allowed for understanding the transmission mechanisms of shocks via both volatility spillover channels. In distinction to this earlier work, this current paper focuses exclusively on emerging Europe to identify particular events which may have significant effect on the markets in the region. Thus, the paper builds on our previous work to further examine the financial interrelationships in the region.

In particular, this paper will tackle the issues of volatility and contagion in a manner similar to Barassi *et al.* (2012) and Cho and Parhizgari (2008), through utilization of an ARMA-DCC-GARCH model on daily stock market data from Poland, Russia and the countries of Central and Eastern Europe. The nature of stock market data creates difficulties in normal econometric estimation, due to pervasive serial correlation issues and conditional heteroscedasticity (Chiang *et al.* 2007) and the GARCH family of models can account for these difficulties. In terms of our research question, the ARMA-DCC-GARCH model is able to simultaneously identify volatility spillover effects and contagion effects due to dynamic conditional correlation analysis; its main advantage is that it takes into account conditional information, which is essential for calculating volatility and correlations (Baillie and Myers 1991).

Given that we would expect to see these two effects at their strongest during times of turmoil in either stock market, this paper will accordingly examine the existence of financial contagion between the two large markets of Poland and Russia and other financial markets by separating out particularly tumultuous times and relatively "tranquil" periods. For the crisis times, we will concentrate on the periods of the Russian banking crisis of 2004, the entrance of Poland into the European Union in May of 2004, the global financial crisis of 2007-2009, and the specific financial crisis in Russia from 2008-2010; specifically, we test whether the Russian market was a source of contagion for the countries of Central and Eastern Europe during the Russian banking crisis of 2004

and the global financial crisis, and whether the Polish market had volatility or contagion effects during global financial crisis and after the accession of Poland into the European Union in May 2004.

Our paper is structured in the following manner: the next section will offer a brief review of the literature on financial market connections, while Section 3 will lay out our hypotheses and Section 4 will explore the DCC-GARCH model and tests for contagion. Section 5 will explore the results of the influence of Russia and Poland on the Central and Eastern European equity markets, while Section 6 concludes.

## Conclusion

This paper examined the transmission of volatility and contagion among equity markets of Central and Eastern European region with Russia and Poland assumed to be a volatility and contagion source in the area. Using a bivariate DCC-GARCH model, we estimated volatility spillover effects and dynamic conditional correlation among European emerging markets from January 2001 to December 2012, with a focus on the effects among the countries of Central and Eastern Europe. Our results show that the influence of Russian market volatility appears to exceed the influence of the Polish market in the Central and Eastern European region, which corresponds to the level of their market capitalization. This also appears to prove the results of Ramaprasad and Nikolova (2009) and Saleem (2009) about the influence of the Russian market in Europe, as well as the conclusions of Syriopoulos (2007) concerning the presence of volatility interconnections among the emerging markets.

Moreover, in a first for the literature, our analysis also revealed contagion effects from the Russian and Polish stock markets for the Central and Eastern European countries during the Russian stock market crash of 2008 and the global financial crisis. However, the accession of Poland to the EU had no effect on the other markets.

In our view, the results of this study contribute to a deeper understanding of the stock market interrelationships in the global economy. In particular, they shed light on the volatility and contagion transmission linkages in the Central and Eastern Europe. Our findings can help investors, asset management companies, international banks, and investment funds who are seeking portfolio diversification in the region, in regards to the extent of interconnections among key stock indices and emerging markets. We think further research can continue this analysis as regional shocks (such as Ukraine) continue to develop our knowledge about both volatility spillovers and contagion. Thus, a full comprehension of the formation of links in the global economy and particularly in Central and Eastern European region may help to reduce investment risks, as well as allows financial regulators to carry out appropriate politics.

## References

- [1] Achsani, N.A., Strohe, H.G. (2004). Dynamic causal links between the Russian stock exchange and selected international stock markets. *Economic Opening Up and Growth in Russia*, 91-111.
- [2] Asaturov, K., Teplova, T. (2014). Volatility Transmission Across Equity Markets: Did the Relationships Hold During the Global Financial Crisis? *World Applied Science Journal*, 29(12): 1497-1515.
- [3] Baillie, R., Myers, R. (1991). Bivariate GARCH estimation of the optimal commodity futures hedge. *Journal of Econometrics*, 6: 109 – 124.
- [4] Barassi, M.R., Dickinson, D.G., Le, T.T. (2012). TDCC GARCH modeling of volatilities and correlations of emerging stock markets. Proceedings from 7<sup>th</sup> RES PhD Meeting Conference 2012.
- [5] Booth, G.G., Ciner, C. (2005). German dominance in the European monetary system: A reprise using robust Wald tests. *Applied Economics Letters*, 12: 463-466.
- [6] Caporale, M.G., Spagnolo, N. (2011). Stock market integration between three CEECs, Russia and the UK. *Review of International Economics*, 19(1): 158-169.
- [7] Chiang, T.C., Jeon, B.N., Li, H.M. (2007). Dynamic correlation analysis of financial contagion: evidence from Asian markets. *Journal of International Money and Finance*, 26: 1206–1228.
- [8] Cho, J.H., Parhizgari, A.M. (2008). East Asian financial contagion under DCC-GARCH. *International Journal of Banking and Finance*, 6(1): 17-30.
- [9] Corsetti, G., Pericoli, M., Sbracia, M. (2005). Some contagion, some interdependence: more pitfalls in tests of financial contagion. *Journal of International Money and Finance*, 24: 1177–1199.
- [10] Dhesi, G., Xiao, L. (2010). Volatility spillover and time-varying conditional correlation between the European and US stock markets. *Global Economy and Finance Journal*, 3(2): 148-164.
- [11] Dungey, M., Fry, R., Gonzales-Hermosillo, B., Martin, V. (2006). Contagion in international bond markets during the Russian and the LTCM crises. *Journal of Financial Stability*, 2(1): 1-27.
- [12] Eichengreen, B., Rose, A.K., Wyplosz, C. (1996). Contagious currency crises: First tests. *Scandinavian Journal of Economics*, 98(4): 463–484.

- [13] Engle, R. (2002). Dynamic conditional correlation: A simple class of multivariate generalized autoregressive conditional heteroskedasticity models. *Journal of Business and Economic Statistics*, 20: 339–350.
- [14] Forbes, K.J., Rigobon, R. (2002). No contagion, only interdependence: measuring stock market comovements. *The Journal of Finance*, 57: 2223–2261.
- [15] Fratzscher, M. (2003). On currency crises and contagion. *European Central Bank, International Journal of Finance Economics*, 8(2): 109-129.
- [16] Gravelle, T., Kichian, M., Morley, J. (2006). Detecting shift-contagion in currency and bond markets. *Journal of International Economics*, 68(2): 409-423.
- [17] Hamao, Y., Masulis, R., Ng, V. (1990). Correlations in price changes and volatility across international stock markets. *Review of Financial Studies*, 3: 281-307.
- [18] Hassan, S.A., Malik, F. (2007). Multivariate GARCH modeling of sector volatility transmission. *The Quarterly Review of Economics and Finance*, 47: 470 - 480.
- [19] Ito, T., Hashimoto, Y. (2005). High-frequency contagion of currency crises in Asia. *Asian Economic Journal*, 19(4): 357-381.
- [20] Jondeau, E., Rockinger, M. (2006). The copula-GARCH model of conditional dependencies: An international stock market application. *Journal of International Money and Finance*, 25: 827-853.
- [21] Kaminsky, G., Reinhart, C. (2008). The center and the periphery: The globalization of financial turmoil. *Flows, Crisis, and Stabilization: Essays in Honor of Guillermo A. Calvo*, 171-216.
- [22] Karolyi, A., Stulz, R.M. (1996). Why do markets move together? An investigation of US-Japan stock returns comovements. *Journal of Finance*, 51: 951-986.
- [23] King, M., Wadhvani, S. (1990). Transmission of volatility between stock markets. *The Review of Financial Studies*, 3: 5–33.
- [24] Koutmos, G., Booth, G. (1995). Asymmetric volatility transmission in international stock markets. *Journal of International Money and Finance*, 14: 747-762.
- [25] Lee, S.J. (2009). Volatility spillover effects among six Asian countries. *Applied Economics Letters*, 16: 501-508.
- [26] Liao, A., Williams, J. (2004). Volatility transmission and changes in stock market interdependence in the European Community. *European Review of Economics and Finance*, 3(3): 203-231.
- [27] Lin, W.L., Engle, R.F., Ito, T. (1994). Do bulls and bears move across borders? International transmission of stock returns and volatility. *Review of Financial Studies*, 7: 507-538.
- [28] Longin, F., Solnik, B. (1995). Is the correlation in international equity returns constant: 1960 -1990? *Journal of International Money and Finance*, 14: 3-26.
- [29] Mandilaras, A., Graham, B. (2010). A Markov switching analysis of contagion in the EMS. *Journal of International Money and Finance*, 29(6): 1062-1075.
- [30] Martinez, C., Ramierz, M. (2011). International propagation of shocks: an evaluation of contagion effects for some Latin American countries. *Macroeconomics Finance in Emerging Market Economies*, 4: 213-233.
- [31] Nagayasu, J. (2001). Currency crisis and contagion - evidence from exchange rates and sectoral stock indices of the Philippines and Thailand. *Journal of Asian Economics*, 12(4): 529-546.
- [32] Neumark, D., Tinsley, P.A., Tosini, S. (1991). After hours stock prices and post-crashes hangovers. *Journal of Finance*, 46: 159-178.
- [33] Ramaprasad, B., Nikolova, B. (2009). Return, volatility spillovers and dynamic correlation in the BRIC equity markets: An analysis using a bivariate EGARCH framework. *Global Finance Journal*, 19: 203 – 218.
- [34] Richards, A. (1995). Co-movement in national stock market returns: Evidence of predictability, not cointegration. *Journal of Monetary Economics*, 36: 455-79.

- [35] Saleem, K. (2009). International linkage of the Russian market and the Russian financial crisis: A multivariate GARCH analysis. *Research in International Business and Finance*, 23: 243-256.
- [36] Samitas, A., Tsakalos, I. (2013). How can a small country affect the European economy? The Greek contagion phenomenon. *Journal of International Financial Markets, Institutions Money*, 25: 18-32.
- [37] Sharkasi, A., Ruskin, H.J., Crane, M. (2005). Interrelationships among international stock market indices: Europe, Asia and the Americas. *International Journal of Theoretical and Applied Finance*, 8(5): 603-622.
- [38] Syllignakis, M.N., Kouretas, G.P. (2011). Dynamic correlation analysis of financial contagion: Evidence from the Central and Eastern European markets. *International Review of Economics Finance*, 20(4): 717-732.
- [39] Syriopoulos, T. (2007). Dynamic linkages between emerging European and developed stock markets: Has the EMU any impact? *International Review of Financial Analysis*, 16: 41-60.
- [40] Tai, C.S. (2003). Looking for contagion in currency futures markets. *Journal of Futures Markets*, 23: 957-988.
- [41] Tanizaki, H., Hamori, S. (2009). Volatility transmission between Japan, UK and USA in daily stock returns. *Empirical Economics*, 36: 27-54.
- [42] Theodossiou, P., Lee, U. (1993). Mean and volatility spillovers across major national stock markets: Further empirical evidence. *Journal of Financial Research*, 16: 337-350.
- [43] Von Furstenberg, G.M., Jeon, B.N. (1989). International stock price movements: Links and messages. *Brookings Papers on Economic Activity*, 1: 125-179.

## Diagnoses Related Group System in Slovakia

Ján SIDOR

University of Economics in Bratislava

Faculty of Commerce, Department of Services and Tourism, Slovakia

[jan.sidor@euba.sk](mailto:jan.sidor@euba.sk)

### Abstract:

*Financing of health care system has undergone in the last twenty years with many changes. The defrayment of ambulatory and acute inpatient care were used in different ways, what leded to diametrically different hospitals behaving. The DRG offers entirely different perspective on financing health care than the traditional performance system or defrayment of inpatient hospital care capitation. It's leading from the payment of treatment to the payment of final product, that's mean treated or cured patient. The DRG is a management tool, which describes the production of the hospital, allows the definition of cost, their comparison, the strategic management of hospitals and also creates optimal conditions for the rational conclusion of contracts. Submitted article is just focused on the above aspects. Its aim is to mention the specificities of DRG system in Ireland and Germany and these specifications connect with the planned activities related to the implementation of DRG in Slovakia.*

**Keywords:** strategic management of hospitals, DRG classification system, SWOT analysis of the DRG system.

**JEL Classification:** I19

### Introduction

The first attempts to create a classification system as a useful global system for effective management of hospitals dates back to 1852. In 1965, thanks to developments in technology as well as thanks to a rapidly increasing cost health care get to the forefront the question of effective hospital management system. Work on the development of the classification system began in 1967 at Yale University. The main researchers' effort was to find and investigate the relationships between diseases and costs of their treatment. The result of their efforts and solutions was the casemix classification system, which was named DRG - Diagnosis Related Groups or group of patients with a related diagnosis. DRG system development process was long and complicated, it represented a process consisting of evaluating the hundreds of thousands medical records of patients, as well as defining important elements of treatment processes to determine the routine cases and review those cases that their course were different.

### Development of the diagnoses related groups system

The primary reason for the DRG system development from managerial point of view was especially efficient management of the hospital. At a later phase, the system began to use also in controlling costs and payments for health care. DRG system therefore appears to be the most appropriate tool with which can be establish financial ties so as to discourage hospitals to provide health care more expensive than they would tolerate an open market. DRG systems currently are used not only for monitoring and management of financial flows, economic and clinical processes, but also as a tool for determining long-term strategies from the perspective of hospitals, regions, insurance companies or state. Information from the DRG system are used by hospital management, hospitals founders, government, professional societies, and individual health care payers. Through the DRG it is possible to increase efficiency of the healthcare, work of individual facilities and medical departments. To individual hospital facilities provides better overview of the funds consumption, enables easier and demonstrable health care billing between providers and payers, more equitable redistribution of available resources and thereby more effective planning (Gavurová *et al.* 2014).



## Conclusion

As is clear from the present contribution DRG system brings significant changes to the existing system of health care financing in the country. DRG system has undergone its development and now represents the tool for management and financing of health care. Each system has its strengths and weaknesses and it is same with DRG system. Despite registered weaknesses it presents the best and in many countries the only one real and useful tool not only to finance acute inpatient care, but also to measure its productivity. Its objective is to eliminate the weaknesses of the still used financing approaches for acute inpatient care, which was primarily an effort to get the highest rewards from provided health care, which only deepened and fixed the funding system imbalance. The implemented DRG system brings to doctors, hospitals management as well as to other market hospital services players common and understandable communication tool and also a tool of management, financing and subsequent benchmarking (with the possibility of a later automation of this process type described in (Janke 2011), which output is understood by all interested parties. With application of uniform financing principles creates an opportunity to compare performances and other treatment parameters between health care facilities, as well as inside it. Thus hospital management is gaining a significant tool for influencing production, strategic planning and helps reduce information asymmetry towards doctors of medical facilities. From above mentioned SWOT analyse results, that DRG system has many more strengths. The extent to which Slovakia can gain significant benefits from this powerful tool will be shown in our near future.

## References

- [1] Benčo, J., Kuvíková, H. *et al.* (2011). *Ekonomika verejných služieb*. Banská Bystrica: Ekonomická fakulta UMB. ISBN 978-80-557-0323-7
- [2] Dorčák, P., Pollák, F., Szabo, S. (2014). Analysis of the possibilities of improving an online reputation of public institutions. IDIMT-2014, Sept. 10–12. Poděbrady: IDIMT Networking Societies-Cooperation and Conflict 22nd Interdisciplinary Information and Management Talks, p. 275-281.
- [3] Gavurová, B., Štefko, R., Bačík, R. (2014). The Analysis of Social Services' Structure in a Specific Region and its Significance for Health and Social Policy in Slovakia. *Polish Journal of Management Studies*, 10(2): 43-53.
- [4] Janke, F. (2011). The Use of Hidden Data in Electronic Business Networks. Benchmark and Network Performance Indicators. In: IDIMT-2011: Interdisciplinarity in Complex Systems: 19th Interdisciplinary Information Management Talks, Jindřichův Hradec. p. 341-348. ISBN 978-3-85499-873-0
- [5] Kalman, I., McCarthy, B. (2007). EC TWINNING PROJECT. Benchmarkové studie DRG systému užívaných v EU. Nemecké a Irské zkušenosti. Project number: CZ2005/IB/SO/03.
- [6] Klepáková, A. (2011). Meranie kvality v zdravotníctve. In: Zborník príspevkov z medzinárodnej vedeckej konferencie Aeronautika 11. TU LF v Košiciach. ISBN: 978-80-553-0758-9
- [7] Kožený, P., Němec, J., Kármiková, J., Lomníček, M. (2010). *Klasifikační systém DRG*. Praha: Grada Publishing. 206 p. ISBN 978-80-247-2701-1
- [8] Kuvíková, H., *et al.* (2006). *Tvorba a realizácia zdravotníckej politiky*. Health policy making. Banská Bystrica: UMB EF Banská Bystrica, OZ Ekológia, 210 p. ISBN 80-8083-340-0
- [9] Matušek, Z. (2011). DRG systém v ČR. UNIVERZITA PALACKÉHO V OLOMOUCI FAKULTA ZDRAVOTNICKÝCH VĚD Ústav zdravotnického managementu. [http://theses.cz/id/ycvah7/Matusek\\_Zdenek\\_DRG\\_system\\_v\\_CR.pdf](http://theses.cz/id/ycvah7/Matusek_Zdenek_DRG_system_v_CR.pdf)
- [10] Pudlo, P., Szabo, S. (2014). Logistic Costs of Quality and Their and Their Impact on Degree of Operation Level. *Journal of Applied Economic Sciences*, Volume IX, 3(29):468-475, [http://cesmaa.eu/journals/jaes/files/JAES\\_2014\\_Fall.pdf](http://cesmaa.eu/journals/jaes/files/JAES_2014_Fall.pdf)
- [11] Šoltés, V., Gavurová, B., (2014), Analysis of Selected Demographic Aspects of Day Surgery in Slovak Health Policy. *Journal of Applied Economic Sciences*. Volume IX, 3(29): 476-486. [http://www.cesmaa.eu/journals/jaes/files/JAES\\_2014\\_Fall.pdf](http://www.cesmaa.eu/journals/jaes/files/JAES_2014_Fall.pdf)
- [12] Šoltés, V., Gavurová, B., (2015). Modification of Performance Measurement System in the intentions of Globalization Trends. *Polish Journal of Management Studies*. 11(2): 160-170. <http://pjms.zim.pcz.pl/PDF/>



[PJMS112/Modification%20of%20Performance%20Measurement%20System%20in%20the%20Intentions%20of%20Globalization%20Trends.pdf](#)

- [13] Szabo, S., Sidor, J. (2014). The performance measurement system–potentials and barriers for its implementation in healthcare facilities. *Journal of Applied Economic Sciences*, Volume IX, Issue 3(29), [http://cesmaa.eu/journals/jaes/files/JAES\\_2014\\_Fall.pdf](http://cesmaa.eu/journals/jaes/files/JAES_2014_Fall.pdf)
- \*\*\* Health Policy Institute. DRG na Slovensku. <http://www.hpi.sk/hpi/sk/view/4084/drg-na-slovensku.html>, (accessed March 28, 2012).
- \*\*\* Healthcare Surveillance Authority. Koncepcia zabezpečenia a zavedenia DRG systému. [http://www.udzs-sk.sk/drg-klasifikacny-system.html?page\\_id=1102](http://www.udzs-sk.sk/drg-klasifikacny-system.html?page_id=1102)
- \*\*\* Healthcare Surveillance Authority. Press conference. [http://www.udzs-sk.sk/drg-klasifikacny-system.html?page\\_id=1102](http://www.udzs-sk.sk/drg-klasifikacny-system.html?page_id=1102)
- \*\*\* Ministry of health of Slovak republic. Manifesto of Slovak Government 2006. <http://www.health.gov.sk/?programove-vyhlasenie-vlady>
- \*\*\* Ministry of health of Slovak republic. Manifesto of Slovak Government 2010. [www.health.gov.sk/Zdroje?!dokumenty/mzsr/PVV\\_SR\\_cast.rtf](http://www.health.gov.sk/Zdroje?!dokumenty/mzsr/PVV_SR_cast.rtf)
- \*\*\* SME, Nemcom za vývoj DRG zaplatíme 1,7 milióna eur. <http://www.sme.sk/c/6208885/nemcom-za-vyvoj-drg-zaplatime-17-miliona-eur.html>
- \*\*\* Hunková, M. Politici rozhodnú, či nemocnice budú platené spravodlivo. [http://spravy.pravda.sk/politici-rozhodnu-ci-nemocnice-budu-platene-spravodlivo-pel/sk\\_domace.asp?c=A120106\\_113913\\_sk\\_domace\\_p58](http://spravy.pravda.sk/politici-rozhodnu-ci-nemocnice-budu-platene-spravodlivo-pel/sk_domace.asp?c=A120106_113913_sk_domace_p58)

# Performance of Minority Data in Financial Distress Prediction Models. Application of Multiple Discriminate Analysis, Logit, Probit and Artificial Neural Network Methods

Jeeranun KHERMKHAN  
Surachai CHANCHARAT

Faculty of Management Science, Khon Kaen University, KhonKaen, Thailand  
[csurac@kku.ac.th](mailto:csurac@kku.ac.th)

## Abstract

*This paper presents a financial distress prediction model that combines the approaches of multiple discriminant analysis, logit method, Probit method and artificial neural network for distinguishing between healthy and financially distressed firms. Financial distress prediction is a key issue in finance. Past research has largely ignored the precision of the minority group and focused on the overall accuracy percentage. This paper suggests artificial neural network is the best high performance method for both the groups. The suggested method serves as an early warning system for firms in financial distress.*

**Keywords:** Financial distress, prediction models, SMEs

**JEL Classification:** G17, G33

## Introduction

The financial distress is biggest problem for small and medium enterprises (SMEs) in Thailand. Most SME entrepreneurs are new entrepreneurs who lack operational experience. Consequently, within a few years, many SME businesses close down. Of the total number of businesses in the country, over 99% are SMEs. SMEs play a significant role in employment and growth distribution, and are important contributors to all economic sectors. Specifically, they accounted for 77% of the total employment in 2012 (Institute for Small and Medium Sized Enterprises Development, 2015). Therefore, it is necessary to develop methods that act as an early warning system before businesses fail. This can help entrepreneurs prepare in advance and take preventive steps. Such methods benefit governments, private institutions, and financial institutions. There are several methods for predicting financial distress, but each method gives a different prediction. In order to minimize prediction error, it is important to determine the most appropriate and accurate method for predicting financial distress.

In this study, we compare four failure prediction models—MDA, logit, probit, and ANN—based on their predictions regarding the failure of SMEs in Thailand. The models used in this paper may help various user groups in Thailand such as accountants, investors, auditors, managers, creditors, and regulatory agencies to predict the probability of business failure. Despite the considerable costs of failure of companies and the significant contribution of SMEs to the economy, relatively few studies have focused on the failure of SMEs.

## Literature review

There are several benefits of using statistical methods for predicting financial distress. First, such methods can determine the importance of a variable in the prediction process. Second, the prediction results using statistical multiple discriminant analysis (MDA) involve dichotomous classification (Altman, 1968; Beaver, 1966; Deakin 1972), while the logit and probit methods yield probability measures (Chancharat and Chancharat 2011; Darayseh, Waples and Tsoukalas 2003; Ohlson 1980). In addition, some tools like artificial neural networks (ANNs) can process information better (Carvalho and Ribeiro 2007; Coats and Fant 1993; Wilson and Sharda 1994). The probit, logit, and ANNs models used in this paper have higher prediction accuracy and possess the ability of generalization (Altman and Narayanan 1997; Atiya 2001; Zmijewski 1984). The best and the most stable performances are those of the probit and logit models (Canbas, Cabuk and Kilic 2005; Lin 2009; Zhang 1999). However, if the data does not satisfy the assumptions of the statistical approaches, then the ANN approach can achieve higher prediction accuracy (Atiya (2001) and Pai, Annapoorani and Pai (2004)). In addition, the models used in this paper have higher prediction accuracy and possess the ability of generalization as compared to those of (Altman 1968; Ohlson 1980). Different models yield different findings (Press and Wilson 1978).

In this study, we compare four failure prediction models - MDA, logit, probit, and ANN - based on their predictions regarding the failure of SMEs in Thailand. The results of our paper may be useful in providing early warning signals regarding financial problems of SMEs before the businesses actually fail. Despite the

considerable costs of failure of companies and the significant contribution of SMEs to the economy, relatively few studies have focused on the survival or failure of SMEs.

## Acknowledgments

The authors gratefully acknowledge Khon Kaen University for providing the necessary financial support for this research.

## References

- [1] Altman, E.I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *The Journal of Finance*, 23(4): 589–609. DOI <http://dx.doi.org/10.2307/2978933>
- [2] Altman, E.I., Narayanan, P. (1997). An international survey of business failure classification models. *Financial Markets, Institutions & Instruments*, 6(2): 1–57. DOI <http://dx.doi.org/10.1111/1468-0416.00010>
- [3] Atiya, A.F. (2001). Bankruptcy prediction for credit risk using neural networks: a survey and new results. *IEEE Transactions on Neural Networks*, 12(4), 929–935. DOI <http://dx.doi.org/10.1109/72.935101>
- [4] Aziz, A., Emanuel, D.C., Lawson, G.H. (1988). Bankruptcy prediction - an investigation of cash flow based models. *Journal of Management Studies*, 25(5): 419–437. DOI <http://dx.doi.org/10.1111/j.1467-6486.1988.tb00708.x>
- [5] Bahnson, P.R. (1987). *An assessment of the contribution of cash flow and the operating cash flow component in classifying failed companies*. The University of Utah: UMI.
- [6] Beaver, W.H. (1966). Financial ratios as predictors of failure. *Journal of Accounting Research*, 4: 71–111, DOI <http://dx.doi.org/10.2307/2490171>
- [7] Canbas, S., Cabuk, A., Kilic, S.B. (2005). Prediction of commercial bank failure via multivariate statistical analysis of financial structures: the Turkish case. *European Journal of Operational Research*, 166(2): 528–546. DOI <http://dx.doi.org/10.1016/j.ejor.2004.03.023>
- [8] Carvalhal, A., Ribeiro, T. (2007). Do artificial neural networks provide better forecasts? evidence from Latin American stock indexes. *Latin American Business Review*, 8(3): 92–100. DOI <http://dx.doi.org/10.1080/10978520802035463>
- [9] Casey, C., Bartczak, N. (1985). Using operating cash flow data to predict financial distress: some extensions. *Journal of Accounting Research*, 23(1): 384–395. DOI: <http://dx.doi.org/10.2307/2490926>
- [10] Chancharat, S., Chancharat, N. (2011). Survival of SMEs in the northeastern region of Thailand. *Journal of Business Management*, 3(1): 1–13.
- [11] Coats, P.K., Fant, L.F. (1993). Recognizing financial distress patterns using a neural network tool. *Financial Management*, 142–155. DOI <http://dx.doi.org/10.2307/3665934>
- [12] Darayseh, M., Waples, E., Tsoukalas, D. (2003). Corporate failure for manufacturing industries using firms specifics and economic environment with logit analysis. *Managerial Finance*, 29(8): 23–36, DOI <http://dx.doi.org/10.1108/03074350310768409>
- [13] Deakin, E.B. (1972). A Discriminant analysis of predictors of business failure. *Journal of Accounting Research*, 10(1): 167–179. DOI <http://dx.doi.org/10.2307/2490225>
- [15] Libby, R. (1975). Accounting ratios and the prediction of failure: some behavioral evidence. *Journal of Accounting Research*, 13(1): 150–161. DOI <http://dx.doi.org/10.2307/2490653>
- [16] Lin, T.H. (2009). A Cross model study of corporate financial distress prediction in Taiwan: multiple discriminant analysis, logit, probit and neural networks models. *Neurocomputing*, 72(16): 3507–3516. DOI <http://dx.doi.org/10.1016/j.neucom.2009.02.018>
- [17] Ohlson, J.A. (1980). Financial ratios and the probabilistic prediction of bankruptcy. *Journal of Accounting Research*, 18(1): 109–131. DOI <http://dx.doi.org/10.2307/2490395>
- [18] Press, S.J., Wilson, S. (1978). Choosing between logistic regression and discriminant analysis. *Journal of the American Statistical Association*, 73(364): 699–705. DOI <http://dx.doi.org/10.2307/2286261>
- [19] Rekba Pai, G.R., Annapoorani, R., Pai, G.V. (2004). Performance analysis of a statistical and an evolutionary neural network based classifier for the prediction of industrial bankruptcy. In *Cybernetics and Intelligent*

*Systems, 2004 IEEE Conference on* (Vol. 2, pp. 1033–1038). Retrieved from [http://ieeexplore.ieee.org/xpls/abs\\_all.jsp?arnumber=1460731](http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=1460731)

- [20] Vanichbuncha, K. (2008). *The Multivariate Data Analysis* (3<sup>rd</sup> ed.). Bangkok: Chulalongkorn University Printing House.
- [21] Wilson, R.L., Sharda, R. (1994). Bankruptcy prediction using neural networks. *Decision Support Systems*, 11(5): 545–557. DOI [http://dx.doi.org/10.1016/0167-9236\(94\)90024-8](http://dx.doi.org/10.1016/0167-9236(94)90024-8)
- [22] Zhang, G., Y Hu, M., Eddy Patuwo, B., & C Indro, D. (1999). Artificial neural networks in bankruptcy prediction: general framework and cross-validation analysis. *European Journal of Operational Research*, 116(1): 16–32. DOI [http://dx.doi.org/10.1016/S0377-2217\(98\)00051-4](http://dx.doi.org/10.1016/S0377-2217(98)00051-4)
- [23] Zmijewski, M.E. (1984). Methodological issues related to the estimation of financial distress prediction models. *Journal of Accounting Research*, 22(1): 59–82. DOI <http://dx.doi.org/10.2307/2490859>
- \*\*\* Institute for Small and Medium Sized Enterprises Development. (2015). Retrieved June 26, 2015, from <http://www.sme.go.th>

## Influence of Socio-Economic Profile and Agents on Awareness Levels of Health Insurance Plans in Punjab. A Study

Hari BABU

School of Business, Lovely Professional University, India  
[singuharibabu@gmail.com](mailto:singuharibabu@gmail.com)

Gurpreet KAUR

School of Business, Lovely Professional University, India  
[gurpreetphil005@gmail.com](mailto:gurpreetphil005@gmail.com)

### Abstract

*Health insurance is the type of financial tool to finance the health care expenditures of the individuals. Since the financial year 2011-12 the health insurance industry consistently registered around 17% growth rate, yet it is less than the growth of life insurance industry. Various reasons are attributed to the lower penetration of health insurance in India such as ignorance and lack of awareness, not sure of timing of availing policies, preference to earn profits and considering investment in insurance as tax –saving instrument. The present study is an attempt to know the influence of socio-economic profile and agents on bringing awareness about health insurance among the people of Punjab. The study was conducted based on the primary data collected from 356 respondents using a questionnaire during February- April, 2014. For the purpose of analysis, inferential statistics such as multiple regression and independent Sample t- test were applied. The results explains the positive influence of employment, annual income and education on level of awareness while gender, age, type of family and number of dependents explains the negative influence on the level of awareness. The role of agents has significant influence on the bringing the awareness and motivating the individuals to subscribe the health insurance plans.*

**Keywords:** agents, awareness, health, health insurance plans, socio-economic profile.

**JEL Classification:** I00, I100, I110, I130

### Introduction

Health insurance business has been defined in the IRDA's Regulations on Registration of Indian Insurance Companies, which covers indemnity type benefits as well as assured benefits. The definition is: "health insurance business" or "health cover means the effecting of contracts which provide sickness benefits or medical, surgical or hospital expense benefits, whether in-patient or out patient, on an indemnity, reimbursement, service, prepaid, hospital or other plans basis, including assured benefits and long term care" (Subrahmanyam 2004).

Health insurance gives the facility to individuals to finance their medical expenses which lessen the financial burden on them. It gives partial reimbursement to the people for expenditure on various diseases (Ghosh 2013). Health insurance is the type of insurance where the insurer pays medical cost for the insured due to illness and accidents (Yelliah 2012). Health insurance is a largely recognized and preferable tool to finance the health care expenditure to the individuals (Bawa and Ruchita 2011). Health insurance is considered not only as a desirable and affordable tool but also diversifies the financial risks, potentially raise income levels and can offer large welfare gains. The health insurance works on a principle of pooling of risks of unexpected illness and needing hospitalization by charging premium from people (Reshmi and Sabu 2007).

The awareness towards health insurance among the people is increasing due to awareness campaigns done by various bodies such as IRDA, General Insurance Council, NGOs and Channel Partners of Health Insurance Companies. Still the large chunk of population is spending huge out-of-pocket expenses for their health care. Various reasons attributed to the lower penetration of health insurance in India when compared with life insurance such as ignorance and lack of awareness, not sure of timing of availing policies, preference to earn profits and considering investment in insurance as tax – saving instrument.

### Review of literature

Healthcare Expenditure is an important variable affecting health insurance purchase (Yelliah 2012). "Out-of-Pocket" health expenditure made poor households financial conditions more vulnerable and they tend to spend larger proportion of their total budget on health care (Joglekar 2013). Health care expenses affected the demand for health insurance purchase decision. Rise in health care expenses leads to increase the interest for buying health plans in a country (Bhat and Nishant 2006). The main aim to buy health insurance plan was to protect against financial risk (Grignon and Bidenam 2009).

Health risk determines one of the important factor for buying voluntary health insurance plans in India (Vellakkal 2013a, Vellakkal 2013b). People having higher chances of requiring hospitalization had higher probability of buying health insurance. Households with morbid conditions and already faced hospitalization situations were more interested to enroll themselves in health insurance schemes (Ghosh *et al.* 2013). However, people gave more importance to their health as compared to do investment in health insurance as a tax savings (Gurunathan and Mohanasundari 2010).

Various studies tried to know the reasons for low penetration of health insurance in India. The literature review suggests that knowledge and awareness are very important determinants for health insurance subscription and low level of awareness is major barrier in subscription among individuals (Bawa and Ruchita 2011, Ramamoorthy 2013, Sheth 2013). Adibe *et al.* (2011) also assess the low level of awareness among Nigerian employees and it associated with demographic variables. Sarwar and Qureshi (2013) found that 82 percent of individuals were heard about health insurance but 65% of individuals know the difference between health and life insurance. Yellaiah (2013) also assess the low level of awareness in Hyderabad and it is positively associated with high income and high education. The level of awareness in South Indian population was reasonable but not so high and it is significantly associated with occupation, family income, educational status, religion and socio-economic status. People having white collar jobs with good income level had high level of awareness (Reshmi, Sabu 2012). In spite of being aware, the major reason for health insurance was family protection as compared to tax savings (Gurunathan and Mohanasundari 2010). Vanithamani (2013) found that majority of the women workers in industry were unaware about the existence of private health insurance schemes. Ghosh (2013) also assess the low level of awareness in Darjeeling district and main source for awareness was tax and agent consultant. Reshmi *et al.* (2010) also found low level of awareness in Karnataka and main reason for this was low socio-economic status of people. A study conducted by Ghosh (2013) found that people were aware but not to that extent that they subscribed themselves.

Income is also another important determinant which influences the purchase decision of health insurance in India. Income found the most important determinant to buy micro health insurance schemes in India (Bhat and Nishan 2006). Makoka *et al.* (2007) examined income as a significant determinant to affect the demand for private health insurance in Malawi district. Level of income affected the purchase decision for buying health insurance policies (Panchal 2013). People with high income and good health were shown more interest to pay for supplementary health insurance plans (2008). Christiansen *et al.* (2002) found that chances of more coverage for health insurance were increased with rise in income. Moreover, incomes of employees directly impact the claims in an unexpected way (Peroz and Sinha 2006). The main reason for less coverage was low income or uncertainty of income among the rural people of Bangalore (Madhukumar, Sudeepa and Vishali 2012).

Health insurance schemes in India are characterized by multiple options and the contracts are also written with much technical jargon which is difficult for an ordinary individual. Agents/brokers play an important role in offering guidance and counseling the individuals in reducing the search costs of suitable health policy when the markets are more competitive (Mandic, Peter and Roger 2013). Vellakkal (2013a, 2013b) and Sarwar and Qureshi (2013) also assess the role of insurance agents to bring awareness and willingness to buy private health insurance in India. But there is also a contradictory study that found agents related problems which affected the demand for purchasing health insurance negatively (Kansra and Gaurav 2012).

Lack of accessibility and availability of services were found major drawbacks in health insurance industry. Moreover, lack of intermediaries, lack of comprehensive coverage and prefer to invest money in some other areas were also obstruct to be subscribed (Bawa and Ruchita 2011). Sarwar and Qureshi (2013) also assess narrow policy options is a major reason for not purchasing a policy. People who were aware but not interested to subscribe to health plan, because of involvement of hidden cost and narrow policy options (Bawa and Ruchita 2011).

Another set of factors which are found important in the literature of health insurance are socio-economic variables. Socio-economic and cultural characteristics of household significantly associate with demand for health insurance. Different Occupations of people had different views regarding purchase decisions (Yelliah 2012). Age has been found positive and significant impact on the probability of buying insurance (Reshmi, Sabu 2007, Yelliah 2012). Gender also plays an important role in the insurance decision through its impact on medical consumption (Reshmi, Sabu 2007, Selvan 2012). Similarly, demographic variable like religion act as a barrier. People believed that their God will always with them to face any unexpected mishappening in a life (Reshmi, Sabu 2007). The characteristics of the family and their health condition as a unit are also important variables to study.



The review of literature emphasized on the influence of socio-economic variable on the level of awareness and willingness to pay. In this regard there were contradictory findings among Yelliah and Ramakrishna (2012) and Kansra and Pathania (2011) with respect to significant relationship between age, gender and awareness. Studies pertaining to influence on level of awareness which is moderated by the socio-economic determinants and the role of the agents before and during the subscription for health insurance policy need to be conducted which forms the background of the study.

## Conclusion

Health insurance market is burgeoning year – on – year due to changes in life styles, improvement in purchasing power of the people, wide spread awareness, and propagation of insurance companies and IRDA. In reality, the picture is different when it comes to semi-urban and rural areas, especially, in middle and low income class segment the level of awareness is quite low in comparison to other Asian nations. The study is conducted to know the relation between the socio – demographic profile of the people and willingness to pay for the health insurance plans.

Finally, it is observed that the financial constraints are the most important reason to get restrained to buy the health insurance plans. Though Central and several State Governments have floated various schemes to support the middle and low class segment, it is not only the agents, Third party administrators, insurance companies and Government, it is the individuals to maintain the financial discipline and instigate to buy the health insurance plans. In this regard, the role of agents is vital in removing the misconceptions and disbeliefs towards the health policies.

## References

- [1] Adibe, M.O., Udeogaranya, P.O., Ubaka, C.M. (2011). Awareness of health insurance scheme among employees of Nigerian University, *International Journal of Drug Development and Research*, 3(4): 78-85.
- [2] Bawa, S.K., Ruchita. (2011). Awareness and willingness to pay for health insurance, *International Journal of Humanities and Social Science*, 1(7): 100-108.
- [3] Bhat, R., Nishant, J. (2006). Factors Affecting the Demand for Insurance in a Micro Health Insurance Scheme, Indian Institute of Management, W.P. retrieved on Oct 27, 2013 from <http://iimahd.ernet.in/publications/data/2006-07-02rbhat.pdf>
- [4] Bolhaar, J., Maarten, L., Bas Van, D.K. (2008). A dynamic analysis of the demand for health insurance and health care, IZA, Discussion Paper No. 3698, retrieved on Jan 5, 2014 from <http://ftp.iza.org/dp3698.pdf>
- [5] Christiansen, T., Jorgen, L., Finn, K. (2002). Demand for Private Health Insurance and Demand for health care by privately and non –privately insured in Denmark, [http://static.sdu.dk/mediafiles/files/omSDU/centre/c\\_ist\\_sundoke/Forskningisdokumenter/working%20papers/20021.pdf](http://static.sdu.dk/mediafiles/files/omSDU/centre/c_ist_sundoke/Forskningisdokumenter/working%20papers/20021.pdf), Retrieved on December 16, 2013
- [6] Ghosh, M. (2013). Awareness and Willingness to pay for health insurance: A Study of Darjeeling District, *IOSR Journal of Humanities and Social Science*, 12(1): 41-47
- [7] Ghosh, S., Shinjini, M. (2011). Willingness to Pay for Health Insurance amongst the Urban Poor. Evidence from a slum in Mumbai, India, *Journal of the Gokhale Institute of Politics and Economics*, 53(2): 117-124
- [8] Gurunathan and Mohanasundari, M. (2010). Level of Awareness in the Indian Health Insurance Industry, *Synergy*, 8(2): 80-92.
- [9] Grignon, M., Bidean, K. (2009). Income and the Demand for complementary Health Insurance in France, *IRDES*, Working Paper, Retrieved on Jan 5, 2014.
- [10] Joglekar. (2008). Can Insurance Reduce Catastrophic Out-of-Pocket Health Expenditure, <http://www.igidr.ac.in/pdf/publication/WP-2008-016.pdf>, Retrieved on 28 October, 2013.pp 3-29.
- [11] Kansra, P. and Gaurav, P. (2012), A study of factor affecting the demand for health insurance in Punjab, *Journal of Management and Science*, 2(4): 1-10.
- [12] Mandic, P.K., Peter, G., Roger, F. (2013). The Role of Agents and Brokers in the market for Health insurance, W.P.19342, Retrieved on 11 December 2013 from <http://www.nber.org/papers/w19342>, pp 3- 48.
- [13] Makoka, D., Ben, K., Patrick, K. (2007). Demand for Private Health Insurance Where Public Health Services are Free: The Case of Malawi, *Journal of Applied Sciences*, 7(21): 3268-3273.
- [14] Madhukumar, S., Sudeepa, D., Vishali, G. (2012). Awareness and perception regarding health insurance in Bangalore rural population, *International Journal of Medicine and Public Health*, 2(2): 18-22.
- [15] Panchal, N. (2013). Customer's perception towards health insurance. An empirical study in Bardoli and Mandhvi Region, *Indian Journal of Applied Research*, 3(4): 62-64.

- [16] Peroz, J., Sinha, T. (2006). Determinants of Group Health Insurance Demand, SSRN Working Paper No. 947345. <http://www.ssrn.com/>
- [17] Ramamoorthy, R., S.A.S.K. (2013). A Study on Customers' Perception towards Health Insurance Policies, *International Journal of Multidisciplinary Management Studies*, 3(2): 80-92.
- [18] Reshmi, B., N.S.N., Sabu, K.M., and B.U. (2007). Awareness of Health Insurance in South Indian Population, *Health and Population*, 30(3): 177-188.
- [19] Reshmi, Raghunath, R., Unnikrishnan, B. (2010). Awareness of health insurance among inpatients at a tertiary care hospital in coastal Karnataka, *Indian Journal of Community Medicine*, 35(3): 445-446.
- [20] Reshmi, B., N.S.N., Sabu, K.M., and B.U. (2012). Awareness, Attitude and their Correlates towards Health Insurance in an Urban South Indian Population, *Journal of Management in Health*, 16(1): 32-35.
- [21] Sarwar, A., Qureshi, H.A. (2013). Awareness and Willingness to buy private health insurance and a look into its future prospects in Pakistan, *European Journal of Business and Social Sciences*, 2(1): 69-81.
- [22] Selvan, M.C., R.V., and S.B. C. (2012). Determinants of Medclaim Policyholder Satisfaction, *Journal of Management and Science*, 2(4): 37-50.
- [23] Sheth, S. (2013). The "3A" Effect-Health Insurance in India, *IRDA Journal*, August, pp.21-25,
- [24] Subrahmanyam, K. (2004) To Health Insurance!, *IRDA Journal*, September, pp.4
- [25] Vanithamani, G. (2013). The awareness, enrolment, willingness to participate in the health insurance schemes among the women industrial workers, *Shanlax International Journal of Economics*, 1(3): 21-31.
- [26] Vellakkal, S. (2013). Determinants of Enrollment in Voluntary Health Insurance: Evidence from a Mixed Method Study, Kerala, India, *International Journal of Financial Research*, 4(2): 99-107.
- [27] Vellakkal (2013). Impact of Private Health Insurance on Lengths of Hospitalization and Healthcare Expenditure in India: Evidences from a Quasi-Experimental Study, *Indian Journal of Economics and Development*, 1(1): 24-28.
- [28] Yelliah, J. and G.R. (2012). Socio Economic Determinants of Health Insurance in India, The Case of Hyderabad City, *International Journal of Development and Sustainability*, 1(2): 111-119.
- [29] Yellaiah, J. (2012). Awareness of Health Insurance in Andhra Pradesh, [http://www.ijrsp.org/research\\_paper\\_jun2012/ijrsp-June-2012-43.pdf](http://www.ijrsp.org/research_paper_jun2012/ijrsp-June-2012-43.pdf), Retrieved on December 10, 2013.

## Labor Theory of Value in the Methodology of Researching Economic Systems

Irina NIKOLAEVNA SYCHEVA

I.I. Polzunov Altai State Technical University<sup>1</sup>, Russian Federation  
[madam.si4eva@yandex.ru](mailto:madam.si4eva@yandex.ru)

Natalya NIKOLAEVNA KUZMINA

I.I. Polzunov Altai State Technical University, Russian Federation  
[kuzmina\\_nn@mail.ru](mailto:kuzmina_nn@mail.ru)

Elena SERGEYEVNA PERMYAKOVA

I.I. Polzunov Altai State Technical University, Russian Federation  
[elena\\_gushina200@mail.ru](mailto:elena_gushina200@mail.ru)

Irina ANDREEVNA SVISTULA

I.I. Polzunov Altai State Technical University, Russian Federation  
[irasvi88@mail.ru](mailto:irasvi88@mail.ru)

### Abstract:

*The present article researches theoretic and methodological regularities of the labor relations genesis in the process of evolution of social and economic systems. The approach developed by the authors allows allotting basic blocks of the labor relations system taking into account operating subjects and objects of the relations. Taken as the basis, such approach allows describing labor relations of any economic system. The allotment of mandatory elements (objects) and subjects in the structure of labor relations allows revealing the content of the "labor relations" category.*

**Keywords:** labor relations, theory of value, economic systems.

**JEL Classification:** D46, P00, F66.

### Introduction

The urgency of theoretic researches of the economy characteristics on the substantial level, the increase in the interest to methodology and theory of economic cognition are stipulated by the controversy and alternativeness of the contemporary stage of the development of the world economy and universal society as a whole. For the Russian society such researches are determined by the exclusive complexity of transformational processes and perspectives of their evolution.

The problem of the initial relation is directly related to the method of ascendancy from the abstract to the specific. It absorbs genetic differences of structural levels of economic relations and transformations that reflect them, as well as historical perspectives in the process of economic systems development. The above method is the most strongly marked form of the systematic, logical method in the economic research. Its application allows establishing the interrelation between the categories, to reproduce the world of economy as a product of self-development, to understand it from the historical point of view, and to synthesize notions into a strict subordinated system.

### Methodology

When acknowledging the priority of the abstract analysis, it is necessary to understand as the economic theory approaches the business practice, its object must include not only general regularities of the development but also specific mechanism of economic entities functioning. Thus, the method of ascendancy from the abstract to the specific allows explaining, from the essence, the form of its appearance that includes the whole richness of the most developed state of this entity (Solomon, Cohen 2014).

Our approach to regularities of the development of the structure of social and economic systems is based on the notion of labor as a kind of human activity that is peculiar to a specific historic period of the economic system development. Social labor acts as the basis of all types of rational activity. Labor makes up the content of the initial category as a gnoseological form of fixing cause-to-effect dependence that dominates over all the rest and defines the quality of economy, its substantial characteristics. Taking into account the complexity and disputable character of the problem, as well as the fact that the economic theory has not formed a unified concept

---

<sup>1</sup> I.I. Polzunov Altai State Technical University, Lenin Avenue, 46, Barnaul, 656038, Altai region, Russian Federation

of the initial economic relation and initial economic category, we will state some methodological provisions that, as we think, can explain our position (Sycheva 2003), as follow:

- The initial category is an ultimate scientific abstraction, where there is still the measure of the phenomenon, and whereof other relations are generated and developed. At the same time the initial relation is an abstraction that stands for a real object.
- The initial relation forms a condition and form of functioning and developing of the system of economic relations. The basic relation defines the goal and social focus of functioning and developing. The initial and basic relations connect all other relations in a single system. The initial relation has a bearer: the first one acts as a sort of content, and the other acts as a form. We use the above terms as synonyms.
- Regarding labor as an initial category, we take into account the defining role of the production in relation to the allocation, exchange and consumption. As labor relations are formed due to the production of material benefits, they have an embodied form, i.e. they have material and embodied content and present the unity of the material and the ideal. Material benefits created by its internal substance always contain labor, and finally the initial relation is always a labor relation.
- Labor contains a nucleus of contradictions of the given social and economic system. It shows a basic genetic relation as the latter one, creates a link between various economic systems, and acts as prerequisite of forming the basic economic relation. Under this approach the basic relation is deduced from the initial one and bears its features. However, it is not identical to the initial relation. The implementation of the initial relation aims to fulfil the basic economic relation. The outgrowth of initial relation to the basic one must be regarded as a principle vector of the self-movement of social and economic systems.

## Conclusion

In conclusion we will say that the national literature of the recent period has offered and offers various combinations, versions, theories about "diffusion" and "synthesis" of scientific political economy with "neoclassical synthesis", marginalism, Keynesian theory, institutionalism, Neoricardianism and neoclassics. At the same time no classical school has offered its unified "synthetic" variant in the area of neither subject nor the research method. Moreover, according to some researchers, the reality of historical development of the world economic thought includes the existence of maximum two economic schools – Marxian and neoclassical (Liubinin 2012). The life shows that today is the time of dialectic and labor classics, because the most reliable source of the development of any social and economic system is an increase in the labor efficiency on the basis of neo-industrialization and vertical integration of productive forces of the society. The labor paradigm was formed by virtue of analysis and synthesis. It determines the labor as the fundamental basis of all productive relations and value forms. More than that, it is the classical political economy that is a connector between "the capitalistic today" to the post-capitalistic future. By operation of law of the socialization of productive forces, becoming and expanding of direct social relations is a general tendency of the contemporaneity. We will recollect that K. Marx introduced the dichotomy of directly social and indirectly social. Herewith, he showed the antecedence of the directly social under the conditions of the capitalistic way of production. Under capitalism, because of the supremacy of the private and capitalistic ownership, the social is objectively mediated by the particular. This is what the classical political economy teaches us. In virtue of the above, sooner or later the private, and capitalistic, and price way of assumption must make way for the social and non-price. Consequently, the renaissance of classics and labor paradigm is in the future.

## References

- [1] Sy, A., Tinker, T. (2010). Labor Processing Labor: A New Critical Literature for Information Systems Research. *International Journal of Accounting Information Systems*, 11(2): 120-133.
- [2] Oswald, A.J. (1993). Efficient Contracts are on the Labor Demand Curve: Theory and Facts. *Labor Economics*, 1(1): 85-116.
- [3] Străoanu, B.M., Pantazi, F. (2011). Concepts and Theories Regarding Economic Balance in Incidence with the Labor Market. *Procedia - Social and Behavioral Sciences*, 15: 818-822.
- [4] Horva, B. (1989). The Pure Labor Theory of Prices and Interest: Basic Principles. *European Economic Review*, 33(6): 1183-1203.
- [5] Mallick, D. (2010). Capital-Labor Substitution and Balanced Growth. Original Research Article. *Journal of Macroeconomics*, 32(4): 1131-1142.
- [6] Foley, D.K. (2000). Recent Developments in the Labor Theory of Value, *Review of Radical Political Economics, Union for Radical Political Economics*, 32(1): 1-39.
- [7] Burmeister, E. (1980). Critical Observations on the Labor Theory of Value and Sraffa's Standard Commodity. *Quantitative Economics and Development*, 81-103.
- [8] Schmid, G. (1993). Equality and Efficiency in the Labor Market: Towards a Socio-Economic Theory of Cooperation in the Globalizing Economy. *The Journal of Socio-Economics*, 22(1): 31-67.
- [9] Bortis, H. (1996). Structural Economic Dynamics and Technical Progress in a Pure Labour Economy. Original Research Article. *Structural Change and Economic Dynamics*, 7(2): 134-146.
- [10] Addison, J.T., Portugal, P., Varejão, J. (2014). Labor Demand Research: Toward a Better Match between Better Theory and Better Data. *Labor Economics*, 30: 4-11.
- [11] Conover, K.L., Shizgal, P. (2005). Employing Labor-Supply Theory to Measure the Reward Value of Electrical Brain Stimulation. *Games and Economic Behavior*, 52(2): 284-306.
- [12] Schöb, R., Wildasin, D.E. (1997). Economic Integration and Labor Market Institutions: Worker Mobility, Earnings Risk, and Contract Structure. *Regional Science and Urban Economics*, 37(2): 141-164.
- [13] Johnson, R.D. (2010). Extracting a Revised Labor Supply Theory from Becker's Model of the Household. *The Journal of Socio-Economics*, 39(2): 241-250.

- [14] Cohen, S.I. (2014). Different institutional behavior in different economic systems. Theory and evidence on diverging systems worldwide. *Economic Systems*, 38(2): 221 - 242.
- [15] Toms, S. (2006). Asset pricing models, the labor theory of value and their implications for accounting. *Critical Perspectives on Accounting*, 17(7): 947-965.
- [16] Liubinin, A. (2012). Two political economies: Social-economic development and processes of economic management. *Russian Economic Magazine*, 1: 86-115.
- [17] Trunin, S.N. (2007). Creative potential of labor theory of use value. *Terra Economicus*, Volume 5, 2(2): 304 - 308.
- [18] Cherkovets, V.N. (2006). Revisiting differences and synthesis of value labor theory and theory of marginal utility. *Bulletin of the Moscow University. Part 6: Economics*, 2: 3-36.
- [19] Sycheva, I.N. (2000). *Labor Relations in the Structure of Economic Systems* (Methodological Aspect) (pp. 383). Monograph – Tomsk: Publishing House of the Tomsk University.
- [20] Sycheva, I.N. (2003). *Source Relation and Forms of Its Implementation in the Structure of Economic Systems*. Monograph (Prof. Bychkov, A.P., Ed., Tomsk, pp. 291). Barnaul: AZBUKA.



## Market Concentration and Investment Efficiency among Publicly Quoted Petroleum Marketing Companies in Nigeria

Kehinde Adekunle ADETILOYE

Department of Finance, Covenant University, Nigeria  
[kehinde.adetiloye@covenantuniversity.edu.ng](mailto:kehinde.adetiloye@covenantuniversity.edu.ng)

Abiola Ayopo BABAJIDE

Department of Finance, Covenant University, Nigeria  
[abiola.babajide@covenantuniversity.edu.ng](mailto:abiola.babajide@covenantuniversity.edu.ng)

Victoria Abosede AKINJARE

Department of Finance, Covenant University, Nigeria  
[victoria.akinjare@covenantuniversity.edu.ng](mailto:victoria.akinjare@covenantuniversity.edu.ng)

### Abstract

*Market concentration becomes important when the firm attempts to show market leadership that might be injurious to consumer welfare in addition to the strong investment in the firm as the responsibility of shareholders since they have the residual claim on the firm. The study investigated the relationship between market leadership and investment efficiency of the firms in the Nigerian petroleum marketing sub-sector. Given the length of data available on the publicly quoted petroleum marketing companies, the study adopted shareholders fund, fixed assets and turnover as the concentration parameters and return on investment as efficiency parameter. Univariate and multivariate regressions were used as techniques. Results show that concentration parameters all tend to converge over a number of years. Turnover is the most representative with both the HHI and CR measures. Furthermore, the results also show that big does not always mean better as the firms with the highest market shares have poor investment efficiency.*

*Also, results further show that the Nigerian market is slightly highly concentrated and this seems to be increasing over the years. Recommendation suggested concerns empowerment of the entrepreneurial and small private petroleum marketing firms to break through the barrier of capital intensity of the market as they are observed to be more active in the market when there is products scarcity than when products flow is normal.*

**Keywords:** market concentration, petroleum marketing firms, Hershman-Hirfindhal index, return on investment.

**JEL classification:** M21, M31, M38.

### Introduction

The public sector divestment process released some firms and companies to the private sector for management and profitability. This affected the petroleum sector, especially the downstream sector where the marketing companies in which the government had shares, for the purposes of exercising control over the market and the sheer inability of Nigerians to put resources together to own one before now, were divested. Since the government has divested fully, many scenarios are being witnessed in the corporate structure and control in the industry and the direction of market leadership. The recent exercise of the Central Bank of Nigeria in the banking sector which encouraged mergers and acquisitions (a practice completely alien to the Nigerian business environment) has brought about new dimensions in corporate ownership and market structure in the downstream petroleum sector in Nigeria. The implications of the present circumstance is that the ascension of powerful firms strong enough to dictate price in the petroleum industry should give cause for concern as the products being sold is of economic and social importance. It is necessary to know the level of market concentration in specific industries to enable the government know how powerful the firms in such industries are and to know if antitrust laws are desirable. For firms in the petroleum marketing industry in Nigeria the need to know this is important as it brings to light the influence a firm can exert on the energy market, especially in the market for other products apart from premium motor spirit (pms). The study of market concentration also becomes important when the effect of particular firms decisions' can lead to dire social and economic consequences where horizontal mergers and consummated.

The basic objective of this study is to find the determinantsof, and the levels of market concentration and investment efficiency of the publicly listed petroleum marketing firms in Nigeria. The paper is organized as follows: section two follows immediately after this, and it deals with conceptual issues and the review of available literature. Methodology and measurement of concentration parameters and investment efficiency are dealt with in section three and results are discussed in section four. Section five makes recommendations and concludes the paper.

## Conceptual issues and literature review

Market power or control is the extent to which the firm is in control of the industry and is able to, as a result, influence or dictate the direction of price and general growth of such industry. The line between the industry and the firm is clearly defined as the firm is about allocation of resources by fiat but price commands the allocation of resources in the industry (Adegbite 2006). The choice of the firm may often be based on some corporate goal or business plan as envisioned by management or owners rather than by price or cost considerations. The industry is defined along production or producer lines while the market is defined alongside product lines and is usually measured by the closeness of substitutes of its product (Jinghan 2003). Market concentration refers to the degree in which a particular firm is in control of the market, and consequently the industry. Thus total production attributes rather than input-consumption is the important criterion in classifying the industry. The firm's concern in the process of allocating resources is to maximize whatever is available for the benefit of the firm's shareholders' wealth, which is regarded as the most superior of the firm's objectives. In the industry where cross-border merger and acquisition is occurring, the domestic subsidiaries may be left with no choice in spite of the national government aversion to some kind of merger arrangements by the Head Offices of Multinationals. However, antitrust agreements and clauses in national laws can address such issues as horizontal mergers that tend to aggravate or increase the market power of any firm.

Typically, any study that claims to test the relationship between price and the level of market concentration is also testing whether the market definition (according to which market concentration is being measured) is *relevant*: that is, whether the boundaries of each market is not being determined either too narrowly or too broadly so as to make the defined "market" meaningful from the point of the competitive interactions of the firms that it includes (or is made of). One of the basic reasons for the measurement of market concentration is that it is useful as an economic tool as it reflects the degree of competition in the market.

Tirole (1988) notes that: Bain's (1956) original concern with market concentration was based on an intuitive relationship between high concentration and collusion in an industry where few firms exist. Oligopolies are necessarily made strong by barriers (Stigler 1968) to entry, of which capital intensity of the industry is one. The study of the market structure of oligopolies enables the understanding of how firms behave and react to the stimuli introduced by anyone of them in the form of changes in price or quantities produced inducing the performance of one another. The earliest model (Cournot's), of influencing the market control is the use of quantity produced in order to corner the market and crowd out the products of other firms while Bertrand's is on the use of price to influence market conditions favourably towards oneself. However, Cournot's model is more relevant here given the structure of the market and the inability of a marketer to administer a price.

Under a Bertrand structure, the firms in the market maximize their profit by choosing a price level, assuming all other firms hold their price constant, and then sell the quantity demanded at this price. In a Bertrand model, with a homogeneous product (i.e.  $\bar{a} = 1$ ) only the firm with the lowest cost will produce or sell. This has led many national governments to watch closely the activities of foreign oligopolists operating within its economy. Thus one hardly ever finds foreign firms in an essential sector such as energy. A firm is independent or market dominant, if it can act independently of competing firms, customers and suppliers (Häckner 2001). Therefore, encouraging more firms to participate in the industry was viewed as a way of expanding the market, achieving intra-industry economies of scale and reducing concentration (Harris and Cox 1983), which can be achieved through deregulation of such industrial sectors. The Structure-Conduct-Performance paradigm, according to Aleksandranova and Lubys (2002) is now seen as a case of intra-industry competition and that concentration in itself does not impact the profitability of the individual firms. It is also believed in certain quarters that increased market size no longer guarantees less concentrated markets (Sutton 1991).

The firms deal in homogenous products which indicate that there is perfect product substitutability between firms, though the firms are multi-product rather than multi-market. Weisman (2003) shows that mergers that increase both market concentration and multi-market participation can yield non-increasing prices when demands are complementary. A key finding is that mergers that increase both market concentration and multi-market participation can yield lower prices, higher profits and hence increase economic welfare despite the absence of merger economies. In other words, consumers can benefit from the integration of two complementary firms despite the reduction in competition *per se*. In contemplating a price increase, a firm will generally have to contend with possible loss that may be reversed during a scarcity, which though may be infrequent. Mergers can increase concentration in the petroleum marketing sector (GAO 2003) as in the American market and therefore it is important to calculate and evaluate the results on regular basis to monitor the trends.

When considering a price increase in a differentiated products market (a market governed by Bertrand pricing), the proportion of marginal customers is crucial. A large proportion of loyal customers are not enough to allow a safe price increase if the proportion of marginal customers is even slightly larger. Those who would cease to purchase the firm's products in response to a small increase in relative prices are the firm marginal customers whose numbers become important during a scarcity. The parameters involved in measuring the level of domination of a company in any market has always been the firm's installed capacity (GAO Reports, 96) which is seen as being more reliable because of the firms' ability to contract and expand production at will, depending on the market mood. This addresses the productive assets base of the firms.

## Conclusion

This paper studied marketing concentration in the Nigeria downstream oil sector and attempted to correlate this with efficiency of investment, thus attempting a relationship between market leadership in a highly concentrated market with investment efficiency of the firm. The market is highly concentrated and becoming more so. Investment efficiency is related to the benefits of the shareholders, while concentration can be traced to management. While various studies have looked at the transparency as key issues in investment efficiency, the paper finds out that the highly investment-efficient firms are not the ones with market leadership. Rather the efficient firms are the mid-size firms. This suggest that there inefficiencies with the usage of capital by the big firms. Empirical study of this the market show that concentration does not necessarily make for efficiency in investment and bigger may mean worse. While Oando has the market leadership by all parameters used in this study, it is not the most efficient in the use of capital. Efficiency in investment belongs to Mobil. The unorganized state of the independent marketers will need to be addressed to wrest the control been enjoyed by the some of the firms and therefore see a gradual dilution of the market for the benefit of consumers through deregulation. Only then can the subsidy being discussed be fully appreciated.

## References

- [1] Adegbite, E.O. (2006). *Business Economics* Lagos. Forthright Publishers.
- [2] Aleksandranova A., Jonas L. (2004). An Application of Structure Performance Paradigm in a Transition Economy: Explaining Reported Profitability of the Largest of the Latvian Firms. *Rigas Ekonomikas Augustketola*. Stockholm School of Economics WP 2004, 8 (63).
- [3] Arosanyin, G.T. (2005). Pipeline Transportation of Petroleum Products in Nigeria: Threats, Challenges and Prospects. *Central Bank of Nigeria: Economic and Financial Review*, 43(2).
- [4] Bakare, A.S. (2005). Petroleum Pricing Crisis in Nigeria: Issues and Implications. *Journal Economic and Financial Issues*. 2(1).
- [5] Bain, J.S. (1956). *Barriers to New Competition* Cambridge. Harvard. University Press.
- [6] Bain, C. (1968). *Industrial Organization*. 2<sup>nd</sup> Edition New York Wiley Press.
- [7] Biddle, Gary C., Gilles H., Verdi, R.S. (2009). How Does Financial Reporting Quality Relate to Investment Efficiency?, *Journal of Accounting and Economics*, 48 (2-3): 112-131. <http://dx.doi.org/10.1016/j.jacceco.2009.09.001>
- [8] Boresstein, S. (1993). Price Incentives for Fuel Switching. Did Price Differences Slow Down The Phase-Out of Leaded Gasoline, *PWP 010*.
- [9] Braunerhejhm, P., Borgman D. (2004). Geographical Concentration Entrepreneurship and Regional Growth: Evidence from Regional Data in Sweden 1975 – 1999.
- [10] Hackner, J. (2003). Vertical Integration and Competition Policy, *Journal of Regulatory Economics*, 24(2): 213-222.
- [11] Jhinghan, M.L. (2003). *Advanced Economic Theory*. 12<sup>th</sup> Edition. New Delhi. Vrinda Publishers.
- [12] McDermott, Katie, E. (2011). Financial Reporting Quality and Investment in Corporate Social Responsibility available [http://www.business.utah.edu/sites/default/files/documents/school-of-ccounting/mcdermott\\_job\\_market\\_paper.pdf](http://www.business.utah.edu/sites/default/files/documents/school-of-ccounting/mcdermott_job_market_paper.pdf) accessed 14/02/2015
- [13] Mohammadi, S.M. (2014). The Relationship between Financial Reporting Quality and Investment Efficiency in Tehran Stock Exchange, *International Journal of Academic Research in Business and Social Sciences*, 4(6), DOI: 10.6007/IJARBS/v4-i6/930 <http://dx.doi.org/10.6007/IJARBS/v4-i6/930>
- [14] Odoko, F.O. *et al.* (2003). The Pricing of Crude Oil and Refined Products in the Nigerian Economy. *Contemporary Economic Policy Issues*, Nnanna O.J., Eds Central bank of Nigeria Publications.
- [15] Qingyuan, Li, Wang, T. (2010). Financial reporting quality and corporate investment efficiency: Chinese experience, *Nankai Business Review International*, 1(2): 197 – 213.

- [16] SöderbomMåns, Teal, F. (2003). Size and Efficiency in African Manufacturing Firms: Evidence from Firm-Level Panel Data. *Centre for the Study of African Economies Working Paper*, Oxford University.
- [17] Sutton, J. (1991). *Sunk Costs and Market Structure*. Cambridge MA MIT Press Weinberg.
- [18] Stigler, G., (1968). *The Organization of Industry*. Chicago IL. University of Chicago Press.
- [19] Tirole, J. (1988). *The Theory of Industrial Organizations*. Cambridge MIT Press.
- [20] Weismann, D.L. (2003). A Generalized Pricing Market Role for Market under CournotOligopoly'. *Economic Letters*, Volume 18 Issue October.
- \*\*\* Central Bank of Nigeria (2000) *The Changing Structure of the Nigerian Economy and Implications For Development*. Lagos. Central Bank Publications.
- \*\*\* Department of Petroleum Resources (2007). Government Subsidizes petrol with N540 Billion. *Downstream Briefs DPR*.
- \*\*\* FACTBook (2012). *The Nigerian Stock Exchange FACTBook*. Lagos, NSE Publications.
- \*\*\* General Accountability Office (1994). *Energy Market Reports 1994*.
- \*\*\* General Accountability Office (2003). Testimony before Subcommittee on Energy and Air and Committee on Energy and Commerce House of Representative.
- \*\*\* Okurounmu: *The Central Bank Bullion* IBID.
- \*\*\* World Bank (2010). Petroleum Markets in Sub-Saharan Africa: Analysis and Assessment of 12 Countries Extractive Industries for Development Series, *Oil, Gas, and Mining Policy Division Working Paper* No 15.

