THE IMPACT OF DEVELOPMENT OF INSURANCE MARKET AND ECONOMY ON THE COMPETITIVENESS OF THE COUNTRY ON EXAMPLE OF V4 COUNTRIES

[a]ELENA ŠIRÁ, [b]ROMAN VAVREK, [c]RYSZARD PUKALA

[a,b]Faculty of Management, University of Prešov in Prešov, Konštantínova 16, 080 01 Prešov, Slovakia
[c] The Institute of Economics and Management, State School of Technology and Economics in Jaroslaw. Jaroslaw, Poland
email: [a]elena.sira1@gmail,com, elena.sira@unipo.sk, [b]vavrek.roman@gmail.com, [c]ryszard.pukala@interia.pl

Abstract: Competitiveness is an important indicator, which clearly defines the position and maturity of the country. But what factors affect this competitiveness? Is it only economic performance measured by GDP? What role in this competitiveness is played by insurance market? We try to find answers to these questions. On the example of V4 countries, we try to identify, if the development of insurance market has influenced the competitiveness of the country and what role in this competitiveness economy indicators play.

Keywords: Insurance market indicators, Economy indicators, Global Competitiveness Index..

1 Introduction

Insurance industry plays an important role in all economies, especially in market economies. (Pukala, 2011) Insurability and insurance industry in the states of the European Union is one of the most important components of all economies. This sector fulfils a very important role in any country's economy and stability of people's life. (Pukala, 2012) Insurance industry as a sector of the national economy offers their goods (financial services) in the insurance market. They include all the relations between the "seller" and "buyer" who use insurance as the subject of their exchange. Insurance services are considered to be specific goods which execution takes place in the insurance market. Insurance helps to address the underlying problems that may arise in connection with an emergency of unexpected events. (Širá - Radvanská, 2014) It helps businesses to maintain economic stability but also ensures the standard of living of citizens under various unforeseen negative conditions.

Insurance covers the various risks as the need of every society. It represents a system of various market instruments and regulatory measures that ensure the flow of funds and insurance services among the insurance market on the principle of conditional return and non-equivalence. (Širá, 2012)

Insurance is divided into two main categories namely:

- life insurance,
- non-life insurance.

Life insurance is a personal insurance against death, survival, or a combination thereof. Non-life insurance contains insurance of tangible assets, intangible assets, liability insurance and personal accident insurance. Compared to life insurance, the insurer in this case clearly does not know whether the insured event occurs or not, and the questionable is the time of insured event. (Kafková, 2007) Based on the above division, commercial insurance companies can be divided into life, non-life and universal. If commercial insurance companies provide exclusively life insurance products, we talk about life insurance companies. If they provide products exclusively on non-life insurance, they are called non-life insurance companies. In case of providing products from both areas, we talk about universal insurance companies. In some countries, insurance market is operated by all three types of insurance companies, but in some countries there are only life or non-life insurance companies. (Širá - Radvanská, 2014)

However, even though the potential contribution of insurance market activity to economic growth has been recognized, the assessment of a potential causal relationship between insurance market activity and economic growth has not been as extensively studied as that of banks and economic growth. (Arena, 2008) We found some studies, where foreign authors analyzed the impact of insurance on the economy of the country. E. g. Kozak (2011), Pukala - Kafkova (2014) and Pukala (2014) analyzes the determinants of the profitability of 25 general insurance companies from Poland during 2002 – 2009 and their effect on national economy. Haiss and Sümegi (2008) analyzed relation between premiums and GDP. Bahloul and Bouri (2016) analysed the efficiency of European non-life insurance to economy.

In case of Slovak authors, there are some studies about development of insurance market, e. g. (Grmanová - Jablonský, 2009), (Pastorakova - Drugdova, 2009), (Kafková, 2007), (Pastoraková, 2006), (Širá, 2012) but there are missing studies on impact of insurance on national economy. Many other authors as Adamišin, Kotulič, Kravčáková Vozárová (2017), Vavrek (2017a) or Kotulič et al. (2015) deal with similar research based on use of several indicators at local or national level.

2 Methodology

The aim of this paper is to identify, if the development of insurance market influenced the competitiveness of the country. We set up the relationship as follows:

$$GCI = f\left(GDP, UNEM, WP_{life}, Pen, Cr_5\right) + \varepsilon$$

where the independent variable represents competitiveness of the country measured by score gained in GCI published by World Economic Forum every year. Dependent variables were sets into 2 groups, where the first group of variables were economy indicators (GDP and UNEM - unemployment) and in the second group were indicators representing the insurance market (WP_{life} - written premium in life insurance, Pen - penetration rate and Cr_5 - concentration ratio 5).

We have analysed the countries belonging to the group named V4, it means the Czech Republic (CZ), Hungary (HU), Poland (PL) and the Slovak Republic (SK), in the years 2003 - 2015.

The relation between selected indicators was described by Kendall coefficient,

$$r_K = \frac{n_c - n_d}{n(n-1)/2}$$

where: n - number of observations of pair of variables
n_c - number of discordant pairs
n_d - number of concordant pairs

regression analysis and the methods of least squares

$$\sum_{i=1}^{n}(y_i - \hat{y}_i)^2 = \sum_{i=1}^{n} e_i^2 \rightarrow min$$

where: y_i - measured value of dependent variable
$\hat{y}_i$ - estimated value of dependent variable
e_i - random error of dependent variable

with expressing the force of the model using a determination coefficient (Vavrek, 2017b).

$$R^2 = \frac{\sum_{i=1}^{n}(y_i - \hat{y}_i)^2}{\sum_{i=1}^{n}(y_i - \bar{y}_i)^2}$$

where: y_i - measured value of dependent variable
$\hat{y}_i$ - estimated value of dependent variable
$\bar{y}_i$ - average value of dependent variable

The analyses were made by MS Excel, Statistica 13 and Statgraphics programmes.

2.1 Indicators description

Global Competitiveness Index GCI - Competitiveness can be measured from a number of perspectives. We choose the Global Competitiveness Index, published annually by the World Economic Forum. Since 1979, this institution has published the Global Competitiveness Report on selected countries of the world. This report is one of the most comprehensive sources of information on the comparative benefits of economies around the world. The GCI index consists of 114 indicators, which are grouped into 3 subindexes. (Schwab et al., 2016)

The Gross Domestic Product (GDP) - Economic growth is usually defined as an increase in the goods and services produced by an economy in given period. (O'Neill, 2014) The GDP growth represents the total growth in goods and services for each country. (Bahloul - Bouri, 2016) This indicator is used in macroeconomics, to set the efficiency of the economy of the country.

Unemployment rate - The unemployment rate is the number of unemployed persons as a percentage of the labour force. (Layard, 2005) That rate means all persons, that are able to work and their age are between 17 and 64 years, but don't have work, compared to whole labour force of the country. The unemployment is negative phenomenon of the economy.

Written Premium - It is an important indicator of insurance market. Written premium is the sum of all premiums paid to insurance companies in one year. (Burca - Batrinca, 2014) When we divide insurance into life and non-life insurance, we can divide written premiums that way, too. So, the written premium in life insurance is an important indicator for insurance market and whole economy growth, because, in developing countries is this indicator very low. (Outreville, 1996) When compared written premium in life and non-life insurance, in developing countries in life area are values under 50 %. (Arena, 2008) In the case of market economy, the higher level of development shows the country's economy, the higher value (above 50 %) achieves the written premium in life compared to non-life. (Chen, Lee - Lee, 2012)

Penetration - There are two commonly-used indicators of the importance of insurance in the national economy (or alternatively, the level of insurance protection) – insurance density and insurance penetration. (Bernat - Grundey, 2007)

Insurance penetration is calculated as the ratio of total insurance premiums – or premiums at the market level – to the country's GDP. (Kwon - Wolfron, 2017) It as an important indicator for insurance. It measures the significance of the insurance industry in comparison to country's economic activity. (Bahloul - Bouri, 2016)

Concentratio Ratio - As a measure of market concentration different indicators are used. The most commonly used are the Concentration Ratio (CR) and Herfindahl-Hirschman Index (HHI). (Hečkova - Chapčakova, 2011), (Kramaric - Pavic Kitic, 2013), (Sharku - Shehu, 2016) Concentration ratio is a simple measure of industrial concentration and is based on calculation of the size of the market share of m largest firms in the industry. In the example of insurance market it shows the share of gross written premiums that was achieved by the greatest competitors in relation to the total gross written premium that was achieved by the entire insurance industry in the respective year. (Brezina et al., 2012), (Širá, 2013), (Kramaric – Pavic Kitic, 2013)

$$CR_m = \sum_{i=1}^{m} s_i \quad \text{for } i = 1, 2. \ldots, m;\ m \in \langle 1, n \rangle$$

where: s_i - market share and
m - number of measured firms

It is a simple sum of their market shares, where the number of companies for the calculation may vary depending on the study objective or the total number of companies in the industry. The number often ranges from 3 to 10. E.g. The world know Financial market supervisory authorities such as BaFin in Germany monitors the largest 15 companies, Finma in Switzerland monitors the largest 5 companies, EIOPA collects and publishes data on concentration in the largest 3, 5 and 10 companies. (Kwon - Wolfron, 2017) Bahloul and Bouri (2016) and other authors monitor concentration of 5 biggest insurance companies.

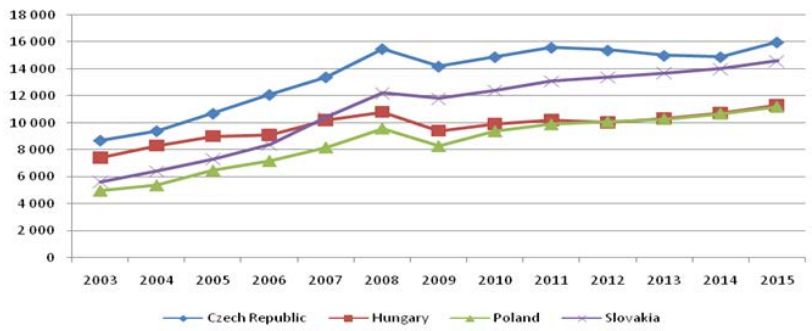
This indicator can take values from the interval $0 \leq CR_n \leq 100$. (Šira - Radvanska, 2014) A lower concentration ratio generally means a higher level of competition in the market or the country. Conversely, a high ratio implies the possible presence of monopolistic competition or oligopoly (a ratio of 100 means full control of the market by the largest companies or the market is probably not privatised). (Kwon - Wolfron, 2017), (Kramaric - Pavic Kitic, 2013).

3 Discussion

Firstly, we have shown the development of some indicators, and secondly, we have analysed the relationships among settled areas.

First of all, we analysed the development of GDP. For better comparison, we choose the values of GDP per capita. As we can see below, the highest values of GDP per capita were obtained for the whole analysed period in the Czech Republic, the lowest values were in Poland. GDP has had in all V4 countries growing tendency. The biggest growth was in the case of the Slovak Republic.

Figure 1 GDP per capita

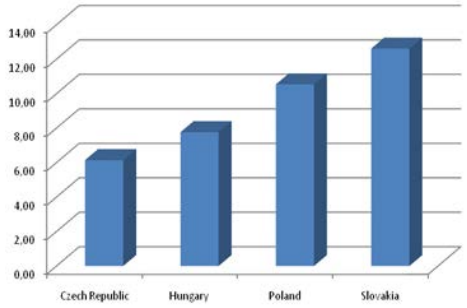


Source: own processing

The second indicator for evaluation of the economy's performance, was unemployment. The unemployment in the monitored period was a moderately declining, or had steady trend (in the Czech Republic). But when we compare the average

values of this indicator, as mention in Figure 2, we can see, that the highest average values were in case of Slovakia and Poland, both over 10 %. The lowest value of average unemployment was in the Czech Republic, in the amount of 6,15 %.

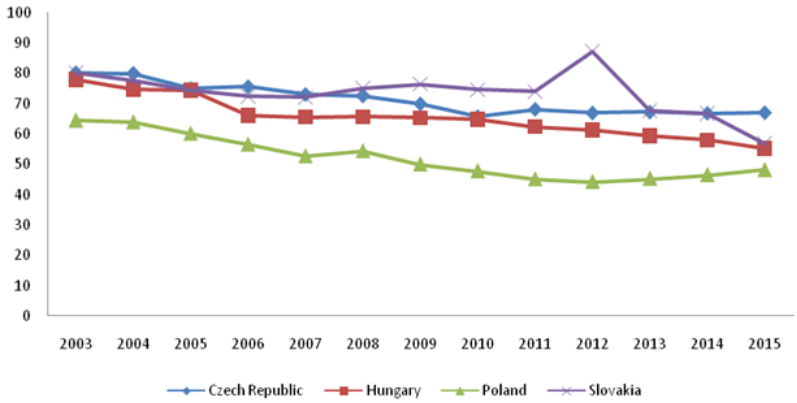
Figure 2 Average unemployment rate in V4 countries, 2003 - 2015



Source: own processing

Typical indicator for insurance and, of course, other industries, is concentration ratio. We calculated Cr_5, that means concentration of 5 biggest insurance companies on the market. Market share of insurance companies was calculated according to amount of total written premium of each insurance company. The development of Cr_5 in V4 countries gained slightly declining trend.

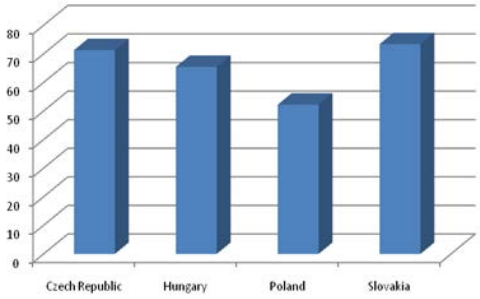
Figure 3 Concentration ratio 5



Source: own processing

Very important finding was, in the average value of that indicator in V4 countries. The average values of concentration in the 2003-2015 shown by Figure 4, show that the Slovak Republic and the Czech Republic has a significantly higher concentration rate than Poland and Hungary.

Figure 4 Average values of Cr_5 in V4 countries



Source: own processing

In this section we offer the findings from the verification of the relationship among the specified variables. The relationship among the GCI index and the selected markers is monitored primarily through the Kendall coefficient, which describes the linear relationship among the observed variables, with the following results.

Table 1 Linear Correlation of the GCI Index and selected indicators

	UNEM	GDP	WP_{life}	Pen	Cr_5
Czech Republic	-0,1600	0,3842	-0,3159	-0,4384	0,2896
Hungary	-	0,3091	-	-	0,5778**
	0,0811		0,6221**	0,0270	
Poland	-0,3626	-0,3358	0,0534	0,0552	-0,3203
Slovak Republic	0,0779	0,5360*	-0,8572**	0,3676	0,0520

* the level of significance <0,05
** the level of significance <0,01

Based on the results from Table 1 we note the linear relationship of the GCI index with the prescribed premium in two countries (Hungary and the Slovak Republic). In the case of Slovakia, a statistically significant linear series correlation with a year-on-year change in GDP was confirmed and, in the case of Hungary, a statistically significant linear market-to-market correlation was confirmed. With the rising value of the GCI index, life insurance premiums are decreasing, and at the same time a year-on-year change in GDP and market concentration in selected countries is rising.

The above-identified statistically significant relationships are subsequently described using a simple regression analysis method, the results of which are captured by the following graphs.

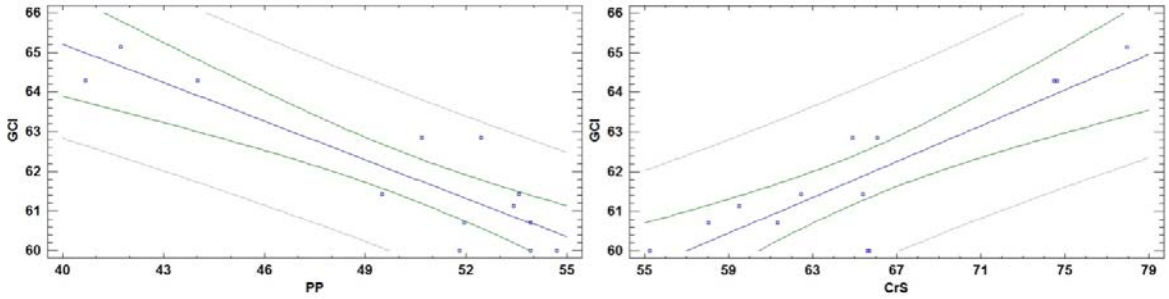
The relation between the GCI index and the written premium in life insurance, respectively market concentration in Hungary can be described by these simple models

$$GCI = 78,1762 - 0,324166*WP_{life},$$

$$GCI = 47,1591 + 0,22529*Cr_5,$$

whose strengths, respectively the quality, expressed by the coefficient of determination (R^2_{WPlife} = 0,7686; R^2_{Cr5} = 0,7166) pointing to the high impact of other factors.

Figure 5 Regression model GCIxWP$_{life}$ a GCIxCr$_5$ in Hungary



Source: own processing

Note: PP - written premium in life insurance

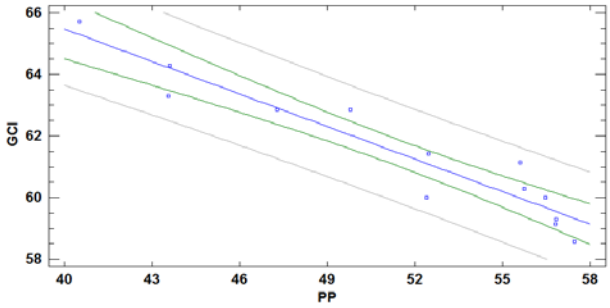
In Slovakia, the relationship between GCI and year-to-year change in GDP and premiums written is monitored. These relationships can be described as

$$GCI = 60{,}0695 + 0{,}328465*GDP, \text{ respectively}$$

$$GCI = 79{,}5477 - 0{,}35187*WP_{life}$$

While the power of the first model is very low (R^2_{GDP} = 0,3447), the second model allows the relationship of these variables to be considered as statistically significant (R^2_{WPlife} = 0,9047).

Figure 6 Regression model GCIxWP$_{life}$ in Slovakia



Source: own processing

Note: PP - written premium in life insurance.

4 Conclusions

Although the development of the country's insurance market is linked to the growth of the economy, as we have seen on the development of selected indicators, we cannot confirm our thesis about the impact of the insurance market's development on the competitiveness of the country.

Based on the above results, we can state that the assessment of the competitiveness of the V4 countries is not determined by the development of the insurance market and the development of the economy expressed by the individual indicators. An exception is the relationship between the GCI index and the premium written in Slovakia, which makes it possible to assume that the development of the insurance market determines the country's performance in assessing its competitiveness.

This article may enrich our knowledge and provide scope for further exploration in this area in the future.

Literature:

1. Adamišin, P., Kotulič, R., Kravčáková Vozárová, I.: *Legal form of agricultural entities as a factor in ensuring the sustainability of the economic performance of agriculture*. Agricultural economics, Vol. 63(2), 2017, p. 80-92. ISSN 0139-570X.
2. Arena, M.: *Does insurance market activity promote economic growth? A cross-country study for industrialized and developing countries.* Journal of Risk and Insurance, 75(4), 2008, p. 921-946. ISSN 1539-6975
3. Bahloul, W., Bouri, A.: *The Efficiency of the European Non-Life Insurance: CEO Power, Macroeconomic, and Market Characteristics Impact*. International Journal of Financial Studies, 4(1), 4, 2016. ISSN 2227-7072
4. Bernat, T., Grundey, D.: *Insurance market maturity: a comparative study in Poland and Lithuania*. Technological and Economic Development of Economy, 13(3), 2007. p. 184-190. ISSN 2029-4921
5. Brezina, I. et al.: *The analysis of concentration of Slovak banking sector*. Strategic management – International journal of strategic management and decision support systems in strategic management, Vol. 17, No. 2, 2012. ISSN 1821-3448.
6. Burca, A. M., Batrinca, G.: *The determinants of financial performance in the Romanian insurance market*. International Journal of Academic Research in Accounting, Finance and Management Sciences, 4(1), 2014. p. 299-308. ISSN 2225-8329
7. Grmanová, E., Jablonský, J.: *Analýza efektívnosti slovenských a českých poisťovní pomocou modelov analýzy obalu dát.* Ekonomický časopis, 57(9), 2009. p. 857-869. ISSN 0013-3035.
8. Haiss, P., Sümegi, K.: *The relationship between insurance and economic growth in Europe: a theoretical and empirical analysis.* Empirica, 35(4), 2008. p. 405-431. ISSN 1573-6911
9. Hečkova, J., Chapčakova, A.: *Competitiveness of the Branch Structure of Slovak Manufacturing Industry in 1998-2008*. Ekonomicky casopis, 2011, 59.1: p. 59-78. ISSN 0013-3035.
10. Chen, P. F., Lee, C. C., Lee, C. F.: *How does the development of the life insurance market affect economic growth? Some international evidence.* Journal of International Development, 24(7), 2012. p. 865-893. ISSN 1099-1328
11. Kafková, E.: *Technické rezervy a investičná činnosť komerčných poisťovní na Slovensku*. Ekonomický časopis (Journal of Economics), 52(2), 2007. p. 166-180. ISSN 0013-3035.
12. Kotulic, R, et al.: *The structural analysis of the sectors of Slovak economy and employment in times of global change and the subsequent development.* Procedia Economics and Finance, 2015, 23 p. 1590-1595.
13. Kozak, S.: *Determinants of profitability of non-life insurance companies in Poland during integration with the European financial system.* Electronic Journal of Polish Agricultural Universities, 14(1), 01, 2011. ISSN 1505-0297.
14. Kramaric, T., Pavic, Kitic, M.: *Comparative analysis of concentration in insurance markets in New EU member states*. Romania, International journal of social, behavioral, educational, economic, business and industrial engineering, Vol. 6, No. 6,. p. 1322-1326, 2012, 1: 92.84.
15. Kwon, W. J., Wolfrom, L.: *Analytical tools for the insurance market and macro-prudential surveillance.* OECD Journal: Financial Market Trends, 2016(1), 2017. p. 1-47.
16. Layard, P., Richard G., et al. *Unemployment: macroeconomic performance and the labour market*. Oxford University Press on Demand, 2005.
17. O'Neill, D.: *Gross domestic product.* Degrowth: A Vocabulary for a New Era, 2014, p. 103.

18. Outreville, J. F.: *Life insurance markets in developing countries*. Journal of Risk and Insurance, 1996, p. 263-278. ISSN 1539-6975
19. Pastoráková, E.: *Javové podoby globalizácie na poistnom trhu v Slovenskej republike*. Ekonomický časopis, 54, 2006. p. 785-802. ISSN 0013-3035.
20. Pastoráková, E., Drugdová, B.: *Komerčný poistný trh v Slovenskej republike*, Finanční řízení podniků a finančních institucí,: VŠB-TU Ostrava, Ostrava 2009.
21. Pukała, R.: *Potencjał rynków ubezpieczeniowych krajów Europy Wschodniej, w „Ubezpieczenia gospodarcze i społeczne. Wybrane zagadnienia ekonomiczne*.", red. naukowa W. Sułkowska, Oficyna Wolters Kluwer, Warszawa, 2011, p.. 261 - 270, ISBN 978-83-264-1536-4.
22. Pukala, R.: *The Polish insurance market in the years 2004 - 2011*. Acta Oeconomica Cassoviensia, 2012, 1:2012. p. 56-81. ISSN 1337-6020.
23. Pukala, R.: *The impact of the global economic crisis on polish insurance market*. Aktual'ni Problemy Ekonomiky= Actual Problems in Economics, (158), 2014. p. 341. ISSN 1993-6788.
24. Pukala, R., Kafková, E.: *Development of commercial insurance in the Slovak Republic, Poland and Ukraine in the period 2004–2012*. Ekonomický časopis (Journal of Economics), 62(3), 2014. ISSN 0013-3035.
25. Sharku, G., Shehu, S.: C*oncentration of Albanian Insurance Market*. Ekonomika a Management, (3). 2016. p. 1322-1326. ISSN 1802-8934
26. Schwab, K. et al.: *The Global Competitiveness Report 2013–2014*. Geneva. World Economic Forum, 2016. 551 p. ISBN 92-95044-73-8.
27. Širá, E.: *Vybrané oblasti poisťovníctva a konkurencieschopnosti komerčných poisťovní*. Prešov: Bookman, 2012, 137 p. ISBN 978-80-89568-44-4
28. Širá, E.: *Evaluation of insurance markets concentration in Slovak republic and Hungary*. Journal of management and business : research and practice, Vol. 5, No. 1 2013, p. 31-40. ISSN 1338-0494
29. Širá, E., Radvanská, K.: Ins*urance as a means of risk transfer*. Challenges to financial stability–Perspective, Models and Policies, volume I : a framework for modeling systemic risk drivers of different markets, Craiova : ASERS Publishing, 2014, p. 212 - 226. ISBN 978-606-8689-01-2
30. Vavrek, R. *Weight of TOPSIS technique parameter and its impact on assessment of municipalities in Slovak republic*. Scientific papers of the University of Pardubice, Vol. 24(9), p.236-246, 2017a. ISSN 1211-555X.
31. Vavrek, R.: *Multi-criteria evaluation of municipalities*. Warsawa: Jedność w róznorodości, 142 p, 2017b. ISBN 978-83-947394-6-1.

Primary Paper Section: A

Secondary Paper Section: AH, AE