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Application of the Perkal method for assessing competitiveness of the countries of Central and Eastern Europe

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Abstract

Research background: The changes that took place in the late twentieth century led to the transformation of the political system in the countries of Central and Eastern Europe (CEE). As a result, there has been an increase in the competitiveness of some of the economies among the CEE states. Due to different priorities and goals, these countries are also characterized by different levels in socio-economic development.

Purpose of the article: The aim of the article is to identify the determinants affecting the competitiveness among the selected CEE countries.

Methods: Based on Eurostat data, a set of determinants affecting competitiveness was established. A number of determinants have been eliminated in relation to the variation coefficient. At the same time, a classification of the level of competitiveness among the CEE countries has been made by using the Perkal method. The analysis used 14 selected indicators, 10 of which are considered as stimulating, and 4 as deteriorating the competitiveness of national economies. The result led to obtaining a synthetic level indicator of potential of the CEE countries.

Findings & Value added: Following the findings of the conducted analysis, the highest economic competitiveness exists in Estonia and in the Czech Republic, while the lowest was found in Romania and Bulgaria. The results of the evaluation obtained with the Perkal

method concerning the competitiveness of the CEE countries that belong to the EU are largely consistent with those presented in different global competitiveness rankings. However, the method applied in this article seems much simpler and less time-consuming, allowing at the same time an optimal choice of analytical determinants. The selected linear Pearson correlation's coefficient confirmed that there is a strong positive relationship between the designated values of the synthetic indicator of competitiveness and the GDP per capita. This confirms the validity of test method used.

Introduction

The changes that occurred in the late twentieth century in Europe led to the transformation of the political system in the countries of Central and Eastern Europe (CEE), the so-called Eastern bloc countries. The processes of globalisation associated with the liberalisation of movement of goods and capital and the opening of markets has led to profound social and economic transformations in these countries (Kornai, 2006, pp. 218, 222–240). Among them, there are former Soviet republics: Lithuania, Latvia, Estonia, Belarus, Ukraine, and the Visegrád Group countries: Poland, the Czech Republic, Slovakia and Hungary. The group of countries in Central and Eastern Europe also includes the countries formed after the break-up of the former Yugoslavia, including, among others, Slovenia, Croatia, Bosnia and Herzegovina, Serbia, Montenegro and Macedonia and other Balkan countries like Romania, Bulgaria and Albania. Some of them (Poland, Hungary, the Czech Republic, Slovakia, Romania and Bulgaria, as well as former Soviet republics Lithuania, Latvia and Estonia) have acceded the European Union (EU), among which some have already adopted the single currency. By doing so, they also strongly engaged in the processes of globalisation. Still other countries have maintained more or less strong ties with the Russian Federation (e.g. Belarus).

Generally, the transformation of the CEE countries made it possible to improve their competitive market positions. However, this involved many changes, not only of political but also legal, social and economic character. The reforms that led to a market economy contributed at the same time to developing a more innovative economy and private sector, rendering the situation on the labour market more real and as a result leading to improvements of their respective competitiveness as measured by the pace of economic growth and improvement of living conditions.

Competitiveness of a country is a result of a number of different factors that affect it positively or negatively. It can depend on external variables so that it also important for a country's economy to withstand external shocks, which may cause economic distortions. In this context, the processes of

globalisation may impinge upon production, financial, investment or other contingencies between different countries, and in doing so it may have a large impact upon the competitiveness of national economies.

States' competitiveness has been defined numerous times. At the same time, however, one has to bear in mind that the same concept has also been criticised by a number of authors, especially by P. Krugman (1994, pp. 31–35). Generally, in classical understanding, this term is understood as an ability to effectively use all factors of production (Porter, 2008, pp. 178, 188; Klamut & Passella, 1999, pp. 58–59) in order to achieve a high economic growth rate (Kharlamova & Vertelieva, 2013 p. 41) and a production of goods and services that meet international standards in the free market competition, increasing thereby the real income of the population, improving their living conditions (Balkytė & Tvaronavičienė, 2010, pp. 343–344; Önsel *et al.*, 2008, p. 222) and promoting domestic enterprises (Kharlamova & Vertelieva, 2013, p. 41).

For M. E. Porter competitiveness is associated with productivity: "*the principal goal of a nation is to produce a high and rising standard of living for its citizens. The ability to do so depends on the productivity with the nation's labor and capital are employed*" (Porter, 2008, p. 176). K. Aiginger, S. Bärenthaler-Sieber and J. Vogel on the other hand claim that competitiveness is the "*ability of a country (region, location) to deliver the beyond-GDP goals for its citizens today and tomorrow*" (2013, p. 13). Still, other authors combine the term "competitiveness" (of countries) with the ability to perceive and understand the broad economic phenomena, instead of only observing their effects (Klamut & Passella, 1999, pp. 58–59).

It should be recalled at this point that, according to the M. E. Porter's definition, it is the similarities rather than the differences that determine the advantages and the competitive positions of countries and regions¹. It does not only depend upon the ability to innovate, on creative skills and learning, but also upon the cultural, historical, and institutional contingencies and structures of a given economy (Porter, 2008, pp. 171, 177–178, 188–199; Balkytė & Tvaronavičienė, 2010, pp. 347–349). Equally, the processes of globalisation as well as all associated global competition also contribute to the ever increasing specialisation (Huggins, 1997, p. 242).

Concluding, it can be assumed that competitiveness is defined as the ability of a country to effectively compete on the international level, it is its ability to shape the economic structures in such a way that it would contribute to achieving successful and sustainable socio-economic develop-

¹ Regions can be understood as some isolated areas, parts of a state or country blocks (Balkytė & Tvaronavičienė, 2010, p. 347).

ment through, among others, effective use of existing resources and the capacity of acquiring knowledge and innovative solutions.

Attention is increasingly drawn to the role of the processes of globalisation and to the processes of global competition. Hence, the concept of competitiveness of countries (national competitiveness) is replaced by the term 'international competitiveness' of a country. The latter is defined by the WEF a "*set of institutions, policies and factors that determine the level of productivity of an economy, which in turn sets the level of prosperity that the country can earn*" (Schwab (Ed.), 2015, p. 4). A certain simplification here is the definition adopted by the OECD: competitiveness in international business is "*a measure of a country's advantage or disadvantage in selling its products in international markets*" (<https://stats.oecd.org/glossary/detail.asp?ID=399>).

It is commonly accepted that globalisation is mainly understood as a process of economic change accompanied by social and cultural changes. It is largely identified with liberalisation of markets, building more and stronger links between national economies, and economic integration (Misiak, 2007, pp. 11–13, 36–38; Salvatore, 2010, pp. 22–23). Beyond those economic and social dimensions of globalisation, R. O. Koehane and J. S. Nye also included a political dimension (Koehane & Nye, 2000; cf. Adamkiewicz-Drwiłło, 2012, p. 1544).

Many researchers have demonstrated in their works that there are links between globalisation and competitiveness of countries and regions understood as groups of countries or geographical parts of the world. G. Kharlamova and O. Vertelieva (2013, pp. 45–52) have showed that there is a clear relationship between selected factors of globalisation and the level of international competitiveness. The positive impact of globalisation on international competitiveness (economic growth) is also confirmed by the research results presented by D. Salvatore (2010, pp. 28–31), H. G. Adamkiewicz-Drwiłło (2012, pp. 1547–1554; 2014, pp. 113, 117–119)² and H. Gurgul and Ł. Lach (2014, pp. 104–106).

The changes related to globalisation have been particularly important for countries with economies in transition from centrally planned economy to free market economy, with which they tried to "catch up" with the developed countries. The CEE countries have managed this task in different ways; their targets have been achieved to varying degrees as well (Kolodko, 2001, pp. 284–289, 317). The CEE countries have different economic potential resulting from historical, social and institutional factors, which

² However, as it was found in this study, there is a positive effect occurring with some delay, generally three years. There is also a negative effect of globalisation in the case of the level of innovation (Adamkiewicz-Drwiłło, 2014, p. 119).

affect their competitive positions in the world rankings. Also, it is not a homogeneous region.

The academic literature often provides studies on economies of the countries that are members of the EU, or on individually selected countries outside this group. There are also studies on factors affecting competitiveness in the CEE region and on individual countries in this region, including for instance innovation of small and medium-sized enterprises — SME (Apanasovich *et al.*, 2016, pp. 33–37), on foreign direct investment (Bevan & Estrin, 2004, pp. 782–785; Giroud *et al.*, 2012, pp. 2213–2219), on key sectors of the economy (e.g. Gurgul & Lach 2015, pp. 20–28; Swinnen & Gow, 1999, pp. 30–37, 44–45) or on barriers in conducting economic activities (Gorzeń-Mitka, 2007, pp. 11–16).

Few studies were carried out on individual determinants, more however on mixes of factors at the same time (e.g. Kharlamova & Vertelieva, 2013, pp. 45–49; Krajnyák & Zettemeyer, 1998, pp. 328–334). Analyses were also made concerning the processes of privatisation, the changes in the level of GDP (Gallyamova, 2015, pp. 252–255), the social inequalities in the CEE countries (Binelli *et al.*, 2015, pp. 242–246) and the changes in the level of prosperity as a result of reforms (Aidukaite, 2011, pp. 212–217) or others.

An interesting question here appears to be the level of competitiveness, however not so much in relation to other countries in the world, but rather in relation to countries within the CEE group to extract and analyse the differences between them. Such a comparison should provide more reliable results than the commonly used rankings of competitiveness, where economies of the CEE countries are compared with the developed economies of the countries of Western Europe or North America.

With regard to the international rankings, the level of economic and social development existent in the analysed countries has improved significantly after the entry into the European Union. Despite the EU membership, however, there are still visible development disparities. The analysed countries, which entered the EU in the recent years, had by then no possibility to take full advantage of the available financial resources available, nor could they implement reform packages related to the EU 2020 strategy.

For the purpose of the article, the authors decided to first identify the determinants affecting the competitiveness between the selected CEE countries in order to then assess the changes in the levels of their respective competitiveness potentials. To achieve this objective, a set of determinants has been defined (stimulants and destimulants) that affect regional competitiveness. To carry out such a study, the analysis focused on the academic literature with particular emphasis on competitiveness rankings.

Research methodology

The analysis selected those CEE countries that joined the European Union, namely: Bulgaria, Croatia, the Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia and Hungary. The classification of the level of competitiveness of these countries have been established by using the Perkal method including 14 selected indicators, 10 of which were considered as stimulants and 4 as destimulants for the competitiveness of the chosen national economies. The analysis was made for 2014 and on the basis of data published by Eurostat³.

As stimulants to competitiveness have been included:

x_1 – activity rates by sex, age and citizenship (share of population at the age from 15 to 64 years),

x_2 – GERD — gross domestic expenditure on R&D (% GDP),

x_3 – exports of high technology products as a share of total exports,

x_4 – total fertility rate (number of children per woman),

x_5 – life expectancy by age (for children at the age less than year),

x_6 – duration of working life,

x_7 – lifelong learning (share of population at the age from 15 to 64 years),

x_8 – employment in knowledge-intensive activities (share of total employment),

x_9 – nominal labour productivity per person (% of EU28 total = 100),

x_{10} – export market shares (% of world total)

Among the destimulants the following have been taken into account:

x_{11} – unemployment — annual average (share of population),

x_{12} – general government gross debt (% GDP),

x_{13} – HICP — inflation rate, annual average rate of change (%),

x_{14} – people at risk of poverty or social exclusion (% of total population).

Concerning the measurement of competitiveness, one important issue is the selection of appropriate indicators. The indicators presented above allow simultaneous assessment of the economic and social situation in a country. According to M. E. Porter and P. Krugman, productivity is one of the key determinants of competitiveness (Porter, 2008, p. 176; Kharlamova & Vertelieva, 2013, p. 40). It also depends among other things on the level of education of employees and their employability.

Another factor linked to productivity is innovation as related to R&D expenditures and the production and export of goods from the high-tech sector. In the era of globalisation, an important issue are also goods in-

³ Statistics for later years were not available then: for 2015 the data were published only partially in Eurostat.

volved in world exports, which is related to competitiveness as well. On the other hand, to the group of destimulants have been included macroeconomic factors related to state policy.

The Perkal method used in this analysis helps to compare different selections of stimulants and destimulants, plus the result of its use allows for obtaining a synthetic indicator for the competitiveness potential in the regions. It is characterised by transparency and, which is most important, by a low information loss during data aggregation. The purpose of the use of this method was to create a classification of objects (CEE countries) according to a fixed set of characteristics. The higher the value of the synthetic indicator, the more favourable the situation in a given country in terms of competitiveness. In this analysis, the index has been constructed on the assumption that all the elements (features) are the same at each level of generalisation.

The first step in the analysis was the determination of variables that describe the object of the study. This was followed by the selection of 14 variables that show a complete and comprehensive picture of the level of development and competitiveness of countries, including the value of the variation coefficient (with the critical value assumed at 5%). In addition, one of the criteria considered by selecting the set of characteristics was the actuality, availability and their comparability.

A normalisation of the given stimulants was then undertaken according to the equation (Dudzik & Głowacki, 2010, pp. 40–41):

$$T_{ij} = \frac{X_{ij} - \overline{X_j}}{S_j}$$

where:

T_{ij} – value of the normalised indicator j for country i

X_{ij} – indicator value j for country i

$\overline{X_j}$ – medium indicator value j

S_j – standard indicator deviation j

In the case of the destimulants, the following equation has been applied:

$$T_{ij} = -\frac{X_{ij} - \overline{X_j}}{S_j}$$

The normalisation allowed for comparability between different indicators, even though they were originally expressed in different units (Dudzik & Głowacki, 2010, p. 41):

$$P_i = \frac{1}{n} \sum T_{ij}$$

where:

P_i – indicator of competitiveness of a country i

n – total number of determinants (stimulant and destimulants)

Hereby, it was assumed in the analysis that each selected determinant has the same impact on the level of a given phenomenon.

The next stage of the analysis calculated synthetic indicators of the level of competitiveness by summing together all the indicators for a given country. The value of the synthetic indicator designated by the Perkal ranges does not go beyond the $[0;3]$ range. For countries with a higher level of competitiveness, the indicator adopts positive values, while for those with a weak level of competitiveness, negative values are indicated. The closer the value of the synthetic indicator gets to the value 3, the stronger the level of its competitiveness becomes. By contrast, wherever the indicator has a value closer to zero, the competitiveness potential of a country gets smaller (Parysek & Wojtasiewicz, 1979, p. 26).

The classification of countries done according to the level of competitiveness used two taxonomic parameters, that is, it calculated the average and the standard arithmetic deviation into the equation. By doing so, three classes were distinguished (GUS, 2013, p. 24):

- I class – the most competitive countries, where the synthetic indicator showed values greater and equal to the sum of the average arithmetic sum and half of the standard deviation $P_i \geq 0,26$
- II class – countries with an average level of competitiveness, where the synthetic indicator showed values being in the range between the arithmetic average minus half of the standard deviation and the arithmetic average plus half of the standard deviation, that is $-0,26 \geq P_i > 0,26$
- III class – countries with the lowest competitive potential, where the calculated synthetic indicator adopted a value below the difference between the arithmetic average and the half of the standard deviation $P_i > -0,26$.

Results and discussion

On the basis of the obtained results (Figure 1), the CEE countries were divided into three groups:

- I class – most competitive countries: the Czech Republic, Estonia and Slovenia,
- II class – countries with an average level of competitiveness: Lithuania, Poland, Slovakia, Latvia and Hungary,
- III class – countries with the lowest competitive potential: Bulgaria, Croatia and Romania.

Categorising a country as belonging to one particular group was largely dependent upon the normalised values of the destimulants and stimulants, as shown in Table 1.

It should be noted at this point that the lowest stimulant values were most often notified in the case of Romania (x_1 , x_2 , x_7 , x_8) and Bulgaria (x_3 , x_5 , x_9). In the case of Poland, Hungary and Croatia, one value was noticed (x_4 , x_6 , x_{10} , respectively). The highest stimulus value was most frequently observed for Slovenia (x_2 , x_5 , x_7), then Estonia (x_3 , x_6) and Latvia (x_1 , x_4). Hungary, Slovakia and Poland obtained the maximum value for individual stimulants (respectively x_8 , x_9 , x_{10}).

By contrast, in the case of destimulants, the lowest value was reported for Croatia (x_{11} , x_{12}), Romania (x_{13}) and Bulgaria (x_{14}). Accordingly, maximum values destimulants were found in the case of the Czech Republic (x_{11} , x_{14}), Estonia (x_{12}) and Bulgaria (x_{13}).

The maximum and minimum values had the greatest impact on the obtained results when the Perkal method was used. The findings can be compared with the two best known rankings of competitiveness published by the IMF and the WEF as well as with the basic measure of economic performance i.e. the GDP per capita (Table 2).

The countries in Table 2 are ordered according to the results obtained with the Perkal method. As regards the IMD and WEF competitiveness rankings, the places in parentheses refer to the order among the EU CEE countries, had they only been taken into account in the study. The above table shows that the applied Perkal method allowed obtaining similar results to those obtained in a more complex method for assessing competitiveness. All methods of evaluation confirmed that the highest competitiveness among these countries exists in Estonia and in the Czech Republic. Differences subsist in the case of the countries being further down in the rankings, which most likely results from the selection of variables to determine the competitiveness: concerning the Global Competitiveness Index (GCI) published by the WEF, more than 100 evaluation criteria are taken

into account (Schwab (Ed.) 2014, pp. 9, 537–545) and the assessment of competitiveness used in the IMD World Competitiveness Yearbook, one finds more than 300 factors (<https://worldcompetitiveness.imd.org/>).

The Perkal method strictly focuses on economic factors and selected social issues. It, however, omits political and legal factors, which also have an influence on the competitiveness of national economies and which are taken into account by the IMD and WEF rankings.

It is worth noting here that the highest value regarding the Perkal indicator points to the countries that joined the EU structures in 2004, which may in turn indicate that with the EU accession, the competitive position of those countries have not only increased among countries belonging to the Central and Eastern European region, but it also increased their competitiveness on the international level.

In the presented analysis, Poland took the fifth place, which is reflected by the IMD and WEF ranking. There, Poland was also on the fifth place. This result may indicate the validity of the Perkal method as to the analysis of the level of competitiveness as well as regarding the selected determinants (stimulants and destimulants).

By contrast, countries that entered the EU structures in 2007 (Bulgaria and Romania) or in 2013 (Croatia) ranked on the synthetic indicator index on places between 9 and 11, a fact that does not correspond with their position in the comparative rankings done by the IMD and WEF. It should be stressed here that the position of Croatia among the analysed countries differs only by one position in the competitiveness rankings of the IMD and WEF as compared with the method used in this study.

By using the Pearson's linear correlation coefficient, the relationship between the synthetic indicator obtained by Perkal method on the one and the GDP per capita value, PPS (euros), on the other hand was also examined. The calculation showed that the Pearson value equalled 0.8395, which indicates a strong positive relationship between the analysed variables. In contrast, the calculations showed a moderate positive correlation (0.5542) between the synthetic indicator and the results obtained in the IMD ranking. A similar comparative analysis of the synthetic indicator in relation to the results coming from the WEF ranking also proves a moderate positive correlation (0.5407).

Already lot of research on economic growth and improvements of competitiveness has been carried out. G. W. Kolodko has studied the economies of the CEE countries and other countries that emerged after the collapse of the Soviet Union. The best growth rate of real GDP in the period 1989–1999 as compared to 1989 (reference year) among these countries was in Poland, Slovenia and Slovakia. In his forecasts for the years 2003–2004, G.

W. Kolodko presented a similar set of countries as leaders. On the other hand, concerning the aggregated GDP for the same period of time, Poland, Slovenia and the Czech Republic obtained the highest values. The analysis of the GDP value per capita (PPS) in 1999, as well as the forecast prepared for 2003–2004, indicated that the value indicator was the highest for Slovenia, Estonia and the Czech Republic (Kolodko, 2001, pp. 287, 294, 302–303).

J. Kornai conducted a similar analysis for the year 2003, based however on the actual data for the selected CEE and Western Europe countries. The year 1989 was taken here as a reference year. Kornai's research confirmed the forecast made by G. W. Kolodko, i.e. the highest GDP growth rate in 2003 was predicted for Poland, Slovenia and Slovakia. By contrast, the rankings of countries made on the basis of the average real GDP per capita growth and average labour productivity growth (as %) provided different results. Concerning both indicators, the highest value was observed for Latvia, Estonia and Lithuania (Kornai, 2006, pp. 212–214). In 2004–2007, those three countries have also led in the group of analysed countries as far as the economic performance and the level of competitiveness were concerned (Pilarska, 2010, pp. 116–119). The highest GDP per capita (PPS) value in 2008 achieved Slovenia, the Czech Republic and Estonia. However, the important issue here is also the social stratification and poverty. In 2009, the Gini index was the lowest for the Czech Republic, Slovakia and Hungary (as well as the absolute poverty rate), whereas the lowest value of the at-risk-of-poverty rate after social transfers was observed in the Czech Republic, Slovakia and Slovenia (Aidukaite, 2011, pp. 213, 215).

Assessing the analysed literature sources with the results obtained by using the Perkal method, it can be said that the highest competitive potential possess the Czech Republic, Estonia and Slovenia, to which G. W. Kolodko and J. Kornai pointed out in their earlier quoted analysis. Equally, these countries have the highest level of GDP per capita among those analysed. Accordingly, the results based on the Perkal method are in line with other studies, which largely confirm the validity of used test method.

Conclusions

Competitiveness as currently discussed in the literature on the international level is primarily associated with a strong and sustainable economy and knowledge society. These issues are discussed at the national level concerning development strategies, as well as are subjects of research in economics. In the current study of competitiveness, the analysis used simple and

transparent synthetic indicator, which is characterised by a low loss of information associated with the aggregation of data.

The Perkal method is not only quite frequently used in evaluating the level of competitiveness and innovation, but it is also applied to analyse other issues related to regional development. Furthermore, it is commonly used to study regional level understood as areas or parts of a country. However, as in the current study, it may be used to assess the competitiveness of regions understood as group of countries.

The results regarding the competitiveness of the CEE countries belonging to the EU and obtained with help of the Perkal method are largely consistent with the results presented in the rankings of countries' global competitiveness. However, the applied method is much simpler and less time-consuming, and it also allows for an optimal selection of factors for the given assumptions, thereby determining the choice of the analysed issue as regards its socio-economic development. However, this method does not take into account political, legal or social contingencies, which also have a large impact on the level of competitiveness of economies.

Following the calculations of the level of competitiveness as determined by the Perkal method, one point is still worth noting: the earlier the Central and Eastern European countries had joined the European Union structures, the higher their international competitiveness would have been. This could have probably resulted from a better use of the EU funds for restructuring and modernisation of their economies, as well as better availability of funds in recent years as compared to the earlier period.

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Annex

Table 1. Minimal and maximal values of determinants concerning the EU CEE countries in year 2014

	Determinants	Normalised value of a country	
		minimal	maximal
STIMULANTS			
x ₁	activity rates by sex, age and citizenship (share of population at the age from 15 to 64 years)	Romania (-1,5128)	Latvia (1,1461)
x ₂	GERD – gross domestic expenditure on R&D (% GDP)	Romania (-1,3576)	Slovenia (2,1655)
x ₃	exports of high technology products as a share of total exports	Bulgaria (-1,332)	Estonia (1,717)
x ₄	total fertility rate (number of children per woman)	Poland (-1,92)	Latvia (1,4797)
x ₅	life expectancy by age (for children at the age less then year)	Bulgaria (-1,138)	Slovenia (2,1649)
x ₆	duration of working life	Hungary (-1,2840)	Estonia (1,9972)
x ₇	lifelong learning (share of population at the age from 15 to 64 years)	Romania (-1,1080)	Slovenia (1,8076)
x ₈	employment in knowledge-intensive activities (share of total employment)	Romania (-2,7900)	Hungary (1,0589)
x ₉	nominal labour productivity per person (% of EU28 total = 100)	Bulgaria (-2,4010)	Slovakia (1,2404)
x ₁₀	export market shares (% of world total)	Croatia (-0,8760)	Poland (2,3668)
DESTIMULANTS			
x ₁₁	unemployment – annual average (share of population)	Croatia (-2,0970)	Czech Republic (1,2918)
x ₁₂	general government gross debt (% GDP)	Croatia (-1,6640)	Estonia (1,7650)
x ₁₃	HICP – inflation rate, annual average rate of change (%)	Romania (-1,7390)	Bulgaria (2,6080)
x ₁₄	people at risk of poverty or social exclusion (% of total population)	Bulgaria (-1,603)	Czech Republic (1,6745)

Table 2. Competitive position of EU CEE countries in 2014

Country	Perkal method		IMD ranking		WEF (GCI) ranking		GDP per capita, PPS, (euro)
	ranking	value	ranking	value	ranking	value	
Czech Republic	1	0,9026	33 (2)	62,213	37 (2)	4,53	14900
Estonia	2	0,7360	30 (1)	64,383	29 (1)	4,71	15000
Slovenia	3	0,5111	55 (9)	46,245	70 (9)	4,22	18100
Lithuania	4	0,0688	34 (3)	62,014	41 (3)	4,51	12500
Poland	5	-0,0399	36 (5)	61,767	43 (5)	4,48	10700
Slovakia	6	-0,0435	45 (6)	53,302	75 (10)	4,15	14000
Latvia	7	-0,0696	35 (4)	61,841	42 (4)	4,50	11800
Hungary	8	-0,0720	48 (8)	52,505	60 (8)	4,28	10600
Bulgaria	9	-0,5323	56 (10)	45,784	54 (6)	4,37	5900
Croatia	10	-0,6259	59 (11)	38,974	77 (11)	4,13	10200
Romania	11	-0,8354	47 (7)	52,841	59 (7)	4,30	7600
Total country number in the ranking / max. value	11	3,0000	60	100 pts	144	7,00	does not apply

Source: own compilation based on research results of IMD Competitiveness Scoreboard (2014), Schwab (Ed.) (2014, pp. 68-69), Eurostat.

Figure 1. Competitive positions of selected CEE countries according to Perkal method

