



## STUDY OF REGIONAL INEQUALITIES: CASE OF BULGARIA

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Received 06 June 2018; accepted 07 June 2018

**Abstract.** The sustainable development of a country depends on many factors. One of them is the balanced development of regions. The aim of this research is to study the inequalities between regions (NUTS 3 level) in Bulgaria by application of the Regional Competitiveness Index (RCI), a tool, which is based on 10 important for regional development indicators. The paper presents the last RCI ranking list (for the 2016 year) and analyses and compares it with the ranking lists for previous years. The results show significant inequalities between the capital region and other regions for the whole period and relative small imbalances between other regions. The RCI ascertained relatively stable groups of most competitive and most non-competitive regions.

**Keywords:** regional competitiveness index (RCI), regional development, regional analysis, regional compares, regional inequality, regional imbalances.

**JEL Classification:** O18, P25, R12, R58.

### Introduction

The balanced development of regions significantly influences the sustainable development of a country. Inequality and disparity of economic and social condition in regions affect businesses and people. Some of the results of increasing differences between regions are depopulation in ‘unattractive’ regions; aggravation of age, education, qualification and etc. structures of population and labour force, overstrain of transport and social infrastructure in ‘attractive’ region; problems with the housing; ineffective use of resources and etc. Although some of the processes may be assessed as positive (for example market expansion, much more opportunities for well-paid jobs, better education and healthcare in ‘attractive’ regions and less environmental pollutions and stress in ‘unattractive’ regions), the final result for a society is negative.

The aim of this research is to study the inequalities between regions (NUTS 3 level) in Bulgaria by calculation of the Regional Competitiveness Index (RCI) based on the latest available data and to compare it with previously published data for it. The RCI is a tool which is based on 10 important for regional development indicators.

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The main tasks of the research are:

- to calculate the RCI for the last year 2016 by regions of Bulgaria and to create a ranking list;
- to cluster regions into groups by the new RCI scores;
- to compare the new RCI ranking list for the 2016 year with the ranking list for the previous years;
- to analyse the RCI in dynamics, from the viewpoint of the regions' variation in the ranking lists and the difference between the most competitive region and the least competitive region.

The objects of research are regions of Bulgaria which, according to the NUTS Classification of the European Union, which corresponds to NUTS 3 Level. The map of the regions in Bulgaria is presented in Figure 1.

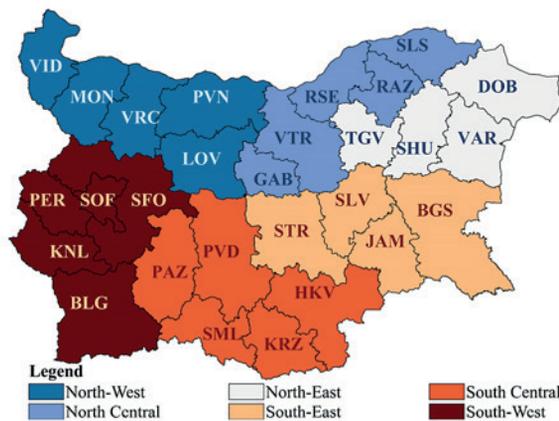


Figure 1. NUTS 2 and NUTS 3 levels regions in Bulgaria

The period of research is the year 2016 but the changes in a region's previous years' ranking have also been analysed. The data was obtained from the National Statistical Institute of Bulgaria (NSI, 2018).

## 1. Literature overview

Many researchers working in the field of inequalities and disparities at the regional level have linked them with regional competitiveness, regional development, sustainable development and etc. Huggins et al. have studied both theoretically and empirically the underlying tenets of regional competitiveness (Huggins, Izushi, & Thompson, 2013). Turok reviews some of the main ideas of competitiveness, particularly as they apply to cities and regions (Turok, 2004). Christopherson, Michie, and Tyler (2010) generalize studies about regional resilience and assess its underlying theoretical foundations, the empirical evidence that may lie behind it and more importantly what it may have to offer to the formulation of policy (Christopherson et al., 2010). Rucinska and Rucinsky describe that the “competitiveness is governable variable consisting of many elements, and each of them can be used for the benefit of competitiveness growth” and “the rate of the influence of a factor depends on the fact whether there is a static

or dynamic regional factor” (Rucinska & Rucinsky, 2007). Lengyel et al. make a redefinition of the pyramidal model for interpretation, measuring regional competitiveness and demonstrating its influencing factors (Lengyel & Rechnitzer, 2013).

There are a lot of approaches and tools for assessment of the competitiveness of regions. Annoni and Kozovska have developed the Regional Competitiveness Index (RCI) which focuses on the NUT 2 level regions of the EU and shows the strengths and weaknesses of each of them (Dijkstra, Annoni, & Kozovska, 2011; Annoni & Kozovska, 2013). Ginevicius et al. propose 45 indicators for evaluation of regional development in three directions: economic, social and ecological (Ginevicius, Hogeforster, & Gedvilaite, 2014; Ginevicius, Stasiukynas, & Gedvilaite, 2016). A similar approach is used by Benzaquen et al., where the competitiveness of regions was identified by 5 pillars: government and institutions; economic development; productive infrastructure; human capital and business efficiency and a set of factors and their variables (Benzaquen, Carpio, Zegarra, & Valdivia, 2010). The Regional Competitiveness Index, used by Muntean et al., includes 5 economic, 4 social and 3 technological indicators with different weights (Muntean, R. Niistor, & C. Nistor, 2010). Judrupa and Senfelde study the problems of evaluation of the competitiveness of Latvian regions (Judrupa & Senfelde, 2008). Enyedi explores the regional competitiveness in Hungary by simple methodology using three interrelated economic parameters: GDP per capita; labour productivity and employment rate (Enyedi, 2009). Mereuta et al. assess the regional competitiveness using a model that evaluates national competitiveness on the basis of five integrating criteria: overall operational economic performance, energy use, information and communication technology, gross value added structure, participation in the international markets (Mereuta, Albu, Iordan, & Chilian, 2007). Snieska et al. have established a new Regional Competitiveness Index and have tested it empirically on the basis of data of 10 Lithuanian districts for a period of six years (Snieska & Bruneckiene, 2009). Gavurova et al. study structural aspects of competitiveness at the level of self-governing regions of the Slovak Republic and develop a regression model of GDP based on eleven variables (Gavurova, Vagasova, & Kovac, 2016). Bronisz et al. examine “a competitiveness from a regional perspective and has attempted to conceptualize regional competitiveness by combining some data, namely inputs, outputs and outcomes in one global index” (Bronisz, Heijman, & Miszczuk, 2008). Nevima et al. propose a modification of a traditional approach to regional competitiveness by using of 7 indicators: gross domestic product, gross fixed capital formation, gross domestic expenditures on research and development, net disposable income, the rate of employment, knowledge-intensive services and patents (Nevima & Kiszova, 2012). Huovari et al. have constructed an index which assesses human capital, innovativeness, agglomeration and accessibility at the regional level and has determined “highly correlated with traditional long-term indicators of economic well-being, such as per capita GDP and personal income” (Huovari, Kangasharju, & Alanen, 2001).

Some of the studies focus on exploration and analysis of the key factors for regional competitiveness. Komarova et al. note that the infrastructure has an important role for regional competitiveness but it must not be overestimated (Komarova, Zjablova, & Denmukhametov, 2014). Caruso and Miro have studied one aspect of sustainable regional development by analysing ‘the relationship between the successful positive influences for farms and the diversifying its activities with respect to the tourism’ (Caruso & Miro, 2016). Ivanova, Kamola

and Kamols have researched income inequality and human capital as factors for the economic development of the regions in Latvia (Ivanova, Kamola, & Kamols, 2016). Foders demonstrates how the economic theory and regional experience in Germany have proved the general importance of training for economic development and regional policy (Foders, 1997). Judrupa and Senfelde explore smart work as a factor for increasing regional competitiveness and improving regional development (Judrupa & Senfelde, 2016).

Studies of Bojkov et al., Ganchev, Ivanova et al., Pashev have described imbalances in the development of Bulgarian regions (regions and municipalities) from different points of view and the influence of industries for regional competitiveness (Bojkov, Ivanovski, & Damyanova, 2002; Ganchev, 1999; Ivanova, Stoenchev, Kovacheva, Ivanov, & Kostadinov, 2008; Ivanova, Stoenchev, Kovacheva, & Ivanov, 2009; Ivanova et al., 2010; Pashev, 2003).

## 2. Methods

Competitiveness of the regions in Bulgaria was estimated using the Regional Competitiveness Index (RCI) which was designed on the basis of 10 indicators. The indicators assess four key spheres of regional development. These are market size, quantity and quality of labour resources, region attractiveness and competitiveness of local businesses (Table 1). The indicators were selected by the author from a data set of 42 indicators, annually publishes by the National Statistical Institute of Bulgaria, on the basis of their representativeness and reliability. Some of them were obtained by additional calculations using the official statistical data.

Although the method was described in previous publications (Ivanov 2008, 2010, 2016, 2017), it is presented again in this publication for better understanding and clarity of analyses and results.

Estimating the RCI was made by using a known mathematical-statistical methodology, which eliminated the difficulties and inconveniences of different indicator measurements. All indicators have the same relative weight in the RCI and the maximum indicator value means the best value.

The methodology used examines each region as a vector whose coordinates are numerical characteristics of selected indicators. The algorithm allows including an unlimited number

Table 1. The key spheres and indicators of the Regional Competitiveness Index

Market size	Quantity and quality of labour resources
population density per sq. km natural growth, ‰ turnover per capita, BGN	rate of employed persons, % the relative share of the population aged between 25–64 with a higher education degree, % the relative share of people aged between 16–74 years who have used the internet in the last 12 months, %
Region attractiveness	Competitiveness of local businesses
foreign direct investment per capita in non-financial enterprises on a cumulative basis, BGN	expenditure on acquisition of tangible fixed assets, thousand BGN productivity, BGN per employed person gross domestic expenditure on research and development per person engaged in research and development, BGN

of indicators regardless of the unit in which they are represented. The dependency n indicators and m regions can be represented by n\*m measurement matrix which is presented by Formula (1).

$$x = \begin{pmatrix} x_{11} & x_{12} & \dots & x_{1m} \\ x_{21} & x_{22} & \dots & x_{2m} \\ \dots & \dots & \dots & \dots \\ x_{n1} & x_{n2} & \dots & x_{nm} \end{pmatrix}. \tag{1}$$

A hypothetical region called standard region or the best region is defined as a vector by the best values for each indicator of the compared regions. Each region is compared with the standard region. The final assessment/score is derived from the aggregation of the distance of each region from the standard region for each indicator.

The steps of the methodology are (Gatev, 1995; Stoenchev, 2010; Stoenchev & Ivanov, 2015, Stoenchev, 2016):

1. Calculating the standardised deviation of indicators (i) for different regions (j) of the arithmetical average of each indicator in order to avoid differences in their scale.

$$z_{ij} = \frac{x_{ij} - \bar{x}_i}{\sigma_i}, \quad i = 1, 2, \dots, n, \quad j = 1, 2, \dots, m, \tag{2}$$

where

$z_{ij}$  is the standardised deviation of  $i^{\text{th}}$  indicator of  $j^{\text{th}}$  region;

$x_{ij}$  – the value of  $i^{\text{th}}$  indicator of  $j^{\text{th}}$  region;

$\bar{x}_i$  – the arithmetic average of  $i^{\text{th}}$  indicator calculated by the formula (3)

$$\bar{x}_i = \frac{\sum_{j=1}^m x_{ij}}{m}, \quad i = 1, 2, \dots, n; \tag{3}$$

$\sigma_i$  – the standard deviation of  $i^{\text{th}}$  indicator calculated by the formula (4).

$$\sigma_i = \sqrt{\frac{\sum_{j=1}^m (x_{ij} - \bar{x}_i)^2}{m}}, \quad i = 1, 2, \dots, n. \tag{4}$$

2. Establishing a Z-matrix by standardized indicators  $z_{ij}$  that determines the standard region.

The obtained standardised indicator  $z_{ij}$  in every line is a vector whose total sum of coordinates equals to zero, but the length of the vector equals to 1. This matrix is meant to calculate final assessment and it is similar to the distance method. The standard region, in this case, is determined by Z-matrix values. This is the vector with the best values  $z_{ij}$  for each indicator  $i$ . When the indicator should have a maximum value, the maximum value of  $z_{ij}$  is chosen, and when the indicator should have a minimum value, the minimum value of  $z_{ij}$  is chosen.

3. Calculating the final assessment/score.

The final assessment is the total distance of each region from the standard region and it is calculated by the formula (5).

$$RCI_j = \sqrt{\sum_{i=1}^n (z_{ij} - z_{im})^2}, \quad j = 1, 2, \dots, m, \tag{5}$$

where

$RCI_j$  is the final assessment/score for  $j^{\text{th}}$  region;

$z_{ij}$  – the standardised deviation of  $i^{\text{th}}$  indicator of  $j^{\text{th}}$  region;

$z_{im}$  – the standardised deviations of  $i^{\text{th}}$  indicator of the standard region.

4. Calculating the interval gap into groups.

The interval gap into groups helps to cluster the regions in groups with the equal difference between the bottom level of the interval and the upper level of the interval, and it is calculated by the formula (6).

$$R = \frac{RCI_{\max} - RCI_{\min}}{k}, \quad (6)$$

where

$R$  is the interval gap between groups;

$RCI_{\max}$  – the maximum value of the final assessment of regions;

$RCI_{\min}$  – the minimum value of the final assessment of regions;  $k$  – the number of the groups.

The  $RCI_j$  represents the distance between a given region ( $j$ ) and the standard region. The most competitive regions have the lowest  $RCI$  score, which means they are the closest to the standard regions. The less competitive regions have higher  $RCI$  scores, which means they are farther from the standard region.

### 3. Results and discussions

The calculation of the RCI for the year 2016 showed that the capital region is the most competitive region in Bulgaria. The RCI score for Sofia (capital) is 5.076 (Table 2).

Table 2. The Regional Competitiveness Index Score for the year 2016 by NUTS 3 level regions in Bulgaria

Rank	Regions		Score	Rank	Regions		Score
	Name	Code			Name	Code	
1	Sofia (capital)	SOF	5.076	15	Haskovo	HKV	12.997
2	Varna	VAR	10.602	16	Kardzhali	KRZ	12.999
3	Plovdiv	PVD	10.767	17	Pleven	PVN	13.079
4	Burgas	BGS	10.774	18	Razgrad	RAZ	13.080
5	Ruse	RSE	11.492	19	Pernik	PER	13.175
6	Sofia	SFO	11.605	20	Lovech	LOV	13.378
7	Stara Zagora	SZR	11.783	21	Sliven	SLV	13.426
8	Gabrovo	GAB	12.204	22	Targovishte	TGV	13.512
9	Veliko Turnovo	VTR	12.426	23	Vratsa	VRC	13.547
10	Blagoevgrad	BLG	12.431	24	Kyustendil	KNL	13.665
11	Shumen	SHU	12.565	25	Montana	MON	13.765
12	Yambol	JAM	12.586	26	Silistra	SLS	13.943
13	Dobrich	DOB	12.685	27	Vidin	VID	14.130
14	Smolyan	SML	12.768	28	Pazardzhik	PAZ	n/a

The next region in the ranking list is Varna with the significant twofold difference in the RCI score. The RCI score for Varna is 10.602. The next regions in the ranking list are Plovdiv (10.767), Burgas (10.774), Ruse (11.492), Sofia (11.605), Stara Zagora (11.783) and etc. One region (Pazardzhik) is not included in the RCI ranking list for 2016 because of the lack of data at the moment of research (February 2018).

The following regions have an insignificant difference of the RCI score in comparison with the previous region and the next region in the ranking list. This difference is less than a unit, in some cases – a few thousand parts of a unit. The top five less competitive regions in 2016 are Vidin (14.130), Silistra (13.943), Montana (13.765), Kyustendil (13.665) and Vratsa (13.547). Three of them (Vidin, Montana and Vratsa) are in the same NUT2 level region (the North-West Region).

For the more understandable presentation of the results, a grouping of regions was made using formula (6). All regions except Sofia (capital) fall into three groups by the RCI score. The groups are competitive regions, moderately competitive regions and less competitive regions (Figure 2).

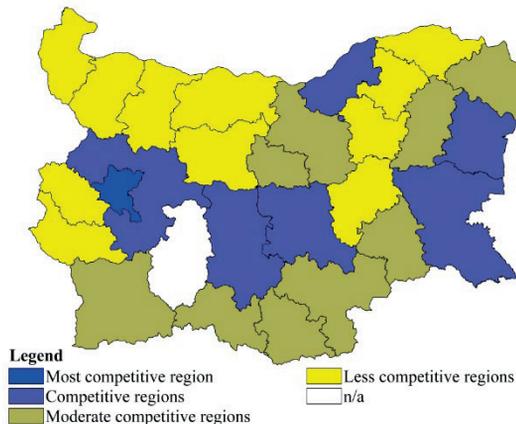


Figure 2. The Regional Competitiveness Index for the 2016 year by NUTS 3 level regions in Bulgaria

The first group of competitive regions for 2016 includes 6 regions (Varna, Plovdiv, Burgas, Ruse, Sofia and Stara Zagora). These regions are with administrative centres in the major cities of Bulgaria and they can be described as an ‘engine’ for the economic development of the country. The regions are attractive for foreign direct investment (FDI). The business regularly, every year and not just sometimes, invests in the economy, which is based on research and development (R&D). In these regions, the population in the active age uses the internet relatively more frequently and has relatively better education and qualification measured by the relative share of the population aged between 25–64 with a higher education degree.

The administrative centres of the regions in this group can hardly become leaders in the RCI ranking list because of the huge differences between them and the capital city. Sofia as a capital city concentrates the FDI, the administration and the R&D potential of the country. The size of Sofia’s market is significant and the labour force has relatively more options for employment and jobs.

Geographically, the competitive regions are mainly located in south Bulgaria and through their territory pass the fully completed highway road named 'Trakia'. The results confirm the conclusions in the study of the Institute for Market Economics about the economic centres in Bulgaria (Nikolova, Tsvetkov, Ganey, Aleksiev, & Slavova, 2015; Nikolova, Tsvetkov, Ganey, Aleksiev, & Slavova, 2016).

The group with moderately competitive regions in 2016 includes nine regions. They are Gabrovo, Veliko Turnovo, Blagoevgrad, Shumen, Yambol, Dobrich, Smolyan, Haskovo and Kardzhali. The gap in the RCI score is less than a unit, more precisely – 0.795. The administrative centres of these regions are middle range cities by population, not big cities. These regions are relatively successful to develop a 'smart' and innovative economy, an economy based on R&D, to be attractive for FDI and etc. Usually, this occurs only sometimes (not every year) or only in a few businesses/companies.

The less competitive regions in 2016 are eleven (Pleven, Razgrad, Pernik, Lovech, Sliven, Targovishte, Vratsa, Kyustendil, Montana, Silistra and Vidin). This is the biggest group in a number of regions if the ranges of groups by the RCI scores are equal. The regions in this group hardly cope with the challenges of the open market and free movement of people, capitals, goods and services. The market size of them is small which affects the FDI and the expenditures for R&D and they are mostly rare occasions, and not permanent. The labour force does not have qualifications in line with the needs and expectations of the 'modern' businesses.

From the viewpoint of ranking dynamics, the results show that the most competitive region for the last two years (2015 and 2016) is Sofia (capital) because its RCI rank has not changed. The other regions that have not changed their positions in the RCI ranking list are Varna and Kustendil. One of them (Varna) is a competitive region, the other (Kyustendil) is in the group of less competitive regions (Figure 3).

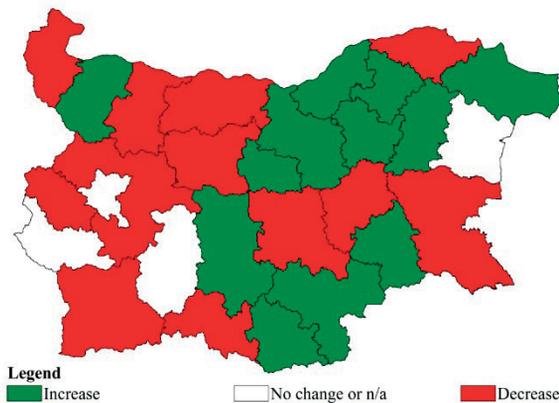


Figure 3. Changes of region's rank during 2016 year in compare of 2015 year

The group of the regions which have improved their positions in the 2016 RCI ranking list in comparison with the 2015 RCI ranking list, and the group of the regions which have worsened their positions are equal in number: eleven regions in each group. The analysis by group shows:

- for the group of competitive regions – two regions are with better ranking (Plovdiv and Ruse) and three are with worse ranking (Burgas, Sofia and Stara Zagora);
- for the group of moderately competitive regions – seven of the nine regions are with better ranking (Gabrovo, Veliko Turnovo, Shumen, Yambol, Dobrich, Haskovo and Kardzhali) and only two of the nine regions are with worse ranking (Blagoevgrad and Smolyan);
- for the group of less competitive regions – seven of the eleven regions are with worse ranking (Pleven, Pernik, Lovech, Sliven, Vratsa, Silistra and Vidin) and only three of the eleven regions are with better ranking (Razgrad, Targovishte and Montana).

The results of the RCI ranking dynamics are particularly worrying for the group of less competitive regions because Pazardzhik is not included in this analysis. In the 2015 RCI ranking list, Pazardzhik occupied 15<sup>th</sup> place, which means that we may assume that the results for the group of less competitive regions are likely to be even worse.

The regions' ranking variation for the period 2004–2016 was analysed by standard deviation, presenting the regions which relatively more frequently change their places in the ranking list. The regions were divided into four groups by the standard deviation value (Figure 4).

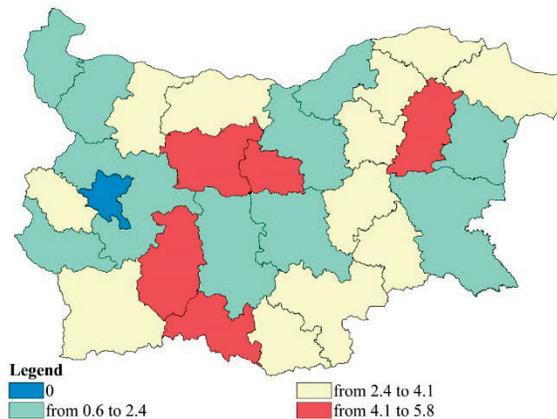


Figure 4. The standard deviation of regions' rank, 2004–2016

The regions, which changed their places in the ranking list in wide limits, are Smolyan, Lovech, Gabrovo, Pazardzhik and Shumen and they are listed from the one with the highest value of standard deviation to the one with the lowest value. The ratio of less competitive regions to regions with moderate competitiveness according to the 2016 RCI ranking is 2:3.

The group of regions with moderate values of standard deviation includes eleven regions, seven of them are less competitive in the 2016 RCI ranking list, the others are with moderate competitiveness.

The third group of regions, which have not changed their places in the ranking list in wide limits, also includes eleven regions. The main share is that of the competitive regions, with all of them under the 2016 RCI ranking belonging to this group. Also here are three less competitive regions – Kyustendil, Montana and Vidin. The results for this group are relatively stable. The competitive regions can hardly be replaced from their top positions in the RCI ranking list. The less competitive region can hardly be pushed up from the bottom without support and change of the regional policy.

There is one region, which has never changed its position in the RCI ranking lists. This is Sofia (capital).

The conclusions about the leading role of Sofia (capital) and the long-term disparities between the capital region and the others regions are again confirmed by the analysis of the dynamics of the gap between the most competitive region and the least competitive region.

The RCI scores for the period 2004–2016 show that the smallest deference between the most competitive region and the least competitive region was in the year 2004 (7.1 points), the highest – in the year 2009 (13.1 points or close to twofold difference); the average value of the gap for the whole period is 9.9 points (Figure 5).

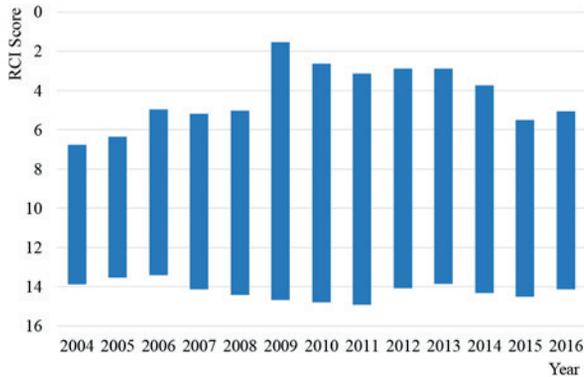


Figure 5. The gap between the most competitive region and the least competitive region by the Regional Competitiveness Index, 2004–2016

The results present a negative tendency of increasing inequalities and disparities in the regional development. The changes of the RCI score for the least competitive region are insignificant, around 14 points – from 13.4 in 2006 to 14.9 in 2011. In comparison, the most competitive region has an RCI score with more sizable variation from 1.5 in 2009 to 6.8 in 2004.

## Conclusions and recommendations

The study of regional inequalities in Bulgaria using the RCI shows significant disparities between the capital region and all other regions, and insignificant differences between all regions excluding Sofia (capital). This observation is valid not only for the last year of 2016 but also for the previously researched period 2004–2015. The group of less competitive regions is greater in number than the group of competitive regions. The regions in these two groups have relatively rarely changed their places in the RCI ranking lists, which shows again that inequalities and disparities between regions in Bulgaria have had a relatively stable character over the years.

One possible solution for reversing this negative tendency is regional policies focused on investment and development of ‘modern’ economy, an economy based on R&D, smart work, activities with high added value and etc. The biggest question is ‘How to achieve this?’. The role of authorities – state, regional and local – is very important in this process.

The most significant factor for regional development is the government, which is confirmed by the RCI. The result of the regional policy for the last twelve years in Bulgaria is an increase of inequalities between regions. The government should change the policy of regions' support and try to create in all regions relatively the same conditions for the development of business and for a living. At the moment in Bulgaria, there is no difference in the share of project self-financing between the 'rich' and 'poor', the big and small, the financially stable and financially unstable regions. There are local administrative units (municipalities) in Bulgaria that have huge financial problems because of bad project management, high current expenditures for unnecessary infrastructure (mainly big stadiums and sports halls in small towns and villages) and etc. Using tools, such as the RCI, can give the government objective criteria for better diversification of regional policy and abandonment of the unified treatment of regions. The role of government should be:

- building/maintaining the infrastructure (transport, electricity, water, gas and etc. supply systems) so that its quality and capacity allow for the development of 'modern' economy and smart work and for better living conditions;
- encouraging entrepreneurs to invest or relocate their businesses in other regions, to install new technologies and to work closely with universities by attractive and stable-in-time tax policy;
- training the local and regional authorities not only to be able to perform their duties but also to know their role, place and importance for decreasing inequalities and disparities between regions;
- providing 'clear' and understandable information campaigns for all potential risks in project management;
- participating in significant infrastructure projects as a member of the management bodies, which will guarantee continuity in case of election changes.

The regional authorities, which in Bulgaria are not elected by the citizens but conduct the state policy at NUTS 3 level, should:

- support and encourage the interregional and cross-border cooperation between municipalities;
- restrict the manifestations of 'local patriotism' and the competition between the regional centre or major city and the other towns or villages in the region;
- provide active information campaign focused on the advantages of the region, the possibilities for business and cooperation and etc.

The local authorities in municipalities should be more responsible for conducting the local policy through projects and for encouraging investment and competition. Continuity in policy implementation would create a better environment for the development of the local economy.

The RCI and the results for the year 2016 confirm once more that the index can be applied as an objective measure for assessing the inequalities at the regional level.

## References

- Annoni, P., & Kozovska, K. (2013). *EU regional competitiveness index. RCI 2013*. European Commission, Joint Research Centre, Luxemburg.
- Benzaquen, J., Carpio, L., Zegarra, L., & Valdivia, C. (2010). A competitiveness index for the regions of a country. *Cepal Review*, 102, 67-84.

- Bojkov, A., Ivanovski D., & Damyanova, A. (2002). *Competitiveness of Bulgarian economy: Annual Report 2001*. Center for Economic Development, Sofia.
- Bronisz, U., Heijman, W., & Miszczuk, A. (2008). Regional competitiveness in Poland: creating an index. *Jahrbuch für Regionalwissenschaft*, 28(2), 133-143. <https://doi.org/10.1007/s10037-008-0026-y>
- Caruso, D., & Miro, A. (2016, May). Rural tourism and sustainable rural development opportunities in Apula region (Sothern Italy). *9th International Scientific Conference "Business and Management 2016"* (pp. 1-9). Vilnius. <https://doi.org/10.3846/bm.2016.05>
- Christopherson, S., Michie, J., & Tyler, P. (2010). Regional resilience: theoretical and empirical perspectives. *Cambridge Journal of regions, economy and society*, 3(1), 3-10. <https://doi.org/10.1093/cjres/rsq004>
- Dijkstra, L., Annoni, P., & Kozovska, K. (2011). *A new regional competitiveness index: theory, methods and findings*. European Union Regional Policy Working Papers, 2.
- Enyedi, G. (2009). Competitiveness of the Hungarian regions. *Hungarian Geographical Bulletin*, 58(1), 33-47.
- Foders, F. (1997). *Regional competitiveness and training in Germany*. Kiel Institute for the World Economy. Kiel Working Paper No, 797, 1-35
- Ganchev, G. (1999). *The competitive advantages of the regions. Creating competitive clusters in the Bulgarian Economy: factors, perspectives and strategies*. Institute for Market Economics, Open Society Publishing, Sofia (in Bulgarian).
- Gatev, K. (1995). *Introduction to statistics*. LIA Publishing House, Sofia (in Bulgarian).
- Gavurova, B., Vagasova, T., & Kovac, V. (2016). *Competitiveness assessment of Slovak Republic regions* (pp. 175-186). European Financial System.
- Ginevicius, R., Stasiukynas, A., & Gedvilaite, D. (2016, May). Complex assessment of the ecological development of the country's region. *9th International Scientific Conference "Business and Management 2016"* (pp. 1-8).
- Ginevicius, R., Hogeфорster, M., & Gedvilaite, D. (2014, May). The formation of the system of indicators of development of the country's region. *8th International Scientific Conference "Business and Management 2014"* (pp. 503-510).
- Huggins, R., Izushi, H., & Thompson, P. (2013). Regional competitiveness: theories and methodologies for empirical analysis. *JCC*, 2(6), 155-172. <https://doi.org/10.7835/jcc-berj-2013-0086>
- Huovari, J., Kangasharju, A., & Alanen, A. (2001). Constructing an index for regional competitiveness. Pellervo Economic Research Institute. *Working Paper No 44* (June 2001), 1-22.
- Ivanov, I. (2008, May). Evaluation of the competitiveness at the local level. *Conference Proceedings, The 5th International Scientific Conference "Business and Management 2008"*. VGTU, Vilnius, Lithuania (CD).
- Ivanov, I. (2010, May). Index of competitiveness of the region in Bulgaria. Selected paper. volume II. *The 6th International Scientific Conference "Business and Management 2010"* (pp. 619-626). VGTU Publishing House "Technika". Vilnius, Lithuania. <https://doi.org/10.3846/bm.2010.082>
- Ivanov, I. (2016). *Economic problems of depressed regions in Bulgaria*, Dissertation. University of Forestry, Sofia (in Bulgarian).
- Ivanov, I. (2017). Dynamics of competitiveness of the regions in Bulgaria. *Trakia Journal of Sciences*, 15(1), 42-50. Retrieved from [http://tru.uni-sz.bg/tsj/TJS\\_Suppl.1\\_Vol.15\\_2017/8.pdf](http://tru.uni-sz.bg/tsj/TJS_Suppl.1_Vol.15_2017/8.pdf)
- Ivanova, D., Stoenchev, N., Ivanov, I., Delijska, B., Popova, P., & Dragozova-Ivanova, E. (2010). *Competitiveness of furniture enterprises in Bulgaria*. Avangard Prima Publishing House, Sofia (in Bulgarian).
- Ivanova, D., Stoenchev, N., Kovacheva, S., & Ivanov, I. (2009, November). Studying of competitiveness of the furniture enterprises in Bulgaria. *Proceeding of scientific papers of Scientific-Technical Conference on Innovation in woodworking industry and engineering design* (pp. 126-130). Yundola, Bulgaria. Avangard Prima Publishing House, Sofia (in Bulgarian).

- Ivanova, D., Stoenchev, N., Kovacheva, S., Ivanov, I., & Kostadinov, A. (2008). *Competitiveness of the furniture industry*. Avangard Prima Publishing House, Sofia (in Bulgarian).
- Ivanova, S., Kamola, L., & Kamols, U. (2016, March). Income inequality and human capital as factors influencing economic development of region – case study of Latvia. *Proceedings of the 2016 International Conference on Industrial Engineering and Operations Management* (pp. 249-257). Malaysia, Kuala Lumpur.
- Judrupa, I., & Senfelde, M. (2016, April). Introducing of smart work – opportunity to increase economic development of municipalities in Latvia. *Economic Science for Rural Development: Proceedings of the International Scientific Conference* (pp. 77-84). Latvian University of Agriculture, Latvia, Jelgava.
- Judrupa, I., & Senfelde, M. (2008, October). The Competitiveness of regions in Latvia and problems of its evaluation. *International Scientific Conference “Competitiveness in the Conditions of a Global Economy”* (pp. 81-88). University of Niš, Serbia, Nis.
- Komarova, V., Zjablova, O., & Denmukhametov, R. (2014). An infrastructure factor in regional competitiveness. *Mediterranean Journal of Social Sciences*, 5(18), 355.  
<https://doi.org/10.5901/mjss.2014.v5n18p355>
- Lengyel, I., & Rechnitzer, J. (2013). The competitiveness of regions in the Central European transition countries. *The Macrotheme Review*, 2(4), 106-121.
- Mereuta, C., Albu, L., Iordan, M., & Chilian, M. (2007). A model to evaluate the regional competitiveness of the EU regions. *Romanian Journal of Economic Forecasting*, 3, 81-102.
- Muntean, M., Niistor, R., & Nistor, C. (2010). Competitiveness of developing regions in Romania. *WSEAS Transactions on Business and Economics*, 7(3), 252-261.
- Nevima, J., & Kiszova, Z. (2012). Evaluation of regional competitiveness in case of the Czech and Slovak Republic using analytic hierarchy process. *Proceeding of the 1st WSEAS International Conference on Economics, Political and Law Science (EPLS'12)* (pp. 269-274). Zlin, Univerzita Tomase Bati.
- Nikolova, D., Tsvetkov, A., Ganey, P., Aleksiev, A., & Slavova, Z. (2015). *The regional profiles. indicators of development*. Institute for Market Economics, Sofia.
- Nikolova, D., Tsvetkov, A., Ganey, P., Aleksiev, Y., & Slavova, Z. (2016). *Regional profiles: indicators for development*. Institute for Market Economy, Sofia.
- NSI. (2018). *Regional statistics and indicators for monitoring*. Regional Statistics, National Statistical Institute, Sofia. Retrieved from <http://www.nsi.bg/en/node/11262>
- Pashev, K. (2003). *Competitiveness of the Bulgarian Economy*. BNB, Sofia (in Bulgarian).
- Rucinska, S., & Rucinsky, R. (2007). Factors of regional competitiveness. *2nd Central European Conference in Regional Science –CERS* (pp. 902-911).
- Snieska, V., & Bruneckiene, J. (2009). Measurement of Lithuanian regions by regional competitiveness index. *Engineering economics*, 61(1), 45-57.
- Stoenchev, N. (2010). *Possibilities for application of statistical methods in studying the company's competitiveness*. Avangard Prima Publishing House, Sofia (in Bulgarian).
- Stoenchev, N. (2016). *Quality of life and specialization of the territory by economic activities in Bulgaria (statistical aspects)*. Intel Entrance Publishing House, Sofia (in Bulgarian).
- Stoenchev, N., & Ivanov, I. (2015). *Manual with solved and unsolved problems in statistics (with application of EXCEL)*. University of Forestry, Sofia (in Bulgarian).
- Turok, I. (2004). Cities, regions and competitiveness. *Regional studies*, 38(9), 1069-1083.  
<https://doi.org/10.1080/0034340042000292647>