REGIONAL ECONOMIC DEVELOPMENT DISPARITIES IN THE BALTIC STATES

Viktor Kozlovskij

Vilniaus kolegija/University of Applied Sciences
Saltoniškių g. 58, Vilnius

Annotation

The problem of inequalities in the economic development of regions is an important topic for economic researchers. Too large inequality influence economic situation and business environment. The aim of the work is to assess the regional disparities in the Baltic States. Methods used: standard deviation; structural divergence index. The uniqueness of the calculation is that it does not calculate the difference between the region and other regions, but it evaluates the aggregate internal difference of a group of regions. The results show that: (1) regional disparities are increasing; (2) there is a clear clustering of regions.

Keywords: cohesion, regional disparities, GDP, cohesion index.

Introduction

The problem of unequal development of regions is widely studied in the works of politicians, sociologists, philosophers, economists and other researchers. Interest in this issue is determined by several factors. First, the political and scientific debate has intensified after the enlargement of the EU. Most of the new EU countries (including the Baltic States) have lower levels of economic development than the old ones. This means that interregional economic disparities have widened further with the accession of new members. Some research suggests that regional disparities within countries have increased too. Secondly, the economic problems caused by the Great Recession call for an increasing focus on reducing regional disparities. In 2007 started financial crisis and the ensuing economic downturn eliminated many years economic progress. Finally, the economic recovery is complex and uneven. Ten years after the onset of the Great Recession, no EU member state is characterized by sustainable long-term economic development. In addition, a new recession is currently looming.

There is no general consensus among economic researchers on the impact of regional differences in economic development on the overall level of economic development and the possibilities of economic resilience to economic threats. Greater regional economic cohesion is likely to be the cornerstone of a country's sustainable economy. This results less negative consequences of the recession and easier economic recovery.

The aim of the research is to evaluate the inequalities of economic development of the Baltic States regions based on the methodology proposed by the author.

The object of the research is the differences in the Gross domestic product (GDP) of the regions of Estonia, Latvia and Lithuania.

The problem of the research is: what are the methods of assessing the inequalities of economic development and how to assess the differences in the economic development of the regions in trhe Baltic States.

Level of problem investigation. Regional development and the reduction of inequalities are given a lot of attention both at the international and national level (Roosens and Laermans, 2009; Pachura, 2010; Faludi, 2013; Adams et al., 2014; Milio et al., 2014; Medeiros, 2016). It is typical for Lithuanian researchers to study regional problems on a Lithuaniań scale. The process of formation and implementation of regional policy was examined by Kilijonienė and Simanavičienė (2010), Melnikienė and Vidickienė (2008), Dumčiuvienė (2011), Žilinskas (2012), Daukaitė and

Puidokas (2013) and others. Theories of regional development and the possibilities of their application were analyzed by Kilijonienė and Simanavičienė (2010), Montvilaitė and Lydeka (2012), Jazepčikas (2013) and others. The unequal development of Lithuania or the Baltic States and their regions has been studied by Lakštutienė and Norvaišienė (2012), Butkus et al. (2016).

Often, research topics were driven by a variety of social, economic, and political factors. For example, in Lithuania's preparations for joining Economic and Monetary Union, a number of cohesion researches related to this aspect were conducted: Montvilaitė (2009), Deksnienė (2010) and others. The Great Recession influenced the emergence of aspects of the economic downturn in cohesion research (Bruneckienė and Kilijonienė, 2011; Juknys and Liobikienė, 2012), economic development and competitiveness (Mačys, 2008; Mickevičienė and Žitkus, 2013).

Research methods: graphical modeling; statistical research methods; horizontal and vertical analysis of indicators.

Evaluation methodology. The research methodology includes the choice of the research period, the research subjects, the indicator and its calculation methods.

The study aims to analyze as long a period as possible, but full statistics on entities are only available from 2000 onwards. And the latest data released by Eurostat during the survey date back to 2017. The survey is conducted at the regional level of Estonia, Latvia and Lithuania (EU NUTS3 level). In Estonia it is 5 regions (Kesk, Kirde, Lääne, Lõuna, Põhja), in Latvia 6 regions (Kurzeme, Latgale, Riga, Pieriga, Vidzeme, Zemgale), in Lithuania 10 regions (Alytus, Kaunas, Klaipėda, Marijampolė, Panevėžys, Šiauliai, Tauragė , Telšiai, Utena and Vilnius).

The indicator is GDP (gross domestic product) per capita. The calculation principles used are: standard deviation and structural divergence index.

In statistical or econometric analysis, a standard deviation is used to estimate the distance of the different values of the criterion from the mean, calculated according to the formula:

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

where s – standard deviation;
x_i – the ith value of the indicator;
$\bar{x}$ – average value of the indicator;
n is the number of indicator values.

The principle of the Structural Divergence Index (SDI) was first proposed by Paul Krugman (Krugman, 1991). This indicator calculates and shows how much the economic structure of an individual country or region differs from the overall economic structure of the analyzed group of countries. Applying an index calculation methodology, such as the EU case, the structural divergence index would look like this:

$$SDI_{i,EU} = \sum_{j=1}^{N} abs(S_{j,i} - S_{j,EU}), [2]$$

where $SDI_{i,EU}$ –is the index of the country 's structural divergence vis - à - vis the EU;
N – number of economic structure elements (sectors) to be analyzed in country i or region;
$S_{j,i}$ – the part of element j (sector) of the economic structure of country or region i, calculated in terms of gross value added, in the gross product of country i or region;
$S_{j,EUS}$ – the part of element j (sector) of the economic structure of an EU country or region, calculated in terms of gross value added, in the gross domestic product of an EU country or region.

This methodology has become popular among researchers of structural convergence and synchronization of business (economic) cycles. Convergence was mainly assessed at the level of EU countries, comparing the level of convergence of all members, euro area countries, cohesion countries or newcomers. Angeloni et al. (2005) examined the monetary, macroeconomic and structural convergence of EU newcomers (new entrants) with the relevant criteria for euro area countries. It was concluded that the structure of GDP is an important tool for assessing structural

convergence and economic development. Traistaru and von Hagen (2005) also examined the macroeconomic and structural convergence of EU newcomers (new entrants) compared to the EU. Vahter and Varblane (2005) carried out a study on the real convergence of the new EU Member States (including Romania and Bulgaria at that time) as well as the cohesion countries in 1995-2004 benchmarking against the EU. It was concluded that the countries of Central and Eastern Europe were more successful in achieving real convergence with the EU before accession. Bojesteanu and Bobeica (2008) used the above methodology to analyze the synchronization of business (economic) cycles between the new EU Member States and the euro area. Also later (Bojesteanu and Manu, 2011), examining the synchronization of business (economic) cycles between Romania and the EU.

All the above principles have been used to create the Cohesion Index:

$$CI = 100 - \frac{1}{n}\sum_{i=1}^{n}|C_i - X|, [3]$$

where, CI is the level of cohesion of the national indicator;
C_i – the value of the indicator of the ith region;
X – average value of the country indicator;
n is the number of regions.

It should be noted that Krugman and other authors calculated the total difference of many indicators from one country. The model proposed by the author calculates the total difference between the values of one indicator but many regions. For this purpose, the sum of the differences between the values of the individual regional indicator and the national average is divided by the number of regions (n).

Overview of the results of the assessment of distributions in the Baltic regions

Analisys of the differences in GDP of the Baltic States, based on the described research methodology, lets observe several important trends.
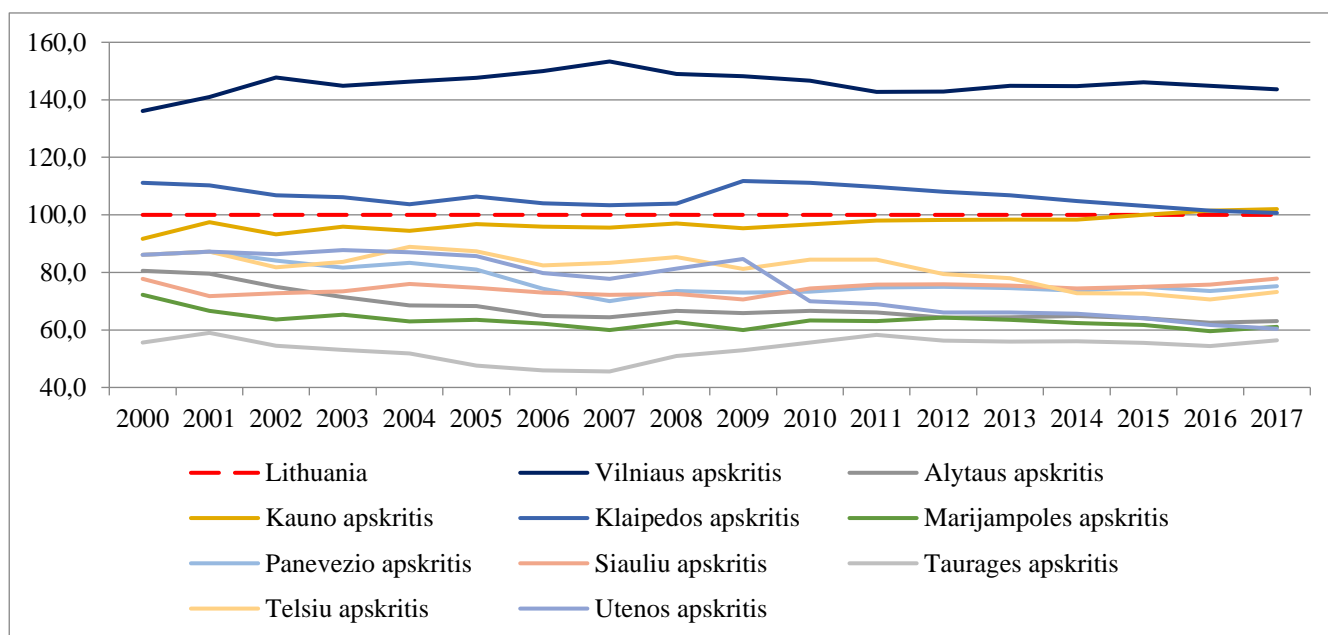

Fig. 1. Relative GDP of Lithuanian regions, compared to the national average, 2000-2017 [source: calculated by the author according to Eurostat data]

In Lithuania, the regions according to the achieved economic development (measured by the level of GDP) are of three levels (Figure 1). The first level is the most economically developed Vilnius region, the level of GDP per capita of which exceeded 140% the average GDP of the country during the whole analyzed period.

The second group includes Kaunas and Klaipėda regions, whose relative GDP per capita fluctuates around the Lithuanian average. The lowest value was in 2002, when the relative GDP of Kaunas region reached 86.6% of the Lithuanian GDP. The highest value is recorded in 2009, when the relative GDP of Klaipėda region was 111.4% of the country's average. In most cases, the values ranged between 95% and 105% of the Lithuanian GDP. It should be noted that the GDP per capita of Klaipėda region was higher than that of Kaunas region for almost the whole reviewed period.

The third group includes all the remaining 7 regions. The level of economic development of all of them is very similar and usually fluctuated between 60% and 80% country's GDP level. The least developed regions are Tauragė and Marijampolė counties.

Interestingly, the division of the country's regions into three distinct levels of development became particularly pronounced after the Great Recession (since 2009).
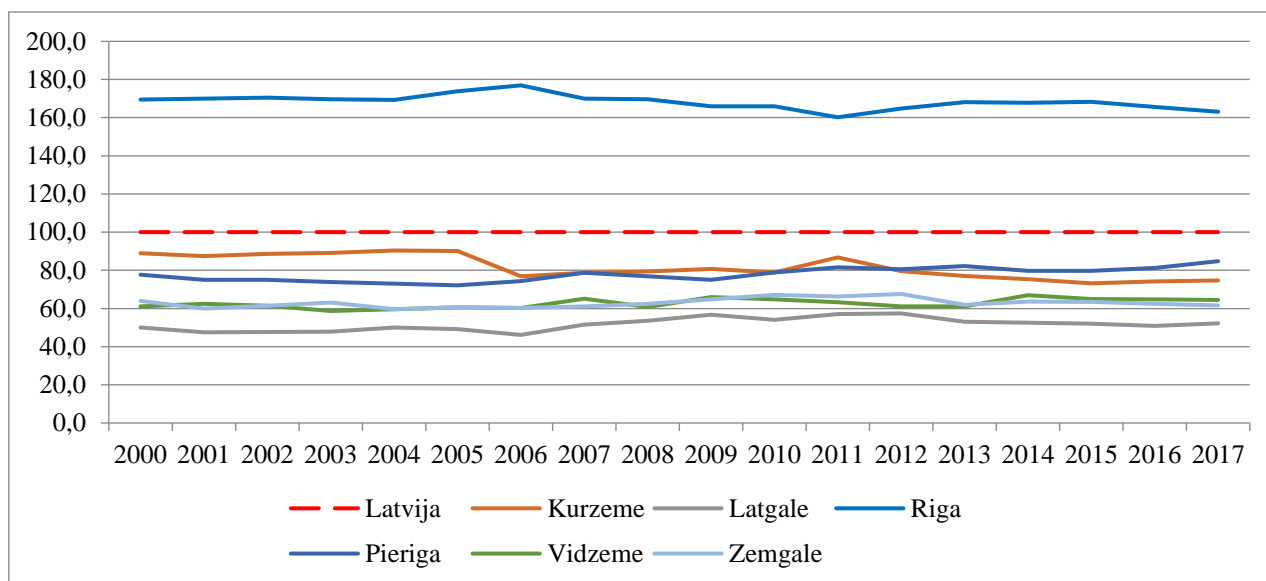

Fig. 2. Relative GDP of Latvian regions compared to the national average, 2000-2017 [source: calculated by the author according to Eurostat data]

The situation in Latvia (Fig. 2) and Estonia (Fig. 3) differs from Lithuania. Both countries have only two distinct levels of regional development: the capital region and others. The differences between them are huge. In Latvia, for example, the GDP of the capital region is more than 4 times higher than that of the most lagging region. All other regions are under the national average. Estonian situation is less dramatic, but still it has huge gap between capital and other regions (no other region reaches even 80% of country's average).

The same as in Lithuania, Latvian and Estonian capital regions went far away. This is especially noticeable in Latvia, where the capital's GDP exceeds 160 percent. country's GDP level. In Estonia, the GDP of the capital region exceeds the average GDP by about 50%. This is more than in Lithuania.
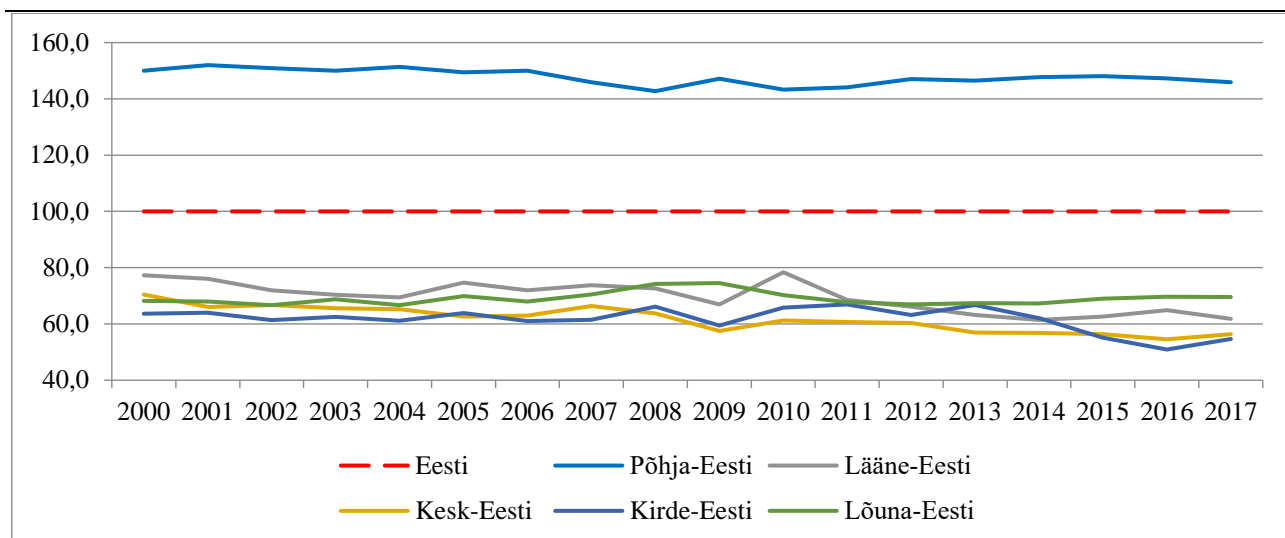
Fig. 3. Relative GDP of Estonian regions compared to the national average, 2000-2018 [source: calculated by the author according to Eurostat data]

There is also a trend common to all countries. Since 2009 regional disparities are growing moderately. The regions of the capital are moving away from the national average in the direction of growth, while the lagging regions are increasingly lagging behind.

After calculating the GDP cohesion indices of the Baltic States (Figure 4, respectively, the Estonian index is called CI_{EE}, Latvia - CI_{LV} and Lithuania - CI_{LT}), the following tendencies can be observed.
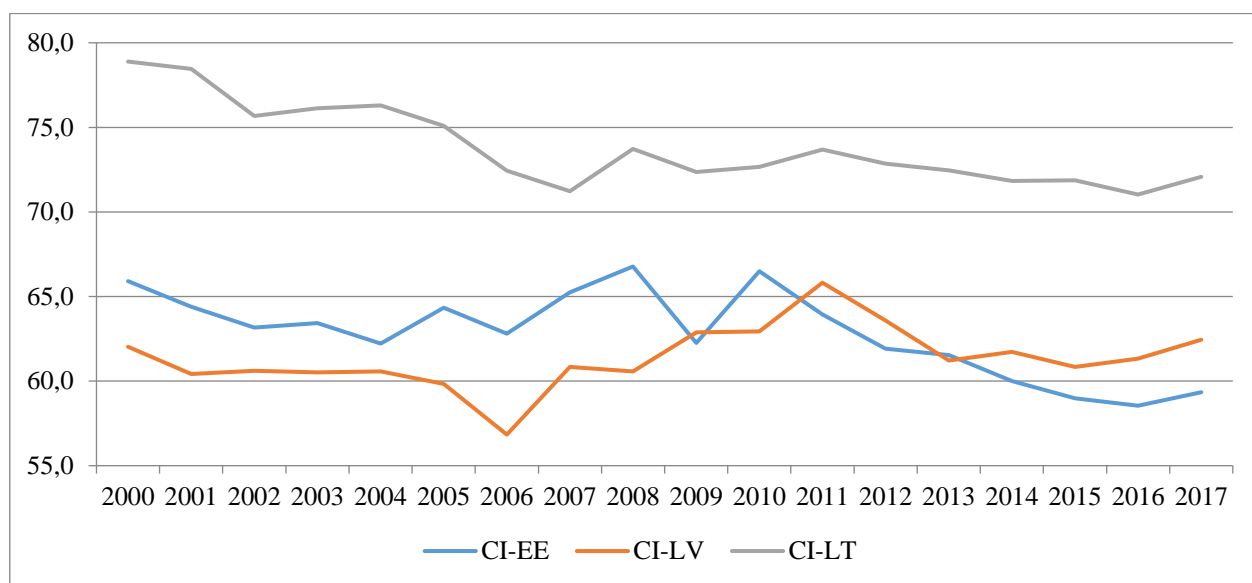

Fig. 4. Regional cohesion indices of Estonia, Latvia and Lithuania in 2000-2017 [source: calculated by the author according to Eurostat data]

First, regional differences are the smallest in Lithuania. The regional cohesion index ranges from 71.0 to 78.9. Meanwhile, the indicators of Latvia and Estonia, respectively, range from 56.8 to 65.8 and from 58.5 to 66.8. This once again proves that in Lithuania the difference between the capital and other regions is smaller than in Latvia and Estonia.

Secondly, in Lithuania, regional disparities increase moderately (the cohesion index decreases) throughout the period under review. They do not depend on the stage of the economic cycle (whether there is economic growth or recession). In Latvia and Estonia, regional disparities were relatively constant during the period of economic growth (2000-2008). Nevertheless, from 2010-2011 disparities start to increase (cohesion index decreases).

Conclusions

1. Studies of regional differences are popular both in Lithuania and abroad. It is true that Lithuanian researchers usually examine only the situation in Lithuania. They examine the possibilities of applying regional development theories and the uneven development of Lithuanian regions. Part of the researches are dedicated to the Structural Funds. Often, research topics were driven by a variety of social, economic, and political factors. For example, in the run-up to Lithuania's accession to Economic and Monetary Union, a number of cohesion research studies related to this aspect were carried out.

2. The research methodology is based on the principles of standard deviation and structural divergence index. Based on them, the author proposes the Regional Cohesion Index (CI). Its uniqueness from the research methods used so far is that it does not calculate the difference between a region and other regions or a country average, but within a group of regions.

3. The situation of regional disparities in the Baltic States is similar in that several groups of different levels of development are clearly visible. There are three levels of development in Lithuania, and two in Latvia and Estonia. The capital regions stand out in all countries (in Lithuania, the GDP of the capital region exceeds the national average by about 40-50%, in Latvia by about 60-70%, and in Estonia by about 50-55%). Lithuania is also distinguished by the fact that since 2009 the clustering of regions has become even more pronounced.

4. When calculating the cohesion indices of the Baltic States, it was observed that regional differences are the smallest in Lithuania ($71.0 < CI_{LT} < 78.9$), and very similar in Latvia and Estonia (the cohesion index varies from 56 to 66). Regional disparities in all countries have started to increase moderately since 2010. It should be noted that in Lithuania the cohesion index has been decreasing since 2000.

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BALTIJOS ŠALIŲ REGIONŲ EKONOMINIO IŠSIVYSTYMO NETOLYGUMAI

Viktor Kozlovskij
Vilniaus kolegija
Saltoniškių g. 58, Vilnius

Santrauka

Regionų netolygaus vystymosi problematika plačiai nagrinėjama politikų, sociologų, filosofų, ekonomistų ir kitų tyrėjų darbuose. Domėjimąsi šiuo klausimu lemia keletas veiksnių. Pirmiausia, diskusijos politinėje ir mokslinėje erdvėje suaktyvėjo po ES plėtros 2004 metais. Tarpregioniniai ekonominiai skirtumai, prisijungus naujoms narėms, dar labiau padidėjo. Dalis mokslinių tyrimų rodo, kad kartu padidėjo regioniniai skirtumai šalių viduje. Antra, Didžiosios recesijos sukeltos ekonominės problemos sąlygoja didėjantį dėmesį skirti regionų skirtumų mažinimui. 2007 m. finansų krizė ir po jos sekęs ekonomikos nuosmukis eliminavo per daugelį metų siektą ekonominę pažangą. Galiausiai, ekonomikos atsigavimas yra sudėtingas ir netolygus. Praėjus dešimčiai metų nuo Didžiosios recesijos pradžios, nei vienai ES šaliai narei nėra būdingas tvarus ilgalaikis ekonomikos vystymasis. Be to šiuo metu gresia naujas nuosmukis.

Tyrimo tikslas – remiantis autoriaus siūloma metodika, įvertinti Baltijos šalių regionų ekonominio išsivystymo netolygumus.

Tyrimo objektas – Estijos, Latvijos ir Lietuvos regionų Bendrojo vidaus produkto skirtumai.

Tyrimo problema – kokie yra ekonominio išsivystymo netolygumų vertinimo metodai bei kaip įvertinti Baltijos šalių regionų ekonominio išsivystymo skirtumus.

Tyrimo metodai: grafinis modeliavimas; statistiniai tyrimo metodai; horizontalioji ir vertikalioji rodiklių analizė. Tyrimas remiasi standartinio nuokrypio ir struktūrinės divergencijos indekso skaičiavimo principais. Jų pagrindu autoriaus sukurtas sanglaudos indeksas (CI).

Baltijos šalių regionų netolygumo situacija panaši tuo, kad ryškiai matomos kelios skirtingų išsivystymo lygių grupės. Lietuvoje turima trijų išsivystymo lygių regionus, o Latvijoje ir Estijoje dviejų. Visose šalyse išsiskiria sostinės regionai (Lietuvoje sostinės regiono BVP viršija šalies vidurkį apie 40-50 proc., Latvijoje apie 60-70 proc., o Estijoje apie 50-55 proc.). Taip pat Lietuva išsiskiria tuo, kad nuo 2009 metų regionų klasterizacija dar labiau išryškėjo.

Apskaičiavus Baltijos šalių BVP sanglaudos indeksus, pastebėta, kad Lietuvoje regioninai skirtumai yra mažiausi ($71{,}0 < CI_{LT} < 78{,}9$), o Latvijoje ir Estijoje labai panašūs (sanglaudos indeksas svyruoja nuo 56 iki 66 proc.). Visų šalių regioniniai skirtumai pradėjo nuosaikiai didėti nuo 2010 m. Pažymėtina, kad Lietuvoje sanglaudos indeksas mažėja nuo pat 2000 m.

Raktiniai žodžiai: sanglauda, regionų netolygumai, BVP, sanglaudos indeksas.