УДК 338.1:[339.923:061.1ЄС]=111 **DOI: 10.30857/2413-0117.2019.2.3**

Viktor Kozlovskij
Vilniaus Kolegija / University of Applied Sciences, Lithuania

SMART GROWTH PROGRESS IN EUROPEAN UNION: A COHESION APPROACH

Economic development and socioeconomic cohesion have always been an object of scientific research. In particular, this issue had become a focus of attention after EU enlargement in 2004 and Great Recession in 2007–2009. The above changes have given way to a certain slowdown in economic growth in most EU countries along with triggering a range of divergence processes between EU countries and regions. As a response to situation, the EU offered a Europe 2020 strategy, in which smart growth was mentioned as one of critical instruments to deal with increasing menaces. The objective of the study is to evaluate the progress of the main smart growth indicators (investment in research and development (R&D), employment rate and share of population obtaining tertiary education) in the EU over the period 2001–2017 within the framework of the economic cohesion concept. The paper seeks to explore the EU from different perspectives. First, the EU new member states (EU-10) and the old ones (EU-14) were compared. Second, the EU countries were divided by economic development level (calculated by GDP per capita in PPP): highly developed (H-7), medium developed (M-7) and less developed (L-7) countries. Finally, aggregate cohesion indices of all three smart growth indicators were calculated for the entire EU (EU-28). The research findings have revealed some interesting trends. First, each smart growth indicator's progress depends on countries' economic development level. Aggregate values for more developed countries (EU-14, H-7 and G-3) are always higher than the EU average (EU-28) and aggregate values for less developed economies are basically lower. Second, cohesion progress of smart growth indicators was influenced by economic recession in 2007–2009. It is argued that cohesion is evident in times of economic growth, but its progress ceases or divergence might occur in case of economic hazards. However, despite the expanding cohesion between the new and the old member states, a gap between certain groups of countries is even growing. This is clearly evident when the EU member states are divided into groups subject to the level of their economic development.

***Keywords**: smart growth; investment; R&D; employment; education; cohesion.*

Віктор Козловський
Вільнюський коледж / Університет прикладних наук, Литва

ПРОГРЕС ПОКАЗНИКІВ «РОЗУМНОГО ЗРОСТАННЯ» В ЄС З ПОГЛЯДУ ЗГУРТОВАНОСТІ

Питання економічного розвитку і соціально-економічної згуртованості завжди були об'єктом активних наукових досліджень. Особливо ця проблематика привернула увагу після розширення ЄС в 2004 році і Великої рецесії 2007–2009 років. Після зазначених вище подій економічне зростання в ЄС сповільнилося, а відмінності між країнами і регіонами ЄС стали збільшуватися. У відповідь на ці виклики було запропоновано стратегію «Європа 2020», в якій «розумне зростання» представлено як один з ефективних способів вирішення існуючих проблем. Метою цього дослідження є спроба оцінити прогрес «розумного зростання» в ЄС у період з 2001 по 2017 роки включно через призму згуртованості. Для аналізу було обрано три основні показники: інвестиції в наукові дослідження, зайнятість населення і частка населення з вищою освітою. Країни-члени ЄС проаналізовано з різних позицій. По-перше, оцінено сумарні показники «старих» членів Євросоюзу (EU-14), а також нових країн, що приєдналися (EU-10). По-друге, країни було поділено на групи за рівнем економічного розвитку: високорозвинені, середнього рівня і менш розвинені країни. Нарешті, сумарний

індекс згуртованості розраховано для всього ЄС. Результати досліджень виявили деякі цікаві тенденції. Насамперед, з'ясовано, що прогрес кожного показника «розумного зростання» залежить від рівня економічного розвитку країни. Сукупні значення для більш розвинених країн (EU-14, H-7 і G-3) завжди вищі, ніж в середньому по ЄС (EU-28), а сукупні значення для менш розвинених країн – здебільшого нижчі. По-друге, на динаміку згуртованості показників «розумного зростання» вплинув економічний спад у 2007–2009 роках. Згуртованість спостерігається за часів економічного зростання, але за часів економічних труднощів рівень її зростання зупиняється або навіть з'являються тенденції дивергенції. Нарешті, незважаючи на те, що розрив між новими і старими державами-членами ЄС переважно зменшується, розрив між окремими групами країн в останнє десятиліття часом навіть став збільшуватися. Особливо чітко це помітно, коли країни ЄС поділено на групи за рівнем економічного розвитку.

***Ключові слова**: «розумне зростання»; інвестиції; НДДКР; зайнятість; освіта; згуртованість.*

Виктор Козловский
Вильнюсский колледж / Университет прикладных наук, Литва

**ПРОГРЕСС ПОКАЗАТЕЛЕЙ «УМНОГО РОСТА»
В ЕС С ПОЗИЦИИ СПЛОЧЁННОСТИ**

Вопросы экономического развития и социально-экономической сплочённости всегда были объектом активных научных исследований. Особенно эта проблематика привлекла внимание после расширения ЕС в 2004 году и Великой рецессии 2007–2009 годов. После упомянутых событий экономический рост в ЕС замедлился, а различия между странами и регионами ЕС стали увеличиваться. В ответ была предложена стратегия «Европа 2020», в которой «умный рост» был предложен как один из эффективных способов решения возникающих проблем. Целью данной работы является попытка оценить прогресс «умного роста» в ЕС в период с 2001 по 2017 годы включительно через призму сплочённости. Для анализа были подобраны три основных показателя: инвестиции в научные исследования, занятость населения и доля населения с высшим образованием. Страны-члены ЕС были проанализированы с разных позиций. Во-первых, были оценены суммарные показатели «старых» членов Евросоюза (EU-14), а также стран-«новичков» (EU-10). Во-вторых, страны были поделены на группы по уровню экономического развития: высокоразвитые, среднего уровня и менее развитые страны. Наконец, суммарный индекс сплочённости был подсчитан для всего ЕС. Результаты исследований выявили некоторые интересные тенденции. Показано, что прогресс каждого показателя «умного роста» зависит от уровня экономического развития страны. Совокупные значения для более развитых стран (EU-14, H-7 и G-3) всегда выше, чем в среднем по ЕС (EU-28), а совокупные значения для менее развитых стран – в основном ниже. Во-вторых, на динамику сплочённости показателей «умного роста» повлиял экономический спад в 2007–2009 годах. Сплочённость очевидна во времена экономического роста, но во времена экономических трудностей её прогресс останавливается или даже появляются тенденции дивергенции. Наконец, несмотря на то, что разрыв между новыми и старыми государствами-членами ЕС в основном уменьшается, разрыв между отдельными группами стран в последнее десятилетие временами даже стал увеличиваться. Особенно отчётливо это заметно, когда страны ЕС поделены на группы по уровню экономического развития.

***Ключевые слова**: «умный рост»; инвестиции; НИОКР; занятость; образование; сплочённость.*

Problem formulation. The capacity of regions to innovate depends on many factors – the business culture, the skills of the workforce, the existence of effective education and training institutions, innovation support services, technology transfer mechanisms, R&D and ICT infrastructure, the mobility of researchers, business incubators, new sources of finance and local creative potential. Good governance is also crucial.

For the last years, one of significant problems in EU becomes lower economic growth rates in comparison with other leading countries as USA, China, Canada, Australia and etc. Statistical data shows that important reason of such productivity gap is low level of innovations (this means lower level of investment on R&D, insufficient use of technologies, difficult access to innovations in some sections of society). Moreover EU faces some problems in education system (this means poor reading skills of children, too many young people leaving education without qualification, qualifications often fail to match labour market needs). In addition to this population ageing process is faster than in main competitors states (this means population is ageing in higher rates than in other parts of the World, fewer people in work have to support higher number of pensioners).

Trying to find appropriated answers to mentioned questions the European Commission launched the 10-year economic strategy, called Europe 2020. This strategy was created to promote smart (developing an economy based on knowledge and innovation), sustainable (promoting a more resource efficient, greener and more competitive economy) and inclusive (fostering a high-employment economy delivering social and territorial cohesion) growth.

Analysis of recent research. Understanding of smart growth concept differs. Gibbs [8] relates smart growth with sustainable development. For Anderson [1] "smart growth recognizes the connections between development and quality of life. It leverages new growth to improve the community. … It also preserves open space and many other environmental amenities." Platje [16] focuses on various problems: lower levels of investment in R&D and innovation; insufficient use of information/communications technologies; difficult access to innovation in some sections of society; problems in educations system; in high rates ageing population.

Smart growth in EU starts from the Smart specialization concept, which appeared as an answer to searching more sustainable growth concepts. Many researchers [4, 11, 14, 15, 17, 19] agree that smart specialization is about placing greater emphasis on innovation and having an innovation-driven development strategy in place that focuses on each region's strength and competitive advantage. Moreover smart specialization places greater emphasis on innovation and focuses scarce human and financial resources in a few globally competitive areas in order to boost economic growth and prosperity. That's why according to A. Mempel-Śnieżyk [15] smart specialization is crucial for the actual effectiveness of research and investment in innovation. Furthermore smart specialization concept emerged from spatial sectoral lines of thinking, but it increasingly shifted towards addressing regional growth issues as fundamental building blocks of national and European growth issues. In order to make the smart specialization logic applicable to a regional context, the proponents [12, 13] of the concept interpreted the idea of a domain in terms of that of a region, and applying the smart specialization logic in this manner.

It must be remembered that further empirical analysis is based on cohesion point of view (the close connection between smart growth, smart specialization and cohesion is recognized by many researches [2, 3, 5, 7, 12, 18]. In economic literature definition of cohesion is not a simple concept – it can be analyzed in different ways. For some, it means the territorial and social relations stability; for others, the process of convergence between regions and social groups, moreover, some scientists even narrow the concept till employment opportunities and preferred living standards. Cohesion policy's aim can be to equilibrate regional and social disparities within the transparent redistribution of GDP, employment, etc. Alternatively, cohesion can be directed to the maximal contribute from regions and social groups to the country's economic performance and so on.

Author considers that cohesion definition must contain two main attributes: first, cohesion means equilibration of disparities; and, secondly, mutual development of all cohesion subjects.

Most researchers analyze smart growth, smart specialization or cohesion phenomenon separately. In this research author want to connect smart growth indicators with cohesion concept.

The aim is to determine smart growth indicators and analyze progress of those indicators according to cohesion point of view.

Research Methodology. Research methodology includes grouping of EU Member States, choosing periods of time, choice of indicators and indicators' counting methods. Object of research is smart indicators progress in EU Member States based on cohesion approach. For that purpose, two grouping models are presented in this paper. First one means grouping of all EU Member States into two groups by their joining to alliance aspect: Old Member States (EU-14, excluding Luxemburg) which joined union before 2004 and New Member States (EU-10) which joined union in 2004. This grouping is in line with popular concept of two-speed Europe [6, 9, 10]. Second grouping model is based on multi-speed EU idea. All mentioned 24 EU countries are divided into four groups by their economic development level (GDP). Grouping was made with statistic data analysis computer program SPSS using clustering function according to 10 years (2009-2018) GDP. The first group is highly developed countries (H-7): Austria, Belgium, Denmark, Finland, Ireland, Netherlands and Sweden, – countries which GDP level (counted as average for analyzed period) is around and higher than 110% of EU average level. The second group of EU members is named medium developed (M-7): Cyprus, Greece, Italy, Malta, Portugal, Slovenia and Spain, – countries which GDP is between 110% and 80% of EU level. The third group is low developed (L-7) countries: Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland and Slovakia, – countries which GDP level is under 80% of EU average. The last group considered from three biggest EU economies – gross economies (G-3): Germany, France and United Kingdom. These countries' GDP level is around 110-120% of EU average.

Choice of research indicators were made by Europe 2020 strategy's guidelines according to analysis above. There were three main indicators chosen: (1) public and private expenditures in research and development (R&D), counted as percentage of GDP; (2) employment level of population aged 15–64, counted as percentage of total population; (3) tertiary or equivalent level education achieved by population aged 24–65, counted as percent of total population.

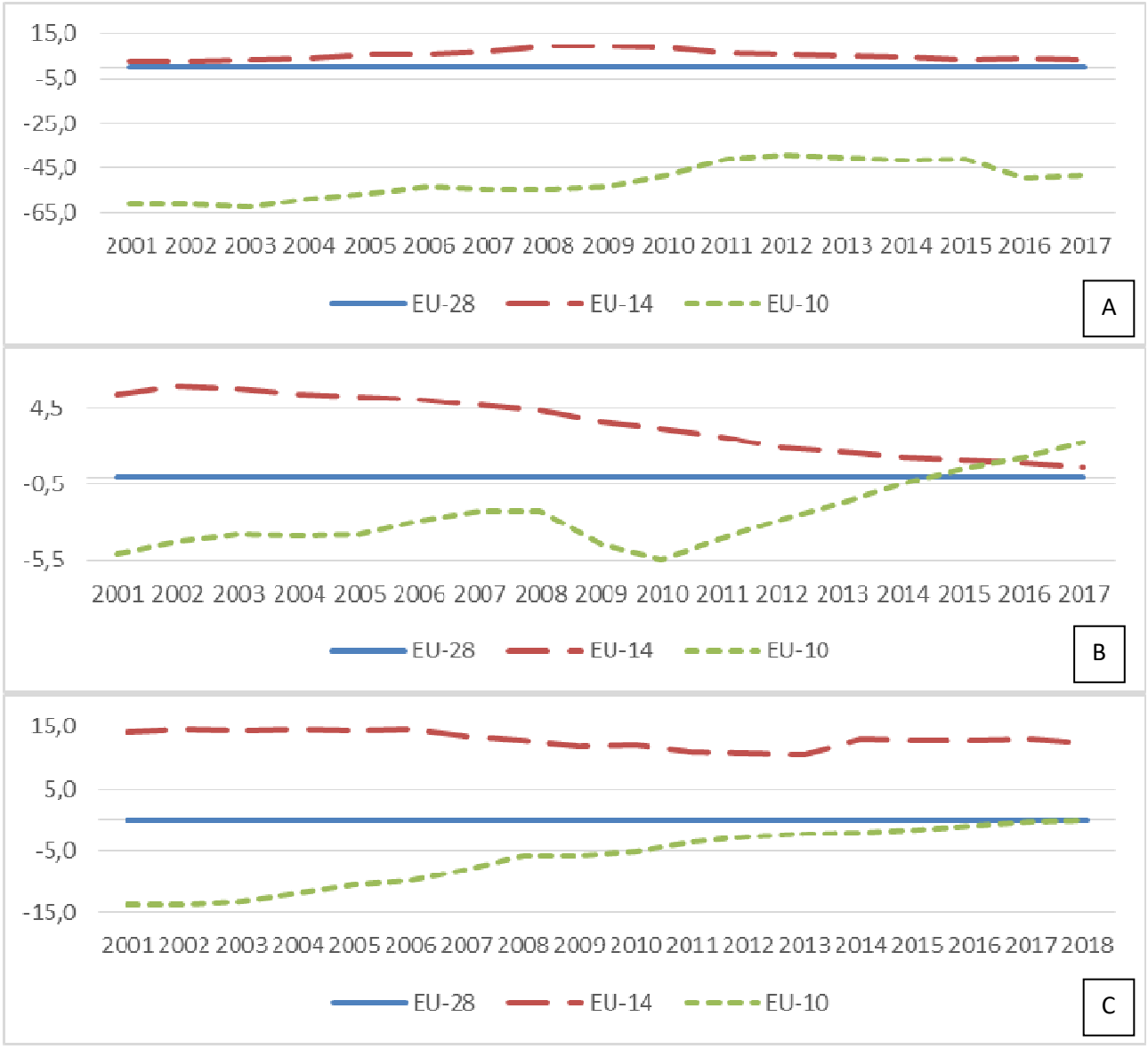
Indicators and cohesion index was counted using simplified standard deviation formula.

Research results overview. Smart growth indicators are quite different. Despite that, it can be recognized some common tendencies between them. First, every indicators' values for old Member States (EU-14) are in better position than EU average (EU-28) and indicators' values for new Member States' (EU-10) are lower (Figure 1). The same principle is correct if countries are divided into groups by economic development level: indicators' values for more developed Member States (H-7 and G-3) are always better then EU-28 and indicators' values for less developed Member States (M-7 and L-7) are mostly worse (Figure 2).

Second, cohesion progress depends on economic situation. For example, it was highly influenced by Great Recession (in 2008–2009). Moreover, cohesion (or convergence) is clear in times of economic growth (during 2001–2007). Together, cohesion progress stops or even divergence appears in times of economic difficulties (after 2008).

Finally, cohesion progress depends on countries' grouping method. While analyzing EU Member States divided by their accession time (EU-14 and EU-10), convergence appears most of time (except of the last 3-5 years when it mostly stopped or divergence started). View changes when countries are divided into groups by economic development level (more developed H-7 and G-3 and less developed M-7 and L-7). Positive cohesion progress is truthful for all four groups of countries during economic growth period (from 2001 until 2008). However strong divergence

between more and less developed countries' groups can be recognized after 2008. Especially obvious divergence process is in case of H-7 and M-7 groups.

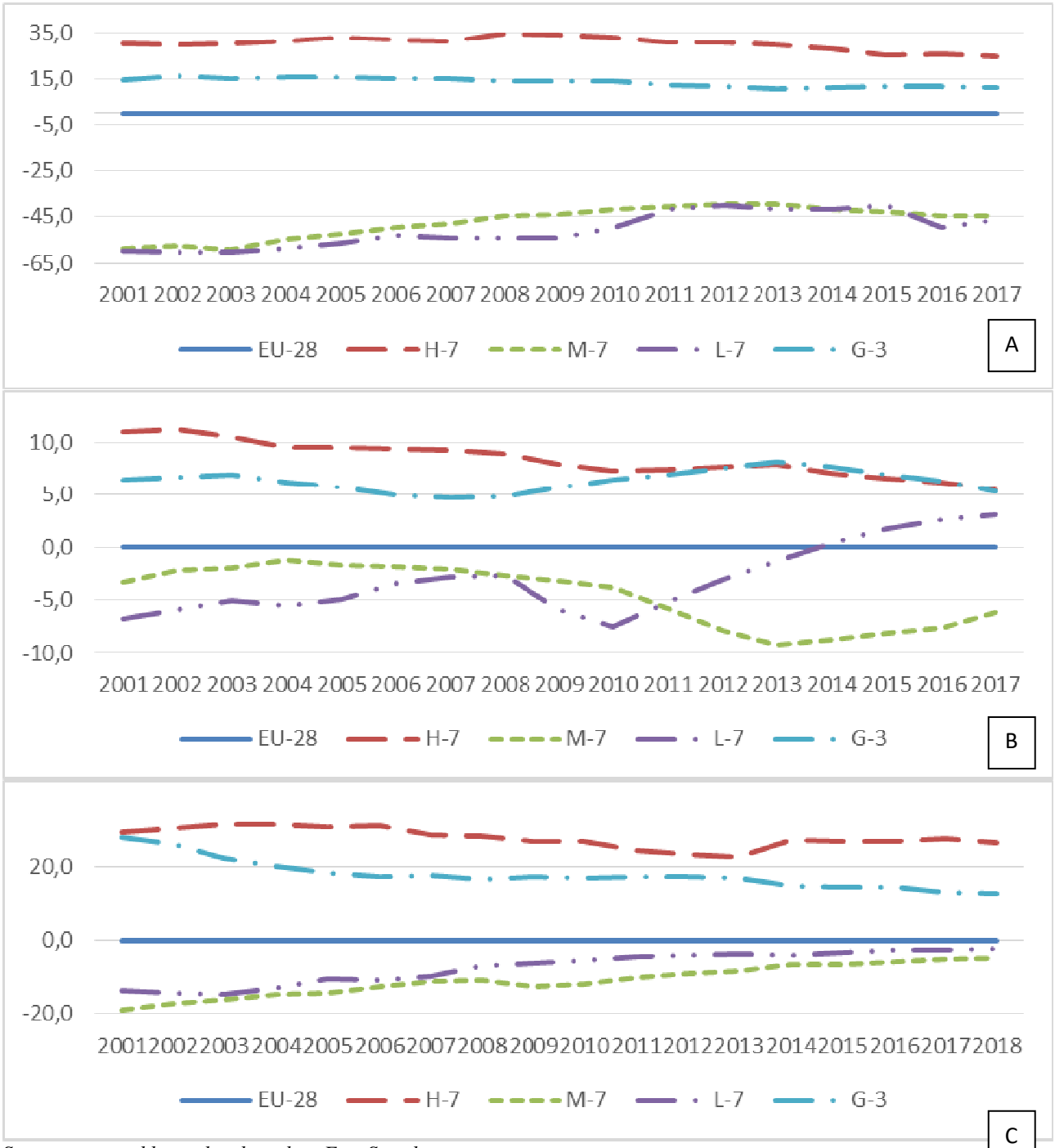


Source: counted by author based on EuroStat data.

Figure 1. **Simplified standard deviation of analyzed indicators [(A) expenditures for R&D; (B) employment rate; (C) tertiary education level] for old Member States (EU-14) and new Member States (EU-10) in 2001-2018**

Results of EU aggregate cohesion index for all mentioned indicators are quite optimistic. Especially good situation is with employment. All EU members have very similar employment rates: cohesion index rate is around 90–94% of maximum 100%. Moreover, during all analyzed period it has slow but regular tendency to grow (from 90.6% in 2001 till 93.3% in 2017).

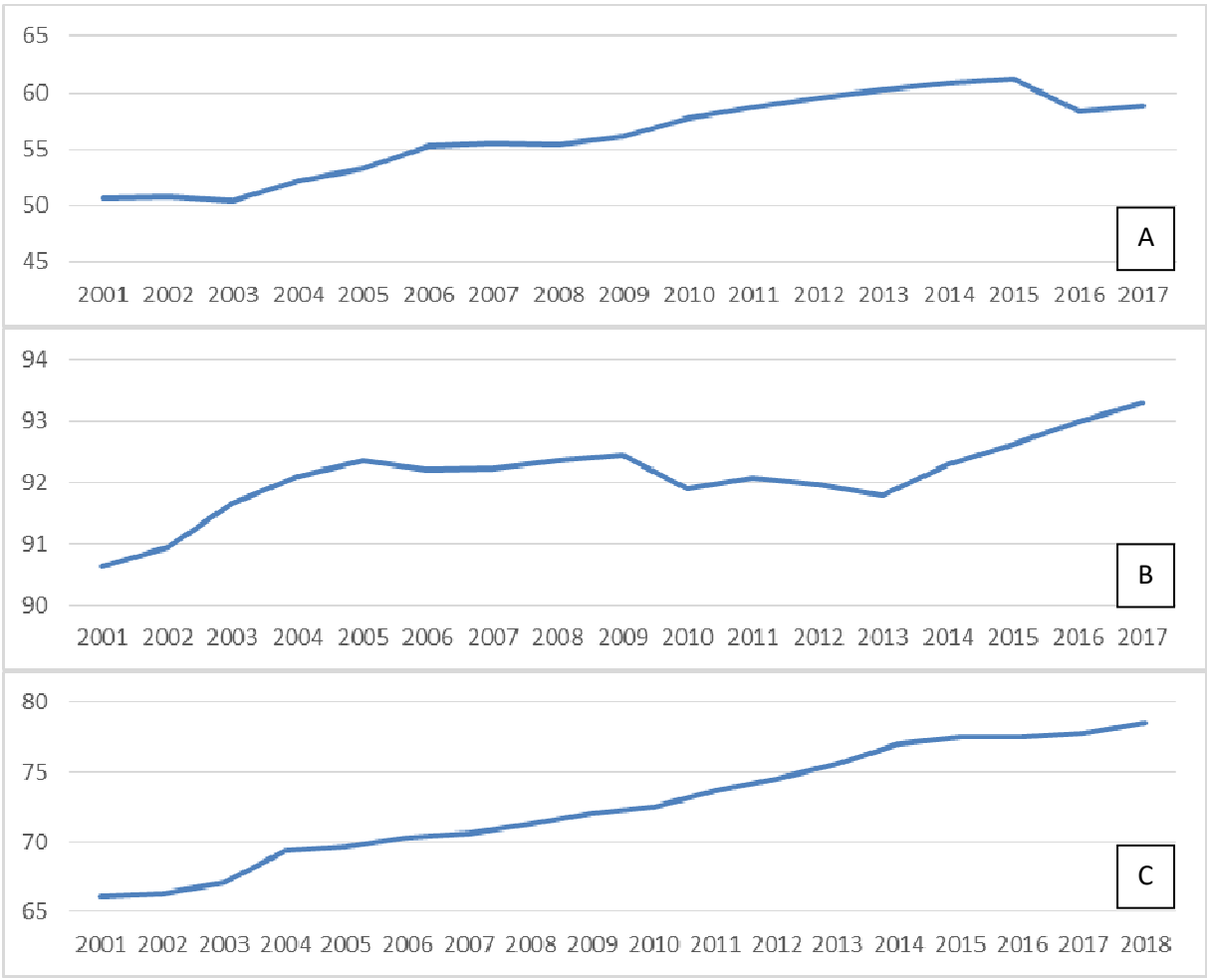
In case of tertiary education level, EU position is worse – differences between Member states are higher in comparison with differences of employment rate (EU cohesion index of tertiary education never reached 80%). From other side, we can see strong permanent convergence during all period. Cohesion level grew from 66.1% in 2001 till 78.5% in 2018. It must be mentioned, that cohesion slowdown appears in 2015 and continues until nowadays (index rate grew only 1% in the last 4 years).



Source: counted by author based on EuroStat data.

Figure 2. **Simplified standard deviation of analyzed indicators [(A) expenditures for R&D; (B) employment rate; (C) tertiary education level] for groups of EU Member States divided by economic development level (H-7, M-7, L-7 and G-3) in 2001–2018**

The biggest differentiation between EU countries is in expenditures for R&D level. More economically developed states are far away from less developed ones (in some cases difference between states is higher than three times). Despite it is growing, EU cohesion index of this indicator is just some more then 50%. More important is that gap between countries decrease very slowly. In period from 2001 till 2009 it grew only about 5%. Similar 5% growth can be seen in period from 2009 till 2015. During last two years cohesion index decreased 2.5%.



Source: counted by author based on EuroStat data.

Figure 3. **EU-28 Cohesion index based on standard deviation for analyzed indicators [(A) expenditures for R&D; (B) employment rate; (C) tertiary education level] in 2001–2018**

Conclusions.

Smart growth concept includes three main components (and corresponding indicators): innovations (investment in R&D), education (tertiary educations level) and employment (employment rate). Smart specialization concept is crucial for smart growth implementation. Smart specialization is about two main ideas: innovation-driven development and addressing regional growth.

Empirical research revealed some general tendencies truthful for all analyzed indicators. Each indicator's progress level depends on countries economic development level. Aggregate values for more developed countries' groups (EU-14, H-7 and G-3) are always higher than EU average (EU-28) and aggregate values for less developed economies' groups are mostly lower EU-28.

Cohesion progress of all indicators less depends on timeline partition into before and after EU enlargement in 2004. Instead of this, cohesion process is more influenced by economic recession (in 2008–2009). Cohesion is clear in times of economic growth and its progress stops or even divergence appears in times of economic difficulties.

If EU Member States are divided into groups by their accession time (before or in 2004: EU-14 and EU-10) convergence can be faced almost all analyzed time. If countries are divided into groups by economic development level positive cohesion progress is truthful for all four groups of countries during economic growth period (from 2001 till 2008). However strong divergence

between more and less developed countries' groups can be recognized after 2008. Especially obvious divergence process is in case of H-7 and M-7 groups.

References

1. Anderson, G. (1998). Why Smart Growth? A Primer. Washington, DC: International City/County Management Association.

2. Antunes, M., Pinho, C., Varum, C. (2015). Under What Conditions Do Structural Funds Play a Significant Role in European Regional Economic Growth? Some Evidence from Recent Panel Data. Journal of Economic Issues, 49(3), 749–771.

3. Bachtler, J., Charles, D., Gross, F. (2012). 'Smart Specialisation' and cohesion policy – A strategy for all regions? Glasgow: EPRC.

4. Bal-Domanska, B. (2013). Does smart growth enhance economic cohesion? An analysis for the EU regions of new and old accession countries. Research Papers of the Wroclaw University of Economics, 286, 100–110.

5. Barca, F. (2009). An agenda for a reformed cohesion policy: A place-based approach to meeting European Union challenges and expectations. Independent Report prepared at the request of Danuta Hübner, Commissioner for Regional Policy, April 2009. Brussels: EU Commission.

6. Dabrowski, M. (2010). The global financial crisis: Lessons for European integration. Economic Systems, 34(1), 38–54.

7. David, P.A., Foray, D., Hall, B. (2009). Smart Specialisation – The concept. Knowledge Economists Policy Brief 9. Brussels: EU Commission.

8. Gibbs, D., Krueger, R. (2008). "Third wave" sustainability? Smart growth and regional development in the USA. Regional Studies, 42(9), 1263–1274.

9. Gogas, P., Kothroulas, G. (2009). Two speed Europe and business cycle synchronization in the European Union: The effect of the common currency. MPRA Paper No. 13909.

Література

1. Anderson G. Why Smart Growth? A Primer / G. Anderson. – Washington, DC: International City/County Management Association, 1998.

2. Antunes M. Under What Conditions Do Structural Funds Play a Significant Role in European Regional Economic Growth? Some Evidence from Recent Panel Data / M. Antunes, C. Pinho, C. Varum // Journal of Economic Issues. – 2015. – № 49 (3). – P. 749–771.

3. Bachtler J. 'Smart Specialisation' and cohesion policy – A strategy for all regions? / J. Bachtler, D. Charles, F. Gross. – Glasgow: EPRC, 2012.

4. Bal-Domanska B. Does smart growth enhance economic cohesion? An analysis for the EU regions of new and old accession countries / B. Bal-Domanska // Research Papers of the Wroclaw University of Economics. – 2013. – № 286. – P. 100–110.

5. Barca F. An agenda for a reformed cohesion policy: A place-based approach to meeting European Union challenges and expectations. Independent Report prepared at the request of Danuta Hübner, Commissioner for Regional Policy, April 2009 / F. Barca. – Brussels: EU Commission, 2009.

6. Dabrowski M. The global financial crisis: Lessons for European integration / M. Dabrowski // Economic Systems. – 2010. – № 34 (1). – P. 38–54.

7. David P. A. Smart Specialisation – The concept. Knowledge Economists Policy Brief 9 / P. A. David, D. Foray, B. Hall. – Brussels: EU Commission, 2009.

8. Gibbs D. "Third wave" sustainability? Smart growth and regional development in the USA / D. Gibbs, R. Krueger // Regional Studies. – 2008. – № 42 (9). – P. 1263–1274.

9. Gogas P. Two speed Europe and business cycle synchronization in the European Union: The effect of the common currency / P. Gogas, G. Kothroulas // MPRA Paper No. 13909, 2009.

10. Hadjimichalis, C. (2011). Uneven geographical development and socio-spatial justice and solidarity: European regions after the 2009 financial crisis. European Urban and Regional Studies, 18(3), 254–274.

11. Hurduzeu, G., Lazar, I. (2016). Research and Development in the European Union. The Annals of the University of Oradea, Economic Sciences, 25, 129–135.

12. McCann, Ph., Ortega-Argiles, R. (2015) Smart Specialization, Regional Growth and Applications to European Union Cohesion Policy. Regional Studies, 49(8), 1291–1302.

13. McCann, Ph., Ortega-Argiles, R. (2013). Modern regional innovation policy. Cambridge Journal of Regions, Economy and Society, 6(2), 182–216.

14. Macnaghten, P., Owen, R., Stilgoe, J. (2012). Responsible research and innovation: From science in society to science for society, with society. Science and Public Policy, 39(6), 751–760.

15. Mempel-Śnieżyk, A. (2013). Smart Specialisation and Clusters in Economic Growth. Research Papers of the Wroclaw University of Economics, 324, 92–103.

16. Platje, J. (2013). A theoretical assessment of the EU's smart, sustainable and inclusive growth policy on resource use. Research Papers of the Wroclaw University of Economics, 318, 37–46.

17. Pugh, R.E. (2014). 'Old wine in new bottles'? Smart Specialisation in Wales. Regional Studies, Regional Science, 1(1), 152–157.

18. Solly, A. (2016). Place-based innovation in Cohesion Policy: meeting and measuring the challenges. Regional Studies, Regional Science, 3(1), 193–198.

19. Ulnicane, I. (2016). Research and innovation as sources of renewed growth? EU policy responses to the crisis. Journal of European Integration, 38(3), 327–341.

10. Hadjimichalis C. Uneven geographical development and socio-spatial justice and solidarity: European regions after the 2009 financial crisis / C. Hadjimichalis // European Urban and Regional Studies. – 2011. – № 18 (3). – P. 254–274.

11. Hurduzeu G. Research and Development in the European Union / G. Hurduzeu, I. Lazar // The Annals of the University of Oradea, Economic Sciences. – 2016. – № 25. – P. 129–135.

12. McCann Ph. Smart Specialization, Regional Growth and Applications to European Union Cohesion Policy / Ph. McCann, R. Ortega-Argiles // Regional Studies. – 2015. – № 49 (8). – P. 1291–1302.

13. McCann Ph. Modern regional innovation policy / Ph. McCann, R. Ortega-Argiles // Cambridge Journal of Regions, Economy and Society. – 2013. – № 6 (2). – P. 182–216.

14. Macnaghten P. Responsible research and innovation: From science in society to science for society, with society / P. Macnaghten, R. Owen, J. Stilgoe // Science and Public Policy. – 2012. – № 39 (6). – P. 751–760.

15. Mempel-Śnieżyk A. Smart Specialisation and Clusters in Economic Growth / A. Mempel-Śnieżyk // Research Papers of the Wroclaw University of Economics. – 2013. – № 324. – P. 92–103.

16. Platje J. A theoretical assessment of the EU's smart, sustainable and inclusive growth policy on resource use / J. Platje // Research Papers of the Wroclaw University of Economics. – 2013. – № 318. – P. 37–46.

17. Pugh R. E. 'Old wine in new bottles'? Smart Specialisation in Wales / R. E. Pugh // Regional Studies, Regional Science. – 2014. – № 1 (1). – P. 152–157.

18. Solly A. Place-based innovation in Cohesion Policy: meeting and measuring the challenges / A. Solly // Regional Studies, Regional Science. – 2016. – № 3 (1). – P. 193–198.

19. Ulnicane I. Research and innovation as sources of renewed growth? EU policy responses to the crisis / I. Ulnicane // Journal of European Integration. – 2016. – № 38 (3). – P. 327–341.