

INTER-REGIONAL AND CROSS-BORDER SPACES IN THE CONTEXT OF SMART SPECIALIZATION

Alexander AMOSHA^{1*}, Viacheslav LIASHENKO², Iryna PIDORYCHEVA³

¹ NAS of Ukraine; amocha@nas.gov.ua, ORCID: 0000-0003-0189-3819

² Department of Regulatory Policy and Entrepreneurial Development Problems; slaval.aenu@gmail.com,
ORCID: 0000-0001-6302-0605

³ NAS of Ukraine, Sector of Innovation and Investment Industrial Development Problems;
pidorycheva@nas.gov.ua, ORCID: 0000-0002-4622-8997

* Correspondence author

Abstract: Globalization is erasing geographical boundaries, leads to the changes in the economic and political interactions. These new opportunities could be used to develop inter-regional and cross-border relations in various spheres of cooperation between countries. The article deals with issues of formation the Polish-Ukrainian inter-regional and cross-border spaces in the scientific-educational and innovative spheres in the context of smart specialization. The links between smart specializations of Polish and Ukrainian regions could be seen as an important element of joint planning and the coordination of measures support for science, education, and innovations at the inter-State level.

Keywords: inter-regional space, cross-border space, scientific-educational and innovative spheres, smart specialization, Poland, Ukraine.

JEL Classification: F2; F5; O31; O33.

1. Problem statement

Regions are the growth poles that can build the backbone of the economic space of the country. Having local competitive advantages, they can be better integrated into the global value chains enabling large producers, small and medium-sized businesses to expand their access to new knowledge, technologies and markets (Ivanov, Lyashenko, & Pidorycheva, 2018, p. 36-84).

Currently, in Ukrainian regions are being rapidly designed the strategies based on smart specialization. Such strategies should take into account the global economic and technological context as well as the profile of the region, its specialization and competitive advantage in order to enable regions to find their unique niches on the world map of markets and technologies.

Globalization and integration are erasing geographical boundaries, leads to the changes in the economic and political interactions. These new opportunities could be used to develop inter-regional and cross-border relations in various areas of cooperation between countries. The article deals with issues of formation the Polish-Ukrainian inter-regional and cross-border spaces in the scientific-educational and innovative spheres in view of the relationship between smart specializations of different regions.

2. Analysis of recent research and publications

The concept of smart specialization, which was formulated by a group of researchers Foray D., David P.A. and Hall B. and outlined in policy brief «Knowledge for Growth» in 2009 (Foray, David, & Hall, 2009), quickly gained popularity and was included in the agenda of the European strategy «*Europe 2020: A strategy for smart, sustainable and inclusive growth*» (European Commission, 2010). It has been widely disseminated far beyond European Union prioritized in policy documents of OECD (OECD, 2013) and UNECE (UNECE, 2014).

Initially, the authors have emphasized the concept of smart specialization does not provide for imposition the specialization for the region «top-down» by the government. Researchers also believe that authority should not be seeking a specialization using a foresight ordered in a consulting firm. Instead, the authors suggested:

«We are suggesting an entrepreneurial process of discovery that can reveal what a country or region does best in terms of science and technology. That is, we are suggesting a learning process to discover the research and innovation domains in which a region can hope to excel. In this learning process, entrepreneurial actors are likely to play leading roles in discovering promising areas of future specialization, not least because the needed adaptations to local skills, materials, environmental conditions, and market access conditions are unlikely to be able to draw on codified, publicly shared knowledge, and instead will entail gathering localized information and the formation of social capital assets» (Foray, 2013).

It is within the entrepreneurial process of discovery – in the interactive process in which market forces and private sector find the information on new activities and the Government evaluates it and provides opportunities for entities, which are able to realize this potential – lies the main difference between smart specialization and traditional industrial and innovation policies (OECD, 2013, p. 11; Foray, 2012).

This suggests another one of core smart specialization`s principles: the government should focus investments not in the economic sectors as such, but on the spheres in which region or country has competitive advantages (specialization) or on the perspective areas, promoting technological (sectoral) diversification. Table summarizes the core principles of smart specialization.

Table 1.
Key principles of the concept of smart specialization

Principle	Implication
The process of self-knowledge or the entrepreneurial process of discovery	Determining the priorities of regional development is not exclusive competence of the government, but is a joint process with the business sector opening new promising kinds of activities for a particular region
Types of activity, rather than the sectors of the economy as such, is the level for the establishment of priorities for development and investment	Sectors of the economy are important but they should not be considered as targets in the definition of development priorities. Such priorities should include activities related to specific technologies or a combination of them, with existing regional capabilities, such as natural resources, etc. The future priorities of development should address those activities in which innovative projects complement existing productive assets. Depending on the general condition of the chosen activity, a goal of reasonable specialization must be differentiated (e.g. modernization, diversification, radical transformation)
Reasonable specialization involves strategic and specialized diversification	Instead of artificially identifying the specialization of the region, "smart specialization" approach encourages the search and discovery of new or unexpected activities for a particular region, which leads to "specialized" diversification
Assessment and monitoring	Like other versions of the new industrial policy, smart specialization involves monitoring, evaluating and adjusting policy measures on this basis. It also requires flexibility in policy development in order to stop or change the vector of state support for R&D and innovation. To do this, you need to define clear control indicators and criteria for success/failure. The policy of reasonable specialization requires the establishment of measurable goals, whether conducting advanced research, commercialization of R&D or growth of research in the business sector

Source: OECD, 2013, p. 18-19.

These principles were worked up by the European Union as the basis of regional innovative strategies for smart specialization (Research and Innovation Strategies for Smart Specialisation (RIS3)) aimed at (Morgan, 2013, p. 5; OECD, 2013, p.19):

- concentration of state efforts, resources and investments on the key priorities of the region;
- development of the strengths of each country/region;
- support for research and technological innovation;
- involving all stakeholders in finding opportunities for regional development;
- monitoring and evaluating the effectiveness of the strategy implementation.

The importance of inter-regional and cross-border interactions is widely accepted amongst scientific and political circles in the world, including European Union (Makkonen, Weidenfeld, & Williams, 2017).

In particular, the dissemination of cross-border regions, as noted in the book (Perkmann, & Sum, 2002), is related to a series of macro-tendencies: 1) the growth of economic transborder activities by increasing movement of products, services and people which contributes to globalization; 2) the transfer of certain state powers upwards, downwards, and sideways from the national state form; 3) the end of the Cold War and as a result integration of the formerly socialist economies into groups. These changes have catalyzed the development of the cross-border regions.

Priority attention of many scientists is given to the question of cooperation in R&D, education and innovation both at the countries and firm levels, and among countries. The study (Gunther et al., 2017) focuses on an analysis of inter-regional scientific cooperation between Germany and Poland. The role of transnational organizations in European innovation policy and of the policy networks established between these organizations and supranational institutions is investigated in the work (Grande, & Peschke, 1999). The authors of the article (Tumelero, Sbragia, & Evans, 2019) considers scientific cooperation between companies in the sphere of ecological innovations. Nevertheless, despite the significant contribution of scientific papers, existing approaches for scientific-educational and innovative cooperation are limited to the EU Member States and do not consider prospects for engagement with Associated Countries such as Ukraine.

3. The purpose

The purpose of the paper is to identify the perspectives of creating inter-regional and cross-border scientific-educational and innovative spaces between Poland as the EU Member State and Ukraine as Associated Country in the context of smart specialization. The linkage between smart specializations of Polish and Ukrainian regions could be seen as an important element of joint planning and the coordination of measures support for science, education and innovations at the inter-State arena.

4. Methodology

The methodological base for the study is an economic theory, theories of innovation, the concept of smart specialization, academic writings of Ukrainian and foreign scientists on the problems of formation the inter-regional and cross-border cooperation. In order to attain the established aim of the article, the research method system was used – dialectical, systemic, logical and historical scientific methods that ensure a conceptual coherence of the article. To carry out the research, the following methods were used: scientific abstraction, analysis, and synthesis – to determine the competitive advantages of countries and perspective spheres of formation inter-regional and cross-border cooperation as well as to analyze the concept of smart specialization; empirical and applied analysis – to identify the priorities in building Polish-Ukrainian scientific-educational and innovative spaces and the intercountry challenges that could be solved through them.

5. Main results of the study

The role of inter-regional and cross-border cooperation in the new economic realities become more important. The formation of such spaces would increase the regions and countries' ability to respond adequately to the challenges of a modern fast-changing world.

Currently, the role of the driver in building «Europe of different speeds», could be played Poland and Ukraine (in the post-war “old Europe” this function was performed by France and Germany) in order to use of the “window of opportunity” that provides the transition from the 5th to the 6th “long wave” of D. Kondratyev. The example of using of this “window of opportunity” was demonstrated by the new industrial countries of South-East Asia which becoming the so-called «Asian tigers» when were being moved from 4th to 5th «long wave» of D. Kondratyev. To achieve this, Poland and Ukraine have competitive advantages:

- advantageous geographical location – in the heart of Europe, at the intersection of major transport and trade routes;
- highly qualified and educated human capital (from 130 countries Poland and Ukraine rank, respectively, 31st i 24th on the Global Human Capital Report 2017 (World Economic Forum, 2018, p. 153, 179));
- large consumer market unsaturated with individual commodities – the population of Poland and Ukraine is respectively 38,2 and 44,4 million people (World Economic Forum, 2018, p. 153, 179));
- a well-developed network of academic institutions and universities that need to be connected to each other and with industry;
- the industrial capacity requiring large-scale innovation-based modernization to ensure high levels and quality of production.

Both countries are particularly interested in developing defense, energy, scientific-educational and innovative spaces. With a view to their formation, we have proposed to consider Ukrainian universities as a platform for undergraduate education from post-Soviet (Azerbaijan, Turkmenistan), Asian (China, Pakistan) and African (Nigeria) countries for Bachelor's degree and further education in Poland and others Member States of the EU for Mastek's degree (Pająk, Kamińska, & Kvilinskyi, 2016).

Actually, the necessary prerequisites for this scenario implementation are already in place – many universities, scientific institutions, and social organizations of Ukraine have concluded relevant agreements with universities and innovative structures of European countries. For example, a Memorandum of cooperation between National science-technological association of Ukraine, Uzhgorod National University and the Technical University of Košice was signed in March 2017 in Košice (Slovakia). In September 2016, similar memorandums of agreement were signed between Academy of Economic Sciences of Ukraine, Institute of Industrial Economics of the NAS of Ukraine, Poltava University of Economics and Trade and

from the Polish side – Poznań University of Economics and Business, Higher Vocational School in Suwałki and Technology Park in Suwalki (Ivanov et al., 2018).

The creation of inter-regional Polish-Ukrainian scientific-educational space could be complemented with the entrepreneurial component. Namely, students who have entrepreneurial abilities and who are studying in Ukraine (on Bachelor's curriculum) start their own business in the business-incubator of the corresponding Ukrainian university and then, transfer it to the corresponding domestic scientific or industrial park. While continuing their education in Poland (for Master's degree), they adapt their small business to the relevant technology park in Poland, that makes them already residents of the EU. This allows them to enter the large Polish market as well as the Pan-European market, without losing ties with Ukraine.

Working together in a better way to address the great challenges faced by humanity is one of the main priorities of the European Research Area (ERA). In fact, the ERA includes six priorities:

- 1) building more effective national research systems;
- 2) optimal transnational cooperation and competition (coopetition), including the creation of high-quality, accessible research infrastructure;
- 3) an open labor market for researchers;
- 4) gender equality and gender mainstreaming in research;
- 5) optimal circulation, access to and transfer of scientific knowledge, open access to scientific publications and data;
- 6) international cooperation.

As noted in the ERA Progress Report 2016 (European Commission, 2017, p. 4), cooperation between the EU Member States and Associated Countries with the aim of finding the best ways to solve modern challenges «is central to Europe's ability to respond to a dynamic and changing world».

In the process of building the inter-regional and cross-border scientific-educational and innovative spaces, the following challenges, that correspond to the priorities of ERA, can be solved:

- development of bilateral and multilateral relations in scientific-educational and innovative spheres in order to achieve maximum results from the convergence of national and regional economic interests, the creation of the necessary conditions for the market of innovative goods development and providing scientific-educational services;
- identification of zones of mutual interest, allocating in them priority technology areas (including key emerging technologies of the fourth industrial revolution) for joint scientific-educational and innovative projects; creating favorable conditions for their implementation for the benefit of states and regions;

- developing of human capital and staffing system of scientific-educational and innovative cooperation, professional training of managers and agents of innovative and scientific-educational programs and projects, among other things, in the sphere of the digital economy;
- effective use of all available scientific-educational and innovative infrastructure, its development; implementation into practice new mechanisms ensuring closer and more effective interaction between the states, scientific organizations, universities, and entrepreneurs;
- removing of possible legal and administrative barriers, creating of conditions for gradual harmonization national systems of institutional and legal regulation of scientific-educational and innovative activity, standardization and product/services certification in the field of development and production of high-technology products/services, technical regulation and self-regulation.

In building Polish-Ukrainian scientific-educational and innovative spaces, the following inter-state priorities can be defined:

- institutional ensuring of the realization of interstate and cross-regional scientific-educational and innovative activities;
- increasing the innovative activity of enterprises in the production sector;
- introduction of economic and financial instruments and promotion regimes of innovative and entrepreneurial activities;
- effective use of intellectual property, development of its common market;
- institutional transformation innovative sphere, namely, creating conditions to implement the concept of «Innovative lift: from school to Europe» (Ivanov et al., 2018);
- personnel training and skills development in innovative and entrepreneurial spheres;
- creating of joint digital and physical platforms, complementary value chains, joint ventures and other forms of economic cooperation;
- introduction of measures in the field of export and customs.

Further based on the inter-regional and cross-border scientific-educational and innovative spaces could be created inter-regional and cross-border innovation systems and high-tech clusters. Research suggests that as the first approximation could be proposed such main steps of inter-regional and cross-border nano- and biotechnologies clusters formation:

I step: choosing profiled institution of the NAS of Ukraine and creation of its branch at the relevant Ukrainian partner university; II step: the signing of a cooperation agreement with a foreign partner-university; III step: providing equipment to structural units engaged in research in the field of high technology; IV step: staffing, internships, academic exchanges; V step: providing financing by attracting funds from the European, national and regional programs, and structural funds, local business structures, through loans, grants and other sources not prohibited by law; VI step: preparing proposals to devise national and regional

smart specialization strategies and diversify of traditional industries of partner countries' regions; VII step: introduction of new special courses «Economics and entrepreneurship», «Nanotechnologies and Economics», «Biotechnologies and Economics» for physical and biological specialties at partner-universities; VIII step: providing services of business-incubators for small enterprises and replication of developments (nano- and biotechnologies) based on local incubators, science, technology and industrial parks.

Dnieper Scientific Center of NAS of Ukraine and MES of Ukraine could design an experiment on formation Ukrainian-Polish scientific-educational and innovative space as a pilot project of a cross-border high-tech cluster. Scientific and methodological support could be undertaken by the Institute of Industrial Economics of the NAS of Ukraine and its Dnipro department.

6. Conclusions and the prospects for further research

Inter-regional and cross-border cooperation arises in response to a need and appropriateness of bringing together and coordinating efforts and action to cope with joint cross-country problems. Nowadays, the tendencies of regional cooperation are increasing which highlight the issue of interaction among regions.

This study analyzed the prospects of creating an inter-regional and cross-border scientific-educational and innovative spaces between Poland as the EU Member State and Ukraine as Associated Country in the context of smart specialization. The links between smart specializations of Polish and Ukrainian regions are an important element of joint planning and the coordination of measures support for science, education, and innovations at the inter-State arena.

It has been proposed to form an inter-state or cross-border nano- and biotechnology cluster as a cooperation tool between Poland and Ukraine. Nanotechnology and biotechnology are smart technologies which in the ensuing years will lead to a radical transformation of global value chains, will be at the heart of research and development, the activities of business structures and government policies, which makes the proposals both relevant and perspective. These issues require further more in-depth interdisciplinary research. In particular, exploring how the formation of inter-regional and cross-border high-technology clusters and innovation systems in view of regions' smart specializations will allow European regions to enhance scientific-educational and innovative cooperation.

References

1. European Commission (2010). *Europe 2020: A strategy for smart, sustainable and inclusive growth*. Brussels. Retrieved from <http://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf>.
2. European Commission (2017). *European Research Area Progress Report 2016. Report from the commission to the council and the European parliament*. Retrieved from http://ec.europa.eu/research/era/pdf/era_progress_report2016/era_progress_report_2016_com.pdf.
3. Foray, D. (2013). The Economic Fundamentals of Smart Specialization. *Ekonomia*, 83, 54-78.
4. Foray, D., David, P., Hall, B. (2009). Smart specialization – the concept. *Knowledge Economists Policy Brief*, 1-5. Retrieved from http://ec.europa.eu/invest-in-research/pdf/download_en/kfg_policy_brief_no9.pdf.
5. Grande, E., & Peschke, A. (1999). Transnational cooperation and policy networks in European science policy-making. *Research Policy*, 28(1), 43-61. doi:10.1016/S0048-7333(98)00099-7.
6. Gunther, J., Latifi, G., Lubacha-Sember, J., Tobelmann, D. (2017). Scientific Cooperation in a German-Polish Border Region in the Light of EU Enlargement. *Foresight and STI Governance*, 11(1), 42-53. doi: 10.17323/2500-2597.2017.1.42.53.
7. Ivanov, S.V., Lyashenko, V.I., & Pidorycheva, I.Yu. (Eds.) (2018). *Ukraine in the European science-educational and innovative spaces: the concept of adaptation and integration in the context of the Association agreement between the EU and Ukraine*. Kyiv: NAS of Ukraine, Institute of Industrial Economy (in Ukr.).
8. Makkonen, T., Weidenfeld, A., & Williams, A.M. (2017). Cross-Border Regional Innovation System Integration: An Analytical Framework. *Tijdschrift voor economische en sociale geografie*, 108(6), 805-820. doi: 10.1111/tesg.12223.
9. Morgan, K. (2013). *Regional innovation strategies: the challenge of collaboration and governance*. Local Economic Growth: Recession, Resilience and Recovery Conference St Catharine's College, Cambridge (11-12 July). Retrieved from <https://www.cpes.org.uk/dev/wp-content/uploads/2013/08/17-morgan-Cambridge-conference-2013.pdf>.
10. OECD (2013). *Innovation-driven growth in regions: The role of smart specialisation*. Paris: OECD.
11. Pająk, K., Kamińska, B., & Kvilinskyi, O. (2016). Modern trends of financial sector development under the virtual regionalization conditions. *Financial and credit activity: problems of theory and practice*, 2(21), 204-217. Retrieved from: <http://fkd.org.ua/article/view/91052/92128>.

12. Perkmann, M., & Sum, N. (2002). Globalization, regionalization and cross-border regions: scales, discourses and governance. In: Perkmann and Sum (Eds.), *Globalization, regionalization, and cross-border regions*. Basingstoke: Palgrave Macmillan. Retrieved from <https://dspace.lboro.ac.uk/dspace-jspui/bitstream/2134/661/3/ch1Perkmann%2BSum.pdf>.
13. Tumelero, C., Sbragia, R., Evans, S. (2019). Cooperation in R&D and eco-innovations: The role in companies' socioeconomic performance. *Journal of Cleaner Production*, 207(10), 1138-1149. doi: 10.1016/j.jclepro.2018.09.146.
14. UNECE (2014). *Report of the Team of Specialists on Innovation and Competitiveness Policies on its seventh session*. Seventh session. 16-17 October 2014. Geneva: United Nations. Retrieved from https://www.unece.org/fileadmin/DAM/ceci/documents/2015/CECI/ECE.CECLICP.2014.2_as_submitted.pdf.
15. World Economic Forum (2018). *The Global Human Capital Report 2017. Preparing people for the future of work*. Retrieved from <https://weforum.ent.box.com/s/dari4dktg4jt2g9xo2o5pkjsjpatvawdb>.