

Concept of Smart Specialization as a Strategy for Sustainable Regional Development

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Abstract

The subject of this paper is a review of previous research on smart specialization as a concept which is one of the strategies for sustainable development of regions. Innovations are considered as one of the key drivers of growth. Recognition of innovation which was central point of strategy 'Europe 2020' where 'smart specialization' needs to make possible for the regions and countries pursue those industries in which they hold a comparative advantage and which have basis for further innovations. The main purpose of this paper is defining smart specialization and its role on the regional development. Analysis and comparison of the scientific literature and applications of smart specialization were used as methods for this paper.

The main findings of this paper show that the basis of smart specialization are innovation, knowledge and research which are pillars of smart, sustainable development. Smart specialization means identifying the unique characteristics and potential of each country and region, with the aim of achieving competitive advantages and excellence. It also includes strengthening regional innovation systems, increasing knowledge exchange and spillover the benefits of innovation throughout the regional economy. By comparison method of the scientific literature this paper will contribute to the development of theoretical background of smart specialization as a strategic concept formed by a group of European Union experts with the aim of reducing the gap in competitiveness between the European Union and the United States, which arises from the lower economic and technological specialization of European countries, especially at the regional level. Also it will promote smart specialization as a concept that can contribute to strengthening regional innovation policy and regional development.

Key words: *Smart specialization, sustainable development, innovation, competitiveness, regional development*

Introduction

In order to maintain the European model of well-being it is necessary to make changes that need to be systematically implemented in economies and societies, and these changes should be based on strengthening competitiveness, social inclusion and responsibility. According to Dragičević and Obadić, competitiveness is a dynamic concept that is constantly changing, adapting and improving (Dragičević, Obadić, 2013.). It is created at micro and meso economic structures: enterprises and clusters, but it also affects macroeconomic growth and development. Competitiveness is also affected by the development of macroeconomic policies and the institutional structure of a country. In the age of globalization, it is increasingly influenced by innovation, knowledge, information and other intangible resources. Also, in order to strengthen competitiveness, it is necessary to work on the development of partnerships between companies, educational and research organizations and the public sector. In the last few years, a model of economic development based on innovation, education and research has been increasingly developed. Knowledge and innovation are the foundation of economic growth and development as well as of job creation. Therefore, the European Union emphasizes the significant role of smart specialization as an innovation policy, based on knowledge and innovation. This concept is designed to promote the efficient and effective use of public investment in research and technology. (Gulc, 2015.). An approach of development based on innovations is important not only for high-tech sectors but for all economic sectors. In order to raise the level of competitiveness of the economy, system approach of planning local and regional development is necessary. One possibility is regional development based on the concept of smart specialization.

The subject of this paper is a review of previous research on regional development and defining smart specialization as a strategy that can be used to achieve the sustainable development of the regions. For the purpose of this work analysis, conceptual mapping and comparison of the scientific literature were used.

Results

Innovations as a pillar of economic growth and development

Innovations are considered as one of the key drivers of growth. Newer theories of economic growth draw attention to endogenous technological change to explain the growth patterns of world economies (Romer, 1986., Lucas, 1988., Barro, 1990., Arthur, 1994.). The economic concept of innovation was introduced by Schumpeter in 1934. He described innovation as the development of



new products, new processes, new markets and new sources of raw materials, that is to say, to shape industrial organization anew (Schumpeter, 1934). According to Cambridge dictionary innovation is a new idea or method, or the use of new ideas and methods (Cambridge dictionary). It is necessary to distinguish invention from innovation. Invention is the discovery of new technical knowledge and its practical application to industry and innovation is the introduction of new technical methods, products, sources of supply, and forms of industrial organization. Schumpeter also introduces into economics the concept of creative destruction as a source of a new economic cycle and links innovation with economic growth (Schumpeter, 1934.).

After Schumpeter the role of innovation in economic development appeared in papers of other authors in this area (Nelson and Winter, 1982). According to endogenous growth models, pioneered by Romer (1986), technological innovation is created in the research and development (R&D) sectors using human capital and the existing knowledge stock. It is then used in the production of final goods and leads to permanent increases in the growth rate of output. At the heart of these models is their postulation that endogenously determined innovation enables sustainable economic growth, given that there are constant returns to innovation in terms of human capital employed in the R&D sectors (Ulku, 2004.). Frantzen and Griffith et al. also confirmed the positive relationship between countries' R&D and productivity growth by studies using international panel data (Frantzen, 2000; Griffith, Redding and Reenen, 2004).

Due to the fact that traditional models of economic growth could not explain a new trends in the regional development a new approach emerged. Various authors conducted their research on how economic development takes place and how it relates to economic geography (Albrechts; Swyngedouw, 1989 ; Barca, McCann; Rodriguez-Pose, 2012 ; Capello; Nijkamp, 2009). According to Vanthillo and Verhetsel (2003) a theoretical transformation stressed the importance of aspects as human capital and innovation (endogenous growth theory), agglomeration and distance (new economic geography) and institutions (institutional economics). It is important to mention that globalization spurred the importance of local specificities and material and non-material assets upon which the competitiveness of regions is based (Capello; Nijkamp, 2009 ; Rodriguez-Pose; Crescenzi, 2008). According to Porter the performance of regional economies is strongly influenced by the strength of local clusters and the vitality and plurality of innovation (Porter, 2003.).

At a regional level European Union is facing the gap in competitiveness compared with United States. This gap arises from the lower economic and technological specialization of European countries, especially at the regional level. Due to that issue, European Union is in the phase of re-discovering innovation through the production of knowledge together with scientific research and entrepreneurial spirit as well as an interdisciplinary approach to organizational practices. (Hahn et al.; 2012). OECD emphasizes that smart specialization can be one of the key drivers for growth but it requires effective and active coordination of policy interventions and longer term visions of policy makers and also various stakeholders, including business. (OECD 2013)

Smart specialization as a concept for sustainable regional development

Globalization, hypercompetition, and rapid technological changes reshape the conditions of regions and local economies continuously. Most of the theories of regional growth and development are derived from theories of economic growth theories. Some of the theories dedicate special attention to regional differences and sources of regional development. Next Table 1 shows the review of previous research and theories on regional development.

Table 1. Review of previous research and theories on regional development

Author	Contribution
Williamson	The first to explicitly establish the relationship between regional inequalities and the degree of development. Williamson actually took Kuznets' concept of an "inverted U-curve" in explaining the movement of regional differences.



Continuous Tabel 1

Kuznets	Points out that in countries at an early stage of development there is economic growth and simultaneous growth of income inequality, and when the country reaches a higher level of development, income inequalities decrease.
Hirschman	Highlights two basic mechanisms through which polarization takes place: one is the displacement of companies in less developed areas due to competition of companies from more developed areas, and the other is the process of migration of more educated people to more developed areas resulting in long-term weakening human potential lagging behind.
Solow, Swan	Solow-Swan growth model. The neoclassical approach to growth emphasizes the role of supply of production factors in the growth process in the short and medium term, while in the long run, the growth rate is determined by technological progress.
Barro; Sala; Martin; Mankiw, Romer; Weil	Through empirical research they showed that the convergence hypothesis is justified if economies converge to the same stable state, i.e. that countries share similar structural features such as technology level, population growth rate, savings rate, education, etc. The neoclassical growth model does not make a special distinction between national and regional levels. This means that differences in regional growth rates can be explained in the same way as differences at the national level.
Romer; Lucas; Grossman; Helpman; Aghion; Howitt i dr.	Endogenous theories of growth. According to endogenous models, the source of growth is in the process of knowledge accumulation. The application of endogenous growth theory at the regional level is largely based on the importance of interactions between people for knowledge transfer. The potential usefulness of endogenous growth theory in explaining regional inequalities in growth rate lies in the hypothesis that knowledge transfer processes are geographically limited and cumulative.
Krugman; Fujite; Baldwin	New economic geography - a model in which the regional dimension is embedded from the very beginning. Models of the new economic geography offer explanations for the increase of regional inequalities as well as their reduction, since the final outcome depends on the strength of the so-called centripetal and centrifugal forces, i.e. forces that stimulate the process of concentration or the process of dispersion of economic activities in space.

Source: author

In the previous European Union strategic periods, horizontal policies dominated the policy process at the regional level. Resources were mostly allocated in a horizontal manner – in order to avoid any preferential interventions and to act on general framework conditions and generic factors (such as public research infrastructure) which are important for the whole system (Foray, 2016.). The horizontal policies were efficient for most developed regions but there were failures in the less developed countries and regions. According to Muscio, et. al.; Percoco, Foray most of the less developed regions and transition regions failed to improve the knowledge gap relative to the top regions (Muscio et.al, 2015; Percoco, 2013, Foray, 2016.). Because of that problem EU has decided to introduce a different type of regional policy which should be place-based and focus on the potential of each and specific region. This policy was named smart specialization.

Definition of smart specialization

Smart specialization is a concept of innovation policy which was developed in order to achieve strategic goals for the period 2014-2020 and it was described in one of flagship initiatives called Innovation Union (Nowakowska, 2010). Member states were obliged to elaborate their smart specialization strategies in order to be supported by Structural Funds (European Commission, 2012A). Therefore, the identification of smart specialization was considered as extremely important process as it decides which priorities will be supported by EU funds and in consequences determines the directions of regions' development.

Solving local and regional problems by using local/regional uniqueness and comparative advantages is supported in both scientific and practical spheres. The idea of smart specialization involves building capacities to particularize specific region by stimulating research activities related to existing economic structures and to reinforce the transformation of those structures. In particular,



the application of smart specialization is crucial for the regions which are not leaders in any of the major scientific or technological domains. (Iacobucci; 2012.)

Smart specialization should be identified in bottom-up process called as entrepreneurial discovery, which means engaging stakeholders not only from governmental sector but also participants representing research centers, society and enterprises (Foray, 2015). It is fundamentally based on a process of entrepreneurial discovery — an ‘entrepreneurial selection’ of market opportunities or a ‘self-discovery process’ (Hausmann, Rodrik, 2013). The objective is not about telling the innovation system actors what the right specializations are but accompanying emerging trends and improving coordination by providing the necessary public goods and creating additional incentives at critical bottlenecks to help the new activity to grow (Foray, 2011; Paliokaite et al., 2015).

The idea of smart specialization is based on the notion that countries, regions or the cities cannot achieve everything in science technology and innovation (Jucevičius, Galbugoiene, 2014). If so, there is no other alternative than to try making a thoughtful prioritization of strategic goals and concentrating resources in certain domains of expertise (McCann, Ortega-Argiles, 2011). Smart specialization could be defined as the prioritization done at regional level in a small group of sectors/technologies potentially competitive in international markets and generators of new activities with competitive advantage over other locations (Foray et al. 2009., McCann et al., 2011). From above mentioned definitions it can be concluded that there are four main dimensions of smart specialization: innovation, smart, specialization, R&TD. Innovation and R&TD, as was described above are the main pillar for the competitiveness and development of regions and nations as well. Specialization basically means that no country or region can succeed in every field so it should engage resources in the sectors in which they have comparative advantages. Smart specialization combines knowledge and innovation with specific strengths of the national or regional economy; also it generates unique assets and capabilities based on the region's distinctive industry structures and knowledge bases. The synthesis and integration of fragmented knowledge and capabilities should help to create a vision for opportunities in existing or new sectors (Jucevičius, Galbugoiene, 2014). In the 2021-2027 programming period there is an enhanced focus upon the development of human capital as part of the Smart Specialization process under the ERDF specific objective “Skills for smart specialization, industrial transition and entrepreneurship” (Woolford, Boden, 2021).

The underlying rationale for smart specialization is that by concentrating resources in research and innovation and linking them to a limited number of priority economic areas, countries can become and remain competitive in the global economy.

Process of implementation smart specialization

The Smart Specialization Platform (S3) defines smart specialization strategies as regional research and innovation strategies that are integrated, place-based economic transformation agendas that do five important issues: (S3 Platform)

- They focus policy support and investments on key national/regional priorities, challenges and needs for knowledge-based development.
- They build on each region’s strengths, competitive advantages and potential for excellence.
- They support technological as well as practice-based innovation and aim to stimulate private sector investment.
- They get stakeholders fully involved and encourage innovation and experimentation.
- They are evidence-based and include sound monitoring and evaluation systems.

There are four rules that are important for the development and implementation of smart specialization. Next figure (Fig. 1) shows 4Cs rules of smart specialization.



Collaborative Leadership	(Tough) Choices and Critical mass	Competitive Advantage	Connectivity and Clusters
<ul style="list-style-type: none"> engagement of different stakeholders in the process of smart specialization (public-private partnership) 	<ul style="list-style-type: none"> identification of a limited number of potentials and development areas on the basis of existing assets and strenghts 	<ul style="list-style-type: none"> concentration of R+D+I spendings on limited priorities in order to obtain competitive advantage 	<ul style="list-style-type: none"> development of existing clusters and finding the links cross-sector through technological diversification

Fig. 1. The four Cs rules of smart specialization

Source: Gulc, A. (2015). *Analysis of methodological approach to identify smart specialization on the example of Polish regions. The 20th International Scientific Conference on Economics and Management*

The interpretation and adoption of the concept of smart specialization into local context need time and effort. There are four main participatory methodologies of decision making based on forward looking activities that should be taken into account (Paliokaite et al., 2015):

- Smart specialization needs to be communicated, understood and acknowledged. Considerable time should be allowed for discussions between the different groups of stakeholders in order for the entrepreneurial discoveries to emerge.
- Governance of S3 has to ensure participation and ownership. The foresight process and implementation of its results have to get stakeholders of different types and levels fully involved. The most important types of organizations that need to be involved in the S3 process are public authorities; universities and other knowledge-based institutions; investors and enterprises; civil society actors; and international experts who can offer benchmarking and peer review services.
- Holistic view to innovation means that several policy areas are concerned with the S3, beyond the traditional science and technology and economy ministries and agencies.
- S3 process has to encourage innovation and experimentation, so it has to include creative thinking outside the list of fields that are ‘usual suspects’ for R&I support. The analysis of future trends in the priority areas, discussions with experts in future technologies and future markets, and implementing elements of participatory foresight should allow for thinking ‘outside the box’ and capturing the changes in the external environment as well as the national economy and science scene.

According to the research of Kaivo-oja et al. if (1) there is not much innovation and R&D activity, if (2) there are not much competitive advantages in local economies, and if (3) spatial development is not effective and economy is not delivering economic growth, welfare, and happiness, the development process is not fully based on smart specialization strategy (Kaivo-oja et al., 2017).

According to the results of the analysis of Cataldo et al., it can be said that, in the way it has been applied, S3 is not yet smart enough. Most S3 strategies include far too many axes of intervention and the norm is that there is limited coincidence with the strengths and specialization of the territories for which the strategies were developed (Cataldo et al., 2022).

It can be concluded that the process of implementation smart specialization is demanding and requires time and effective governance

Conclusions

The concept of smart specialization will probably be the subject of various research for in the future because it is a highly contested concept. Even its architects (Foray) concede that it is a



perfect example of “policy running ahead of theory”. Smart specialization was developed as a concept from the idea that regions across the EU have different economic and institutional structures that shape possibilities for their development.

For the implementation of smart specialization business sector and educational and research institutions must interconnect and develop educational programs that can follow the direction of economic development. The economy must constantly invest in knowledge and research and development in order to remain competitive and to maintain comparative advantages. Smart specialization should enable long-term development based on a strategic approach that requires, among other things, the interaction of various stakeholders in the economy and society. In this way, it contributes to long-term, sustainable, smart and inclusive development.

The process of implementation smart specialization is demanding and requires time and effective governance. It can be effective if regions develop unique strategies. There are still no evidence of the significant success of these policies, but considering the overall events on the global scene in recent years, further development and stability of the economy is needed in order to see the real effects of smart specialization policy.

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