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The Spatial Transformation of the Urban Environment in the Conditions of Post Industrial Development of Society: Dedicated to the 100th Anniversary of Jean Gottmann, Immanuel Kant Baltic Federal University, 23-26 August 2015, Russia.

Instruments of Innovation Security

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ABSTRACT

Current article sets out a scientific debate on the phenomenon of innovation security (IS) and regional IS in particular. Authors suggest that IS should be considered as an independent type of regional security, along with economic, environmental, political, etc. security types. It is assumed that IS is one of the key imperatives of regional development along with the sustainability, competitiveness, and innovativeness. Article rests upon the analysis of the mechanisms and tools within the innovation policies of the highly innovative countries of the Baltic region - Denmark, Finland, Germany, Norway, and Sweden, which demonstrate an “unintended” application experience of the regional IS provision. The study underlines the most influential factors affecting the institutional framework of an IS establishment process. Paper concludes with a set of policy recommendations on regional IS in the context of contemporary socio-economic trends.

Keywords: Innovation Security, Innovation Policy, Innovation Potential, Region, Baltic Region, BSR, Germany, Nordic Countries, Russia, International Cooperation

JEL Classifications: D83, D85, F52, O33

1. INTRODUCTION

Reorganization of the modern world space architecture occurs under the conditions of contemporaneous intensification of international socio-economic, geopolitical, cultural, historical, scientific, technological, military-industrial, and other types of networking between some countries and a full or partial exclusion of the other states from these links. An expression of this structural imbalance is the formation of the nodes (i.e., cores, poles) and peripheral areas of different scale being characterized by varying degrees of integration depth, breadth and frequency of functions and processes (Klemeshev, 2005). Qualitative unevenness of the world system is a consequence of the trinity of interrelated effects of “globalization - regionalization – polarization” (Fedorov and Korneevets, 2010; Klemeshev, 2004) that is primarily manifested in the strong differentiation of areas in terms of socio-economic development as a result of rivalry for resources. In this regard, countries intensify the desire to ensure long-term competitiveness via building up strategic competitive advantage that cannot be fully or partially reproduced anywhere else, which would involve their

localization in certain geographically and institutionally defined borders (Porter, 2005; Samson, 2000). In the foreground comes the competitiveness of a particular region, being determined by the efficiency of the functioning of its institutions (Shastitko, 2009; Danilov, 2006).

Regional development becomes an objective requirement of achieving national competitive advantage, while decentralization and empowerment of regional authorities is a necessary condition for such development. The region is increasingly being transformed from a passive object for implementation of state policy, and masters the role of an independent and direct participant in the political and economic processes, including those of an international character, realizing the need to protect the vital interests of the national and regional levels (Mikhaylova, 2014). In this context, the relevance of issues related to the formation of a comprehensive regional security system and determination of a place and role of a particular region is increasing tremendously. Of particular importance is an innovation security (IS) as an integral characteristic of regional security, affecting the whole complex

of relations and sub-systems of a regional system, being directly related to ensuring the competitiveness of the region.

2. IS - PURPOSE AND A NECESSARY CONDITION FOR ECONOMIC DEVELOPMENT IN A GLOBALIZING WORLD

The first publications in the field of IS have appeared at the turn of the 2000s (Tatarkin et al., 2000; Naboichenko et al., 2003; Sapir, 2007). However, a focused interest in the problem of IS and the security of innovations in Russian science and practice has evolved in recent years due to the increasing influence of the complex of unfavourable foreign political and economic factors on the national economy. Common to articles on the subject (e.g., Kuklin et al., 2013; Bagaryakov, 2012; Bagaryakov and Nikulina, 2012; Afonsova and Bogomolov, 2013; Golova, 2014; Sukhovey, 2014; Burmistrova, 2011; Kulagina, 2012; Barchuk and Maslennikova, 2013; Kormishkin and Sycheva, 2013) is the understanding of IS as a subsystem of the socio-economic, and, above all, the economic security. Based on the classification of Burmistrova (2011), which is developed taking into account the above-mentioned approach, four levels of presentation of the IS of a region given by Russian scientists can be highlighted. These levels vary in breadth of affected areas. First level - the technological and/or scientific and technical security; second level - the security in the sphere of innovation, which is the basis of economic security of the region; third level - the security of the region in the scientific, technical, industrial and innovative sectors of the economy; fourth level - the socio-economic security of the region, defined by the development of scientific, technical, industrial and innovation sectors.

In our opinion, the economic component in the structure of the IS, undoubtedly, plays a significant role, due to the very nature of innovation as commercialized novations. However, such an approach is rather narrow and does not enable to fully take into account all the factors that influence the process of ensuring IS. Therefore, along with the economic and social components, it is offered to further highlight scientific and technological, political, legal, environmental, and geographical components of an IS of a region. In this regard, the IS ceases to be solely a subsystem of the economic or socio-economic security, and appears as a separate type of regional security.

It is noteworthy, that all of the principal approaches used in determining the security as the basic category (Mikhaylova, 2015b) are applicable to the IS. This enables to consider IS as a system, which is both a reflection of the regional system, its characteristics and conditions (i.e., environment) in which it operates. However, according to the results of the authors' conceptual and terminological analysis, researchers tend to focus their attention on just one aspect of the above, that is either: The state of security of the regional economy (Burmistrova, 2011; Afonsova and Bogomolov, 2013), the nature of innovation processes in the region (Golova, 2014), the set of conditions and factors of scientific, technical and innovative development of the region (Bagaryakov et al., 2014; Kuklin et al., 2013; Oleynikova,





2004), or the ability of the state to provide a certain level of innovative development (Sukhovey, 2014).

The formation and implementation of policy in the field of IS covers different hierarchical levels: Federal, regional, municipal, and in the case of countries belonging to the strong integration associations, such as the European Union, the supranational level as well. The role of the region in the context of IS depends on the implementation of measures for its provision and can be reduced to two basic conditions. Passive - the region acts as an area and/or an object of the national innovation policy implementation of the federal government. Active - the region itself is the subject of IS manifested in protecting regional interests by undertaking independent or participating in the formation of federal innovation policy, as well as acting as a source of threats to IS for other regions or the country as a whole.

Based on regional economic development studies, such as (Mingaleva and Gershanok, 2012; Perfilov, 2012; Nikonova, 2014; Uskova, 2009; Mahanko, 2015; Samoilov et al., 2014) to name just a few, a justified inference would be on the appurtenance of IS to regional development as one of its key imperatives, along with the sustainability, competitiveness and innovativeness, which are being subject to mutual influence that can be represented as a matrix of causation (Figure 1).

In a globalized world, where access to traditional factors of production is no longer a unique competitive advantage, the basis for long-term sustainable economic development is the choice of so-called "high-road knowledge-based policies" (Malecki, 2004. p. 1103), implying that competitiveness is ensured by the efficient use of specific resources of immaterial nature, such as innovation, knowledge and competence. Their accumulation in the region is linked to the building-up of "territorial capital" (Camagni, 2008; Torre and Wallet, 2014), the value of which is determined by the density of regional cooperation networks (i.e. relational capital), the development of a collective learning process, the formation of regional identity and a number of other factors. The accumulated relational capital enables to maintain relationships (i.e., linkages) based on trust and a sense of belonging to a single regional community, which greatly facilitates the transfer of new knowledge and information between the participants of the regional market, and ultimately helps to reduce costs and intensify innovation, providing economic advantages to business entities localized in the region (Wolfe, 2002; Camagni, 1991). Active social communications, woven into the institutional framework is the necessary foundation to achieve synergies and mutual learning of actors in the "region-region" and "region-outside world" systems (Storper, 1997; Chistyakov, 2011), which in turn play a key role in shaping the regional innovation environment (i.e., the "industrial atmosphere" of Marshall, 1920; or the interaction of "a community of people and a population of firms," as stated by Becattini, 1990. p. 38). Learning and "learnability" reflects the strength and dynamics of cooperation ties between the various participants in the innovation process (e.g., companies, research and educational institutions, government authorities and their subordinate agencies, non-profit organizations, etc.), their ability

Figure 1: The system of regional development imperatives. RS: Regional system

	Sustainability	Competitiveness	Innovation	Innovation security
Sustainability		Condition of maintaining competitiveness of the region at the level achieved for a certain period	Status of the RS achieved by a balance between positive and negative effects of different types of innovation	Condition of preservation / maintenance of RS's security, the ability to withstand external and internal threats
Competitiveness	Basis of sustainable development that characterizes the performance of the RS. There is a direct relationship: the loss of competitiveness entails reduced sustainability		Strategic goal of the formation and development of RS; positive outcome of competition of the region in the international markets of new technologies and innovations	Factor / condition for ensuring security of the region
Innovation	Depending on the nature of the effect it may act as condition / mean of achieving sustainability or as destructive factor leading to instability of the RS	Instrument providing competitiveness underlying the model of intensive development of the RS by increasing its efficiency in the process of restructuring		May act as an instrument for ensuring or threatening the security of the region depending on the nature of the effect
Innovation security	Criterion / attribute / condition / element / basis of the RS sustainability	State of RS prerequisite for which is to maintain competitiveness	Strategic goal of innovative development. Determined by the degree innovative independence of the region.	

to adapt to ever-changing conditions of the context and to react promptly to emerging challenges and threats, i.e., maintain the IS (Camagni, 1991; Cooke, 1998; Morgan and Nauwelaers, 1998).

Ensuring IS of the region is realized through innovation policies - a complex representation of the state policy in the sphere of science, education, entrepreneurship and regional development. The formation and implementation of innovation policy affects several hierarchical levels: Supranational, national, regional and municipal. Despite the fact that the main role in the development of the strategic guidelines of innovation policy is owned by institutions at the national level, which shall elaborate policies and programs of innovation development (national, sectoral, cross-sectoral) as well as form the legal framework, the involvement of regional institutions is actively expanding.

The implementation of the priority directions of innovation policy at all hierarchical levels is achieved by using a variety of mechanisms and tools that differ in nature, extent and direction of influence. On the basis analyzing the factors, conditions and prerequisites that contribute to the formation and development of the innovation system in the region (Mikhaylova and Mikhaylov, 2015; Mikhaylova, 2015c), the following five main areas of such influence are defined: Personnel, infrastructure, research, innovation environment, economic framework conditions. Below are the main vital interests and threats the region is facing in the

process of building an institutional framework of IS in light of the allocated influence areas.

1. Personnel (HR) Component

Vital interests: Accumulation and maintenance of a critical mass of labor force of certain specializations, relevant to the structural features of the regional economy and the strategic priorities of its development; inflow and accumulation of highly skilled professionals in the region in accordance with the innovative profile of the regional economy; strong performance in migration and social mobility of labor force; preservation and improvement of the general level of education of the population; support a high level of interest among regional specialists to continuous professional development, expansion of competencies and deepening of specialization; ensure well-functioning education system, capable of providing high quality education and meet international standards for the training of specialists and personnel in a timely manner as to meet the HR needs of the region; preservation of regional identity and cultural values on the background of the maintenance of cultural diversity. Security threats: Inflow of low-skilled labor in the amount significantly exceeding the needs of the regional economy; inflow of labor force, whose competence, education, specialization does not correspond to the specialization and the innovative profile of the regional economy; systematic exodus of young qualified specialists to other regions; low

level of education in the region, inaccessibility of educational services; inefficient system of education and training for the regional HR; low innovation culture; closed society, the lack of commitment to cooperation and exchange of experiences and knowledge; cultural and ideological disunity, differences in mentality, traditions, leading to the destabilization of the social situation in the region.

2. Infrastructure component (including science parks, technology parks, business incubators, venture capital and seed funds, innovation and technology centers, certification and patent offices, centers of expertise of innovative projects, educational and business centers, centers of excellence, engineering centers, technology transfer centers, centers of cluster development, testing laboratories, data centers, etc.)

Vital interests: Creation of regional innovation infrastructure of world-class level as to form cutting-edge centers of excellence; integration of regional innovation infrastructure in the global innovation space; ensure developed entrepreneurial and business services sector, focused on the needs of actors involved in innovation activities; ensure high diversity of organizations promoting innovation and maintaining the internationalization of innovative companies of the region.

Security threats: Weak development of innovation infrastructure and/or its mismatch with the needs of innovative companies located in the region; infrastructural isolation/restricted access of regional actors in the global innovation infrastructure; high dependence of innovation activities in the region on the innovation infrastructure facilities located in other regions or abroad; undeveloped sector of specialized business services in the region and/or a high proportion of it being delivered by foreign organizations.

3. Research component

Vital interests: Strong scientific and educational foundation, formed by a recognized competence center undertaking scientific work on a set of particular research areas; combination of basic and applied science, the development of multi-disciplinary research aimed at obtaining new knowledge, including inventions, advanced technology, know-how, industrial designs, etc.; generally high level expenditure on R and D (research and development) (approx. 3% of GRP) with significant investments of the business sector (50% and above); high level of commercialization of R and D results obtained by research organizations and universities located in the region; advanced international cooperation in science and technology (joint research projects, participation in international forums, conferences, etc.).

Security threats: Lack of research expertise in the region being able to act as a basis for the formation of a world-class center of competence; insufficient level of research funding; bureaucratic, chaotic, overcomplicated and latent process of R and D funding; absence or low interest of business in regional R and D; informational isolation or violation of the circulation of new knowledge between research organizations in the region and the external environment; absence or inefficient system of facilitating the commercialization of innovations being the result of research and development of universities; absence or inefficient system of intellectual property protection.

4. Innovation environment (milieu)

Vital interests: Formed common vision, objectives, values of innovation development being shared by all the actors and set out in the regional development strategy; tight formal and informal links between business, research organizations, government and other stakeholders, leading to an increase in innovative activity; active development of small and medium-sized enterprises, accompanied by a growth in the number of new companies; formation of the “spirit of entrepreneurship” and the “innovation atmosphere;” active introduction of innovations in all spheres of social life (e.g., health, education, housing, social security, etc.); support for competitive environment and organizational diversity in the region; clustering of economic activities, the creation of strong regional clusters; continuous improvement of the institutional framework for conducting innovative activity in accordance with the needs of regional actors.

Security threats: Absence or low efficiency of the mechanisms of interaction between representatives of the ‘triple helix’ system in the region; strong imbalance in the interests of different groups of actors, not allowing to form an overall strategy of innovative development of the region; exclusion or strong restriction of powers of regional authorities in the formulation and implementation of innovation policy; inefficiency of the regional innovation policy; absence of a critical mass of companies in the region for the formation of competitive clusters (i.e. the problem of “low institutional density”); strong dependence of the regional companies on foreign technology against the backdrop of a weak interest in R and D being produced in the region; low level of investment in R and D and widespread use of outdated, environmentally dangerous technologies by regional companies; insufficient level of informatisation of the regional economy; problem of “technological lock-in.”

5. Economic framework conditions

Vital interests: High level and quality of life; stable political and economic situation; favourable ecological environment, maintaining the balance in nature - society - industry trinity; confidence and trust in regional authorities; diversification of the regional economy, development of inter-sectoral and inter-organizational linkages; favorable investment climate and business environment.

Security threats: Industrial fixation/mono specialization/absence of inter-sectoral linkages; high dependence of the regional economy on the narrow range of trading partners; stagnation in the traditional sectors of the economy, the low proportion of services in GRP; political and economic instability; lack of trust in authorities; low level and quality of life; bureaucratized procedure for opening and maintaining business activities; heavy tax burden on business; weak development of production infrastructure in the region.

3. THE EXPERIENCE OF THE BALTIC REGION IN PROVIDING IS

Maintenance of vital interests in the field of IS is associated with the need to solve a whole complex of problems of both national

and regional scale. On the one hand, it indicates a considerable degree of specificity of innovation policies implemented in each region, and on the other, enables to select a set of basic tools of influence used in overcoming similar regional problems. A possibility of classifying the tools on providing IS in light of individual problem areas makes it advisable to study the experience of various regions and countries with a view to its subsequent transfer and adaptation in the 'home' region. In this regard, of considerable interest are such countries of the Baltic region as Denmark, Finland, Germany, Norway, and Sweden, which for a long period demonstrate sustainable economic development based on innovation. The results of a number of studies evaluating the innovation potential (e.g., Mikhailova, 2013; Klemeshev, 2011; Klemeshev and Fedorov, 2013; Fedorov et al., 2012), as well as the analysis of thematic international ratings (Schwab and Sala-i-Martin, 2014; Global Innovation Index, 2014; KEI and KI Indexes, 2012; Innovation Union Scoreboard, 2014) demonstrate a consistently high position of these countries in the context of the macro-region, the European Union, and worldwide, being sufficient evidence on the effectiveness of ongoing approaches towards innovation policy development.

Note that the policy in the sphere of innovation as such emerged in the developments of the governments of Denmark, Finland, Germany, Norway, and Sweden since the end of the 1990s. However, this was preceded by a long process of registration of its foundations as a result of weaving industrial, scientific, educational, technological and regional policies being implemented under the active deployment of globalization. Throughout the twentieth century the ever-increasing need in maintaining competitiveness and ensuring national security against a background of limited resources and a small domestic markets of these countries (to a lesser extend for Germany) has led to the need for a gradual restructuring of their economies (Mikhaylova, 2015a).

In the process of innovation systems' development in these countries, a whole range of issues was and is being solved at the national and regional levels. These issues are associated with increasing the efficiency and transparency of the functioning of key institutions and the formation of the legal basis of their activities, with building up human capital, increasing the share of private investment in innovative sectors of the economy, expansion of the number of innovation market participants as well as changing their qualitative composition in the direction of increasing the share of small and medium-sized enterprises, increasing the return on public investment in R and D, etc. The overall objective for the activities carried out within each of the mentioned problems, is to increase productivity, ensure high standards of living and overcoming imbalances in territorial development, which is directly reflected in the long-term strategy of innovative development of each country: Sweden ("The road to a world-class innovation climate in 2020"), Denmark ("Denmark 2020. Knowledge - growth - prosperity - welfare"), Finland ("Finland's National Innovation Strategy"), Norway ("Innovative and Sustainable Norway") and Germany ("High-Tech Strategy 2020 for Germany").

The detailed analysis of the formation of innovative policies of developed countries of the Baltic region (the results presented in

Mikhaylova, 2015a) enabled to identify a number of commonly used tools and classify them according to five areas of influence on the system of IS of the region given earlier (Table 1). Among the most common tools are: Fiscal incentives, government purchases, loans and loan guarantees, subsidies, venture capital, grants, budget allocations and investments, public services, public awards, public-private partnerships, etc.

A consequence of the growing urgency of the problem in ensuring regional IS is an increased attention of public authorities in Germany and the Nordic countries to the issues of equalization of socio-economic development of territories by improving the well-being of peripheral border areas. The main focus of the undertaken regional policy in the last decade, has shifted to improving the competitiveness of the economies of individual regions through the use of the positive effects of internationalization through the mechanism of cluster-network partnerships. The interest in such cooperation among the countries of the Baltic region at the turn of the XX and XI century led to the emergence of various sustainable forms of interactions (e.g., international clusters, networks of international production, innovation and research networks, Euroregions, transnational and cross-border transport regions, multinational energy systems; Klemeshev and Fedorov, 2015), including specific ones (e.g., large regions, growth triangles, arcs, tripolar territorial system; Fedorov, 2013; Klemeshev et al., 2011).

As one of the widely used tools of innovation policy, aimed at promoting the internationalization of the regional business and increase of its competitiveness in the international arena, we should note a variety of national and regional cluster programs aimed at strengthening regional smart specialization and the formation of cross-border and transnational clusters. According to current estimates, the Baltic region accommodates 28 international clusters being the result of these program activities. Of which the actors form Denmark and Sweden are involved in 19, Germany - 10, Norway and Finland - 6 clusters (Mikhailov, 2013). Furthermore, Mikhaylov (2013) reflects on a significant number of cluster initiatives being implemented in the Baltic region.

In addition to programs on promotion of clustering and the formation of a world-class centers of excellence, the developed countries of the Baltic region have programs for the internationalization of start-ups and business training programs aimed at reducing the risks of access to international markets for the regional companies. As an example, below are some recent initiatives undertaken in Norway: "Technology incubator" and "Innovation House" to establish a remote business incubators in Singapore and Silicon Valley; "Entrepreneurial Marketing," offering learning opportunities for Norwegian businessmen in New York; "Business - camp," aimed at developing a mentoring mechanism of international experts over the Norwegian start-ups.

In the context of IS, the role of a region in Denmark, Finland, Germany, Norway, and Sweden has significantly expanded in the development and implementation of innovation policy according to its vital interests. Many of the regions have developed their own long-term and/or medium-term strategies for socio-economic and innovation development (Mikhaylova, 2015a). However,

Table 1: Sample of the tools providing innovation security in highly innovative countries of the Baltic region

Purpose of influence	Policy instruments/example of a country
Personnel (HR) component	
Increase in the proportion of people with higher education, the formation of a pool of qualified professionals Upgrading the scientific staff, the prevention of “brain drain”	Student loans (DK, DE), scholarships for gifted young people; increased student scholarships (DK, DE) Grants to young scientists on research projects; funding for postgraduates (DK, DE)
Public recognition, raising the prestige of scientific activity Attracting highly qualified specialists and scientists in the country	Awards, prizes (DE, NO, SE) Tax relief for individuals (personal income tax for foreign experts and scholars; tax and social security deductions from wages) (DK, FI, SE)
Infrastructure component	
Promoting the commercialization of innovation, technology transfer and innovation	Investments in innovation infrastructure (DK, DE, NO, SE, FI)
Providing access to the participants of the innovation process to information on a wide range of issues	Consulting services (in the field of patents, commercialization of innovations, access to international markets, etc.) (SE, DE, NO)
Facilitating access of innovative companies to the country’s advanced knowledge and the most important markets in specific thematic areas	Promoting the internationalization of start-ups (SE, DE, NO)
Raising awareness of entrepreneurs in the field of conducting innovative and international activities	Training programs for SMEs (NO)
Research component	
Assistance in the commercialization of R and D results of universities, support for promising student project initiatives, support for innovative companies at different stages of their development Getting new knowledge of the fundamental and applied character, including new technologies, patents, know-how, etc.	Direct equity investment, co-financing by the state of private investments, long-term investment loans for start-ups, spin-offs, student start-ups, innovative SMEs (DK, DE, NO, SE, FI) Grants for basic and applied research (individual/collective, targeted/initiatives) as part of programs with open and closed-themed (DK, DE, NO, SE, FI)
Support for the most important institutions in the field of education and science Targeting to obtain breakthrough scientific results of world significance; development of competencies in a particular area	Direct government funding (DK, DE, NO, SE, FI)
Protection of the results of national R and D	Co-financing of parastatal research structures (e.g. centers of excellence, centers of research innovations, competence centers, living laboratories, etc.) (DK, DE, NO, SE, FI) Co-financing the costs of patenting (DE)
Innovation environment (milieu)	
Increase in the total expenditure on R and D, promotion of innovation companies	Tax incentives for companies (profit tax for companies conducting R and D expenditures) (DK, DE, FI); tax credit (for SMEs and large enterprises engaged in R and D expenditures; for the business angels paying tax on capital gains) (DE, NO, FI) Accelerated depreciation (DK, FI, SE)
Support for accelerated renewal of fixed assets, introduction of new technologies, modernization of production	
Fostering business in acquisition of R and D and services produced in the country	“Goodwill agreement” (benefits for the acquisition of exploration) (NO)
Fostering innovative activities, including SMEs; introduction of significant innovations for citizens in order to improve the quality of life (i.e., social, environmental, public sector innovation)	Simplification of the procedure of public procurement, the expansion of opportunities for participation of SMEs, the reorientation on the purchase of innovative goods and services (DK, DE, NO, SE, FI)
Support for innovative SMEs, stimulating the creation of new companies, the increase in employment	Preferential loan for SMEs with the % below the market rate; credit guarantees for SMEs on unsecured loans; innovation vouchers (i.e. small lines of credit to finance expenditures of SMEs on R and D) (DK, DE, SE)
Establishing dialogue between academia, business and government to increase the commercialization of innovations, involvement of SMEs in innovation	Co-financing of research projects involving the joint participation of the actors of the ‘triple helix’ (DK, DE, NO, SE, FI); Industrial PhD program; an increase in the number of places for trainees in enterprises; an increase of internships within educational programs (DK, DE)
Economic framework conditions	
Support for the development specific types of activities	Targeted subsidies (DK, FI)
Reduction of differentiation in the level of development of the regions, the establishment of growth nodes in the country, increasing the competitiveness of regional businesses	Programs for the creation and support of clusters and regional networks; financial support for certain regions; examination of regional development programs (DK, DE, NO, SE, FI)
Promotion of international business activity	State guarantees for national direct investments abroad against political risks; guarantees for unrelated financial loans (DE, DK) Organization of conferences, meetings, forums, etc.; funding the participation of scientists in international conferences (DK, DE, NO)
Development of the network partnership, encouraging the sharing of knowledge between stakeholders	Service on search of partners in other regions/countries (NO, FI)
Promotion of internationalization for national business; export promotion	Advertising services (NO)
Creating a recognizable national brand at the international level	

DK: Denmark, FI: Finland, DE: Germany, NO: Norway, SE: Sweden

despite the general trend towards decentralization, the degree of participation of the regions in the IS of each country differs and is largely defined by the peculiarities of the political system. In Germany, the federal lands have more authority than the regions of Denmark, Sweden, or Norway. The regions of Finland have the weakest involvement in the process of strategizing; consequently, the system of IS is to a greater extent formed at the national level.

4. CONCLUSION

The modern-day approach towards national competitiveness rests upon the strategic excellence achieved in certain activities, often generalized into smart specialization or cluster categories. These competitive advantages are secured by innovative, inalienable, somewhat unique competences of the regional communities of individuals, firms, and institutions that reflect a certain degree of cohesion. Thus, ensuring the well-thought-out national innovation policy is all about considering the heterogeneity of the national innovation and production system's elements - the regions, acknowledging the differences of their capabilities and roles (e.g., in generation and absorption of innovation - the "commercially ready knowledge;" Mikhaylova and Mikhaylov, 2016). The optimal configuration of the 'delegated duties' provides the IS at the national level. With that, IS of a particular region often remains neglected, left aside, in favor of nationwide interests. Blind adherence to the national innovation policy guidelines might increase the imparity of regions, often reflected in clear delimitation of the 'growth poles' and the periphery.

Empowerment of the regions on elaborating independent innovation policies can boost their development and ensure greater IS due to context specific measures of strategic and tactic nature. The interdependence of the regional sustainability, competitiveness, innovativeness, and IS as the key imperatives of regional development require direct involvement of the regional authorities and local communities.

The countries of the Baltic region are a good example of formation of an IS system with the participation of the regions. Despite the fact that each of the countries in this respect comes from its historical roots, political and legal regime of the structural features of the economy, they are united in an effort to ensure and strengthen the competitiveness of each of their regions, continuing a national strategic policy. At present, the countries under study are at different stages of establishing the IS systems in their regions. While Finland is still at the beginning of this way, the Germany is defined as an experienced player. However, as our research has shown, the countries adhering to innovative development have similar problems to be solved.

This made it impossible for us to develop a generalized system of interconnected criteria, objectives of influence and policy instruments of achieving the state of IS. Most of them (i.e., tools, instruments, measures, etc.) still belong to the national level of strategizing, but challenges of the time make it necessary to strengthen the identity of individual regions and their political will in matters of their own innovative development, in finding the best tools of it achievement. The first step in this regard is to

elaborate the innovation development strategies by each of the regions while defining the long-term goals, a common vision, and specific resources, which will be the basis of competitive advantages, as well as the complex of predictable threats.

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