

РЕГИОНАЛЬНОЕ ВОСПРОИЗВОДСТВО ИННОВАЦИЙ И РАЗВИТИЕ СЕТЕВОГО ПОДХОДА

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***Аннотация.** Глобализация экономики способствует ускорению инновационной деятельности, развитию межфирменной коллаборации и сетевых организационных структур, функциональной интеграции и сотрудничеству внутри фирм, а также с государственными и частными лабораториями, университетами, к изменению бизнес-моделей. В данной статье авторы исследуют теоретико-концептуальный базис региональной инновационной системы в условиях так называемой «глокализации» экономики. Представлена эволюция сетевого подхода в исследованиях зарубежных авторов. Предметом исследования является становление и развитие регионального подхода к исследованию инновационных процессов. В качестве методов научного познания послужили методы анализа, синтеза, сравнительного исследования, логического анализа, построения гипотез, индуктивного и дедуктивного анализа. Представлены причины, обусловившие переход от доминировавшей на протяжении многих лет в теории и практике инновационной деятельности концепции национальной инновационной системы к концепции инновационных систем регионов. Обоснован сетевой подход к построению инновационных*

систем регионов. Сформировано авторское видение предпосылок развития теории региональных инновационных систем, а также обоснованы преимущества рассмотрения и исследования инновационных процессов на региональном уровне.

Ключевые слова: *регион, инновация, инновационная система, сетевой подход.*

REGIONAL REPRODUCTION OF INNOVATIONS AND DEVELOPMENT OF NETWORK APPROACH

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Abstract. *Globalization of economics contributes to advancing innovative activity, developing inter-firm collaboration and network organizational structures, functional integration and cooperation inside firms, as well as with state and private laboratories, universities, to changing business models. In this article the authors research theoretical conceptual basis of regional innovative system under the conditions of the so-called “glocalization” of economics. The article presents evolution of network approach in the works of foreign authors. The subject of the research is the origin and development of regional approach to researching innovative processes. The functions of scientific cognition methods were performed by the methods of analysis, synthesis, comparative research, logical analysis, hypothesis generation, inductive and deductive analysis. The article reveals the causes of transition from the concept of national innovative system, which dominated for years in theory and practice of innovative activity, to the concept of regional innovative systems. It substantiates network approach to building regional innovative systems.*

The authors view on prerequisites of developing theory of regional innovative systems is formed, as well as advantages of considering and researching innovative processes at the regional level are substantiated.

Keywords: *region, innovation, innovational system, network approach.*

Introduction. According to a number of researchers^[1] the world economy is becoming global, and globalization of economics is understood as the economy which functions as a whole in real time and space independently of the fact if it is concerned with capital, management, labour, technology, information or markets. In modern research literature on globalization the term “glocalization” is more and more often used. According to its dictionary meaning, the adjective “glocal” and the noun “glocalization” are formed by “merging the concepts of global and local”.

In the early 1990s R. Robertson^[2], an English sociologist, defined this term as universalization of particularization and particularization of universalization. For Ritzer, globalization^[3] is globalization plus glocalization. Globalization means imperatives of growth inducing “organizations and nations to expand globally and prevail over local”.

In addition, under modern conditions the regional aspect is becoming the determinant one in innovative processes as well, which is supported by well-known research^[4,6]. Regionalization of innovative activity is closely connected with the process of globalization. K. Ohmae^[5] states that in the world, where borders are gradually and increasingly disappearing, the region is becoming a “natural” economic area. Consequently, the efficiency of the national innovative system functioning, its competitiveness depends significantly on dynamization of innovative processes at the level of particular regions. The given fact is supported by the practice of foreign countries development where the current intensive economic growth is mostly provided by effective regional systems in innovative sphere.

In this context the scientific world as well as the world politics increasingly demand theories of regional development. Among them the following theories are worth mentioning: neoclassical development theory, agglomeration theory, growth pole concept, M. Porter’s competitive advantage theory, regional clusters theory, regional innovative growth model, technical and economic paradigm concept, etc. Currently, the interest of the scientific world in this issue causes the emergence of new theories and concepts of regional development.

Modern approaches to defining the term “region”

The analysis of theoretical sources allowed us to point out a number of major approaches to defining the concept of the given definition in scientific literature. In the research the term “region” is considered in broad and narrow senses of the word. For example, in the broad sense region is defined as “a group of neighbouring countries representing a separate economic and geographical, or similar in national composition and culture, or having the same type of social and political structure territory of the world” ^[7].

W. Isard, a classic in American regional economy, characterizes region as an open economic unit within the borders of the given state ^[8].

I.M. Busygina considers region to be a whole system with its structure, functions, relations with the environment, history, culture, conditions of life for the population ^[9]. A.G. Granberg thinks that region is a territory that differs from other territories in a number of features and that has a certain wholeness and interconnectedness of its elements ^[10]. According to V.P. Samarina region is a social and economic system with the position of interaction and balanced development of its three main components: natural environment, society, economy ^[11].

The above mentioned definitions can be included in the framework of *system approach* to analyzing the definition under research. The given approach was also chosen by a number of other scholars, such as L.T. Shevchuk, B.B. Rodoman, V.S. Bilchak, V.F. Zakharov, etc. ^[12].

Territorial approach to studying region in combination with administrative approach is characteristic of research by F. Cooke, G.B. Gutman, V.I. Butov, V.G. Ignatov, V.I. Leksin, A.I. Shevtsov, L.I. Kogan, Yu.A. Korchagin, etc. For example, F. Cooke says, that region is a territory which is smaller than the territory of a sovereign state, which has clear administrative, cultural, political and economic authorities and unity that differs this region from state and other regions ^[13-16].

G.V. Gutman states that region is a territorial entity which has clearly defined administrative boundaries within the limits of which there is reproduction of social and economic processes that provide life activities of the population and that are conditioned by the place of the region in the system of social division of labor ^[14]. Yu.A. Korchagin writes that region is an economically single territory, that is territorial entities of the RF and large territories which are closely connected economically ^[15].

Under *territorial geographical approach* the concept “region” is interpreted by such researchers as B.A. Roysberg, L.Sh. Lozovsky, E.E. Starodubtseva, Yu.G.

Volkov, I.A. Arkhangelsky, etc. For example, Yu.G. Volkov defines the term as part of territory which has community of natural, economic, national, cultural and other conditions ^[16-18].

Definitions of region given by such authors as I.V. Arzhenovsky, I.A. Dobrynin, A.S. Marshallova, A.S. Novoselov, N.N. Nekrasov ^[19,20] and others can be united, in our opinion, under *reproduction approach*. For example, A.S. Marshallova and A.S. Novoselov interpret the term “region” quite clearly: “region is a subsystem of social and economic complex of the country, and at the same time is a relatively independent part of it which is characterized by the complete cycle of reproduction and characteristic forms of reproduction process stages, as well as specific features of social and economic processes” ^[21].

Under *social approach* there are interpretations of the definition under research given by the following authors: G.V. Cherkashin, Yu.M. Barbakov, S.I. Barzilov, A.G. Chernyshev, etc. ^[22]. In their article “Region as political space” S.I. Barzilov and A.G. Chernyshev define region as a sociological qualification of some administrative territorial unit, natural historical space within the framework of which there is social and economic activity of people living there ^[23].

There is also *complex approach*. For example, researchers V.V. Kistanov, N.V. Kopylov in their definition of the term “region” state that it is part of the country territory which is characteristic of community of natural, social, economic, national, cultural and other conditions, which is different in some functional features ^[24].

Some definitions emphasize geographical or cultural aspects of region. In this sense region doesn't require a particular size. It is a heterogeneous territory from the point of view of certain criteria: it may be different from neighbouring areas, it may be a certain unity or have some specific features of interaction; there may be some kind of internal unity. The type of definition influences greatly on weak and strong sides of particular aspects of regional competitiveness and, thus, makes it impossible to compare with them. In the cultural aspect the meaning of the term “region” is better defined with the help of the term “rootedness” which emphasizes consistency, interconnection and interdependency of the region.

It is mentioned absolutely correctly in the research conducted by UNIDO ^[25] that region is, in the long run, an intellectual construct. It exists only as an ideal object which people single out in the physical reality on the basis of particular criteria. According to UNIDO these criteria include the following:

- Fixed size;
- Intrinsic homogeneity;

- Features distinguishing it from neighbouring territories;
- Internal unity.

However, without detailed elaboration of these criteria it is problematic to identify the borders of regions. The name “region” can be given to an area at the subnational level as well as at the supranational level (for example, Asian-Pacific Region, Shanghai Cooperation Organization or Association of Southeast Asian Nations). At the subnational level a city or part of a city can be represented as a region, as well as a big part of a country which has administrative, natural geographic or cultural boundaries. In different research works of regional innovative systems particular countries, provinces, clusters of cities or particular cities, urban areas, etc. acted as regions ^[26,27].

In spite of the variety of approaches the dominating point of view is that *a region is a geographical entity that has the next level of decomposition after the national state.*

Changing role of a region under globalization of economy and developing network approach

An important point is considering the changing essence and content of the concept “region” under the conditions of globalization. According to a number of researchers ^[26] there is intensification of various relations on the global scale, and globalization means expanding, advancing and accelerating world-wide relations. Dutch researchers think that globalization is an abstract process of reducing the importance of geographical distances due to high intensity of economic, political, social and cultural interactions^[27]. Economic globalization is understood as a tendency to establish common investment environment and an integrity of national capital markets. Thus, it is a combination of processes of spatial merger of capital markets, goods, services and financial tools which are accelerated under the influence of competition at the innovation technologies level. According to A.I. Utkin^[28] globalization leads to decreasing barriers between various economies which contributes to trade interexchange.

Under globalization there is a growing importance of network as a form of representing complex systems. In such conditions it is increasingly important to interconnect the elements with the elements of other levels.

Recent research of innovative process emphasizes the importance of network in providing success for innovations, thus transforming the traditional model, which

characterizes innovations as a linear sequence originating from fundamental research by means of product design, manufacturing and marketing. Currently innovations are viewed as an interactive process which requires intensive movement of facts, ideas and data in the firm's internal and external environment.

Recently the concept of network has made a breakthrough in the theory of territorial economy after it began to be actively used in different forms and meanings in many disciplines.

The concept of innovative network has a wide character. This definition encompasses innovative networks promoted by large European programmes which connect firms and other establishments from different countries, sectors into competitive innovative environment that is used by small and medium-sized business to implement innovative projects.

If the purpose of cooperation is not connected with innovative activity, the mere fact of cooperation with other firms increases innovative opportunities. In its easy sense, network can mean a group of cooperating firms; the particular group can represent an innovative system, supply chain, cluster, or any other type of interfirm relations.

Networks can connect only a couple of firms, or they can be quite wide, including the whole industry. They can focus on one type of activity, for example, education or a particular engineering problem, or on activity within the framework of the whole value chain. The duration of network can be limited by lifecycle of one product or current ones, or by that of all projects. Network can be supported by formal relations or it can be not.

In our opinion it is Tijssen's ^[29] definition that reveals the most adequately the major features of network approach. In his view, a network is a developing system of mutual dependence based on resource interconnections where the system character of the latter is the result of interactions, processes, procedures and institutionalization. Creating, integrating, exchanging, transforming, incorporating and using resources within a wide range of formal and informal relations constitutes activity within the framework of such network.

It is evident that the nature of networks is quite diversified. Networks are so complex that theorists are not able to define an ideal network, although, as the experience shows, some functions can provide particular benefits. An ideal network is a network whose key actors are closely located; connections are long-term and stable, each connection is the key part of participants' business-strategy; there are close informal relations, the relations are running smoothly; all network members are equal,

and the number of actors is big enough to provide a rich source of knowledge, and at the same time it is small enough to be manageable.

Networks are considered as a new way of organizing economic activity, which gives an opportunity to neutralize the disadvantages existing in deeply integrated firms as well as the disadvantages which appear under direct market contacts. Networks enhance the advantages of specialization (through easy access to external sources of knowledge) without provoking price rise^[30]. Networking method of allocating resources gives an opportunity to conduct transactions through the network of individuals or institutions engaged in mutually beneficial and supportive activity, and not through odd exchanges and administrative orders^[31].

Advantages of innovative processes research at the level of regions

As it is well-known, innovative process can be considered within highly technological zone, industrial park, global value chain, region, cluster, community, etc. In this connection it is necessary to answer the question “What advantages exist in researching innovative processes at the regional level?” Let’s consider the following points.

1. As it has already been mentioned, first scientific works on innovative process concentrated on enterprise as a subject initiating it. Later, the accepted role of knowledge spillover contributed to changing the focus on the territorial aspect as the basis for innovative activity. It means, that there was a transition from enterprise to territory where the innovative process is taking place (new knowledge is produced and it is commercialized in innovation). According to M. Fischer^[32], territorial proximity between economic agents plays an important role for simplifying exchange of implicit knowledge, without which many radical innovations are impossible. Thus, an institutional context of innovative process appears, which gives an opportunity to localize it and to do comparative analysis of different territories.

2. Within the framework of region there appears an opportunity to conduct complex innovative policy, as it is region that is able to identify strategic priorities on behalf of the state, establish relations with other regions, which, basically, gives it an authority of political jurisdiction.

3. Region openness allows them to be flexible and to easily adapt to fluctuations of global innovative network. M. Kahler, D. Lake^[33] state that globalization, which is understood in the narrow sense as “economic integration into international system”, has caused problems connected with the necessity of taking decision-making into non-governmental sphere. Control changes its place.

Governments either delegate more responsibilities for decision-making to supranational establishments or transfer authority of decision-making to subnational political entities. Such type of analysis points at the fact that as a result of globalization national economic sovereignty is becoming weaker while local economies, those which K. Ohmae ^[34] calls “city states” are becoming the main actors in the global economy.

4. Changing forms of innovative process participants’ communication, increasing role of horizontal connections, interactive communications also causes to single out the regional level of innovative process.

5. The regional level provides the presence of a variety of producers offering specialized services timely and flexibly in reply to requests, emergence of local labour force funds with concentration of specific skills and education forms, cultural and institutional infrastructure, which constantly appears inside and outside industrial clusters and which is very important for effective work of a single local social and economic system.

6. Region is a place of economic interaction and innovative activity. Region has specific and inherent to particular region resources to stimulate innovative opportunities and competitiveness of enterprises. Porter stated that strong competitive advantages in the global economy are often linked to the place. Earlier research of regional innovative systems confirm that innovative activity of enterprises is based on localized resources (specialized labour market, labour force, suppliers, intellectual resources, traditions of entrepreneurial activity, clients, sponsors, etc.).

7. Innovations are phenomena that belong to the system of social relations. In the regional context there is a set of rules, norms, and regulations of firms behavior which are derivatives from economic and social and cultural factors. A set of informal relations on the particular territory defines the image, a sense of belonging to the structure, which increases innovative potential of the territory by means of synergetic exchange, information and knowledge exchange.

Region has additional nonmaterial assets (internal dynamics of regional social and cultural and political assets, informal knowledge spillover, etc.) which represent a specific form of capital that is derivative from social relations, norms and values within the framework of society. This capital helps to overcome difficulties on the market by supporting stable and mutually beneficial relations.

Advantages of regional innovative system concept

Modern state of research in the sphere of national innovative systems is characterized by the following aspects:

1. The main processes for research are innovations and education, and most importantly, transfer of knowledge between organizations.

2. Pride of place goes to systemic view on studying innovations, however, most part of foreign and national research refers to particular subsystems of national innovative systems.

3. Historical processes are included which depend on the previous development pathway.

4. The determining methods are interactive methods of interaction between organizations and institutes from the point of view of feedback.

5. The main elements of research are institutions in the sense of norms, habits, rules, conditions, methods and ways of their development.

6. The research aspect in the sphere of national innovative systems is directed at assessment developments, not at establishment of the formal theory by working out the conceptual structure of system innovations.

Globalization of the world economy has greatly influenced the concept of national innovative system. The main trends of impact by economic globalization processes at national innovative system function are as follows:

1. Importance of global scale technologies predetermining globalization processes on the world market of research and development activities.

2. Necessity of investment provision of many new technologies exceeding the options of separate industries, corporations and states, which creates the basis for developing innovative systems.

3. New approaches to organizing research and development activities, their significance and impact on social life, which contribute to eliminating barriers between fundamental and applied research.

4. Specialization of national innovative systems in particular aspects of research and engineering progress by pointing out crucial technologies meeting the requests of national security and having national competitive advantages.

5. Changing research and engineering approach to management for innovative approach which leads to a higher level of integrating research and engineering, economic, industrial and educational policies.

The idea of territorial boundaries of innovative processes was further detailed by F. Cooke and other researchers, who claimed that there are subnational (regional

innovative system), sector, technological and metropolitan levels of innovative activity.

The concept of regional innovative systems has become attractive for researchers since the 1990s. This approach seems promising from the point of view of creating the base for enhancing the ideas about innovative processes in regional economy. The popularity of this conception was also substantiated by appearance of production clusters as well as increasing activity of regional innovative policy where region was considered the principle unit for strengthening innovative economy or economy based on knowledge and technology^[35].

This conception appeared at the time when politics orientated on system support of localized development of knowledge in order to support competitiveness of particular regions. Concentrating effort on increasing potential and productivity of local enterprises and on advancing business environment substantiates the promotion of policy measures aimed at developing regional systems. It seems important from the point of view of interaction between innovative processes participants. That is, political strategies can contribute to developing innovative systems as well as to increasing local competitiveness.

The main factors of forming regional innovative systems conception include:

- 1) increasing significance of regions as the basis for global economic competitiveness of companies;
- 2) focusing on significance of norms, procedures and conditions identifying the work of infrastructure providing regional economic competitiveness;
- 3) recognizing informal relations between firms along with formal organizations as mechanisms of maintaining trustworthy relationships between firms;
- 4) re-evaluating factors of geographical proximity or agglomeration for assisting exchange of implicit knowledge and other externalities;
- 5) recognizing the importance of ability to institutional and organizational learning for developing regional economy;
- 6) developing small innovative business and recognizing its role in building the economy of knowledge;
- 7) acquiring new interactive nature of innovative processes.

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