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The Role of the University and the Innovative Research-educational Cluster in the Formation and Development of Innovative National System

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Abstract. When developing the national innovative system, the integration of high school science into national innovative system is always an important issue. According to the Author, one of the most effective methods for this mechanism is Innovation Research-Educational Cluster.

Keywords: Innovation Research-Educational Cluster; national innovative system.

At the present time the Russian economy is to be given the task of modernization of production, improve the national system of innovation, improving its performance to the world level. In the frames of international division of labor there is a global trend of increasing competition between different models of economic development and position of a state on the international arena is becoming increasingly dependent on its overall competitiveness, which is held in conditions depend on the structure and efficiency of its innovation system.

Speaking about the innovation of the national system, it should be noted that the development of this sphere is impossible without an efficient and practical use of innovation and scientific and intellectual potential to the increment of the social product and the creation of conditions for the development of the state and its citizens. It is widely believed that the main structural elements of the national innovation system include: government, business and educational institutions as creators of human intellectual capital. Economic growth in the national innovation system is achieved through investment in research and development (R & D) to improve innovation and education and training of the economically active population.

Economy and development trends of the high – economically developed countries suggest that science and innovation – a vital part of economic development, without which it is impossible to raise the country's competitiveness in world markets. To maintain that it is necessary that science and innovation activities are carried out consistently and on an ongoing basis. However, technical and technological re-equipment of most sectors of the Russian economy is carried out very slowly.

Considering the innovative economy as a knowledge economy, we note that for this type of economy expenditures on human capital and social infrastructure raise. The result

of fact that intelligence and information (as a derivative of intelligence) are factors of production of the knowledge-based economy is the process of stimulating the growth of investment in human capital. If you violate the mechanism of production and development of human capital in the innovation economy you have some type of demotivation of economic agents, which hinders the further development of effective innovation and economic policy. As things stand for the higher education sector is very acute problem of development of new educational institutions, which are included in the mechanism of transit of research and educational institutions in the form of a new quality to maximize efficient generation and use of human capital.

Recently, in the founding documents more and more refer to the need to fully utilize the scientific and innovative potential of higher education in Russia in terms of establishing and developing relations with industry and with the Russian Academy of Sciences. If you perform this task, the integration of Russian higher education and research and development of the national innovation system is the task of studying and optimizing management system and the interaction of science and innovation institutions and economic actors interacting with them in this area. In the relevant literature an innovative system usually understood as a system of interlocking institutions, "designed to create, store and transfer knowledge, skills, define new technologies" [1]. In turn, under a system of interlocking institutions can be understood as economic agents (enterprises, research organizations, universities, foundations, investors, etc.), as well as social values, norms, and legal system.

Efficient construction of a national innovation system is impossible without the active use of research and innovation capacity of institutions of higher education, and this potential should be integrated into the process of their implementation efforts with business. Analysis of countries with high rates of innovation activity shows that the basis for the growth of innovation capacity of the state is the harmonious integration of human capital, the activity of the element of "business" and infrastructure, which includes the scientific and educational structures that could provide training for new-brand professionals in demand in the labor market.

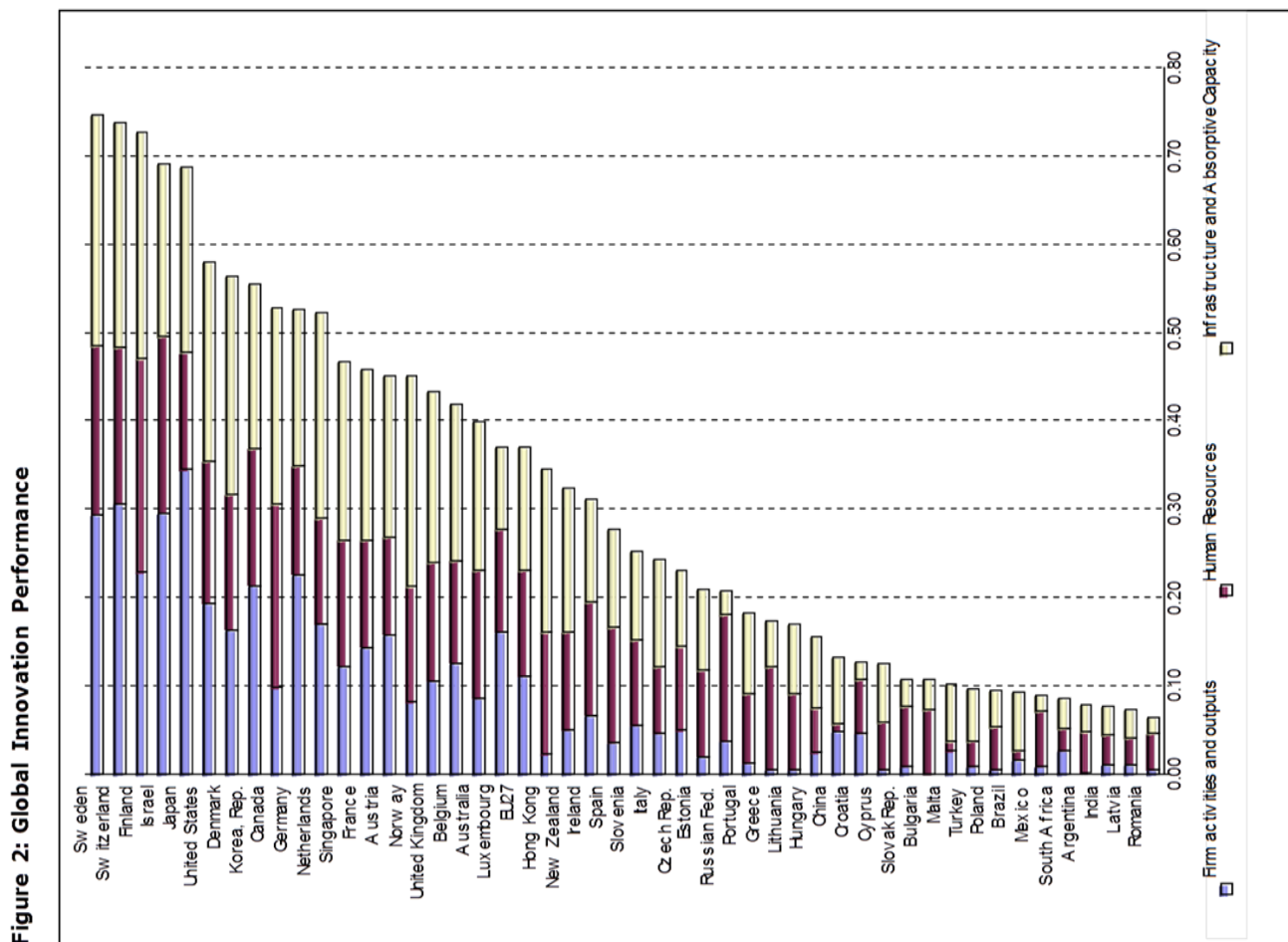
In economical literature the integration is understood as "the integration of economic actors, the deepening of their cooperation, the development of relations between them." The processes of integration in the modern economic science are generally considered by industry (intra) and intersectoral (interministerial) aspects. The first involves the merger of science and education in one sphere of government (education). Cross-sectoral approach is a broader understanding of integration, covering several areas of governance, as it reflects the convergence of the spheres of science and industry with education, culture, cooperation and the production of educational institutions in order to improve scientific and educational activities. At the present times domestic researchers pay much attention to the level of integration of science and education in the socio-economic system. At the same time highlighted the micro-, meso- and macro-levels of integration. Integration of science and education at the microlevel is the interaction of these components within a given organization or at the level of intra-integration (interaction of scientific and educational institutions of any affiliation.) Meso-level reflects the interdisciplinary (interdepartmental) integration – partnerships scientific and higher educational institutions of different affiliation (eg, joint research of the state universities and scientific institutions of RAS). At the macro level is represented by the integration of a holistic system of education and research activities across the country [3].

Based on the above common understanding of integration of science and education seems appropriate to formulate a definition of the integration of university research in the national innovation system as the union of all resources of higher education in order to enhance the innovative capacity of universities, as well as the creation of innovation

infrastructure based on the interaction of subjects of educational, scientific and business to participate actively in shaping the NIS [3].

Table.

Global Innovation Performance (Data of Daniele Archibugi, Mario Denni and Andrea Filippetti, Italian National Research Council, CNR-IRPPS, 2009) [2]



What should be the advantage of a structural model of coordination between the technologies, forms of social interaction and economic organizations, which in fact forms the national innovation system?

In world practice, formation and functioning of the national system of innovation consider in the frames of three main models, which differ radically from each other. Model NIS namely, in which the leading role in shaping owned firms, Triangle-model in which the leading role belongs to the state, and the model that Henry Etzkowitz called The Triple Helix, in which the leading role in the development of innovative national system belongs to the University as the core of the innovation system in the region and state. The latter model is especially relevant for Russia, because at the moment this model is being promoted at the regional and national levels. Note that this model belongs to the category of dynamic ones, and constantly serves as a subject for active international debate [4].

Considering the university as the core of the innovation system, and recognizing him for the lead role in shaping the investment climate we want to note the following:

"In general, world-class universities differed in their interpretation of several key features, the most important ones: progress in research, highly qualified teachers, high quality management, private financing, as well as talented students. According Salmi

(2008: 5), reaching the level of world-class universities and also requires three additional factors, namely:

- High concentration of talented teachers and students.
- A wide range of resources above offer advanced learning environment, and conducting advanced research;
- Enabling management functions, which serve to effectively implement the strategic vision, innovation and flexibility.

All title allows universities to make decisions and manage resources, without being burdened by bureaucracy "[5, C. 59].

Thus, the development and implementation of the above functions are needed for efficient development of infrastructure of the University, which serves the purpose of integrating the results of university research in regional and national innovation systems.

Effective innovation infrastructure of the university is designed primarily to ensure implementation of the full innovation cycle, which includes, according to many authors of works on the affected subjects, three stages, namely:

1. generation of ideas, an appropriate theoretical research, patents;
2. experimental development and applied research and prototypes tested equipment / technology;
3. production of innovative products, the problems of investment, market research, transfer of finished goods to market.

If we are for the purposes to study the innovation process in the University try to decompose these processes commercialization of innovations that are created in University, we will pay attention that of the model are formally drops out as a future student (and at times – and now) an active subject of the creation of innovative ideas and party of research. In fact, a student, of course, is involved in these cycles. For example, faculty can attract students to participate in various research projects, but not on a regular basis, but rather, the act is an act of "goodwill" of the professor, and does not constitute the practice of the national higher education. The reasons are different – from the human factor, finishing with the lack of an implementation to include the student in full innovation cycle.

In our opinion, to avoid this unfortunate institutional trap can be achieved by mandatory inclusion in the innovation infrastructure of the University of innovative research and education cluster. In this paper, called a cluster is considered as a system of interrelated economic agents in the field of higher education, aimed at achieving a certain level of innovation capacity of the university and the region. At a time when universities are seeking to maintain a balance between academic and entrepreneurial activities, the development of this form of public-social partnership, which brings together the efforts of all agents in a cluster on the commercialization of university research on all cycles, it is especially important to us. Besides the obvious benefits, such as the implementation of training programs that are able to adapt to rapidly changing conditions of occupation, pay special attention to the aspect of participation of business [6]. When engaging element of business in this form of the social partnership is to attract business not only to the formation of state standards in vocational education, and his participation in the scheme of social control and regulation of professional education, but also to participate in the active formation of a national innovation system [7].

Moreover, in this case we can talk about synergy as increasing the efficiency of the cluster as a result of the integration, consolidation of individual parts into a unified system through the so-called systemic effect. The model includes all the institutions more favorably influencing the development of new financial incentives, intellectual mode, the process of overproduction of knowledge for new purposes, which serves as a positive trend towards achieving the objectives of the innovation system formation region and the state.

Thus, educating and promotion of a new type of specialist - a specialist of innovation type, with innovative thinking and ability to navigate in an innovation-based society, which is important for the strategic development of the national government is impossible without constructing the innovation infrastructure of the University, and innovative scientific and educational association as an educational cluster high school, high school science and business structures there is an important element.

References:

1. Smolyanova E.L, Kuznetsov A.V, Serebryakova N.A. Development of mechanisms for integration of university science in the national innovation system <http://www.ecsocman.edu.ru/text/33722398/?eng=0>
2. Daniele Archibugi, Mario Denni and Andrea Filippetti, The Global Innovation Scoreboard 2008: The Dynamics of the Innovative Performances of Countries
3. Tsiglyayev V.A. Theoretical basis of the integration of university science in the national innovation system - URL: <http://koet.syktsu.ru/vestnik/2011/2011-2/15/15.htm> [Electronic resource]
4. Henry Etzkowitz, The triple helix: science, technology and the entrepreneurial spirit, Journal of Knowledge-based Innovation in China, Volume 3 issue 2
5. V. Lynn Meek Ulrich Teichler, Mary-Louise Kearney (Editors) Higher Education, Research and Innovation: Changing Dynamics Report on the UNESCO Forum on Higher Education, Research and Knowledge, 2001–2009.
6. Konyukhov V.Yu. The traditional model of strategic management for universities, colleges and schools (article) / Problems of Earth civilization / Collection of articles "Finding solutions to problems of survival, security and development of human civilization". - Irkutsk: Issue 18, 2007g.- 283s. S.91-95/5s./3s./Schadov M.I. /
7. Krasikova T.Yu. Innovative infrastructure of higher educational institutions and cluster / Idearum, 2011. №2. P. 18-22.

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Роль Университета и инновационного научно-образовательного кластера в формировании и развитии инновационной национальной системы

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Аннотация. При становлении и развитии национальной инновационной системы актуальной задачей является разработка механизма внедрения вузовской науки в национальную инновационную систему. По мнению авторов статьи одной из наиболее эффективных форм действия данного механизма является инновационный научно-образовательный кластер.

Ключевые слова: инновационный научно-образовательный кластер, национальная инновационная система.