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State Regulation Features of University Integration into National Innovative System in the Light of "Triple Helix" Modern Concept

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Abstract: The study is devoted to state regulation features research of university integration of into national innovative system in the light of "Triple helix" modern concept developed by Itskovits-Leidesdorf, describing development of innovative systems through dynamics of state, business and universities network relations. Universities active participation in national innovative system due to effective realization of scientific and innovative potential significantly enriches state's innovative space image as well as causes the necessity of essential modifications in its regulation mechanisms. In regard to this state participation in innovative process degree and forms seriously changes. Government institutions become integral links of accelerated scientific and innovative cycles and are urged to assume the initiator role in national innovative system development, the role of innovative interactions key regulator in a triad "state-business-universities". Various ways of process efficiency promotion in creating innovations are presented in article, development need for horizontal communications between the state, business and universities, first of all, by means of strategic innovative network models introduction are proved.

Key words: National innovative system, "triple helix" by Itskovits-Leidesdorf, state regulation, integration of universities into national innovative system, innovative development subjects, triad "state-business-universities"

INTRODUCTION

Modern innovative economy is based on knowledge production, therefore, its development is inseparable from higher education system. In conditions of innovative updating universities are proclaimed founders of necessary prerequisites for developed environment of "knowledge generation" creation, first of all due to effective realization of scientific and technical, intellectual and personnel country potential function and innovative development necessary for material sphere of economy and successful formation of national innovative system (further-NIS) reproduction.

K. Frimen, B.A. Lundvall and R. Nelson are considered to be the NIS theory founders; they analyzed innovative activity development in various countries and on this basis formulated NIS definitions close by meaning and generally describing national innovative system as set of institutes relating to private and state sectors which individually and in interaction with each other cause development and distribution of new technologies within the certain state (Freeman, 1987; Lundvall, 1992). In the first decade of 21 century, the concept of NIS formed a basis of three practical methodologies of territorial benchmarking development: European innovation scoreboard, global competitiveness index, knowledge assessment methodology which were a little modified and adapted for the comparative analysis of scientific and educational systems of Central and Eastern Europe countries are in work (Moskovkin *et al*., 2013).

Today in many countries including Russia, the main objective of NIS formation is creating innovative infrastructure as systems of interconnected and complementary organizations of various organizational and legal forms and forms of ownership and also conditions for their effective interaction providing successful realization of innovative activity at all stages of innovative cycle: from basic scientific researches, through promotion of idea and development of product prototype (research and development) to serial production and sale to the consumer.

Synthesizing judgments of most specialists in this perspective, we see best to define NIS as set of subjects, institutes (relations between subjects, rules of interaction) and infrastructures (financial, organizational) providing creation, distribution and practical application of new knowledge and technologies in interests of innovative

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country development and increase of its economy competitiveness (Freeman, 1987; Lundvall, 1992; Moskovkin *et al*., 2013; Vasin and Mindeli, 2011). NIS effective functioning is based on close interaction of its three main subjects: state, business and universities. Thus development and integration of universities as strategic resource of new ideas and technologies generation into NIS, their introduction and replication becomes one of the most important priorities of public policy.

MATERIALS AND MATHODS

Research grounds are scientific works on NIS concept, management theory, economic theory policy, including innovations theory in the light of network way formation in world economy; system analysis; integrated approach to scientific works in the field of innovative management study; results of scientific researches on problems of state integration, business and universities in interests of innovative economy development.

RESULTS AND DISCUSSION

The higher school contribution importance in respect of NIS formation is confirmed by world experience. It shows that all countries which successfully overcame transition to innovative economy considered the sphere of higher education as priority and proceeded to the innovative policy. Thus, it is important to note that currently new model of innovative development built according to principles of relations sets in triad "state-busines-universities" crossing and DNA which received in world innovatics by analogy with crossing of molecule spiral structures wins the name of "Triple helix" and receives more and more recognition in the world (Etzkowitz and Leydesdorff, 1995).

Today, it is considered to be the most effective for accelerated innovative development of territories due to introduction of network way of communications coordination of the main interaction subjects. Under the influence of globalization rigid hierarchy designs are everywhere forced out by flexible network designs and economic systems gradually get a cluster structure instead of traditional branch one. Dynamic network interactions are considered to be the necessary institutional environment for innovative type of growth based on continuous updatings. World economy and all its subsystems are stratified in cluster and network structures far more plastic than the hierarchies (classical firm model or centralized state) and which were at the same time more integrated than market model.

The main thesis of "Triple Helix" theory is that in system of innovative development the universities responsible for creation of new knowledge start holding dominant position. As the reason for transformation so important the logic of science development served; it is giving rise to more and more of synthetic directions including researches of interdisciplinary character. In these areas formation of "clusters" forming future potential of innovative development is observed (bi and nano-technologies, information technologies) and communications between scientists, technologists and users become qualitatively different as well as the functions which are carried out by main subjects of innovative development. They now enter interactive network cooperation during which their competences are more and more combined and gain interchangeability: universities master the role of enterprise centers, companies and enterprises master university roles and the state takes up a role of venture fund and/or business manager supporting a spiral configuration in general. This transformation brings nonlinearity into cluster functioning: areas of three pair interactions become epicenters of new products and technologies creation as well as epicenters of new organizational formats generation which, in turn are followed by new social and economic relations. Thereby the triple helix assists a turn of innovative systems towards fractal development in the mode of continuous updatings.

In regard to this state participation in innovative process degree and forms seriously changes. The state support of NIS is transformed to comprehensive package of measures on ensuring integrity and stability of innovative organism and government institutions become integral links of accelerated scientific and innovative cycles, conceding the role of leading player in development of innovative systems to universities and seeking for their full-scale integration into NIS. The success of such integration substantially depends on the state regulating influence efficiency as leading subject of national economy and guarantor of its sustainable development.

The term "state regulation" within this research is used according to traditions of administrative and legal science and is considered as one of public administration functions. Its use for designation of prevailing form operating influence at universities integration into NIS signifies the need of minimization of direct management and state excess intervention into these processes as universal operating subject and the extreme importance of self-government and self-organization mechanisms implementation, autonomy and independence of the

operated subjects. Thus, the state is capable to act: first as partner having considerable resources, secondly, organizer of NIS development, thirdly, regulator of innovative interactions institutional and organizational basis.

According to scientific literature and state documents belonging to the considered problem carried-out analysis under state regulation of universities integration into NIS we understand the number of measures and actions applied by the state to effectively promote scientific and innovative potential in NIS interests. The purpose of NIS universities integration state regulation is from our point of view, universities influence strengthening on innovative reorganization of national economy, increase of economic role of the innovations created and maximum use of their scientific and innovative potential for sustainable development of NIS and accumulation of global competitive advantages of the country. Basic principles of universities integration into NIS state regulation are:

- Strategic orientation to innovative reorganization of economy as key, main direction of social and economic transformations across the nation
- Effective use of scientific, technical and intellectual potential which is saved up by universities
- Development of universities network cooperation communications with science academic sector organizations and sector of applied science as well as real production sector
- Creation of optimum conditions for innovative activity for all its subjects taking into account features of organizational and legal forms as well as forms of ownership; continuous improvement of legislative norms regulating the scientific and innovative sphere

Integration of universities into NIS taking into account the principles of triple helix causes radical restructuring of organizational and institutional image of the state innovative policy (Vasin and Mindeli, 2008). First, it appears not as some set of directive documents of certain government body and it is rather a synthesis of scientific and innovative reference points of various departments and interdepartmental formations. Secondly, political installations comprise prerequisites of active interaction between government institutions for ensuring complexity of operating influences. Thirdly, the state organizations formulating political priorities and their activity directly join in structure of NIS. Thus, improvement of research and innovative activity organizational forms, support and distribution of progressive cooperation forms in triad "state-business-universities", organizational structure reduction of science and innovations public sector in compliance with requirements of innovative system acting as direct product of innovative cooperation which is developed between NIS subjects in various forms and directions at different levels-from local to global become priorities of organizational and institutional regulation of universities integration into NIS. Increase of innovations creation process efficiency requires development of horizontal communications between state, business and universities that is introduction of strategic innovative network models. Network organization efficiency of interaction with the state, business and universities is that its result is not linearly increased with network scales growth. Each network knot, whether it be the producer or the consumer of innovative production, gains additional effect from simple increase in quantity of hubs. Existence of network means need of transformation for interests of NIS state functions, business structures and universities according to principles of triple helix and transition to recursive monitoring system when state bodies cannot influence the other subjects of regional innovative system and inevitably are passed with directive image to type of relations which can be characterized as partnership or social contract.

CONCLUSION

Theoretical aspects of state regulation general characteristic of NIS university integration clearly demonstrates all importance of the above process for national innovative system formation, ensuring its competitiveness and sustainable development. Active participation of universities in NIS due to effective realization of scientific and innovative potential by higher education institutions significantly enriches shape of innovative space of the country as well as causes the necessity of essential modifications in mechanisms of its regulation. In regard to this state participation in innovative process degree and forms seriously changes.

Government institutions become integral links of accelerated scientific and innovative cycles and are urged to assume the role of NIS development organizer, the key regulator of innovative interactions according to concept of "Triple helix" first of all by means of effective models introduction of strategic innovative networks providing development of horizontal communications between state, business and universities for purpose of essential efficiency increase of innovations and growth creation process of the country competitiveness.

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