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FORMATION OF LOOSELY STRUCTURED ASSOCIATIONS AS A WAY TO OVERCOME THE BARRIERS

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Abstract

The final result of the development of scientific and educational organizations is their contribution to the growth of the innovative potential of the economy. The aim of this paper is to identify and assess the barriers to the development of scientific and educational organizations in order to determine the direction of their further development and highlight the scientific prospects for the use of informative tools. To determine these barriers, the following algorithm was used: the dominant factors in the development of scientific and educational organizations were identified; the obstacles for the development of these organizations were determined, the relationship between the dominant factors and possible barriers to development was revealed, the assessment of such barriers through SWOT analysis was carried out. The implementation of this algorithm made it possible to determine the main institutional and economic limitations to the development of scientific and educational organizations: the predominance of administrative changes over organic processes of differentiation and integration in scientific and educational field; lack of mechanisms to attract private investment in the development of the system; governmentalization of the state system, formalization of public-private partnership relations; encumbrance of small innovative enterprises with excessive bureaucratic costs, which reduces their contribution to the reforms in the regional economic system; formation of institutional traps in the course of the reforms in the sphere of education and science. The article describes the mechanism for overcoming these barriers by means of creating loosely structured associations.

Keywords: Development barriers, informative tools, innovative economy, loosely structured associations, scientific and educational system.

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1. Introduction

The following are the dominant factors in the development of scientific and educational organizations under the conditions of modernization (Babkin, Muraveva, & Plotnikov, 2015, p.1291):

- institutional factor, which is represented in the norms, contracts, forms of behavior of the participants in the scientific and educational system, as well as the environment for the formation and implementation of the relevant component of the regional economic policy;
- subjective factor, which is represented in the reproduction of labor, entrepreneurial potential and human capital of the system under study;
- organizational factor, which is represented in the competitive interaction of the participants in the scientific and educational system, the organization of this interaction and the management mechanisms.

Thus, these factors determine the conditions and results of the formation of the main barriers to the development of scientific and educational organizations.

2. Problem Statement

The key external challenges for Russia in terms of innovative development are the following:

- growth of the technological development of the world economy;
- increased world competition for highly skilled personnel and investments, involvement of the new knowledge, technologies and competences to projects, which implies the demand for the factors determining the competitiveness of innovative systems; in the conditions of low efficient innovation system in Russia, this leads to the brain drain of competitive personnel and outflow of technologies, ideas and capital from the country;
- climate change, aging of the population, problems in the system of healthcare - these challenges are faced up not only by our country, but by the humanity as a whole; these challenges call for priority development of the relevant areas of scientific research and technological development, including clean energy, genomic medicine, new technologies in agriculture, which are not sufficiently developed in Russia (Forecast of long-term social and economic development of the Russian Federation for the period until 2030).

Summarizing the statements above, we will determine what areas are subject to the formation of the barriers to the development of scientific and educational organizations and work out the mechanisms for overcoming these barriers.

3. Research Questions

3.1. Administrative barriers. In scientific literature, administrative barriers are understood in two ways: first, as specific difficulties of economic development caused by the imperfection of the state regulation and control or the deliberate infringement of the interests of market participants (Small enterprises in Russia: state, problems, prospects, 1999); secondly, as subjective restrictions on business entities caused primarily by the fact that the current mechanism of the state regulation of economic activity is "tuned" to a relatively low pace of decision-making due to the bureaucratic principles of work and due to the fact that the work of bureaucratic structures that create barriers is paid by the businessmen themselves.

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Auzan and Kryuchkova (2001) made an attempt to synthesize the above mentioned factors by defining administrative barriers in the economy as the rules established by the decisions of the state with the observance of these rules being an indispensable condition for market activities, which entails payments to avoid bureaucracy.

Let us define the administrative barriers with respect to the system under study. As a result of the changes in funding and the transition of several social spheres to market relations, scientific and educational organizations were given certain financial freedom in the form of independent disposal of their monetary funds and assets. However, this independence is rather formal (Vasilenko, Linkov, & Glukhov, 2017).

The barriers also arise within the contractual procurement system. Formally, the introduction of such system is focused on combating the corruption, but in fact it leads to a significant increase in costs and timing of the transactions, which is followed by the loss of the most profitable contracts (Brill et al., 2017). A great number of uncompleted contracts are due to undercutting by economic entities, which entails the inefficiency of the contract or its failure.

The winner at auctions is determined by the price, and the quality criterion is not taken into account. In many cases, the auction is won by business entities which fail to perform their work efficiently due to the lack of qualification and insufficient production capacities. This is caused by the fact that the level of qualification of the participants is not taken into account in the process of tenders. Qualification and quality criteria in the tenders for state orders are absolutely vital. Quite often, flimsy companies, which do not have proper equipment, necessary material and labor resources, enter the auctions. Moreover, such companies often win contracts due to lower prices and shorter terms. They get pre-payment, but do not complete the work.

Public guarantees of free education imply the availability of state and municipal educational organizations financed from the budget from the level of preschool to professional levels of education. According to the constitution, in this range education should be free for public, and on the level of the secondary school it should be compulsory. Higher professional education, funded by the state, is provided on a competitive basis.

3.2. Barriers to the monopolization of the market of scientific and educational services.

In the real situation, mergers and acquisitions of scientific and educational organizations are influenced by the administrative resources. Universities do not merge according to the situation in the market, but according to the demands of the "stronger" ones.

It seems that in the analysis of the barriers to the monopolization of the market of scientific and educational services, the cognitive capabilities of the theory of interests play an important role. The existence of their own interests can give the management bodies special motives for mergers and acquisitions that are contrary to the interests of owners and economic expediency. In Shnurenko (2012), Alexandrov's view of this problem is worth mentioning here: the mergers of St. Petersburg universities can be compared to mergers and acquisitions in business; accordingly, the result of the merger is the criterion for the assessment: whether a more powerful organization with new competitive advantages will be established or the assets of the organization will be simply withdrawn so that a group of persons could participate in the hidden accumulation of the capital.

3.3. Institutional barriers. In the rapid development of reforms, the main task of public authorities, and, primarily, its legislative branch as regulating the most important social issues is the adoption of

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adequate standards. At present, legislation in Russia is constantly changing and it is adjusted in accordance with the needs of economic and social development (Nekrasova & Shumeyko, 2017).

Today, education is becoming increasingly important for the formation of the new economy and its role increases with the growing importance of human capital. The Russian education system is quite competitive compared to the education systems of the developed countries. At the same time, there is a need for comprehensive public support of the current educational policy, wider responsibility and more active role of the state in this sphere, as well as deep and comprehensive modernization of the educational system with the allocation of the necessary resources and mechanisms for their effective use.

It should be stated that the investment attractiveness of education should be increased for businesses, organizations and citizens. For this reason, organizational and economic mechanisms in education should be updated, which will increase the amount of extra-budgetary funds in education, and radically improve the use of these funds by sending them directly to educational institutions (Klochkov, Klochkova, & Vasilieva, 2016).

3.4. Barriers of the "new bureaucratization". The development of the vertical of the state power marked a new round of bureaucratization in the Russian economy, this time intertwined with market relations. We will present the necessary arguments to prove this point on the example of the task of stimulating workers according to their performance on the basis of a "road map" aimed to increase the average salary according to the categories of personnel. The ways to ensure the desired increase in the average wage are as follows: reduction in the number of personnel, provided that the funding is not reduced (the work load grows for the remaining academic staff); reduction in the number of subsidiaries; increase in the salaries of the academic staff by reducing the wages of other categories of workers (Mokin & Pankova, 2012).

The implementation of the road map is provided at the expense of several sources: at the expense of funds from the reorganization of inefficient organizations, from the use of fixed assets and material resources of the modernized institutions, from the savings as a result of redundancies, and also from income-generating activities.

In the context of accelerated post-industrial transformation, the needs for training specialists are dynamically changing. In the near future the demand will be for the specialists in the fields that have not yet appeared. In this situation, the most effective way of developing the system of education is its close interaction with innovative businesses. The mechanism of public-private partnership (PPP) ensures an increase in the efficiency of spending budget funds and improves the quality of public services. At the same time, the concept of PPP in the Russian Federation is defined only locally, which means that in practice PPP is realized only partially (Babkin et al., 2017).

The basic mechanisms of PPP are realized in additional education. High-tech companies set up laboratories of the future providing fully equipped facilities for teaching children not only in schools, but also in higher educational institutions. In some universities, the specialized departments have been founded, which can be regarded as the implementation of PPP mechanism.

3.5. Barriers of encumbrance of small innovative enterprises with excessive bureaucratic costs, reducing their contribution to the transformation of the regional economic system. The establishment of small innovative enterprises is an important milestone in the development of scientific projects

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commercialization (Egorov, Babkin, & Kovrov, 2016). For example, with science and research developments in the field of high-tech industries, the university can patent its achievements and set up a small innovative enterprise on the basis of this patent.

The first barrier that arises is the fact that the university can only invest its right to use the patent as a contribution to the authorized capital. The question remains: where to find the initial capital and the property for the startup? Hence, the investors should be attracted. Long negotiations do not necessarily bring the desired results, but some profitable projects can get the businessmen involved.

The second barrier is as follows: small innovative enterprises have a preferential rental rate, but the lease authorization is provided by the founder. Currently, it is impossible to obtain such permission.

The third barrier is the research component. Small innovative enterprises mainly focus on research, so the real project becomes a utopia, as we are engaged in both commercialization and research at the same time.

The fourth barrier is the fact that the profit should be distributed among the participants, and the management of educational institutions plays a crucial role here. As an alternative, all activities of these universities are regarded as their own and are constantly monitored by small innovative enterprises, in such case there is a chance to get part of the profit. In the case when the activity of the small innovative enterprise is considered as the activity of a separate legal entity, there is no chance to get any profit even if the performance of the enterprise brings good results (Klochkov et al., 2016).

3.6. Barriers to the formation of traps in the modernization of education and science. One of the main obstacles to successful economic development is the formation of institutional traps, that is inefficient, but sustainable institutions, or norms of behavior that keep the economy in an inefficient equilibrium. The predominance of barter exchanges, non-payments, corruption, shadow economy are the examples of institutional traps that hamper reforms in modern Russia (Polterovich, 2004).

On the one hand, it seems that scientific and educational organizations perform quite efficiently and have no chance of falling into an institutional trap. However, the main indicators of their performance reflect negative dynamics: the amount of funding is reduced and the number of lecturers with DSc and PhD degrees is decreasing. These negative tendencies suggest that institutional traps are likely to be formed in the near future. Once in an institutional trap, any system chooses a low-efficiency trajectory, which complicates the transition to effective development.

Summarizing the statements given above, we will define the actual barriers with the use SWOT analysis. The results of the assessment of the barriers to the development of scientific and educational organizations are given in the table (Rybyantseva et al., 2017).

Table 01. Assessment of barriers to the development of scientific and educational organizations

Strengths (S)	Weaknesses (W)
S_1–affiliation with loosely structured associations, secured by many competitive advantages S_2 – historically formed priority of the scientific and educational system in the region S_3 – investment attractiveness of the region, the implementation of major development projects in the region	W_1 – underinvestment W_2 – low-pressure regional economy, lack of an adequate system component W_3 – high level of physical depreciation of capital and infrastructure elements W_4 – inadequate normative framework

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S_4 – higher effectiveness to boost the development of the system	
Opportunities (O)	Threats (T)
O_1 –the inclusion of individual elements of the system in the international rating O_2 –creation of the regional centers for the collective use of scientific equipment O_3 – the possibility of setting up the basic corresponding departments at enterprises O_4 –the engagement of the regional authorities in the development of the scientific and educational system	T_1– reduction in the number of universities as a result of monitoring of the Ministry of Education and Science of the Russian Federation T_2 – slow adaptation of subjects of the scientific and educational system to rapidly changing conditions T_3 – redundancies in the scientific and educational system T_4 – the threat of disintegration within the system

4. Purpose of the Study

The aim of the research is to conceptualize the key problems of scientific and educational organizations overcoming which can contribute to the growth of the innovative economy. The way to overcome these barriers is to create loosely structured associations.

5. Research Methods

In order to ensure the reliability of results, various research methods, including scientific and economic ones, were used: statistical and structural analysis, method of economic and statistical groupings, and a monographic method.

6. Findings

The formation of loosely structured associations is one of the mechanisms for overcoming the barriers to the development of scientific and educational organizations. Loosely structured associations represent a consistent result of the long-term interaction of economic entities combining and exchanging their own resource bases, capitals and infrastructures, which underlies the formation of a synergetic effect. Applied value of such associations is in their contribution to the increment of economic potential, competitiveness and investment attractiveness of the economy. These associations will make it possible to implement the mechanism of public-private partnership, attract private investment in the development of the system; to overcome institutional traps in the process of the reforms in the sphere of education and science.

It is necessary to single out the priority needs of loosely structured associations that are reflected in the pre-dominant needs. The basic need of loosely structured associations is the need for information. Competing organizations are united in order to avoid the information vacuum. In the process of communication, scientific and educational organizations exchange technological breakthroughs, legal problems, positive aspects of counterparties, and economic optimization schemes. This activity facilitates effective performance of the association and boosts the innovative growth of the entire loosely structured association, as well as its members.

One of the priority needs is the availability of resources. Loosely structured associations need a variety of economic resources. Modern economic science excels the three main types: land, labor, capital.

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Land as the most important economic resource is limited and non-reproducible. Labor in this context implies both intellectual and working capital. Capital is materialized in raw materials and energy resources.

The need for public-private partnership is represented as an institutional and organizational alliance of state power, science, education and business aimed to identify and develop promising areas of technological development, to develop a mechanism for co-financing the organizations in the field of research and development using the system of grants, co-financing the implementation of network innovation projects and support of long-term innovative partnerships in high priority technological directions. The mechanism of PPP allows us not only to raise funds for the implementation of socially significant projects for the city, but also to find the most modern technical solutions and effectively manage the newly established objects.

The need for institutionalization is realized through a synergetic process of transition from self-managing and self-organizing structures to well-organized and manageable ones. Institutionalization should be followed by the formation of formal and informal rules and norms that ensure the adaptation of the entities of loosely structured associations to the conditions of the transitive economy by changing their behavior as the main economic entities which is manifested in the search for additional sources of income and determines the realization of the potential of their labor, material and financial resources.

The analysis of the priority needs and the ways to satisfy them allows us to identify the main functions of loosely structured associations.

1. Direct communication and feedback function. Direct communication and feedback function is realized through information. In post-industrial systems, information allows us to improve the processes connected with transformation of matter, energy, and information itself.

One of the most important types of information is economic information. Economic information comprises the information about the processes of production, material resources, production management processes, financial processes, and the information exchanged between different management systems.

Loosely structured associations represent a subsystem, i.e. a hierarchical level of the system, and the elements within the system are interconnected, and communicate with other systems, directly and by feedback, through the external environment. Consequently, the elements of the subsystem are also connected to one another and to the external environment directly and by feedback.

Information needs are growing, as evidenced by the increased share of information and communication technology costs in GRP, as well as the share of economic entities using these technologies. The information need is satisfied by the increased efficiency of the use of ICT infrastructure facilities, the widespread use of "cloud technologies" and the standardization of the maintenance of the resources use.

2. The cumulative function is reflected in the coordination and allocation of resources. The implementation of the cumulative function generates the coordination effect. It ensures savings for the organizations on the costs of studying and forecasting the market resources that they face in different situations. Any association affects the allocation of resources through the limitation of the range of possible actions. The reduced level of uncertainty of the external environment, ensured by the association, allows for planning and implementing long-term investments, thus creating greater values. In addition, funds saved on researching and predicting the behavior of counterparties can also be used for productive purposes.

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On the contrary, in conditions of uncertain environment, economic entities not only face low returns on the planned investments (which may lead to their refusal), but also have to spend money on various preventive measures when carrying out economic activities.

The potential of loosely structured associations is a combination of different types of resources: financial, intellectual, information, scientific and technical, etc., necessary for the implementation of innovation activities. Its condition largely determines the scale and dynamics of the generation of the new knowledge and its application in innovative production of the association.

3. Concession function. The concessional function of loosely structured associations implies that the state engages businesses for the implementation of many projects. The commercialization of scientific projects can be given as a bright example. Scientific and educational organizations (more often state ones), develop scientific projects, but for the implementation of these projects they have to find businesses so that their work could be more effective. Therefore, often associations are set up in affiliation with scientific centers, as they help to run business with innovations.

To assess the level of concession, it is necessary to calculate the level of cooperation between educational and scientific organizations and other organizations that are members of the association. This indicator can be calculated as the arithmetic mean of expert estimates of the level of cooperation.

4. Strategic function. The prerequisite for the effective functioning of the market mechanism is the development of the relevant institutions.

The strategic function of loosely structured associations is represented in the specialization of theoretical conclusions and verification of their reliability through economic activity, the search for effective forms and methods of managing economic processes, and the creation of an adequate economic mechanism at all levels of the economy. The strategic function ensures stability, increasing the level of organization of the association, and the ability to be flexible when some fluctuations or changes occur.

Hence, it is necessary to take into account the principle of complementarity of the institutions: institutions complement one another, and the desired economic effect is achieved only on the basis of interrelated institutional changes.

7. Conclusion

This paper presents the main results of the study:

7.1. The loosely structured associations demonstrate effective performance, and their activities lead to the development of the necessary competitive advantages in the relevant environment. The formation of the associations can be initiated by the scientific and educational organizations as well as the regional authorities, since such associations help the region to develop and attract investments.

7.2. The functions of loosely structured associations are aimed at increasing the organizational level of economic cooperation between different entities in order to achieve high dynamics of social and economic parameters of economic development: direct communication and feedback function, cumulative function, concession function and strategic function.

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