

Interregional Clusters as Drivers of Innovative Entrepreneurship

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Abstract

The modern world is on the threshold of transition to the sixth technological mode, which will cause tremendous shifts in the economy around the world. The transition to the sixth technological mode will entail the emergence of new branches of the economy and the dying out of some of those that are functioning now. As a result of the transition, the principles of conducting economic activity will also change, due to changes in the resource base of industries, as well as the principles of management activity. This paper identifies the problems associated with the transition to the new technological mode, and also proposes an approach to managing this process. The paper considers the hypothesis that there is a direct relationship between the level of technical complexity of the product produced and the degree of dependence on the interregional interaction. The paper considers interregional interaction as one of the fundamental factors of the economic success of the new technological mode. Interregional "cluster cubes" are defined as the institutional basis for building the economy of the new technological mode.

Keywords: Sixth technological mode; Interregional interaction; Innovative entrepreneurship; Cluster cubes; Strategic potential; Regional economy.



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1. Introduction

One of the main specific of new technology structure is interweaving of industries (Manukov, 2016). This is so called NBIC conception, what means integration of nanotechnology, biotechnology, information technology and cognitive science (Frolov and Babkin, 2016). The main challenge here is differentiation in development level of different industries. Under the six technology structure we have no more ability to develop biotechnology with the low level of information technology and so on. Also we should notice what one of the basic strategy of some countries, regions was to choose a sphere of specialization and to catalyze its development. Sciences also were developing separately from each other. The new technology structure requires performing integration of industries and synthesis of sciences.

In addition, the development of technologies of the new technological mode will require the strengthening of interregional interaction, both in the number of horizontal links and in their complexity.

Technologically more complex products are produced as a result of a longer and more complex production chain, which necessitates a greater division of labor. Throughout the entire Russian Federation, more complex production requires more interaction between regions. The purpose of this paper is to analyze the hypothesis of increase in the role of interaction between regions with increasing complexity of the technological process (Akhunov, 2016; Nikolaev and Yu, 2016).

To date, the creation of regional clusters is the basis for the development of the innovation economy in the Russian Federation (Grigorian and Ramazanov, 2016).

The main advantages of clusters are:

1. The commonality of technology;
2. Territorial localization;
3. Common resources.

All these aspects lose their significance in the conditions of the sixth technological mode. So, the commonality of technology should be replaced by the integration of industries and technologies from different directions. Territorial localization and community of resources lose their significance, because in the structure of products of the new generation material resources will play lesser and lesser role, due to their replacement by more mobile resources: human capital and information technologies. It is not the physical distance between the cluster members that comes to the fore, but the institutional distance between them, which is an assessment of the economic, legal and bureaucratic barriers between them.

An interregional cluster requires investments in building logistics of the work process. This is both the logistics of traffic flows, and the construction of a remote project management system.

An interregional "virtual" cluster requires less capital investment, but requires a higher competence of the composition of managers due to the territorial distribution of the system.

The role of the regions participating in the project implementation is to create a single space for cluster members.

2. Methods

The hypothesis was tested by factor analysis with the example of 79 regions of the Russian Federation. Based on the data of the Federal State Statistics Service, we constructed two regression models:

- 1) The influence of interregional interaction on the production of products with low added value;
- 2) The influence of interregional interaction on the production of products with high added value (Gerasimova and Dunford, 2017).

Based on the analysis of the models, we came to the conclusion that the interaction between the regions is extremely necessary for the production of products and the role of interaction becomes more important when the production is complicated.

The models were constructed by us using the method of least squares. As a factor variable, a composite variable "Import" was chosen, reflecting the import of agricultural and non-agricultural products, the import of cars, the rental of sawn timber, and cement for 2010-2013. The resultant variable is the number of enterprises in different industries as of 2014.

Agriculture, fisheries and mining were analyzed as the industries with low added value. Processing industries, construction and communications were analyzed as industries with higher added value.

3. Results and Discussions

We got the following relationship as a result of the analysis of manufactures with low added value:

$$P_1 = 1853,09 + 0,0006 * T$$

Where:

P1 is the number of enterprises producing agricultural products, fishery products and mining;

T is the volume of imports to the region from other regions of the Russian Federation.

The adjusted coefficient of determination is only 0.26, what leads us to the conclusion about the weak influence of the interregional interaction on the production of products with low added value.

As a result of the analysis of industries with higher added value, we got the following relationship:

$$P_2 = 4332,21 + 0,0129 * T$$

Where:

P2 is the number of manufacturing industries, construction and communications enterprises;

T is the volume of imports to the region from other regions of the Russian Federation.

The adjusted coefficient of determination is 0.89, what indicates the serious influence of interregional interaction on the production of products with high added value.

If to detail the model obtained decomposing the import into its components and determining the most significant of them, we get the following relationship:

$$P_2 = 2710,57 + 0,0548 * A + 1,5257 * R + 33,4554 * L$$

Where:

P2 is the number of manufacturing industries, construction and communications enterprises;

A is the import of cars and various auto components;

R is the import of metallurgical products;

L is the import of sawn timber.

The adjusted coefficient of determination for such a model is 0.96. Thus, we can come to the conclusion that interaction between regions is extremely necessary for the production of products and the role of interaction becomes more important when the production is complicated.

Carrying out a strategic analysis of the social and economic development of the Russian Federation, it is necessary to take into account the fact that the structure of the national economy of the Russian Federation differs significantly from the structure of the economies of developed countries. One of the most important differences is the low share of industries rendering services to the population. Part of the "service economy" will require additional educational services in the form of the emergence of new training programs and centers for professional retraining. This will also require additional mobility of the population and an increase in the level of interaction between the regions in the field of education (Makhrov *et al.*, 2014).

Based on the results of the factor analysis, the hypothesis was confirmed, which asserts that with increasing complexity of the production process, the growing role is played by the interaction between regions.

System integration has its goal-setting to obtain a synergistic effect (Makhrov *et al.*, 2014). Thus, the interaction between regions will be reflected not only in increasing in the effectiveness of each region separately, but will also affect the emergence of fundamentally new industries, development programs and projects that each individual region is unable to implement individually.

The structure of interaction between innovative industries, research centers and universities should be clearly formed, and new institutions that influence on the transformation of society should be also formed, because the foundation for the existence and sustainable development of the real sector of the economy is supporting the creation and promotion of an innovative efficient production and social infrastructure. That is, the country's ability to introduce new technologies and use innovations shows how competitive and promising the country is in the world economic arena (Fehr and Gächter, 2000).

4. Summary

Interregional cooperation is not limited to the integration of the production sector, but also aims to integrate the financial, investment, innovation, energy, transport spheres, as well as interaction in the areas of labor, human potential and services.

The incentives for such integration are the existing system of division of labor, as well as the growth of supra-regional entities, such as commercial banks and transport companies, etc.

One of the forms of effective interaction between regions is the formation of interregional clusters (Nikolaev and Yu, 2016). An interregional cluster is the integration of two or more regions which economic systems complement each other through the mutual use of resources to achieve a common goal: for example, entering the world market, integrated and effective development of natural resources, creation of joint industrial, agricultural, tourist, scientific, innovative and other centers (Akhunov, 2016).

Interregional clusters will have a slightly different character as part of the transition to a new technological mode. Unlike in the traditional approach, affinity of technologies will be to a lesser extent important in formation of a cluster. At the forefront there will be the commonality of the achieved goal, because the products of the new technological mode will imply the intertwining of the achievements of various scientific spheres. One branch will not be able to produce a product of a new generation in isolation from other branches of the economy.

In view of this, the association will take place on the basis of innovative industries in various industries with the support of educational institutions and commercial banks.

When formulating new policies on regional interaction, it would be necessary to take into account all the differences in the current social and economic situation of the regions, and it would be also necessary to individually approach the definition of the strategic potential of the region. The strategic potential of the region should include the competitive advantages of a certain territory. It can be: resource advantages; geographical position; technological competitive advantages; competitive advantages based on economic factors: favorable tax regime created by the government of the country, large and growing capacity of the regional market, solvency of the population, short payback periods of capital investments; infrastructure of the regional market, including: transport infrastructure, development of the distribution network; competitive advantages based on demographic factors; innovative activity, specialization of the region.

At the heart of the formation, development and implementation of the strategic potential of a region there should be the system of strategic management of a particular territory (Zhoglina, 2013).

Forming the strategy of interaction between the regions, it would be important to come to a balanced approach in determining the effective degree of interaction between the regions. Reengineering of business processes should be performed on the basis of analysis of synergistic effects and effects arising from disintegration.

Synergetic effects occur when implementing the integration of production and management functions. But the likelihood of synergistic effects is reduced if processes of differentiation and disintegration of production and management functions begin to dominate instead of integration processes. For example, outsourcing, consulting and leasing, the essence of which manifests itself in the disintegration of production, management and financial functions, leads to a reduction in synergistic effects (Mozhaev and Mozhaev, 2015).

5. Conclusions

For the Russian Federation to gain a competitive advantage in developing new technologies and building a new economy, it is necessary to develop institutions that stimulate effective interaction between regions by coordinating the activities of regions, and also reducing transaction costs. As such institutions, the introduction of a policy of interregional clusters is proposed. All this requires a rethinking of the cluster concept, as a result of which we get such a mechanism as a "cluster cube", which sides are: interregional interaction, integration of industries, and synthesis of scientific knowledge.

Cluster cubes require a dialogue between the state, the business community and the academic community.

The construction of the economy of a new technological structure based on the "Cluster Cubes" should begin with an analysis of the starting points for the development of technology. It is necessary to identify key enterprises that will become drivers for the development of innovations in the new technological mode. This forms the first vertex of the hierarchy. The next step is the selection of project partners from the academic environment. Those universities should be selected for formation of clusters which develop the scientific directions that contribute to the development of this industry, as well as those universities that prepare qualified personnel for the direction. Further, the structure of enterprises is formed, which should serve as resource providers for key companies of innovative development. The next step is to create a regional profile, an enterprise profile, and a profile of the academic environment that is involved in the project.

This approach to the development of innovation is fundamentally different from the current approach to the formation of regional clusters in that the starting point is not the region but the key enterprises. This approach also stimulates higher interaction between regions.

Acknowledgements

The work is carried out according to the Russian Government Program of Competitive Growth of Kazan Federal University.

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