

The innovation potential of regional clusters

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Abstract—In the article theoretical and practical aspects of influence of a clustering on the regional economy of the country are considered. In modern conditions, globalization of economy interacts with local trends of cooperation which increases communication between of a cluster. For several decades various approaches, both to understanding of the cluster, and to factors of development of a clustering are formed. To begin with there is a factor of development of the innovation potential of a cluster and assessment of its influence. In this article we present the point of view of both the Russian authors, and the foreign researchers noting the innovation orientation of activity of clusters, their complex impact on development of economy, benefits of formation, development and realization of the innovation potential. Authors note the tendency of clusters to innovate, generate new information and knowledge, implement innovations. A number of authors consider regional clusters in the concept of a glocalization, noting complementarity of global and local tendencies in activity of clusters that it promotes forming of a glocalized innovation in their activity. In this regard, the research purpose of this article consists in assessment of the impact of the innovation potential of a regional cluster on development of economy of the region or country. The authors have conducted a case study on the innovation opportunities of a regional cluster – the Petrochemical cluster of the Omsk region. The methodology of this research includes general scientific, empirical, social, practical researches.

The article describes the Strategy of Innovative Development of the Russian Federation, where pointed out benefits of the clustering to national economy and its role in the innovative development of regions and the states. Omsk region is assessed in terms of its innovative attractiveness for Russian and international business. Based on the BCG-matrix, the cluster portfolio of the Omsk region is assessed. It includes both existing and potential clusters. The petrochemical cluster takes the leading place in a cluster portfolio of the Omsk region, so the purposes, benefits and key performance indicators in the innovation aspect are allocated to it. Based on the SWOT-analysis method, an assessment of the innovative potential of the Petrochemical Cluster is given. The main strategies for it are formed taking into account the influence of internal and external factors. In the introduced strategic pyramid of all levels, the interrelation of the innovation strategy of the Russian Federation, the Omsk region and a petrochemical cluster is marked out. In the conclusion aspects of influence of the innovation potential of a regional cluster on the innovative development of the region are revealed.

Keywords—cluster; regional cluster; the innovation potential; glocalisation; glocalisation of innovations; Omsk region; Petrochemical cluster

I. INTRODUCTION

In the modern business environment, a cluster approach is actively implemented in regional development. The

clusterization of the economy is actively implemented in foreign practice, where clusters are the basis for the development of innovative processes. According to world practice, clustering covers more than half of the economies of foreign countries. Most of all, clustering practice is common in the USA, Italy, Great Britain, India and France. In world practice, the number of cluster initiatives is growing. As noted by the European Cluster Observatory, there are currently more than 1080 such projects in EU countries [1]

Currently, there are regional clusters in Russia, some of them are innovative. The clustering reaches the global level, at the same time is localized at the regional level. Therefore, both science and practice to assessment of a role of regional clusters on development of economy at all levels is observed: as at the level of macroeconomic, mesoeconomy, and on microeconomic levels. A large number of approaches, both to interpretation of the term "cluster", and to assessment of its influence is investigated. At the same time the points of view of authors are diverse. We will consider a number of approaches of domestic and foreign science on assessment of a role of clusters in aspect of influence on the innovative development of the region, country.

The Russian authors of I. Kalishenko, E. Povareshchenkova, E. Stepanova claim that activity of clusters is based on use of large volumes of new technologies [2]. U. Smirnova notes the innovation orientation of clusters as one of features, an inherent cluster system [3]. V. Prosalova considers that the benefit of a clustering makes complex impact on regional development [4]. V. Volkov, E. Malitskaya note that clusters are a kernel of the innovation economy of the region.

Foreign researchers analyzing activity of the usual enterprises and clusters, as a rule, come to conclusions that clusters are more inclined to innovations, than the enterprises which are not entering a cluster. K. Byudri and S.Greshi analyzing activity of the cluster and not cluster organizations of Great Britain and Italy, came to a conclusion that the firms which are in clusters are more inclined to innovations, but at the same time the clustering is not an incentive for innovations [5]. A. Malmberg and D. Pauer proved that the companies which are in clusters exchange among themselves knowledge and generate new knowledge that promotes innovations [6]. The innovation component of development of clusters is developed in M. Feldman and D. Audretsch theory according to which clusters promote introduction of innovations in the relevant industry or sector [7]. H. Bathelt notes interaction of participants of the innovation process: the enterprises of a cluster, the research centers and the universities for exchange of information and forming of new knowledge that leads to forming of one of a component of an information process – the innovation environment [8].

The innovation opportunities of a cluster are noted by M. Enright - it is capability of participants of a cluster to create key innovations [9]. Also M. Enright one of the first used the term a glocalisation in economy in relation to cluster approach. M. Enright understands globalization of the competition and localization of sources of competitive advantages of regional clusters as a glocalisation [10]. R. Robertson also considers regional clusters in the context of a glocalisation – the regional scenario of globalization at which global and local processes complement both trends [11].

E. Islankina, E. Fiyaksel develop the concept of a glocalisation in the context of a glocalisation of innovations, noting that internationalization of clusters expands opportunities for reorganization of regional innovations [12]. The OECD allocates possibilities of a regional cluster in the concept of a glocalisation of innovations by means of two interconnected trends: global coherence and local density. I.e., on the one hand it is necessary to consider degree of the involvement of the players having international backgrounds in a regional innovation system, and on the other hand, extents of internal cooperation of participants of a regional cluster [13]. Modern foreign authors [14, 15, 16] mainly assess the innovative potential of clusters through its impact on competitiveness and the characteristics of cluster policy.

II. METHODS

The methodological base of a research was made by theoretical methods of a research of the analysis and synthesis, abstraction, analogy, also empirical methods of a research: studying of references, the analysis of the obtained information; statistical techniques of a research for identification of top trends of influence of clusters on the innovative development of the country, the region.

III. RESULTS

In Russia's Innovative Development Strategy 2020 attention is paid to development of industrial clusters as territories of innovations. In particular, in Strategy aspects of development of territorial and production clusters, including the innovation are considered. Also in Strategy the main benefits of a clustering to economy of the state are allocated: attraction of the direct foreign investments, integration of clusters into world integration communications. In general forming and development of clusters will lead to growth of competitiveness of the enterprises of a cluster and their innovation activity that will promote economic growth.

According to Ministry of Industry and Trade of Russia of November 4, 2018 industrial clusters are created in 28 regions of Russia, in their structure about 1500 enterprises with products production volume more than 1.3 trillion rub a year [17].

The Omsk region is the important industrial center of the Russian Federation in its Siberian and Far East part. The territory of the Omsk region is 1/15 part of Western Siberia. The region is industrially developed territory. In Siberian Federal District on the volume of the Gross regional product the Omsk region takes the 5th place, in the Russian Federation – 31 and makes 1/8 part of total volume of industrial output of regions of Siberia. In general, among all

regions of Russia on the production volume of industrial output the Omsk region takes the 35th place [18].

The Omsk region is investment attractive region in the Siberian region as has a number of competitive advantages: resource, potential production, availability of the operating clusters, the developed scientific and educational complex. At the moment in the Omsk region 2 industrial clusters work: Petrochemical and Agro biotechnology (transformed from the Agro food cluster). It is in the long term going to create the Timber industry cluster. Using a BCG-matrix, we will carry out the assessment to a cluster portfolio of the Omsk region (Fig. 1).

Apparently from a cluster portfolio the leader is the Petrochemical cluster. We will introduce short characteristic of the Petrochemical industrial cluster of the Omsk region which was included in the register of Ministry of Industry and Trade of Russia on December 26, 2016 by order No. 4715. The share of petrochemical production in structure of the industry of the Omsk region makes 78% [19]. The petrochemical industry of the Omsk region contains more than 360 large, medium-sized and small enterprises and the organizations today. Participants of a cluster are 10 industrial enterprises. Main objectives of creation of the Petrochemical cluster are:

- Improving competitiveness and development of industrial potential of participants of a cluster due to their effective interaction;
- Increase in investment attractiveness of the Omsk region;
- Creation of new types of industrial output and also improvement of quality of products, including within import substitution;
- Performance improvement of work on industrial enterprises – participants of a cluster and also creation of new high-performance jobs.

The key indicators characterizing development Petrochemical a cluster are presented in Table 1.

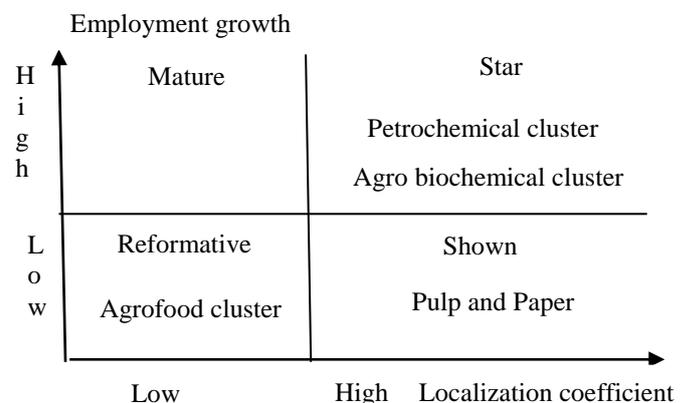


Fig. 1. Ranging of clusters of the Omsk region by the BCG method (cluster portfolio)

TABLE I. INDICATORS OF DEVELOPMENT OF THE PETROCHEMICAL CLUSTER OF THE OMSK REGION.

Key indicators	Petrochemical cluster in 2020 to level 2016
Growth of total amount of the goods of own production, the performed works and the rendered services (own forces) shipped by participants of a petrochemical cluster	not less than for 19 percent
growth of volume of tax and customs payments of participants of a petrochemical cluster in budgets of all levels of the budgetary system	not less than for 11 percent
growth of volume of costs of participants of a petrochemical cluster for research and development	not less than twice
growth of export volume of the goods made by participants of a petrochemical cluster	not less than for 58 percent

It is made on a source [20]

Using the SWOT analysis method on the basis of regional data, we will create the main strategies of development for the innovation activity of the Petrochemical cluster of the Omsk region on the near-term outlook (Table 2)

TABLE II. SWOT ANALYSIS OF THE INNOVATIVE DEVELOPMENT OF THE PETROCHEMICAL CLUSTER OF THE OMSK REGION TILL 2020

	Strengths	Weaknesses
	<ul style="list-style-type: none"> - availability of educational institutions with profile education - availability of the developed production base in oil processing and petro chemistry - transition to production of oil products of light fractions with high value added - accumulation of volumes of production capacities and production volumes 	<ul style="list-style-type: none"> - high capital intensity of projects in the sphere of petro chemistry - not high innovation activity of the petrochemical enterprises of a cluster - insufficient level of the investments directed to updating of production capacities
Opportunities	<ul style="list-style-type: none"> - development of the export potential and import substitution - increase in depth of processing up to world level 	<ul style="list-style-type: none"> - realization joint investment in cluster projects - increase in level of cooperation of participants of a cluster with a scientific capacity of the region and bodies of the regional power

Threats	<ul style="list-style-type: none"> - insufficient capacity of domestic market - high tariffs for electrical energy and transportation of products - high share of import of both basic, and special components 	Strategy by comparison of Strengths and Threats <ul style="list-style-type: none"> - promotion of products satisfying to Euro-5 standard - increase in the international cooperation 	Strategy by comparison of Weaknesses and Threats <ul style="list-style-type: none"> - involvement of the new enterprises in a cluster - development of new technologies
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On the basis of the carried-out analysis, we will introduce interaction of strategy of the innovative development of the Russian Federation, the strategy of development for the Omsk region and the Petrochemical cluster of the Omsk region until 2020 (Fig. 2).

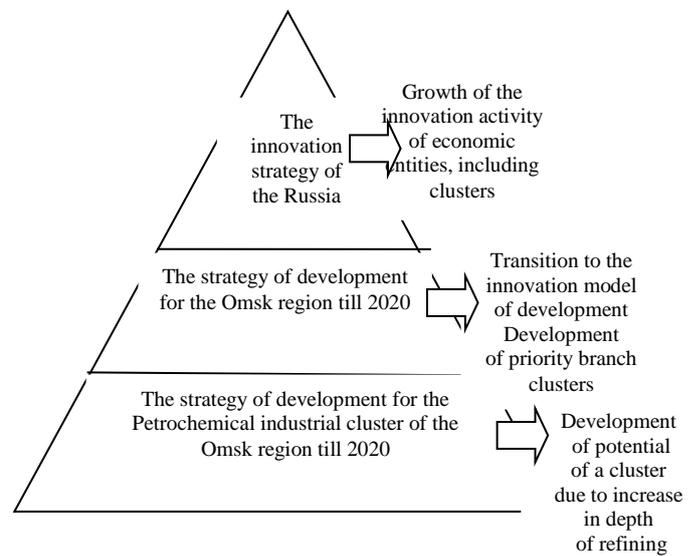


Fig. 2. Interrelation of the Innovation Strategy of the Russian Federation, Omsk region, petrochemical cluster.

IV. CONCLUSION

To conclude, the article substantiates that the innovation potential of clusters has a significant impact on the innovative development of the region, because in the very nature of the cluster laid an innovative component. An assessment of the innovation potential of the clusters of the Omsk region. The main innovation factors that influence regional development are highlighted: the investment attraction, development of investment business climate in the region, digitalization of the region, integration of the industry, science, education with authorities, development of the innovation industrial production and the developed infrastructure, a globalisation of innovations, development of small and medium business, development of the regional market and many other factors.

State and regional policies supporting cluster initiatives contribute to the development of the cluster's innovative potential and the development of innovative processes in general.

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