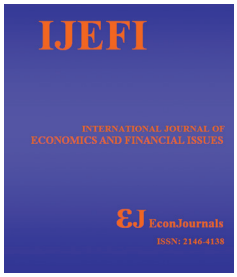

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Innovation Clusters: Advantages and Disadvantages

Vladimir V. Mazur[1], Karine A. Barmuta[2]*, Sergey S. Demin[3], Evgeny A. Tikhomirov[4], Maxsim A. Bykovskiy[5]

[1]Moscow State University of Mechanical Engineering, Moscow, Russian Federation, [2]Don State Technical University, Rostov-on-Don, Russian Federation, [3]Financial University Under the Government of the Russian Federation, Moscow, Russian Federation, [4]Moscow State Forest University, Moscow, Russian Federation, [5]Moscow State Forest University, Moscow, Russian Federation. *Email: carinaba@yandex.ru

ABSTRACT

The main direction of the current economic development is found in a transition of the most civilized countries to a new stage of creating an innovative society, i.e. building the economy based mainly on offering, spreading and using of knowledge. The specific functioning of innovation clusters allowing to create new technologies, implement deep technological modernization and innovative industry development based on personal or adopt technologies, as well as to train personnel for work in the conditions of the current industrial and technological formation, is characterized by the three components: The fundamental, practice-oriented science, innovative industry, and developing education. Along with that, nowadays there is a need to take firm measures not only to revive the innovative activity, but also to make a breakthrough in this area. Therefore, it is necessary to provide the state-of-the-art mechanisms to increase the innovative activity of domestic high-tech innovative economy based on the cluster approach, cluster initiatives.

Keywords: Innovation, Cluster, Disadvantages, Creation, Advantages, Economy
JEL Classifications: O30, A11, A10

1. INTRODUCTION

The concept of a cluster is a concentration of innovative-active organizations of a state. The innovative activity counts the practical focus of firms on innovative development (which, in turn, is understood as a continuous improvement of the competitive advantages due to different types of innovations, as follows: Technological, organizational and marketing) (Arzhakov and Silnov, 2016).

The degree of innovative activity is the most often determined by the indexes of R&D expenditure level and number of granted patents (filed applications for a patent). The high potential of innovative activity also requires the involvement of scientific and educational community in the activities of a company and firms combined into a single innovation cluster.

The base and development of an innovation cluster net, as a way to implement the competitive potential of subjects, is one of the points of long-term socio-economic development Conception of the Russian Federation before 2020.

It is relevant to implement the effective cluster policy, because it is primarily important to have an innovative type of education of the Russian economy and to maintain the high level of competitiveness due to the unstable international business situation (Zeitlin, 2004).

Execution of cluster projects is one of the strategic objectives of many territorial entities of the Russian Federation, as it contributes to the economic development of regions and increases the level of innovative development of enterprises which form a cluster.

Nevertheless, the most significant objective for the subject development is to determine the implementation level of developed cluster projects, to measure their effectiveness and impact on the subject well-being. The objectives of the article are to study the key features of the cluster policy of the Russian Federation and

to determine positive and negative cluster policy impacts in the innovative potential forming of domestic economy.

2. THE BENEFITS OF CLUSTERS, FACTORS AND PROBLEMS

Increasing competitiveness through cluster initiatives is becoming a basic element of the vast majority of countries development strategies. Analysis of more than 500 cluster initiatives implemented over the last 10 years twenty countries, shows that the high competitiveness of these countries is based on the strong positions of individual clusters – competitiveness locomotives. Actively the process of cluster formation in Southeast Asia and China, in Singapore (in the field of petrochemicals), in Japan (automobile) and in other countries ("The Benefits of Clusters, Factors and Problems," 2014). In China today, there are more than 60 special zones clusters in which there are about 30 thousand. Firms with 3.5 million employees. People and the level of sales of approximately $200 billion USD per year.

Studying the experience of developed countries shows that innovation clusters have a greater ability to innovate due to the following key advantages:

1. Unlike traditional industrial innovation clusters represent a system of close relationships not only between companies, their suppliers and customers, but also to institutions of knowledge, including research centers, universities, scientific research institutes. As a generator of new knowledge and innovation, they provide a high level of competitiveness. The innovation process includes suppliers and consumers, as well as companies from other industries, and as a result of inter-firm cooperation on R&D costs are reduced;
2. Subjects of companies – participants of the innovation cluster, especially SMEs, are able to more accurately and more quickly respond to customer needs. Participants cluster facilitated access to the new technologies used in various areas of economic activity;
3. Cluster structures create positive effects not only for the cluster association and its members, but also for the home regions: An increase in employment, the growth of wages and profits, intensification of entrepreneurial activity, etc (Press, 2006). Cluster structures provide economic growth for the region as a whole, not only for cluster members, improving the welfare of the entire population, acceleration of regional scientific and technological progress, improving the regional innovation system;
4. The subjects of the firm in the cluster are under intense competitive pressure, which is exacerbated by the constant comparison of their own business activities with those of similar companies;
5. Ability to coordinate efforts and financial resources to create new products and technologies, and output them to the market (Nafziger, 2012). Within the cluster, it is possible alignment of supply chain, from product creation to its production and to market;
6. The establishment within innovation clusters mainly export-oriented products and technologies, i.e. intra-cluster competitive advantages are significant on an international scale;
7. State participation in the formation of cluster strategies. If the initial clusters are formed only due to the "invisible hand of the market", especially when upgrading TNCs in recent years, many governments began to "grow" their own initiative in the framework of public-private partnership, giving this process a tangible material and moral assistance;
8. Creating a sustainable distribution system of new technologies, knowledge, products, so-called technological network, which is based on a joint scientific base;
9. Ability to carry out internal specialization and standardization, minimizing the cost of innovation;
10. The presence of the system of innovation clusters of flexible business structures – small businesses, competing in the production of creative ideas that allow grope innovative points of growth of the regional economy;
11. Regional and local clusters of small firms provide a high degree of specialization in servicing a particular business niche, because it provides access to capital for industrial enterprises, other resources, and actively going exchange of ideas and knowledge transfer from scientists to businessmen.

Thus, the presence of cluster structures in the regional economy can successfully combine the interests of business, government, science and education, which, in particular, explains the popularity of this approach to the development of the regions in accordance with the December (14.12.2012) Message of the President of the country "strategy-2050" and his keynote address (25.12.2012), dedicated to the Day of industrialization.

In terms of history it should be noted that the founder of innovative clusters is considered to be the US Silicon Valley, in the territory of which there are about 87 thousand companies, 40 research centers and a dozen universities, the largest of which is Stanford. Between universities and the private sector here is adjusted constant exchange of information and "charged" pioneering spirit people. Serve cluster of about a third of US venture capital companies (180 companies), 47 investments and 700 commercial banks, which are somehow finance the activities of companies. This amount of innovation has allowed Silicon Valley to become the leader of the country's exports, and accounts for 40% of export trade in California. In the world technology try to repeat the success of the valley, up to the imitation of the names: Silicon Plateau in Bangalore (India), Silicon Island in Taiwan, Silicon swamp in Israel.

The analysis shows that the cluster model of organization of innovation leads to the creation of an innovative product. This innovation is the product of joint activities of business entities, which allows them to speed up the dissemination of the network relationships in general regional economic space. In addition, a variety of different sources of technological knowledge and relationships facilitates the combination of factors in achieving competitive advantage and becomes a prerequisite for innovation. Combining in innovation cluster based on vertical integration

forms not spontaneous concentration of various technological inventions, and certain system dissemination of new knowledge and technologies. At the same time the most important condition for the effective transformation of inventions into innovations is to create a network of sustainable partnerships between all cluster members.

The advantage is also the cluster coverage effect that arises when there are factors of production, which can be used both for the production of several types of products. The nature of this factor is multifunctional. And in clusters coverage effect is greatly enhanced, as there is a possibility to use multi-factor at various enterprises while minimizing the costs associated with its transmission. In addition, the innovative cluster structure helps reduce the total cost of the research and development of innovations by increasing the production structure effect, which allows participants to cluster consistently innovate.

In recent decades, many governments develop a "cluster model and strategy," the purpose of which is the realization of the benefits of its national economy, and not copying other people's achievements. Formation and development of national clusters contributes to the effective integration of intellectual and financial resources, both inside and outside the cluster. Thus, the cluster model are combined not only industrial, but also a new generation of innovative business. The points of growth are not only companies, but also centers of innovation and knowledge, research institutes and universities, serving and infrastructure entities (Burtenshaw, 2006). It is important that the cluster is achieved primarily through the synergistic effect of the business relationship, science and government.

Clusters contribute to the development of regional and national economies, due to the following provisions:

1. The relationships within the cluster lead to new methods of competition that contributes to the creation of innovation.
2. Clusters create the conditions for the formation of regional innovation systems.
3. Clusters act as "growth points" of the domestic market and international development for the whole country or the region's economy. The presence of a cluster of industries accelerates the creation of competitive advantage factors, the process through joint investment in the development of technology, information, infrastructure, and education.
4. Relationships within the cluster ensure the development of outsourcing, where small and medium-sized enterprises producing products, works and services for the key stakeholders of the cluster, thus contributing to the business development in the region.
5. The competition between producers in the cluster leads to greater specialization, finding new niches and expand the cluster, resulting in the formation of new businesses, thus increasing the profitability of regional production, solve the employment problem and reinforces the integration potential of the region.
6. Clusters are one of the forms of institutional provision of cross-border cooperation in trade, agriculture, tourism, transport, infrastructure, which contributes to the economic development of border areas.

3. DISCUSSION

Cluster formation in general is set as a process of an organized integration of independent enterprises and other active participants, cooperation around the determined functional niche and as a determination of close relationships and labor unions to increase their collective competitiveness.

There are such types of clusters as innovative, industrial, and regional. Scientists peculiarly define the essence of cluster communities. Some scientists determine the geographical concentration as a main characteristic of a cluster, while other researchers consider a sectoral affiliation or an innovative orientation as the main feature of a cluster.

In the current economy, innovative determination is becoming the main characteristic of the current clusters, because it determines their competitiveness.

An innovation cluster is an informal union of various organizations (industrial companies, universities, research centers and laboratories, bank and non-bank credit organizations, investment and innovative companies, venture capital funds, government bodies, social organizations, etc.) allowing to use the advantages (Koloshin et al., 2009) of the in-house structure and market mechanism. That has the potential to distribute new knowledge, scientific discoveries and inventions more quickly and efficiently.

The innovation cluster involves the continuous cycle of "research – development – production – use."

An innovation cluster is such an organizational form which leads to the creation of a particular form of innovation, i.e. "the total innovative product." This innovation is a product of several firms or research institutes, that allows to bring closer their spreading through the net interconnections in the common economic space of a region, state and world community.

The sustainable development of these clusters significantly depends on the access to the up-to-date sources of scientific knowledge and state-of-the-art technologies. It also depends on the concentration probability of significant volumes of financial resources. The decisive role in the innovation orientation process of a cluster plays the existence of civilized infrastructure of intellectual and financial capital.

The interaction within an innovation cluster is performed through vertical and horizontal connections. It is the cooperation within a cluster and the ability of its participants to effectively use internal and external resources which determines the competitiveness of the entire innovation cluster.

A union involved in an innovation cluster creates a particularly oriented distribution system of new knowledge, technologies and innovations.

At the same time, the net formation of permanent and stable relationships among all the participants of a cluster is an important

condition for the effective transformation of inventions into innovations and innovations in the competitive advantages (Aniskin et al., 2015).

Innovation activity clusters create a new product or service by means of combined companies or research institutes that makes it possible to speed up their distribution through the business relationship net (Kimelman, 2010; Silnov, 2016). The cluster structure, namely, the cooperation, contributes to reducing of the total research and development of innovations and their subsequent commercialization due to the high efficiency of production and technological cluster structure. It allows participants of a cluster to organize a stable innovation activity of the production cycle for a long time.

Well-functioning innovation clusters focus an innovation process, and the participants of a cluster form the advantages as follows: The innovativeness, business rationalization, faster productivity growth, etc.

The most successful innovation clusters are developed where a breakthrough in engineering and production technology followed by the access to new market niches is implemented, or expected.

According to Oreshnikova, one of the hallmarks of innovation in the XXI century will be their environmentalization, i.e. a focus on the rational use of natural resources and reduction of environmental pollution (Oreshnikova, 2010).

The man-made human impact on the environment is strong enough that the natural systems in the biosphere cannot self-reproduce and operate without environmental innovation.

Based on the above advantages of an innovation cluster as a part of the domestic economy development and the industrial relationship development we should note the positive aspects of innovation clusters.

Firstly, they are based on the formed permanent system of state-of-the-art technologies, knowledge, products, so-called technological net, which is based on the collective scientific base.

Secondly, cluster enterprises have additional competitive advantages due to the ability to implement internal specialization and standardization and to minimize the innovation cost in production processes.

Thirdly, innovation clusters are important for small business building: They provide small businesses a significant degree of specialization in servicing of a specific business niche, because the access to capital of industrial enterprise is easier, and there is an active exchange of ideas and knowledge from experts to entrepreneurs, from companies to enterprises, from businesses to the state.

However, clusters are not an ideal element for the economy because the list of advantages may be continued by the list of innovation cluster disadvantages, as follows (Petrov, 2010):

- The excessive concentration of enterprises in domestic relationships and environmental conflict beyond the cluster may lead to technology obsolescence and decrease of their competitiveness in the domestic and foreign markets;
- The cluster's reserved character may cause the elasticity reduction of participating enterprises;
- The absence of competitors in an isolated cluster "destroys" the need for constant updating of the production and sales process;
- The uniqueness of each cluster leads to considerable complication of efficiency assessment of its functioning, because there is no opportunity for comparison with other clusters;
- The correlation between the entire cluster consequences and the performance of its each member.

The world experience shows that the regions on the territory of which innovation clusters are developed hold the leading positions, acting as the concentrated forms of economic activity, carried out in close cooperation with the infrastructure knowledge.

The works of different scientists show that the uniqueness of the current economy is a creation of strong innovation clusters (Meng, 2005; Gitelman et al., 2014; Tkachuk et al., 2015; Babkin and Novikov, 2016). Today, many countries use the cluster approach to deal with micro- and meso-economic processes.

The main priority of the current economic policy is to construct a national innovation system, taking into account the cluster nature of the competitive industries.

Leaders of many countries and world regions direct their efforts to build innovation clusters on their territory. At the same time, the cluster approach fundamentally changes the structure of the state industrial and innovation policy: The efforts of national governments are not directed to support some enterprises and industries of the economy, but to form the relationships between suppliers and customers, end-consumers and producers, producers and state institutions.

4. RESULTS

Clustering of the domestic economy is not an entirely new mechanism of innovative development and is more a prototype of the territorial-production complexes built in the command economy.

Cluster formation in the Russian economy, in fact, is a "clone" of the territorial-production approach to the productive force implementation in the country. The current domestic economy has a particular formation experience of similar structures, but in the conditions of the establishment and development of the national innovation system.

The clustering process is becoming particularly important and is considered to be a formation mechanism of the regional innovation systems which generate a national innovative system.

The mechanism of the cluster formation in a region is implemented on the basis of the joint efforts and competences of different participants, among which there are industrial enterprises in the production and processing of raw materials, commercial sales and marketing organizations, service companies in the field of logistics, finance, consulting, scientific-research and teaching-educational institutions, management and regulatory organizations.

The isolated actions of all members of a cluster are consolidated in one direction to obtain the best results, involving a significant level of competitiveness in the domestic market.

Clusters conduct business not only by means of the effective mechanism for regional development, but they also create the conditions for effective cooperation between business, science and government.

Practical experience shows that the highest level of the domestic market competitiveness is purchased due to innovation cluster formation.

The main role in the innovation cluster organization plays the integrative cooperation of scientific and educational enterprises with industrial enterprises with the government agency support.

The most effective clustering process is carried out in the regions which actively create the innovative infrastructure to support the industrial potential of scientific-innovative and educational potential.

5. CONCLUSION

Thus, if innovative clusters are present in a country, region, territory or any other formation, it changes the content of economic policy, when efforts are directed towards not to support individual enterprises, but to develop a system of relationships between active participants of the economy and state institutions.

Economic policy should be directed towards the competitive advantages through the development of innovation clusters as an effective implementation mechanism.

Innovative cluster policy is a master plan for the innovation development, where not only the initial industrial configuration, which is based around the new regional key technologies, should be shown, but also a particular system of developing industrial and technological schemes, taking into account resource, infrastructure, and market conditions.

An innovation cluster is a dynamic system which provides self-development on the basis of performance of the synergistic effect. Promoting the development of the initial net system in a state to get the innovative production, the cluster policy should determine the character of technological progress at certain stages, creating conditions for the research base development and increasing the educational potential. One of the priority directions of innovation cluster development should be a creation of innovative business that can implement breakthrough technologies, both in the domestic and foreign markets.

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