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Clustering of Modern Industrial Enterprises as a Criterion of Successful Activity

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Abstract: It should be noted that the cluster development of the economy is a business tool. Market oriented society that creates rules for the activities of its business entities through laws, relationships, banking sector, support institutions, etc. Therefore, the cluster existing in the framework of these rules, is nothing else, as a specially organized space that allows you to develop successfully large firms, small enterprises, suppliers (equipment, components, specialized services), infrastructure, research centers, universities and other organizations. It is important that the cluster is achieved primarily synergistic effect, since the participation of competing companies is mutually beneficial. Clusters can be identified as a group of firms-participants of a particular market associated on the basis of long-term contracts with the aim of efficient use of resources and specific advantages for joint implementation of business projects. Using primarily horizontal communication, specialization and complementing each other, they are able to achieve better results. A distinctive feature of cluster – targeted business activities. Within the cluster together not only production, but also innovative business, a comprehensive quality control of products and service.

Keywords: cluster, cluster management, enterprise, territorial and production cluster, globalization, innovation

JEL Classification: P25, P28, R1, R12

INTRODUCTION

A cluster is a group of geographically localized interconnected companies, suppliers of equipment, components, specialized services, infrastructure, research institutes, universities and other organizations

complementary to each other and reinforcing the competitive advantages of individual companies and the cluster as a whole.

In the classical sense of “a cluster is a geographically concentrated group of interconnected companies, specialized suppliers, service providers, firms in related industries, as well as related to their work organizations (e.g., universities, standards agencies, and trade associations) in particular fields that compete, but also leading joint work” (Andersson, 2004).

Thus, in order to be a cluster, a group of geographically neighbouring interconnected companies and related organizations should act in a certain area, characterized by common activities and to complement each other. Today, the application of the cluster approach is regarded as one of the most effective ways of development of territories.

The development and importance of sources of competitive advantage determine the stage of development of competition and models of economic growth of States, regions and enterprises. Industrial enterprises provide the basis for consumption and increase national wealth, therefore, in a market economy there is a great importance their competitiveness. In General 3 different broad definitions of clusters, each of which emphasizes the main feature of their functioning:

- limited forms of regional economic activity within related sectors, usually linked to the different scientific institutions (research institutes, universities, etc.);
- vertical industrial chain, narrowly-defined sectors in which adjacent stages of the production process form the core of the cluster (e.g., chain “supplier-producer-marketer-client”). This category is network formed around a parent firm;
- industries are defined at a high aggregation level (for example, “chemical cluster”) or set of sectors at an even higher level of aggregation (for example, “agro-industrial cluster”).

With the system approach, a cluster is a set of entities are interrelated in various industries, combined into a single organizational structure, which elements are in interrelation and interdependence, functioning together for a specific purpose. The formation of effective technological chains of several independent business entities is a strategic event that requires certain long-term investments in their implementation, and possible only through their self-organization results from the interaction of assumptions prevailing both inside and in the external environment of these potential systems. Such interaction should result in additional benefits for each of the subjects, to create a specific stimulus to the formation of a unified system of functioning, to ensure an integrated system.

LITERATURE REVIEW

The category “cluster” is borrowed in the English language. Its active use in the Russian economic literature began in the 90-ies of the last century and due to the translation into Russian language of the work of Nobel prize winner Michael porter (Harvard business school), became the founder and promoter of the theory of clusters and cluster development (<http://dictionary-economics.ru>). However, some of the Soviet and Russian economic-geographers (A.P. Gorkin and L.V. Smirnyagin), the Swedish specialists in business administration (K. Fredriksson and L. Lindmark) in the 1970s. the term “cluster” was used to refer to clusters of enterprises in space.

A significant contribution to the development problems of formation and development of integrated corporate structures of various types made by domestic and foreign scientists: I. Ansoff, S. Batchikov, P. Drucker, G. B. Kleiner, O. Williamson, P. Waterman, etc.

Problems of formation of industrial clusters studied N.M. Kosov, O.I. Zhdanova, V.Ya. Zakharov; innovation clusters – G.B.Kleiner, A.M. Sergeev, E.A. Lurie, N.I. Zakharov, G.N. Stashevskaya, V.V. Spitsin.

The processes of development of regions and individual industries and complexes in the regional economy in their works considered N.T. Agafonov, A.S. Barabanov, N.N. Baransky, V.F. Basargin, A.G. Granberg, E.S. Gubanova, V.G. Prudsky, A.N. Pytkin, V.M. Hodachek, A.N. Chistobaev, I.S. Kobersy, D.V. Shkurkin, V.S. Novikov, etc.

The functioning of industrial-construction sector and identify ways to improve its effectiveness highlighted in the works including T.Ch. Amaliev, A.N. Asaul, Yu.P. Panibratov, etc.

The role of cluster strategy is reflected in scientific publications M.A. Aksenov, L.G. Iogman, V.V. Ilyina, T.V. Uskova.

The development and implementation of cluster policy dedicated to research, I.V. Pilipenko, I.B. Kosarev, A.N. Margolin, G.A. Yasheva.

Based on the study of foreign and domestic experience of formation and functioning of clusters, it is possible to offer recommendations for the implementation of the economic policy, improvement of state regulation of regional construction cluster. The cluster in the current economic conditions is becoming an important tool for ensuring the rational development of the region.

MATERIALS AND METHODS

Methodological foundations of cluster theory were laid by M. Porter. Among the foreign studies on this issue are the work of T. Andersson., A. Marshall. Despite the fact that the study of the cluster approach to the integration of industrial enterprises has recently been given much attention, this problem remains relevant and understudied.

The issues of integration of business structures are reflected in the writings of O.S. Vikhansky, I.N. Gerchikova, P.A. Fatkhutdinov, V.M. Yuriev.

At the same time, it should be noted that studies of domestic scientists, in their majority, are based on foreign experiences of practical integration, which requires some clarification of the categories and techniques to the Russian reality.

Theoretical-methodological base of research is the dialectical approach to the study of various phenomena and regularities of the development of socio-economic relations in the conditions of market economy formation (Pries & Janszen, 1995).

Used set of techniques and methods of scientific knowledge of socio-economic phenomena and processes. Among them, the specific historical, systematic and goal-oriented approach, statistical methods, factor, financial and comparative analysis, methods of control theory.

Widely used the works of the classics of economic theory and contemporary Russian and foreign researchers on the issues addressed in the study (Shumakov, Troitskiy & Silnov, 2017).

Information base of research was made the official statistical data of Federal state statistics service of the Russian Federation, materials of periodicals, the results of research carried out personally by the author regarding financial and economic activities of industrial enterprises, including internal local information.

Among the sources of information used in scientific publications and books, Russian and foreign specialized periodicals and reference books, materials of scientific reports and papers, conferences, seminars, hearings, round tables on the subject of the State Duma of the Russian Federation, Ministry of industry and energy, Ministry of economic development and trade (MEDT), the Ministry of natural resources of Russia, data of companies and research institutes.

DISCUSSION

Cluster as a Factor of Economic Development. Any organized system tends objectively to strengthen its integrity, since the weakening of the connections and relationships forming between its elements (subsystems) lost the overall goal, order and hierarchy that distinguish the system from a simple aggregate of any things or phenomena. Association of economic subjects, deepening of their interaction, the development of the relations between them are defined as economic integration (from Latin integer “whole one”). It can be argued that integration is the main trend in the development of the world economy and its macro-, meso-, micro - and munirovna.

With all the numerous kinds of economic integration discussed in research depending on the subject composition of the participants in the process, stands out:

- territorial (inter-state, inter-regional) integration initiated by the Central and local authorities and management;
- production integration, an initiative of the enterprises and organizations of the subjects of entrepreneurial (economic) activities.

And territorial and industrial integration does not rule out the emergence and interaction of combined forms of cooperation. On this basis, the economy receives an impulse, on the one hand, to maintain equilibrium, on the other - to self-development. This is evidenced by the experience of the European Union (EU), North American free trade area (NAFTA), Common market of the South (MERCOSUR) and the TRANS - and multinational corporations and other entities, territorial and industrial integration.

Production integration in the modern sense is not a new phenomenon. Actually the beginning of the process was laid out in the last third of the XIX century, when was vykristallizovyvalas trend towards the concentration of production and capital on the basis of merging the individual companies and development of corporate forms (Tyson, Petrin & Rogers, 1994). This was due both to the need for consolidation of production structures, in order to more effectively apply new techniques, technologies, energy sources (technical background) and narrowing of spheres of free capital and increased competition (economic background).

Historical development of the integration is not limited to alternation of forms. She has come a long evolutionary way of development, which included a cartel - typical forms of monopoly contrary to the basic principles of the Antimonopoly legislation; corporations, characterized by a common property of the participants; consortia – groups of participants based on the target agreement on joint activities to

implement a unified project; holdings as a coherent, unified scientific-technical and economic policy (Tece, Rumelt, Dosi & Winter, 1994); financial-industrial groups – organizational and economic entity, with clear-cut dominant link that determines the overall strategy and the functional traits of industrial and financial capital; the cluster form of integration, aimed at creating the industrial base to increase competitiveness, high productivity and economic growth.

However, the natural conflict of objectives of the participating enterprises and organizations is one of the main reasons for the low degree of intensification of integration processes. And here to the fore the problems of the formation of sustainable competitiveness. It is obvious that the competitiveness is determined by a number of microeconomic, macroeconomic, social and cultural factors and features. A detailed analysis of the competitiveness factors conducted in the work of a Professor at Harvard business school, Michael porter “Competitive advantage of Nations”, first released in 1990. Under the influence of the theory of M. porter in many countries in improving the structure of the economy has been used the cluster method in industrial organization (Porter, 2000).

Under the cluster is a network of independent production, infrastructure and service firms, including suppliers, the creators of the technology and know-how (universities, research institutes, engineering companies, etc.), binder market institutions (brokers, consultants) and consumers interacting with each other within a single value chain.

Since the mid 90-ies of studies on the competitiveness of clusters, have become widely held by the scientific community, in particular within the European Union. Cluster analysis methods are constantly being improved. In consideration of the structure of the clusters, scientists have shifted from expert assessments to the use of tables “expenses – output”, greatly improved the methods of predicting absolute values. However, visualization of cluster structure and competitiveness factors remained the same - a few modified models based on the works of porter.

At the end of 2003, according to the study, World Economic Forum, 1st place in a rating of perspective competitiveness of Finland won, overtaking such leading industrial powers, such as USA, Japan, UK. Russia in this rating takes only 70-e a place, the study was conducted among 102 countries of the world. Successful experience of our Northern neighbor can be useful for organising own priorities for economic policy and corporate strategies.

Disadvantages of cluster. In addition to the above advantages of clusters, we can talk about their shortcomings.

As stated earlier, a cluster is a form of boosting competitiveness within the same country, in the international market. As a result of increased competition from foreign producers increases the elasticity of labor demand in clusters, which can lead to the stagnation of wages or increasing unemployment (Doronina, 2016).

As practice shows industry clusters, sometimes relationships within clusters may become “too close”, and then, with extensive collaboration with government agencies, ie state regulation of clustering is, in most cases, can lead to corruption in the bureaucratic ranks. In addition, the formation and operation of clusters may lead to conflict between the individual related ministries and agencies (Somova, 2010).

One of the pitfalls of public administration lies in the fact that the General policy and activities of individual departments are not consistent with each other and lack continuity. Sometimes the result is that one Ministry publishes rules and regulations that are contrary to the rules of the other related ministries.

In addition, focusing on cluster development, it is necessary to consider side effects such as the possibility of blocking effect companies, i.e. it is not excluded that a single company will be more competitive compared with cluster (Isbasoiu, 2008).

There is also a potential threat of excessive “brandization” cluster. The process of brandization of the term “cluster” should be given special attention, as in most cases the notion of a cluster is automatically perceived as competitive. That is why many regions are actively using the brand.

We can highlight the following pitfalls of clustering:

- Vulnerability. Specialization can cause the vulnerability of the region. Technological discontinuity may undermine some of the benefits of the cluster.
- Effect closure. Excessive reliance on local contacts and tacit knowledge in combination with neglect of external linkages and lack of foresight may explain the effect of isolation, due to the predominance of well-established practices.
- Inflexibility. Hard existing structures risk delaying a radical reorientation or to prevent the necessary restructuring.
- Reducing competitive pressures. Cooperation can cause a reduction in competitive pressures and hence driving forces of innovation.
- Syndrome of self-sufficiency. Getting used to past successes, a cluster may not be able to recognize changing trends.
- Domestic downturn. As social capital can be required for the formation of the basis for the development of clusters, the latter may undermine and even destroy the social fabric that underpinned it.

Examining the relationship of cluster members, it is impossible not to accept that, focusing only on internal relations, the subjects of cluster risk not only the loss of independence, but, in the case of cluster, the lack of reliable economic agents (Silnov, 2016).

The syndrome of self-sufficiency, in our opinion, an acute problem of clustering. Clusters, being a form of competitiveness, implying in most cases, major scientific activity, the creation of new technologies and innovation in General. The syndrome of self-sufficiency, however, hinders, if not stops, the scientific activity of the cluster, and this, in turn, there is a deceleration of technical progress. Decrease in competitive pressures as a lack of cluster, in my opinion, is closely associated with the syndrome of self-sufficiency of the cluster.

Thus, the identified main shortcomings of the clustering, the removal of which should be an important part of the cluster policy in any region or the country as a whole.

Clusters in the Federal legislation. The legal definition of “cluster” in the Federal laws is missing. This fact is explained by the fact that laws often are accepted by the legislature with some delay in time from the moment of occurrence of those social relations that they later regulate (Sergeev, 2008). The

existence at present of the relations connected with the creation and development of clusters of enterprises is confirmed by the fact that the term is actively used in the sectoral regulations of the Russian Federation. Here are just a long time of them:

1. The decree of the RF Government dated 23.04.2010 No. 282 “On the national nanotechnology network”;
2. The decree of the RF Government from 17.11.2008 No. 1662-R “On the concept of long-term socio-economic development of the Russian Federation for the period till 2020”;
3. The decree of the RF Government from 17.11.2008 No. 1663-R “On approval of main directions of activities of the government of the Russian Federation for the period till 2012 and the list of projects to their implementation”;
4. The decree of the RF Government dated 01.10.2010 No. 1660-R “On approving the concept of the Federal target program “Development of pharmaceutical and medical industry of the Russian Federation for the period until 2020 and further perspective”;
5. The order of the Ministry of industry and trade of the Russian Federation dated 23.10.2009 No. 965 “On approval of the Strategy of development of pharmaceutical industry of the Russian Federation for the period till 2020”;
6. Order of the RF Ministry of economic development dated 16.02.2010 No. 59 “On measures for implementation in 2010 of measures on state support of small and average business”.

In particular, the documents contain the following definitions:

- research and production cluster - negotiable form of cooperation between organizations providing and carrying out purposeful activity on development, production and promotion of nano-industry production of internal and external markets of high-tech products;
- pharmaceutical cluster is a group of geographically localized interconnected innovative companies – developers of drugs, manufacturing companies; suppliers of equipment, components, specialized services; infrastructure: research institutes, universities, technology parks, business incubators and other organizations complementing each other and reinforcing the competitive advantages of individual companies and the cluster as a whole. The hallmark of effective clusters is the output of innovative products;
- centers of cluster development of subjects of small and average business is created in order to facilitate decision-making and coordination of projects for development of innovative clusters of small and medium enterprises and increasing the competitiveness of the region-based innovative clusters corresponding and cooperative interaction of cluster participants with each other.

In addition, these documents are widely used the terms “territorial innovation clusters”, “innovative high-tech clusters”, “formation of industrial clusters”, “high technology clusters”, “technology clusters”, “profile innovation clusters”.

The relevance of the development of cluster forms of interaction of the enterprises is confirmed by the desire of the Federal Executive authorities to build and develop clusters of enterprises based on their own recommendations.

Thus, the Ministry of economic development of Russia has issued guidelines on the implementation of cluster policy in the constituent entities of the Russian Federation (letter dated 26.12.2008 No. 20615-AK/D19), which aims to promote the development of cluster initiatives in the regions of Russia. Guidelines prepared taking into account the Concept of long-term socio-economic development of the Russian Federation, the approved order of the Government of the Russian Federation of 17 November 2008 No. 1662-R, and contain the principal provisions regarding the implementation of cluster policy in regions of Russia.

According to the document, regional clusters (clusters) - an Association of enterprises, suppliers of equipment, components, specialized production and services, research and educational organizations, linked by relations of territorial proximity and functional dependence in the sphere of production and realization of goods and services. The clusters can be located on the territory of one or several subjects of the Russian Federation.

Clusters and joint projects. The lack of formulated in the law of cluster definition led to the fact that in some cases the Executive bodies of state authorities prefer to use their instruments better known practice, the notion of “joint projects”. These documents in Moscow are:

1. The Moscow Government resolution dated 09.09.2008 No. 818-PP “On approval of the Regulations on the procedure of granting at the expense of means of the Moscow budget subsidies to implement measures for the development and support of small and average business in the city of Moscow”;
2. The Moscow Government resolution dated 29.12.2009 No. 1471-PP “On measures for support of subjects of small and average business in innovative sphere in the city of Moscow for 2010-2012”.

Comparing the above definitions of a cluster with the order of regulation of relations connected with the implementation of joint projects, leads to the conclusion that these concepts are identical. This is indicated, in particular, the analysis of the following formulations used in these regulations:

1. Subsidies for implementation of joint projects provided for the following purposes:
 - creation and development of the complex infrastructure (business incubators, techno parks, technology transfer centers, centers for collective use of equipment, industrial parks, etc.);
 - creation of new types of innovative products of enterprises participating in joint projects (market analysis of technologies, acquisition of patents and licenses, research and development, preparation of production, etc.); information and marketing promotion of products produced in the framework of implementation of joint projects, including regional and overseas markets (the creation of information resources, participation in exhibitions, carrying out of marketing researches, development and promotion of a collective brand is a joint project, to inform the state customers on the benefits of using innovative products, created in the framework of implementation of joint projects, etc.) (Arzhakov & Silnov, 2016);
 - other necessary for the development of joint projects of the event.
2. The experience of recent decades shows that the competitiveness of high-tech industries achieved only through close cooperation between scientific, infrastructural, operational, financial and marketing

organizations that provide within a narrow specialization, high production efficiency, against the background of mobility, upgrade of production capacity and product range (Mingaleva & Tkacheva, 2009). The most rational form of such unification are the enterprises of small and medium enterprises, which implement joint projects combining all kinds of the above organizations into a single body for the production of specific high-tech products.

CONCLUSION

A distinctive feature of the cluster is the occurrence within it of a number of positive effects, providing the comparative advantage of the forms of organization of inter-firm relationships. First and foremost is the effect of scale, which is based on the presence in the person of one of the firms in the cluster core innovation activity. Another beneficial effect characteristic of clusters is the effect of coverage. In the General case, it occurs when the existence of the factor of production that can be used simultaneously to produce multiple types of products. Grouping of firms in the cluster the effect of the coverage is greatly enhanced, since it allows the use of such a multifunctional factor in a variety of enterprises with minimal transaction costs associated with its transmission.

The third positive effect of the cluster is a synergy effect, which occurs, for example, with General standardization of products. Under the action of these three effects (scale, scope and synergy) non-profit enterprises of cluster can overcome the lower bound of profitability through specialization, providing increase of productivity and reduction of cost of goods produced. Thus, the cluster companies gain additional competitive opportunities.

In addition, with the innovation cluster related to the concept of the so-called trigger effect. It occurs when for implementation of a primary innovation or the primary production needed to produce a lot of expensive secondary changes, resulting in profit from the basic innovation or production may be even less than the cost of the required reorganization. From the individual firm's risk of this effect is quite large. In a cluster, firms can minimize the cost of such secondary changes, allowing them to implement a variety of technologies. Thus the characteristic for the cluster communication network creates particularly favorable conditions for their rapid proliferation.

The basis for the development of a clustered network of relations is historically the region's production structure. Large companies usually establish small and medium-sized firms, the relations of supply, which is fast enough to introduce technological innovations, contributing to overall economic growth. But a dominant position on the market large companies may hinder the development. Most of these companies completely control the infrastructure and political institutions of the region, as a small business they need only as a supplier of intermediate products and components. It is with this type of networks is linked to almost all determinants of the stagnation in traditional industries.

In turn, the cluster inter-firm cooperation, stimulating innovation and productive activity, require the mainly horizontally. This allows the use of flexible specialization, facilitates the conclusion of contracts and contributes to the acceleration of diffusion of innovation.

The members of the cluster by combining the resources contribute in the form of cash, technology, patents, trademarks (including franchising), know-how, qualified personnel. Thus they carry out regular consultations in order to determine what resources are needed for joint projects that is required for their

effective use, what is the distribution of costs and benefits. But they remain completely independent in other areas of research and production activities.

Such cooperation can significantly reduce the risks of its participants, expanding resource opportunities, including through the use cooperate the parties the qualifications and competence of partners, leading to cost savings on research and development by eliminating duplication and increasing productivity.

It can be argued that clusters of related firms and organizations conducting research and development to minimize or for a certain period to completely remove such impediments in the implementation of innovative and production activities, as resource deficiencies, lack of motivation, conflicts of interest, poor communication and possible lack of confidence.

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