

SCIENTIFIC PRECONDITIONS FOR THE DEVELOPMENT OF CLUSTER RELATIONS

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Abstract: *The author studies the specific features of formation of cluster structures, which allow to identify economic and social preconditions for the emergence and development of cluster relations. The development of any cluster formation should be viewed as the process of interaction between opposite sides and trends arising from the intrinsic characteristics of these opposites. The author considers that cluster relations should be viewed as a system of relations on the formation and use of all types of resources aimed at the implementation of the expanded reproduction with the purpose of receiving profits systematically. Under present conditions the development of cluster relations occurs with participation of actors of economic ensuring of cluster formations' activity. On the basis of a systematic approach the author identifies and structures internal and external economic and financial conditions and factors of cluster relations. Cluster development theory is complemented by justification of key features and economic elements of cluster relations. The justification of the economic essence of cluster relations is provided.*

Keywords: *cluster relations, development, cluster formations, preconditions, factors, conditions, economic elements.*

INTRODUCTION

As a result of the domestic economy transformation objective conditions for the formation and development of new economic, financial, social and other relations were created. These relations are based on cluster formations as a leading economic entity. Cluster formations as a phenomenon reflect the entire system of relations that objectively arise for manufacturers: relations of economic entities with each other, with customers, suppliers of all factors of production (raw materials, equipment, fuel, energy, etc.), with market agents, hired workers and the state represented by relevant Executive bodies of the Russian Federation subjects and local authorities.

This problem is particularly acute in a competitive economy, typical for the national social and economic sphere. A significant breakthrough, allowing to overcome the existing imbalance of development, lies in the fact that cluster formations as an economic phenomenon reflect the commodity

nature of relations of manufacturers with other economic entities on the basis of economic laws (the law of supply and demand, competition, cost, etc.) and all the instruments of commodity production and circulation.

The purpose of the study consists in the justification and development of scientific and methodological positions aimed at identification of scientific, economic and organizational preconditions for the development of cluster relations in the industrial sectors of the economy, which provide an innovative way of the country development.

The main scientific results which have contributed significantly to the development of the cluster theory are the following:

- The key features and economic elements of cluster relations have been justified on the basis of the study of the state and trends of social and economic processes in their interrelation with integration forms of development of industrial formations.

- For the implementation of innovation and technology policy, we offered a new approach to the development of cluster formations in the industry through the action of the main signs of cluster relations and identification of the key parameters of their development.

THEORETICAL STUDY

Based on the theory of cluster development (Porter, 1993; Schumpeter, 1982) one should notice that the success of industries and enterprises in competition with competitors is largely connected with the state of the economic environment, characterized by the following determinants of competitive advantage: factor conditions; demand parameters for the products and services of the industry in the country; the presence of related and supporting industries that are competitive in the international market; strategy of an industrial organization, its structure and the nature of competition in the domestic market.

We can distinguish the following main economic preconditions for the emergence of cluster formations:

- a plurality of key enterprises, the owners of which are interested in cooperation in the framework of the cluster formation;
- high innovation potential of enterprises and organizations of the cluster formation;
- developed innovation infrastructure and support infrastructure for small and medium-sized businesses: technology parks, business incubators, industrial parks, venture capital funds, funds of credit assistance, funds of business support, centres of technology transfer etc.;
- cooperative, technological and other ties between enterprises, developed manufacturing traditions, well established mechanisms of interaction, a high level of mutual trust;
- high share of export in the products of the cluster formation;
- a need for fundamental changes in the economic development of the country, region, field of activity.

Social preconditions contributing to the development of cluster formations are:

- public awareness of the crisis situation (by associations, research organizations, parties, institutions of professional education, etc.), the need, desire and willingness to take action to resolve the crisis;
- the presence of the leaders, offering ideas, programmes for their implementation, resources for the crisis overcoming;
- willingness of owners and managers of the leading enterprises to operation in the context of increasing cooperation, collaboration and competition in the interests of intensive development of production;
- the presence of existing market infrastructure aimed at production support (professional education system has a necessary capacity and experience of training and retraining of the personnel for the relevant sectors of the economy; the banking system is able to support business development; the developed system of insurance; trading; leasing companies);
- availability of experts who are ready and able to foster a dialogue between authorities and business in order to overcome the crisis and improve the competitiveness of the cluster formation;
- having a positive experience of business and government in terms of the growth of cooperation and competition;
- the interest of the authorities in a clustered version of regional economic development, the development of cooperation and collaboration;
- experience of successful cooperation between authorities with the production, especially in that

sector of the economy where incubation of the cluster formation is assumed;

- a well-developed legal and regulatory framework contributing to the growth of business confidence between the production and power structures;
- willingness of the authorities and business to conduct a dialogue on the basis of partnership and trust.

The above mentioned preconditions are mostly of an objective nature, but one should also consider a significant role of subjective factors in the development of cluster formations.

It should be noted that there are quite a lot of methodological approaches to the selection of the criteria base for ensuring the stability of cluster formation work and, accordingly, mechanisms for achieving the desired level of stability.

In the process of their development cluster formations are impacted by both external factors (such as inflation, price rising for raw materials, introduction of new tax payments, etc.) and internal factors (which reflect the state of already formed structure of cluster formations). Hence, the development of any cluster formation can be represented as a process of interaction between opposite sides and trends arising from the intrinsic characteristics of these opposites. Under the opposites in this case we understand such elements of the cluster formation, which are inseparable unity, are mutually exclusive and interpenetrate each other. These opposites include economic interests of cluster formations, employees, society (in obtaining the maximum profit, wages, income, etc.). Relations of the cluster formation with the outside world and internal relations within it usually generate a number of additional opposites. For example, the interests of the cluster formation as a supplier and as a buyer are different. Thus, the aim of the cluster formation is to buy cheaper and to sell more expensive, to purchase with deferred payment and to obtain payment for the sold goods immediately. Workers in addition to obtaining the maximum wages are interested in job security and social security. Investors, who make contributions to the capital of the company, are interested in maximizing revenue and minimizing risk, etc.

Thus, the relations of the cluster formation are the intersection point of multiple interrelations that are potentially controversial. This is because the parties, in this case, cluster formations, entering into relations, initially strive to achieve certain economic goals, trying to combine their demands with minimum obligations or their obligations with the highest possible requirements. However, it is essential not only to identify the points of contradiction or consensus, but also to link these points on a system basis so that, ultimately, the

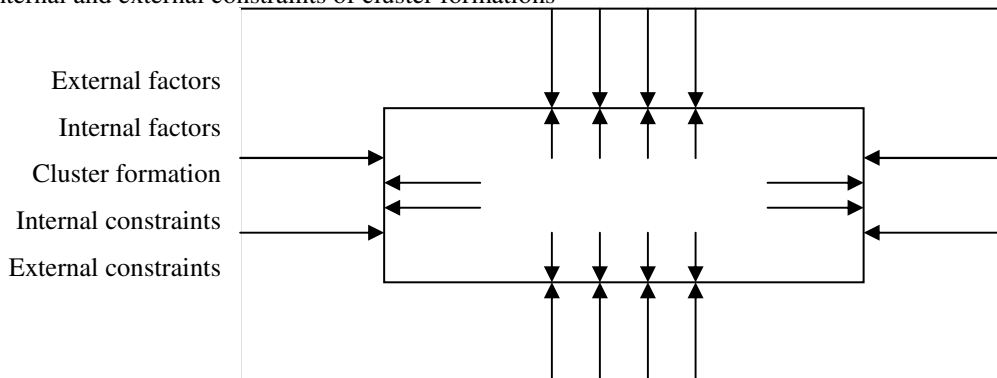
desired harmony in functioning of the economic system, which is determined by the state of development of cluster relations, will be achieved. On this basis, it is possible to consider the development of cluster relations as a system of relations on the formation and use of all types of resources (Miller, 2010). Within cluster relations their participants overcome objective external constraints through internal rearrangements and adaptations (and in some cases through active countering), and have the opportunity to carry out expanded reproduction to ensure systematic profit obtaining. The development of cluster relations is achieved at such state of social and economic relations, where there are no threats of critical nature and at the same time the ability of the cluster formation to respond to these threats adequately as soon as they arise, maneuvering financial resources, production programmes, technologies, is preserved. In other words, cluster relations represent such state of general balance between participants of these relations, which is, first, characterized by "immunity" to the effects of external and internal factors that violate their reproduction activity and, second, allows to carry out development and obtain profit. Changing the degree of stability of cluster relations takes place according to the law of transition from quantitative to qualitative changes. As these relations achieve a certain level of development, the change of

quantitative parameters that characterize the economic state of the cluster formation (indicators of relations' sustainability), occurs. As the indicators of relations' sustainability change, one can notice their transition to a qualitatively new state: from the least resistant to the most stable, and vice versa.

METHODOLOGICAL RESEARCH

It is known that the stability of the cluster formation depends on many factors. The whole set of factors that determine the stability of the cluster formation can be divided into internal and external ones (Abaeva, 2014). Internal factors include factors which define the work of the production team and depend on its activity. External factors are factors which do not depend on the activities of the production team, but affect the level of use of industrial and financial resources of this cluster formation. In other words, any economic system has both internal constraints caused by the internal potential of the cluster formation, and external constraints arising from the influence of macro factors (Figure 1). It is necessary to build or modify the existing efficient production and organizational structure to manage internal constraints.

Figure 1. Internal and external constraints of cluster formations



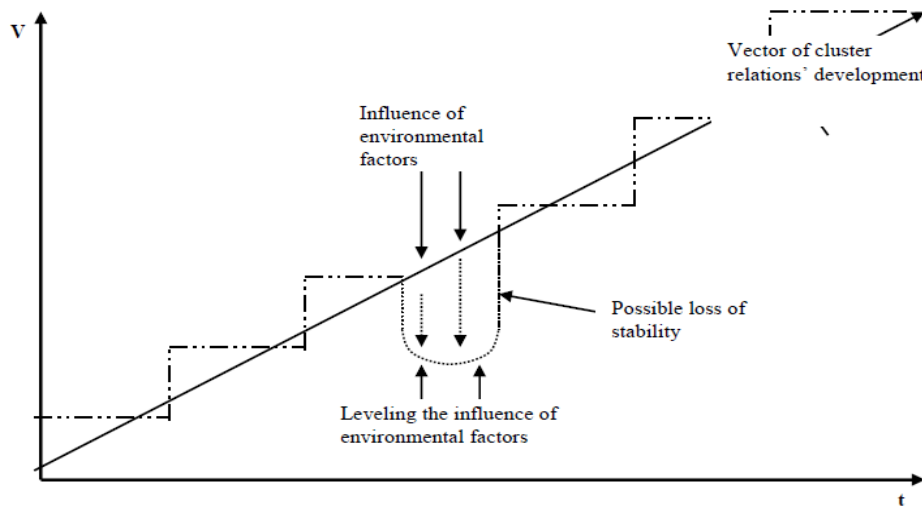
Source: Authors' research

The most successful organizational solution for managing a set of internal factors may be a matrix structure. Multiple communication channels allow the matrix organization to receive and analyze data incoming from the external environment. Its redundant reliability is specifically designed to overcome the limitations of interests of individual organizational groups. This in turn allows the cluster formation to gain necessary flexibility.

External factors (or macro-environment) form political, social, macro-economic conditions.

Cluster formations are dependent on the external environment both in terms of resources and consumers. The term "external environment" includes economic conditions, consumers, trade unions, competing organizations, environmental factors, existing legislation and other components. These interrelated factors have an impact on functioning of the cluster formation, its production, innovation, trade and financial activities (Figure 2).

Figure 2. Preserving the stability of cluster relations by means of leveling the influence of environmental factors



Source: Authors' research

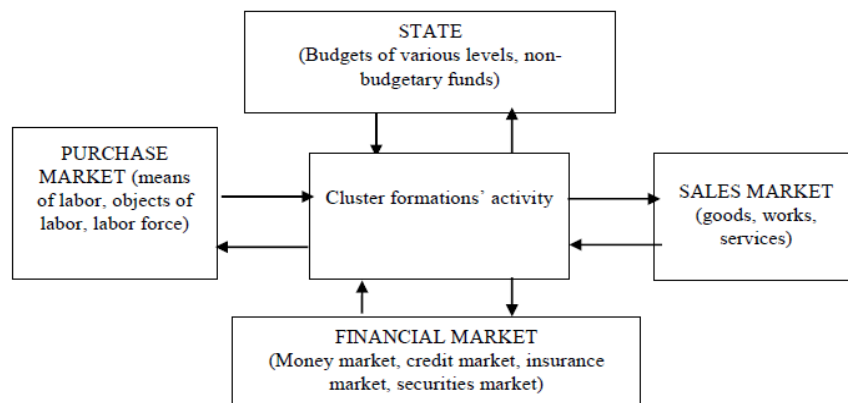
Thus, in modern conditions the development of cluster relations is influenced by a complex set of factors. Besides the diversity of specific economic situations, there is a certain unity that characterizes an economically sustainable cluster formation.

This unity is manifested in the availability of the cluster approach to the organization of production, financial and marketing operations; the ability to perceive "weak" signals of the change of environment and respond to them quickly by adapting, active opposition; the ability of the

leadership of the cluster formation to use "human capital" effectively through harmonization of interests of the cluster formation and separate workers; constant updating of technologies, dynamism and innovation.

Considering the activities of cluster formations as a process in which production of products, goods, works and services, identified for further sale to consumers, occur, it is necessary to identify entities in charge of economic support of the activities of cluster formations (Figure 3).

Figure 3. Entities of economic support of cluster formations' activities



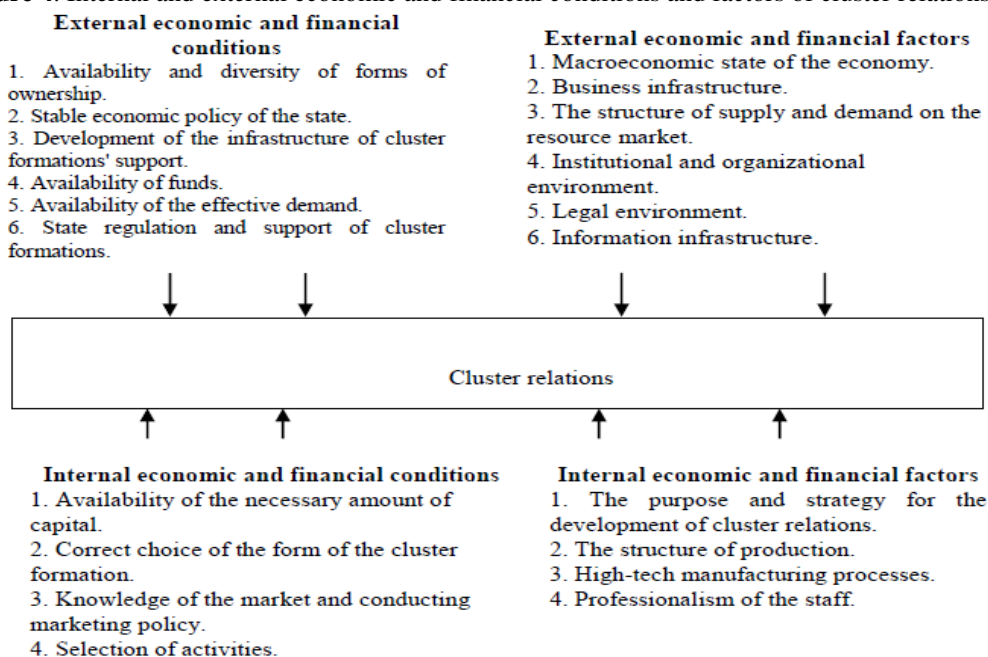
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The role of entities of economic support of cluster formations' activities consists of providing cluster formations with capital; investing in means of production, acquisition of objects of labor, labor recruitment; cash inflow resulting from the sale of goods, services, works. Accordingly, cluster formations interact with the entities of economic support by directing monetary funds for the purchase of factors of production and capital

replenishment; carrying out production and sale of finished products, as well as mandatory payments.

There are some conditions and factors which affect the activity of modern cluster formations and, therefore, they are very important for successful functioning of the former. A special place is occupied by economic and financial conditions and factors forming cluster relations (Figure 4)

Figure 4. Internal and external economic and financial conditions and factors of cluster relations



Source: Authors' research

The content of internal and external economic and financial conditions and factors constitutes sufficient and necessary to formulate the concept of cluster relations, which should be understood as a set of relations, which objectively occur in cluster formations (as economic entities) with each other, with customers, suppliers and intermediaries of the market, as well as with the state and municipal authorities in the implementation of sale and purchase of goods (services). Cluster relations represent a system of relations between subjects

(entities) that is generated through the establishment of targeted relations between them based on mutual consideration of interests of each entity of the cluster formation. The most important features of cluster relations are: object, subject, subject matter, the fundamental principle and targeted orientation (Table 1). The object of cluster relations should be considered relations between the subjects, resulting from the nature of activities of cluster formations.

Table 1. The main features of cluster relations

Name of the feature	Content of the feature
1. Object (focus of cluster relations)	Relations between subjects, resulting from the nature of activities of cluster formations.
2. Subject (participants of cluster relations, entities)	Participants of cluster relations
3. Subject matter (scope of potential changes)	The production relations
4. The fundamental principle of development	Ensuring dynamic and sustainable operation and development of cluster formations
5. The targeted orientation	Reduction of production costs, minimization of economic risk, sustainable profit growth

Source: Authors' research

The subjects of cluster relations are participants of cluster formations entering into relations with each other and with other entities of the market in the process of bringing goods and services to consumers.

The subject matter of cluster relations is production relations. The fundamental principle represents ensuring dynamic and sustainable operation and development of cluster formations. The targeted orientation of cluster relations is

connected with reducing production costs, minimizing economic risk and ensuring sustainable profit growth.

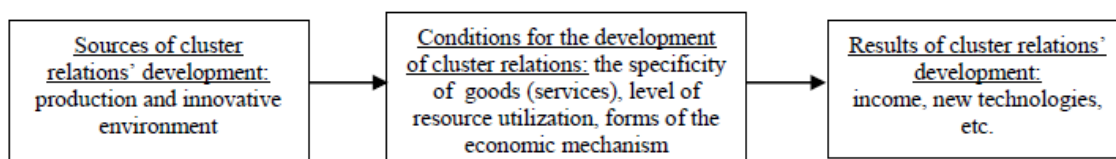
The essential elements of cluster relations are: functions, principles and the mechanism of these relations' organization.

The principles of business relations are fundamental rules which are the basis of cluster relations. These principles include: the rule of law; unity; targeted orientation; complexity;

effectiveness and efficiency. Cluster formations perform a variety of functions to ensure the effectiveness of cluster relations. The main ones are general economic; resource; innovation and organizational functions. The mechanism of the organization of cluster relations implies the existence of contracts as a means of forming these relations; the structure and content of contracts as an instrument for regulation of relations; systems of liability and sanctions for all participants of cluster formations. Cluster relations developing between the subjects (entities) of cluster formations, are quite diverse and interrelated. The totality of these relations is characterized by constant innovation, change, development. Accordingly, the development of cluster relations should be understood as a directed regular change in relations between the subjects of cluster relations arising in the implementation of the activities of cluster formations. As a result of the development, a new qualitative state of its composition and structure occurs.

In the most general form the development of cluster relations can be represented by the following parameters (Figure 5). The results of the development of cluster relations are the outcome indicators, such as profitability, costs, new production technologies, etc. The source of the development of cluster relations is production and innovation environment. The conditions for the development of cluster relations are such circumstances or data which influence the final result: the specificity of goods (services), level of resource utilization, forms of the economic mechanism. The development of cluster relations implies the existence of indicators which allow to assess the level of their development and can be regarded as indicators for assessing the efficiency and effectiveness of relations. The effectiveness of relations is the degree of achievement of planned results. In each particular case, qualitative and quantitative parameters of the result evaluation should be defined. The efficiency of relations involves the ratio between obtained results and wasted resources.

Figure 5. Parameters of the development of cluster relations



Source: Authors' research

CONCLUSION

Cluster relations involve the formation of ties between economic entities in the process of production of goods and services aimed at bringing them to consumers with the purpose of receiving profit. At the same time cluster relations are characterized by constant changes, caused by factors of internal and external environment and affecting the results of cluster formations' activity. The generalization of the above mentioned information allows us to form some idea of the economic nature of cluster relations:

1. Cluster relations represent a set of relations which objectively occur between the participants of cluster formations (as economic entities) with each other, with customers, suppliers and intermediaries of the market, as well as with the state and municipal authorities in the process of production of goods (services) and other related activities.
2. Cluster relations involve the formation of ties between the subjects (entities) of cluster formations in the process of production of goods, services, aimed at bringing goods to consumers with the purpose of receiving profit. At the same time cluster relations are characterized by constant

changes, caused by factors of internal and external environment and affecting the results of cluster formations' activity.

3. The development of cluster relations is straightforward and legitimate. It is based on such principles as the rule of law; unity; targeted orientation; complexity; effectiveness and efficiency.

SUPPORT

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