MODERN TENDENCIES OF THE DEVELOPMENT OF INNOVATION ENTREPRENEURSHIP IN THE SPHERE OF RESEARCH AND DEVELOPMENT

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Abstract: the paper presents a description of modern tendencies of the development of innovation entrepreneurship in the sphere of R&D which are implicit in a conceptual scheme which reflects the dynamics of changes of innovation structures in the space; (centralized – dispersed R&D): (concurrence – cooperation).

Key words: research and development; entrepreneurial firms; innovation strategies.

The phenomenon of entrepreneurship in the theory of innovation economy has been paid more attention over the last years. The entrepreneurial firms are expected to be the main driver of innovation in the XXI century. But, at the same time, the modern empirical data suggests that "the entrepreneurs who produce high-level impact on the economy" represent a relatively small part of the entire entrepreneurial body [7].

The definition mentioned above refers to the entrepreneurs whose business activity intensifies the degree of competition, provides the greatest potential for created new jobs, and stimulates economic growth. Although scientists have marked the importance of the "high impact" entrepreneurship, the conditions that contribute to the activity of such people and businesses, organizational mechanisms remain relatively underexplored. In this paper, we analyze the development tendencies of innovative strategies of innovative companies, taking into account the role of the business sector.

It is generally agreed, that the business sector is composed to a greater degree of small and medium enterprises (SMEs) or small autonomous units of large organizations. Modeling of innovative activity of small entrepreneurial firms (small and medium enterprises - classification according to Rosstat: SMEs) encounters several problems, which are as follows: In the process of modeling and estimating results one should take into account both quantitative and qualitative parameters; Among these parameters there are: nonmaterial input parameters, such as stable size and age of the enterprise; the degree of stability in relation to national circumstances, business climate, and other institutional factors.

Conceptual models of SMEs are traditionally based on the priority principles of industrial relations in this sphere. However, these principles used to be interpreted in the way that led to the previous models oriented mainly on financial result forecasting (paying capacity evaluation, profitability, bankruptcy probability, etc.). Modern researchers believe that various parameters must be included in the model, as well as those that differ from traditional accounting indicators [5 , 19].

There are many reasons why the "traditional" models based on financial indicators are not suitable for SME result assessing. In particular, it is because statistical methods are sensitive to assumptions about the "normal" proportions in the enterprise structures, technical and financial requirements. Apart from that resolution, they are based on statistically controlled financial forecast, and may actually provoke bankruptcy. The provoked bankruptcy is a big problem for SMEs [19 , 20]. However, quantitative models are still preferred more than purely human expert judgment.

The two non-financial parameters were offered as part of alternative approach, which drew the attention: the stable size and age of an enterprise [9, 12]. It was found that when such nonmaterial variables are used

together with the financial indicators, efficiency of predictive models is significantly improved [7, 12].

It turned out that the size of the enterprise, as well as its rate of growth, are inversely related to the probability of bankruptcy, and that SMEs usually fail within the first years after starting [9, 10, 16]. Other researchers have found that in general the probability of survival increases with the increase of years of the firm.

The third main problem in creating functional models of innovation activity of SMEs is that the model should be able to show the change which is caused by the influence of many factors mentioned above. Traditional models often ignore these changes and consider SMEs as a homogenous group [15, 19]. In addition, changes in the nature of SMEs require a complex approach to understanding their activity. Thus, so as to assess the work of incubators, some experts discuss various approaches with the help of which incubators chose candidates to be admitted to their membership. [8] Other researchers are studying the path followed by companies in their technological development [2, 13]. The results of SME activity research at different stages of the technology life cycle are also of great interest.

The fourth problem is connected with the difficulty of the optimal use of the limited information on the activities of SMEs available from accounting reports. In case of large companies, a sufficient number of features of the production relations can be estimated according to the information from the available financial documents, but the financial information presented by small firms is often unreliable. Small firms are not required to disclose their financial situation publicly.

Most of SME model have been created to meet the needs of traditional users of performance evaluation models, such as banks and other financial institutions [6, 16, 19]. However, these models are difficult to be used as a basis for the formation of organizational practice.

There are few models that could be easily used by entrepreneurs who lack knowledge in the theory of finance and accounting. They include "business platform model," which came into use in the nineties of the last century [13]. This model can be used to decide which issues should be focused on and to use the eight management principles so that their firms will develop steadily.

To be theoretically described the structural nature of SMEs requires the model that would not only help to examine the environment, within which the enterprise is run, in what way environmental factors influence the enterprise's activity, but also to include these factors in the management tools [10]. Because of the fact that the modern economy is becoming more and more open, mobility and flexibility of SMEs give them a competitive position over larger companies. Organizations can benefit from the use of information technology in their daily activities. This implies that they must also manage network effects, ensuring stable operation [2, 5, 18].

In general, the models connected with the activities of small businesses can be divided into two big groups. The first group consists of models that provide sustainable growth, and use control methods with the help of measured economic indicators.

The second group of business models is focused on predicting the development, which is based on a complex approach with the definition of the sustainable functional qualities of the enterprise. The models of this group can be further divided into two subgroups: the theory of stable dynamics and financial models of paying capacity forecasting. In this analysis, we dwell on the first subgroup models.

However, it should be pointed out that until recently the main part of applied research and development in the world has been carried out by large multinational corporations, which is defined historically, or, in terms of institutionalists, according to dependence on the distance covered.

Evidence given by researchers at the macro level, confirms the present main role of industrial laboratories of large corporations.

We can also define indicating possible reasons for this situation in scientific literature. So there are descriptions of quite usual situation, when employees of a large corporation create a local network with suppliers and institutions that produce knowledge, when geographical proximity plays an important role, especially - encourages the spread of implicit ("soft", " tacit") knowledge and skills [3, 5] . Such tacit knowledge is necessary for transfer and sharing of information, which proves to be essential condition for successful implementation of research and development.

The development of information and communication technologies has become the basis of generating the idea of "death of distance", which was further reflected in the fact that research and development have become more free and common. And this, in its turn, it led to the formation of an alternative to the dominance of large enterprises as the center of industrial research and development.

But, most companies continue to choose the support strategy of their main R&D base of the existing sites, because it allows them to benefit from economy of scale thanks to the growth of production and local networks with which their researchers interact closely.

In addition, the excess of knowledge received from research activities contribute to higher rates of

innovation, the growth of entrepreneurship and productivity gain in geographically bounded areas.

Comparative assessments obviously depend on the type of economic sector and the business considered. In case of market-driven industries, such as food processing, innovative activity depends on geographical proximity, in case of industries, such as chemicals or electronics, the concentration of all enterprises and units in a single place is more preferred.

Taking into account the prespecification data observers point up the following main strategies of innovation development. The performance strategy of the main scientific - technical base refers to the first variant of the strategy: research in this case is carried out centrally, and local R&D activities are response to the need to adapt to the local market. Thus, choosing a location for the innovation center is determined by the relevant markets.

The alternative variant of the strategy is the strategy to increase the main scientific – technical science and technology base: innovative actions are developing in a place where potential of the technology is obvious, developed in the same scientific and technical sphere. These new local actions together with the central current of innovative actions lead to the enterprise knowledge base increasing. During the 1990s the strategy to increase the main scientific - technical base began to take on greater importance.

The determinants of local scientific - technical potential cover the availability of highly qualified staff and quality of available infrastructure. At the same time, the surrounding scientific information environment can be considered more broadly. Experts point to the importance of the presence of regular users and/or specialized suppliers that can stimulate the company to develop its local R&D potential [1, 4].

M. Porter states that not only these factors are of great concern, but also the "innovation climate" in a broader sense, including such aspects as financial climate, infrastructure, and other typical macroeconomic factors of adjustment of innovative action tools. [4] Furthermore, the costs in modern economy do not make difference in the choice of innovation activity localization. The really important criterion is the quality of innovation product, rather than R&D expenses.

Scientific papers today present the tendencies that can be reduced to the main five ones determining the changes in the organizational structures of research and development. Fig. 1 shows the author's own understanding of these tendencies.

Innovative strategies of industrial corporations are positioned in the space determined by the vectors: (centralized – dispersed R&D): (concurrence – cooperation).

The first tendency is the fact that enterprises with centralized structures, grouping in the national economy, are beginning to adapt to the international public opinion, i.e. are geared to outside markets.

Research also confirms that innovations are becoming more and more evolutionary, and non-linear; strengthening of interactions between the firm and its external environment is becoming typical of them.

It is becoming more apparent that it is necessary to adapt to the needs of both the local and the global market. This implies a change of direction from locally-central (ethnocentric) to geocentric organizational structure (tendency 1 in Fig. 1).

The second tendency of development is increasing of the number of so-called units of excellences. These unites are becoming important sources of new knowledge, which will satisfy the identified requirements. These strategies are shown as tendency 2 in Fig. 1. These tendencies may determine the further development of ethnocentric, as well as geocentric centralized structures.

The third tendency is that the state management and R&D organization control by industrial, national and international enterprises are reduced in favor of greater autonomy and authority of decentralized research organizations that acquire flexibility and creative potential, and whose number is increasing. In this regard, importance of information exchange and coordination between innovative enterprises is increasing. Cooperation increase causes greater integration and formation of network structures. (tendency 3 in Fig. 1).

The fourth tendency is characterized by specialization increase of various enterprises within the branch, as well as function distribution between various departments. Centers of Excellences are being created; they are designed to coordinate the activities of innovative units, reduce the risk of research effort duplication, and strengthen the innovation work, in particular by means of synergy (tendency 4 in Fig. 1).

The fifth tendency is to increase the network interactions within the production chains, which will enable the optimal profitability of economic activity and coordination between various production units. In a certain sense, it's a new type of centralization, especially when the number of innovative units is reduced to the limited number of centers of excellence.

The mentioned above tendencies are complementary, and, at the same time, in the areas of their intersection there is tension that arises because of ambition to choose the best combination of the organizational types discussed herein.

The two other recent tendencies in the organization of innovation processes and R&D are the model

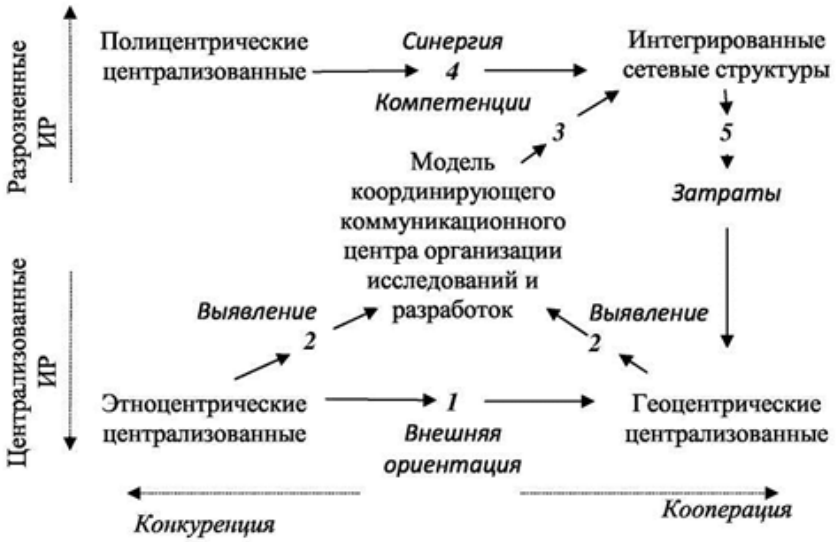

Fig.1. Development of innovative strategies of industrial corporations

of "open innovations" [4, 5] and the model of "innovations controlled by the user" [11].

The details of the model of "open innovations" can be expressed in the way that firms can and should use external ideas, as well as internal ideas, and internal and external paths to the market, in their effort to promote their technologies.

Even the leading companies can no longer perform their innovation efforts independently, but they must open their networks and cooperate with others. The companies consider "open innovations" as a mechanism for closer cooperation with external partners, that is: clients, consumers, researchers or other people who may have knowledge relevant to the needs of their company. When opening the High Technology University of Eindhoven, Philips, for example, created all the conditions for the implementation of "open innovation" model.

The term "innovations controlled by the user" means that in certain economic sectors users play a key role and constitute the main source of innovative ideas. These are, for example, sports industries, equipment and health care, personal hygiene means, and computer applications.

Experts confirm that "in order to provide people with really meaningful resolutions, instead of technological capabilities, the needs of the people from the earliest stages of development should be taken into consideration" [17]. Such work requires flexibility, responsivity, which is currently a feature of only small innovative enterprises. Thus, in the light of current tendencies in the development of innovative strategies entrepreneurial firms are becoming increasingly important.

Considering the existing tendencies in the development of innovative strategies under the conditions of Russian entrepreneurship, it is possible to notice that the most appropriate existing situation may be the strategy of business structure development within larger organizations (probably enterprise clusters of the similar specialization) with an active support and participation of the state, as the coordinating and partner center.

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