Universities Innovation Clusters: Approaches for National Competitiveness Paradigm

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Abstract
In this study we investigate the principal factors for universities research parks competitiveness, treated as an innovation cluster near universities. The main idea is to determine the role of the university in the cluster and to find the approach definitions. The Porter cluster model is presented as the starting point for the problem.

Keywords: Cluster, Innovation universities systems, Cluster Theories.

1. Introduction
Before the Russian economy there is a challenge – transition to an innovative way of development that means not simply growth of innovative activity, and qualitative changes in the majority of spheres of economy. Directions of these changes are forming of groups of the enterprises – clusters, including the small scientific enterprises. Problems of their functioning and possibilities to form the clusters are an actual object of research.

The main condition of successful development of business is the open entry to resources, the information and credits. The economic freedom including the initiative in a business activity should be combined with complete responsibility for observance of contracts and financial results. The number of small enterprises in Russia last year’s constitutes hardly more than 1 million, the contribution to gross national product – 12 %, for comparison – in Europe about 20 million small and medium scale enterprises with the contribution to gross national product more than 60 % [1]. In the USA – more than 15 million the small enterprises, which contribution – 40 % of gross national product [2]. Such insignificant number of small enterprises, in comparison with developed countries, is caused by considerable number of unresolved problems of small-scale business. The cores among them are the following: problems of the state control and the supervision, consisting in excessive checks and any administrative barriers and infrastructural restrictions. To these restrictions concern, first of all, absence accessible, modern office, production premises, absence of access financing. So, to 90 % of beginning businessmen borrows money from relatives and friends; procedure of certification of goods: the
specific weight of kinds of goods subject to obligatory certification constitutes 89% that in 4 times more than in the European countries.

For today small-scale business is concentrated mainly in trading-intermediary sphere. In the industry and a science small-scale business is presented, basically, small firms. The share of highly educated youth among businessmen for last decade has decreased. The small-scale business share in such key industries as housing and communal services, formation, information servicing is low. The share of the small-scale business occupied in a science annually falls. For achievement of the purposes put before small-scale business it is necessary to increase number of small enterprises in times, having provided thus qualitative change of branch structure. Advancing growth of the enterprises in the high technology sectors, in other strategically important industries is necessary. Their share should be prevailing in general structure. For this purpose it is necessary to estimate occurrence of small enterprises in the sample scheme of interaction of the innovative enterprises in clusters.

Innovative cluster is the localized set of industrial companies, the research centers, individual businessmen, high schools and other organizations with motivated and steady formal communications. From the point of view of the founder of the theory innovative clusters M. Porter: Clusters have the various form depending on the depth and complexity, but the majority include: the companies of a "ready" product or service, suppliers of factors of production, financial institutions, firms in accompanying industries. In cluster, also, the firms working with sales channels or consumers, manufacturers of by-products, specialized providers of an infrastructure, the governmental and other organizations providing special training, formation, information receipt, carrying out of researches and giving technical support (universities, advanced training structures) often enter. The governmental structures, making essential impact on clusters, can be considered as its part. Many clusters include enterprise consolidations and other joint structures of a private sector, the organization on the cooperation, supporting members of cluster [3]. Character of communications between the enterprises entering cluster, can be both vertical, and horizontal. Cluster can include itself the enterprises of one industry, or different industries.

Porter’s cluster model predicts that the core competencies of the universities should align with the needs of companies, located in clusters (and especially universities research parks). But actually it is not the case at least at Russia. There is a small correlation between of the total research funding of the university and the number companies in the cluster or university research park. These facts show that there are some lacks in the system, at least at its economic effectiveness.

2. Disconnects between Theory and Practice

The disconnects between theory and practice raises a fundamental question: the applicability of cluster theory to the practical implementation for clusters and universities collaboration. In this sense we ought to discuss two main practical questions:

1. Is university research strength is correlated the needs of firms located in the associated with University Park (or cluster)?
2. Is university human capital strength associated cluster?

All above leads to the primary problem: is the cluster the organic structure and what the role of government in its creation?

2.1. Application of Cluster Theory to Universities Parks and Associated Clusters

We have well known idea in which scientific researches pushes technological innovations. But actually innovation process does not necessary follow such a linear pas and can be characterized as a feedback mechanism, which connects the stages of the innovation processes. Such a dynamic model of innovation is a justifier for the need of research universities parks. The need for environment suggests the collaboration of industry and academia while the linear model suggests the pass of knowledge from university to the company only. The last idea does not support the need of real parks or clusters.
From general point of view research park can be regarded as a cluster of university(ies), associated companies and supporting organizations. At least the idea of Russian Skolkovo Park is very similar to this paradigm.

One of the critical points for our research is to discuss the role of each actor in the cluster, particularly the university. Universities are the prime producers of three main factors: new knowledge (research), faculty (manpower) and students (future manpower). We believe that economic support to facilitate universities efficient transfer of these factors to technology-based innovation firms will definitely promote regional economic growth.

Only universities are the main sources of research and scientific expertise. In this sense the research parks near university is a way to build university-industry relationship, facilitate technology transfer and apply research to commercial needs. All above can be done through establishing academic start-ups to facilitate the access to academic resources. Such cluster ought to not only produce scientific knowledge but also its application to technology.

The economic role of the university coincides with well known Porter [3] model for competitive advantage:

- strengthening the knowledge base of existing or developing clusters;
- creating the crucial factor of educated work force;
- providing the scientific and technological infrastructure;
- providing the research efforts to the technology foundation of the cluster.

Universities provide cluster through consultancies, both in technologies and in new business strategies. So the main advantage to the company of the cluster not to have its customers and suppliers nearby but to have new possibilities nearby.

### 2.2. Some Approach to Methodology

The majority of the literature on research parks shows that most of them are not economically effective. So we need to fulfill the research to determine the primarily factors (for cluster theory). Surely we ought to determine some independent and dependant variables, trying to choose only main of them.

It seems to us that the main independent variables are to be:

- University knowledge – R&D expenditures in science and technology;
- University faculty capital – Number of faculty members in science and technology fields;
- University human capital – Number of degrees awarded in science and technology fields (bachelors, masters, doctors’ degrees).

It seems to us that the main dependent variable is:

- Number of technology-based firms in a cluster in each of principal technology fields for the park (in five fields in the case for Skolkovo).

To have our research task fulfilled in the next stage we plan to have the statistical analyses of known Russian technologies park to determine the correlation of these factors.

### References

