SMALL BUSINESS CLUSTERING AS A MEANS OF COMPETITIVENESS IMPROVEMENT

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Abstract. The article deals with the problem of formation and development of a small business cluster in Ukraine through the internal-territorial cooperation. The cluster efficiency is determined primarily by the competitiveness level of the products manufactured by small enterprises. Two clusters of a small business are built. A methodology was developed for the effective functioning of the cluster and the companies belonging to it.

Keywords: competitiveness, small business, enterprise, cluster, estimation, clustering.

Introduction

The competitiveness estimation, probably, has recently become the biggest problem, the solution of which depends on the prosperity level of the small businesses themselves and the national economy as a whole. In this regard, the development of the theory and practice to ensure the competitiveness of a small business has now got not only the theoretical but also the very practical importance.

The majority of economists examine the problem of competitiveness in relation to a material object – a product and the enterprise itself which produces it. This approach is incorrect, since any economic process, including the development of the competitive products, bears the features of the general and special, the essence and the phenomenon. Therefore, the consideration of products' competitiveness in isolation from the processes of the competitiveness provision of an enterprise is hardly possible and justified. If we consider the competitiveness of the closely related enterprises, i.e. a cluster, together, we analyse not only the manufacturer but also the suppliers of raw materials, consumers, etc.

The advantage and novelty of the cluster approach lies in the fact that it attaches a high importance to the microeconomic component as well as the territorial and social aspects of the economic development. In addition, it offers the effective tools for the regional development stimulation, manifested in the increasing employment, the competitiveness improvement of the regional production systems, the growth of budget revenues, etc.

To build the cluster, small businesses were selected, as they have such several advantages:

- the mobility and flexibility of the transition to the new environment;
- the ability to quickly switch to another activity;
- the strong motivation, as the successful implementation of the new project will provide the opportunity to realize the entrepreneurial ambitions and so on.

Short Review of Researches and Publications

For the first time the phenomenon of clustering for the industrial enterprises was described by the eminent scientist Michael Porter. He believed that a cluster is a group of the geographically interconnected companies and related organizations (Porter, 2008).

In the course of his research, Michael Porter analysed the competitive capabilities of over 100 industries in ten countries. It appeared that the most competitive multinational companies usually are not haphazardly scattered in different countries, but tend to be concentrated in one country, and sometimes even in the same region of the country. This is due to the fact that one or several firms, achieving competitiveness at the world market, extend their positive impact on the immediate environment: suppliers, consumers and competitors. The success of the environment, in its turn, affects the further growth of the company's competitiveness.

This problem has become of great importance in the works of such scholars as Wolfgang Price, S. Sokolenko (2004), V. Cherhanova and I. Bryzhan (2002), O. O. Tarasova (2007) and many others.

Most scientists, who examine the advantages of clusters, first of all distinguish innovations. Cluster members have an access to new technologies, working methods, and the like ones. The main feature is the presence of the venture capital, which funds the majority of innovations, in clusters.

Task and Its Relevance

Clustering in the economic practice of Ukraine is a poorly studied phenomenon: there is no information which allows to identify the components of the cluster, there is no harmonized system to measure the effectiveness of its activities, the assertion proof of the various internal and external parameters' impact on the operation success of this organizational structure of the regional production is required. Actually, the very fact of the successful clusters' existence in Ukrainian conditions requires proof.

The insufficient development of the theoretical, methodological and practical researches on these problems leads to the determination necessity of the competitiveness problems of a small businesses' cluster.

The aim of the study is the clustering of small entrepreneurship in the Ukrainian conditions.

The main objective is to develop a methodology for the estimation of the cluster competitiveness.

Highlights of Research

According to the theory of Michael Porter, a cluster is a group of the geographically related companies (suppliers, manufacturers, etc.) and connected with them organizations, operating in a certain area and complementing each other. (Porter, 2008: 89).

M. Porter proposed the following system of the competitive advantages' determinants (Fig. 1):
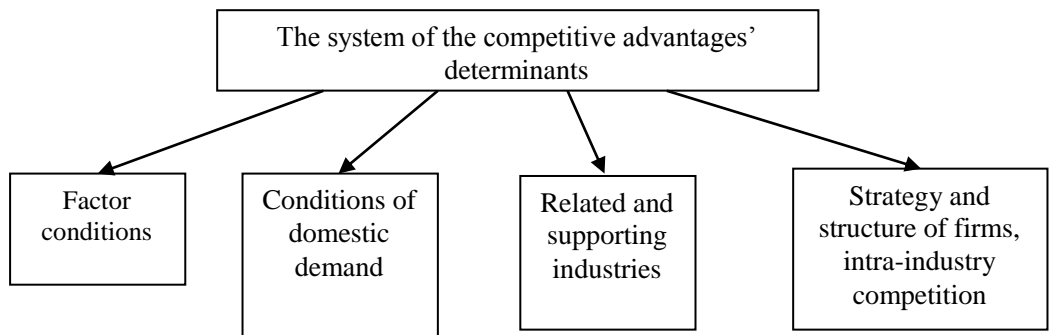
Fig.1: The system of the competitive advantages' determinants
(after M. Porter, 2008)

The factor conditions include the human and natural resources, the scientific and information capacity, the capital and infrastructure, including the life quality factors.

The domestic demand conditions include: the quality of demand, the conformity to the tendencies of the demand development at the world market, the development of demand volume.

The related and supporting industries (clusters of industries) include the flow areas of raw materials and semi-finished products, the scope of the equipment arrivals, the scope of the raw materials' usage, facilities and technologies.

The strategy and structure of firms and intra-industry competition include the goals, strategies, methods of organization, management of firms and intra-industry competition.

In the end, a "cluster" is formed - a community of firms, closely related industries, which promote the competitiveness growth of each other mutually. For the whole state economy clusters act as the growth points of the domestic market. The first cluster most often gives rise to the new ones, and as a whole, the international competitiveness of the country is growing. It keeps its strong positions due to the individual clusters, whereas outside them, even the most developed economy can give only moderate results. In the cluster a benefit extends to all areas of relations:

- New producers that come from other industries accelerate their development, stimulating scientific research work and providing the necessary tools for the new strategies' implementation;

- There is a free exchange of information and the rapid spread of innovations through the suppliers or consumers, who have contacts with numerous competitors;

- The relationships within the cluster, often absolutely unexpected, lead to the new ways of competition and generate completely new opportunities;

- Human resources and ideas form new combinations.

The cluster companies reveal favourable opportunities for coordination in the sphere of common interests without the threat of competition or limit on the intensity of competition. Public or private investments bring benefits to many firms at the same time. The peculiarity of clusters is the presence of the flexible entrepreneur structures of small businesses in their composition, especially a venture that provides the opportunity to create the innovative "points of growth".

Competitiveness is a complex phenomenon that cannot be described with the help of the separate partial characteristics that can vary quite contradictory (Mahomedov, Mahomedova, 2002: 48).

The competitiveness factors are considered to be the phenomena and the processes of the industrial - economic activities and the social-economic life of a society, which cause a change of the absolute and relative costs 'values of production and sales, and as a result, bring changes into the level of competitiveness.

The factors can influence both directions of competitiveness - increase and decrease. The factors are those that contribute to the transformation of possibilities into realities. The factors determine the means and methods of the competitiveness reserves' usage. But the presence of factors only is insufficient to ensure the competitiveness. Obtaining a competitive advantage on the basis of the factors depends on how effectively they are used and where, in what industry they are applied (Factors and reserves of competitiveness of the enterprise, n.d).

The evaluation specificity of the cluster competitiveness makes it necessary to use a number of indicators, the analysis of which can't be avoided in the overall estimation of the enterprise's production and economic activity. These figures primarily indicate the degree of stability, the ability to produce goods that are in demand among consumers and ensure a steady income to them. Such indicators should include the following:

- the ratio of the sales' total value to the value of the unsold goods, indicating a drop in demand for the company products and overstock of the finished products;
- the ratio of the profit to the total sales, indicating the improvement of the enterprise competitiveness;
- the ratio of the sales' cost to its amount for the current period, which determines the factor due to which the sales have increased - due to the price increases or an increase in sales;
- the ratio of the costs' magnitude to the total amount of profit, which allows us to detect the unnecessary costs throughout the distribution chain from a seller to a consumer.

To identify the nature and extent of the relationships between the elements of the potential cluster with the process of the competitiveness improvement, it is recommended to carry out the rating evaluation on the   application basis of the correlation and regression analysis, which ensures the accuracy of the calculations (due to the necessary and sufficient number of variables, describing the competitiveness) and a high degree of the statistical reliability, as well as the methods of the cluster analysis.

As for the cluster analysis algorithm, it is proposed to use one of the so-called agglomerative hierarchical algorithms. All algorithms of this class proceed from the matrix of distances (differences) between the grouped objects, each of which is initially treated as a separate cluster. Next, at each step the two closest clusters merge and therefore a distance matrix is created, the distance to each of the clusters that have merged is excluded from it, and the distance between the newly acquired clusters and all the rest is added. The algorithm ends when the items are combined into a single cluster.

Next, while using the cluster analysis, a typical group of small businesses in terms of their competitiveness are highlighted. The established classification is of great importance, because the place of the enterprise in a series of similar productions is defined by a set of indicators, characterizing their competitiveness.

The use of the cluster analysis as a method of the multivariate statistical groupings in the analysis of the enterprises' competitiveness allows us to:

    − highlight the entire set of those enterprises which are very different in the complex of their objective conditions of functioning;

    − form groups of the interrelated variables in an adequate statistical model's construction of the competitiveness indicators;

    − form groups of the enterprises with the similar performance results and highlight the typical groups of the advanced, middle and lagging enterprises for their subsequent comparison.

    Ward's method was selected as a basis for clustering of small businesses. It is grounded on the fact that the distance between the clusters is the increase in the sums of squares of the object distances from the cluster centres, obtained as a result of their merging. This method uses the methods of the variance analysis. We choose the City-block (Manhattan) distance as a distance measure.

    The calculation formula for the Manhattan distance is the following (Kupalova, 2008: 489):

$$\rho(x, x') = \sum_{i}^{n} |x_i - x'_i|$$

(1)

    The totality of Ukraine small enterprises were divided into many groups, and then were reallocated to the clusters by a hierarchical method of grouping. The following indicators were selected for the cluster analysis: the employment, the number of small businesses and the volume of sales in the regions of Ukraine. After the completion of all regrouping, the following vertical dendroid gram has been received.

    As it can be seen in fig. 2, the entire set was divided into two large clusters. As the dendroid gram shows, one cluster was formed in the city of Kyiv, i.e. in the city of Kyiv there is a large cluster, integrating the small enterprises, which interact with each other.

    The second cluster includes small businesses in Kharkiv, Odessa, Lviv, Donetsk and Dnipropetrovsk regions. The relationships between the companies in the region are well traced on the tree diagram.

    There are several regions where small business is developed at the low level. They are Rivne, Zhytomyr, Volyn and Vinnitsa regions.

    It should be noted that there are prospects for the clusters' creation in almost all regions of Ukraine, as the country's specialization in manufacturing of various industries can be clearly seen. However, today there is a list of the objective reasons that prevent the creation of clusters in Ukraine, namely:

    - the lack of cooperation relations between the enterprises, research institutions, infrastructure organizations, local government bodies;

    - the awareness lack of economic agents on the advantages of the cluster form of cooperation;

    - the absence of the legal framework, regulating the relations of the public-private cooperation, in Ukraine; the lack of special regional bodies, responsible for the innovative development and clustering, the low efficiency of trade unions;

    - the insufficient quality and availability of industrial and innovative infrastructure;

    - the lack of experience in strategic planning of the cluster development, etc.
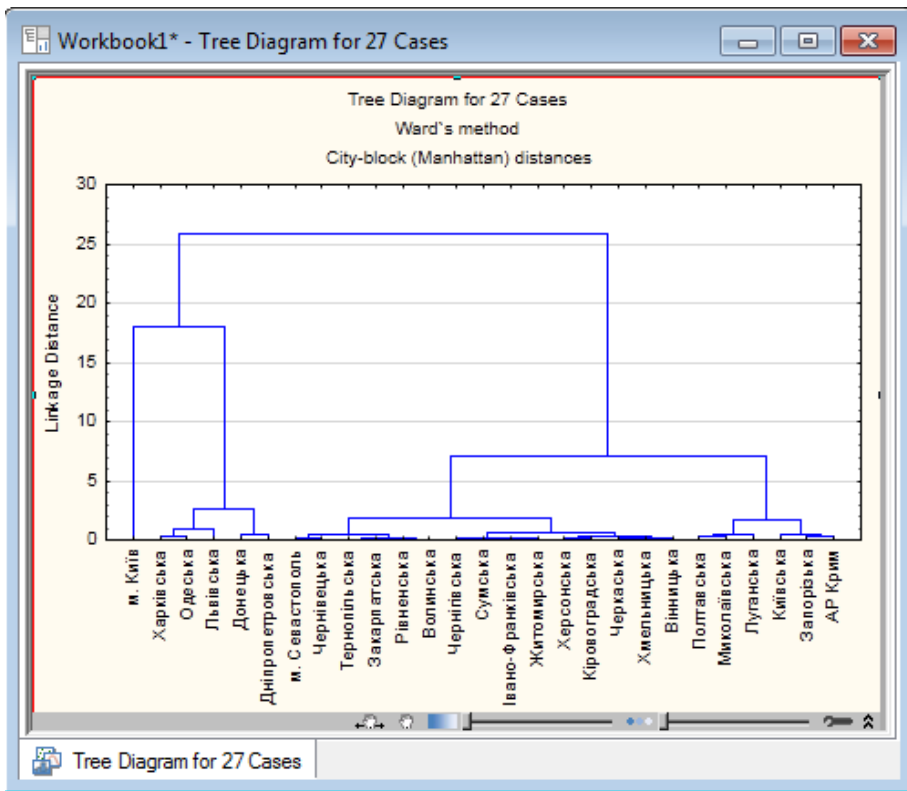
Fig.2. Hierarchical clustering. Dendroid gram of small businesses, according to regions

The clusters of small enterprises can be formed on the basis of self-organization as a result of natural integration and cooperation of production or through the state.

The self-organization of the entrepreneurs, as a rule, is carried out on the initiative of the entrepreneur-leader.

The enterprises, included into one cluster, can produce similar goods or services and can be the competitors to each other. In this regard, the entrepreneurs have concerns that their business would be lost.

The mechanism of clusters' formation and development in Ukraine includes the following stages (Stimulation of innovative activity of small enterprises in the context of ensuring competitiveness of the economy, n.d):

1) the initiation – it involves the rationale for a cluster's creation in the region, defining the objectives, priorities and the type of a cluster, the capacity estimation   of clustering, determining the territorial boundaries, analysing the barriers and opportunities for the cluster development, the analysis of the value- added production chain and the possibility of the competitive advantages' obtaining;

2) the development of the clustering strategy – it requires the development and the plan of actions on the implementation of the cluster development strategy, the definition of a cluster's projects set, the formation of the future structure of the cluster, the key participants and the establishment of the effective communication between them;

3) the implementation of the clusters' development program - it is the formation of the specialized structures, the conclusion of a multilateral cooperation agreement, the establishment of the necessary infrastructure (market, industrial, innovation, social ones), the communication between the key participants of the cluster, and the establishment of mechanisms for the subcontracting relations, the activities' coordination of the cluster participants, the introduction of mechanisms to encourage the cluster development, the promotion of innovation and cooperation, as well as the mechanisms' implementation of entering a foreign market;

4) the efficiency estimation – it involves the analysis and evaluation of the clusters' efficiency as well as adjustments in the development of clusters by using the methods and instruments of the state cluster policy.

To implement the first and the second stages, the main tool is considered to be a set of consulting and educating activities with the invited leading experts, the potential participants and the interested parties. These activities may take place in the form of seminars, round tables, conferences, meetings and may also include a series of educational courses, the creation of specialized Internet resources and the issue of thematic publications. The information technology can also be used for searching and creating of new jobs. Thousands of the companies practise a distant job and put big bets on earnings in the Internet.

The implementation of the third and the fourth stages of the cluster development requires first of all the creation of the favourable conditions from the state for the promotion of small businesses within the cluster.

We believe it is appropriate to use the following instruments of the small entrepreneurship's activity stimulation in the cluster system in the regions of Ukraine:

- government guarantees and programs to reduce risks and to reimburse risk losses;

- targeted subsidies, research and development;

- partial or full compensation of the interest on loans for the introduction of innovations.

At this, the amount of certain benefits, subsidies or compensation should depend on the region of the cluster location, its specialization and advantages. Thus, the parameters of the cluster policy tools should depend on the regional characteristics and the regional economic policy.

Conclusions and Suggestions

The fundamental importance for the small businesses is the cluster formation processes, which modify and reduce the capacity of the regional economy in one unit, ensure the efficiency and competitiveness.

The identification of clusters and estimation of their efficiency is connected with a number of problems, the main ones are as follows:

- the absence of the statistical data' necessary organization at the area level, in particular, the inter -sectorial product flows in the fractional industry classification;

- the divergence between the spatial boundaries of clusters and territories that are subjected to the collection of the statistical data;

- the lack of information for many qualitative characteristics of clusters' activity;

- the lack of a single agreed list of measuring instruments of clusters' activity, etc.

In this respect, the most appropriate method of the identification and estimation of the regional clusters' activities in Ukrainian conditions is presented in an approach that fits to the

definition of clusters, based on the nature of economic activity in certain areas and grounded on data obtained mainly by means of an expertise.

The cluster approach to enhance the competitiveness of small business is a combination feature of the territorial and inter-sectorial management principles. At the regional level of the entrepreneurship clusters exist as single agents of a network and competitors, which allow them to speak on equal terms and to resist the destructive tendencies of the global competition.

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