*Reg. 33/15*

Translation from Polish. Translation from an original document.

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Review of a doctoral thesis of Mgr Juan Carlos Guzman "Clusters as a factor of competitiveness of candy industry companies in Mexico"

In the conditions of progressive globalization, technological revolution and global crises more and more companies – regardless of their sectors or markets – are looking for the ways how to improve their competitive position, often through the formation of modern network structures or various business connections. The main reason for starting enterprise cooperation in a cluster system is to combine strengths in order to neutralize and limit threats, complete resources and fully use their skills. Gaining knowledge and introducing internationalization, effective research and development implementation, having bigger influence, increase and significant success in business. Those solutions can lead to product, service and market development due to cost reduction, which enables us to sell cheap products and services. This issue is presented in the work of Mgr Juan Carlos Neri Guzman, in which he pays special attention to the issues related to economy competitiveness on the example of candy industry in Mexico. Mexican producers' export increase did not affect the growth of their competitiveness. According to UNIDO in Mexico one should strengthen local economic activity as a mechanism leading to the increase of SMEs competitiveness. Mexico is the second biggest supplier of food in the USA and the third in continental America, so food sector is a very promising sector. It amounts to almost 10% of GDP, SMEs in Mexico form 99.7% of all enterprises, they employ 69.5% of the working force and contribute to achieving 38.9% of TGO. Region San Luis Potosi is the fourth biggest subject in candy production in Mexico and its strategic geographic localization enables it to influence national and international markets. Chapter one of the thesis presents research methodology, description of objectives, hypotheses and research questions. Chapter two describes the problems related to the key role of industrial clusters in economy; chapter three presents the significance of candy production industry in Mexico and its competitiveness attributes. Chapter four concerns the model of an industrial cluster, which has been put forward, and its verification. Chapter five presents the research results including candy production sector from the perspective of a key

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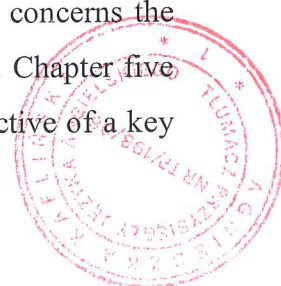
role of cluster policy in San Luis Potosí and is the basis of recommendations for the development of other regions in Mexico in the context of cluster activity. The research of industrial cluster activity is based on the analysis of five elements:

- Industrial structure integration
- Products realization
- Roles of the sectors involved
- Consolidation of product characteristics
- Context analysis

Those elements are to facilitate the functionality of economic activity in the candy production sector and to determine the direction of changes.

The author focuses on the fact that 87% of candy production companies are willing to participate in industrial cluster policy. However, only 45% will be ready to cooperate within the chain of values and initiatives which support the industry.

The objective of the doctoral thesis was to

- Conduct bibliographical research on the subject of clusters
- Analyze the operations which were conducted in the candy production process
- Develop the model of measuring cluster influence on competitiveness
- Put forward the activities aiming at the competitiveness growth in the candy production sector in San Luis Potosi.

The research covered participants of candy production value chain (producers, suppliers, customers) and the subjects linked to their activity (universities, technology transfer centers, financial institutions, self-government authorities and other). The research was conducted in 2010-2014.

The following hypotheses were put forward:

I. The cluster research, which was related to cluster issues and competitiveness factors, had so far been conducted in foreign countries and for that reasons its results do not apply directly to the industry in Mexico, particularly in the context of SMEs activities;
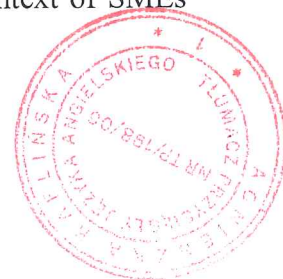
II. It will be possible to determine the role of a cluster as a factor which stimulates competitiveness on the basis of the research of candy production sector in Mexico.

III. In order to define the influence of a cluster on competitiveness, a cluster model and its practical validation, one can apply the experience of candy production sector (in particular of the SMEs role) in San Luis Potosi.

The following research questions were asked:

- How have clusters and their characteristics affected the global increase of competitiveness?
- What qualities should be taken into consideration while designing a cluster model on the basis of candy production sector in San Luis Potosi?
- How do clusters and their qualities affect the competitiveness growth of Mexican candy production industry?
- What are the requirements which should be met by other regions in Mexico so as to be able to extend the recommendations which were put forward pursuant to the research of candy production sector in San Luis Potosi?

Expected results are as follows:

- Complex examination of companies which are a part of the productive chain in food industry and in particular in candy production industry;
- Presentation of effectiveness assessment methodology of local activity from the perspective of industrial clusters;
- Designing a timetable of concrete activities facilitating the productivity of economic activity in candy production industry and promoting clusters as an option which leads to the increase of their competitiveness.
- Propositions of cluster initiative implementation.

Deductive research was applied which took into account the transfer of experience from highly developed countries in the area of cluster policy into local markets of economic activity in Mexico in order to strengthen them.

The author:

- has conducted theoretical studies concerning the subject of industrial clusters as competitiveness factors;

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- has analyzed the economic situation of candy production industry in Mexico (the example of San Luis Potosi)
- has designed a cluster model as a tool for defining competitiveness factors.
- has analyzed competitiveness factors in candy production industry in San Luis Potosi.
- has indentified the factor which facilitate competitiveness promotion in other regions in Mexico
- has verified research hypotheses, research objectives and questions

The research model covers in total 56 variables; out of those 44 variables are from the category of the so called "soft data" from the research (79%) and 12 from the so called "hard data" from official institutions (21%). For the five components of the cluster model, which has been described above, 20 factors in total were defined which describe those components:

- industry structure (representativeness, technology level, integration, expected benefits)
- types of products (customers identifications, commercialization indicators, market expectations)
- actors integration (institutional connections, their basic participation and needs)
- product characteristics (conflict, external markets influence, market competitiveness and preferences, innovation sources, promotion, product final quality)
- activity status trends (national and international competitiveness context, macroeconomic context, changes in demand and customer preferences)

In the theoretical part the author took into account theoretical schools which influence cluster economic theory. He also referred to the main theories concerning innovation and regional development, including the ones related to local industrial concentration, industrial district theory, endogenous development assumptions, innovation diffusion, flexible production systems, Michael Porter's cluster theory, cultural support, systemic approach. The second part of bibliographic research covered the issues related to competitiveness measurement, cluster definition and typology, models of industrial clusters, such as:

a. triple helix model – higher education schools, industry, local and national authorities.
b. Michael Porter's model
c. Funnel model

The thesis also presents the issue of cluster internationalization, pointing out global experience in the area clusters activity. The author covered the subject of clusters as a factor of competitiveness growth in Mexico. He extensively described the candy production industry in Mexico, including San Luis Potosi as a representative geographical locality. He pointed out the background of experience of Mexican leading world candy manufacturers. Chapter four describes a proposed model of industrial cluster and its practical verification. Figure 4.1 and 4.2 present the factors which influence the innovations that promote competitiveness and the conceptions that help to define cluster components. The components which allowed the author to form his cluster model were generated pursuant to wide bibliographic research (Table 4.1). For every indicator which describes a cluster model component related variables were defined. Every component was described in individual detailed tables. On the basis of the proposed model the author developed a general index of cluster functionality. The research covered producers, primary and secondary suppliers, distributors and sellers. In order to verify the model statistic tools were used, including linear correlation coefficient. Those indicators were applied describing the power of correlation between individual components of a cluster model (Table 4.9). A linear regression model was applied to describe the model. In the final part of the work results of the research are presented which cover the issues constituting the elements of a general cluster model which has been formed. One of the work results was a competitiveness star which is built out of the components of the cluster model and competition (Figure 4.35). An important element of work is Cluster Integration Index which is empirically confirmed and is described with a mathematical equation. In order to illustrate the work better the author developed various assumptions which present the relationship between individual components of his model, including portfolio analysis. The author described his assumptions for designing growth strategies for candy production industry in San Luis Potosi in relation to the cluster components which have been designed and empirically verified. The work finishes with recommendations which are to facilitate operationalization of the activities of the candy production cluster in San Luis Potosi. The following milestones were put forward:

- Identification of network cooperation
- Promoting cluster integration
- Developing a strategic plan for the cluster
- Cluster implementation
- Monitoring mechanisms implementation

For the purposes of this operationalization the author developed key initiatives and actions which facilitate the implementation of the candy production cluster. The author also developed a strategic map of the cluster and its management structures, including a decision making structure in the cluster. The role of individual stakeholders of the cluster was defined. The work finishes with recommendations, conclusions and guidelines for further studies. In order to write this thesis the author used the literature list of 333 publications in total. He applied 103 figures and 49 tables. At the end of the work there is a survey which was used in the quantitative research. The work has 264 pages.

Critical remarks:

1. In the theoretical part there is a visible lack of references to the network paradigm and a theoretical description of network and network environment, he straightway moves into the mechanisms of cluster functioning. The work does not refer to the assumptions of industrial cluster functioning in the context of a network theory e.g. Coase's theory of transaction costs, Williamson's theory of specific assets transaction costs.

2. There is no description of a structuralism mechanism in networks which results in cluster initiatives.

3. There are no defined network attributes which are applied in cluster initiatives.

4. There is no description of network dynamism and references to the conception of stakeholders in networks.

5. There are no references to the business models which are based on network structures and cluster initiatives.

6. Out of the three hypotheses in fact only the first one refers to a scientific problem:
   - The cluster research, which relates to clusters and competitiveness factors, has been done so far in foreign countries and its results do not apply to the industry in Mexico, particularly in the context of SMEs activity.

   The remaining two hypotheses:
   - It will be possible to determine the cluster role as a factor promoting competitiveness on the basis of research of candy production sector in Mexico.
   - In order to define the influence of a cluster on competitiveness, a cluster model and its practical validation one can use the experience of candy production sector (in particular the role of SMEs) in San Luis Potosi,

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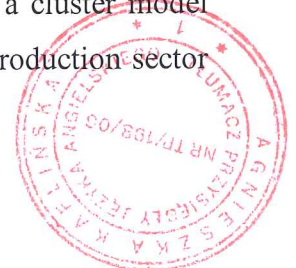
are obvious and concern the scope of the conducted research without pointing out dependencies between the researched variables.

- Within this scope innovation research has been done in a very small degree, although the theoretical part devotes relatively much space to this problem.
- In the work the author did not describe unambiguously a current cluster status, and in particular its leaders or a coordinator. He did not refer to the fact if there is perhaps some cluster development strategy for the San Luis Potosi region.

Summing up: taking into account the above mentioned positive assessment - despite the doubts which are enumerated – of a reviewed work I confirm that this work meets the criteria of the *Academic and Artistic Degrees and Titles Act* and I petition for authorizing it for public defense.

Warsaw 15 April 2015

Translator's commentary: In a right bottom corner there is an illegible signature.

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I, Agnieszka Kaflińska, a licensed English-Polish translator and interpreter, certify the consistency of this document submitted to me for translation. Translation from an original document.

Reg. number 33/15. Lodz, on 21 May 2015.