TO THE QUESTION OF THE ESSENCE OF BUSINESS CLUSTERS: A LITERATURE REVIEW OF EXISTING APPROACHES

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ABSTRACT: The purpose of this paper is to analyse existing theoretical and practical approaches to the explanation of the essence of business clusters. This study observes the nature of clusters, as well as inspects dynamic changes in the perception of a cluster as an agglomeration. The research is based on a literature review, within the scope of which theoretical approaches are divided into four categories, namely the British, Italian, American and Scandinavian visions. Not only does the paper contain detailed examinations of the approaches, but it also reveals an evaluation of each approach from the position of nine measurement criteria that are proposed within a comparative analysis. The choice of implemented criteria is justified by their significance for the description of clusters. Apart from that, the study highlights distinguishing features of all approaches.

KEY WORDS: business clusters; clusters of enterprises; triple helix; clustering approaches; literature review

1. INTRODUCTION

In modern conditions the attention to business clusters is rapidly growing both in developed and developing countries. The point is that clusters enable to unlock economic potential and to increase the competitiveness of economies. Hence, more and more practitioners and theorists refer to such term as “business clusters” and “clusters of enterprises”. Although there is plenty of information concerning the phenomenon of clusters, it is useful to observe it deeply within the bounds of a comparative analysis of existing approaches.

This article encompasses inspection of definition of the term “cluster”, observation of approaches to cluster formation that are divided into four categories in accordance with the countries of their origin, as well as a comparative analysis of the approaches based on proposed criteria (structure of core enterprises; importance of geographic concentration; likeliness of sectors, in which enterprises operate; level of employee specialization; key components for smooth operation; critical resources; objects of export (goods and/or services); elements of exchange between enterprises; importance of popularization and its main techniques).

2. THEORETICAL BACKGROUND

The term “business cluster” is continually used in theory and practice of enterprise management. Clusters are formed either with a top-down or a bottom-up mechanism, and in some cases through combination of both (OECD, 2007). Without regard to the instruments of formation, clusters represent agglomerations of enterprises that are capable to boost the economic growth of regions and countries, where they are operating. A cluster in general is defined as a group of similar things that are located close to each other, sometimes surrounding something (Cambridge Dictionary, n.d.). In some respects, clusters possess similar nature, but for a thorough understanding of their essence let us observe distinctive definitions (Table 1).

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Porter (1998a)</td>
<td>Clusters are groups of firms and institutions that are interconnected with each other and operate in a particular field.</td>
</tr>
<tr>
<td>Baptista &amp; Swann (1998)</td>
<td>A cluster is a strong collection of related companies located in a small geographical area, sometimes centred on a strong part of a country’s science base.</td>
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<tr>
<td>Ceglie &amp; Dini (1999)</td>
<td>Clusters are groups of interconnected firms and related institutions that operate on the same territory and have common sectoral focus. The agglomerations specialize at producing basic and complementary goods and/or services, being surrounded with supportive institutions, including associations and training service providers.</td>
</tr>
<tr>
<td>Feldman &amp; Audretsch (1999)</td>
<td>A cluster is a diversified group of industries interconnected by the supply and purchase correlations based upon a “cost – output” matrix.</td>
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<td>Waits (2000)</td>
<td>Clusters represent geographical concentrations of competitive firms in related industries that do business with each other and that share needs for common talent, technology and infrastructure.</td>
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<td>Rosenfeld (2002)</td>
<td>A cluster is a spatially limited critical mass (that is sufficient to attract specialized services, resources and suppliers) of firms that have systemic relationships to one another based on complementarities or similarities.</td>
</tr>
<tr>
<td>Whittington et al. (2009)</td>
<td>Clusters are networks that stimulate benchmarking among firms, as they observe the performance of each other. In this respect, clusters lower the coordination costs without decreasing the flow of information through them.</td>
</tr>
<tr>
<td>Frenken et al. (2014)</td>
<td>Although clusters represent groups of firms that are operating close to each other, there is only weak evidence that localization contributes to firm performance, whereas the impact of firms from related industries on overall cluster success is continually growing.</td>
</tr>
</tbody>
</table>

Source: Author
Although such distinguished researchers as Dahmen (1970), Pyke, Becattini & Sengenberger (1990) proposed detailed definitions of business clusters in the second half of the 20th century, it is considered that Porter (1998a) was the first to give the most precise explanation.

As described in Table 1, through years the definitions of clusters became more sophisticated. The perception of the nature of clusters was supplemented with technological and innovative components. Not less importantly, the definitions describe that the role of systemic connections and relations among members of clusters, as well as the significance of firms from related fields have increased hugely. Hence, it should be noted that contemporary business clusters differ from those that existed more than three decades ago.

3. RESEARCH METHODOLOGY

The previous section represented a theoretical foundation for the study of the nature of clusters, which changed from formal and goal-oriented to democratized and innovative. To evaluate these modifications in the perception of clusters, let us divide the existing knowledge into four main categories, namely the British, Italian, American and Scandinavian approaches to clustering. The division is justified by the country of origin where authors conducted their researches.

For the analysis to be full-fledged and complete, let us observe the contributions of authors by highlighting key aspects of their approaches and by comparing their visions based on a list of criteria (Table 2). Each approach will be described in the next section, and evaluation of essential criteria will be undertaken.

### Table 2. List of criteria for the comparative analysis

<table>
<thead>
<tr>
<th>No.</th>
<th>Criteria</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Structure of core enterprises (large/ medium/ small)</td>
</tr>
<tr>
<td>2</td>
<td>Importance of geographic concentration for enterprises</td>
</tr>
<tr>
<td>3</td>
<td>Likeliness of sectors, in which enterprises operate</td>
</tr>
<tr>
<td>4</td>
<td>Level of employee specialization</td>
</tr>
<tr>
<td>5</td>
<td>Key components for smooth operation</td>
</tr>
<tr>
<td>6</td>
<td>Critical resources (natural /human/ technological/ etc.)</td>
</tr>
<tr>
<td>7</td>
<td>Objects of export (goods and/or services)</td>
</tr>
<tr>
<td>8</td>
<td>Elements of exchange between enterprises</td>
</tr>
<tr>
<td>9</td>
<td>Importance of popularization and its main techniques</td>
</tr>
</tbody>
</table>

Source: Author

Author proposes specific comparative criteria due to their relevance and capacity to reveal the features of approaches when observed together.

4. LITERATURE REVIEW

To examine the peculiarities of approaches, let us observe them in chronological order. It is worth mentioning that the existing theories of clustering were formulated not only by researchers from the UK, Italy, the USA and Scandinavian countries. However, this study reflects the most specific and distinctive particularities of visions on business clustering.

4.1. British Approach to Business Clustering

Alfred Marshall (1918), the renowned economist, analysed successful industrial enterprises in order to identify the reasons for their high productivity. The researcher came to conclusion that firms operated more efficiently when concentrated in one *industrial district*. In the first half of the 20th century there was no appropriateness in opening mineral processing plants on territories, bowels of which did not contain deposits. Entrepreneurs considered easier to localize production processes and to outsource the functions of production and processing of raw materials to a particular region. Later, the output was transported across the UK and Europe. Although Alfred Marshall used the “*industrial district*” expression instead of the term “cluster”, the industrial districts represented early prototypes of contemporary clusters.

Marshall (1919) mentioned that concentrations of enterprises in a particular territory stimulated development and honing of skills of workers. The wider the district’s scale (the greater number of enterprises it encompasses), the more probably regional population will demonstrate intentions to work in the sector, where it operates. Thus, early clusters fostered labour specialization, which in turn enhanced the performance of regions and improved regional economies.

The economist introduced the concept of “industrial atmosphere”, which facilitated the formation of a joint pool of knowledge and values. Hence, firms cooperate and compete in the atmosphere of knowledge exchange. This idea was later advanced by Jane Jacobs (1969) who proposed the thought that pools of knowledge, skills and values enabled active entry of new organizations, fostering mutual interconnections.

Obviously, firms were not able to coexist without conflicts, which encouraged the formation of associations that regulated confrontations of interests of local workers. Moreover, the specialization required improvement in knowledge and skills, which increased the role of universities that prepared professionals in specific areas. Banks had significant influence on industrial districts, providing emergency funds to firms.

It is worth mentioning that the role of the British approach to cluster formation should not be underestimated. Although the first analogues of clusters were not sophisticated, they served as a basis for further development of cluster theories. In a way Marshallian approach represented findings about existing peculiarities of industrial districts and recommendations of how to foster their formation and management.

4.2. Italian Approach to Business Clustering

Together with the associates, Giacomo Becattini (1978) succeeded in reflecting the theory of Marshall in the regions of Italy. The researchers conducted their own analyses and expanded upon the theoretical provisions of their predecessors. Unlike Marshall, the economists highlighted that institutions left crucial impact on the development of clusters and internal relations between cluster members, as well as the external organizational environment. Representatives of the Italian approach to clustering mentioned the significance of social capital among cluster members, which evolved in that respect. The researchers did not use the term “clusters”. Instead, Becattini (1989) distinguished two types of aggregations of industrial enterprises. Let us observe them more scrupulously.

- **“Industrial zones”**. These groups of large companies produced their goods on particular limited areas. While operating, enterprises developed special industrial atmosphere of knowledge and values. The inner climate of industrial zones fostered the exchange of expertise. Such zones ideally encompassed certain suppliers of various essential resources.

- **“Industrial districts”**. These business structures comprised local small- and medium-sized enterprises that worked together and were united with common aims. Formation of teams implies mutual support among enterprises in an advanced industrial
atmosphere. At this point, firms operated in large systems and developed their loyalty to industrial districts.

Researchers from the Italian approach attached particular importance to financial institutions and banks in clusters’ development. Banks served as key supporters for business communities of industrial districts and zones. Becattini (1990a) opined that within clusters banks played crucial roles in the success of small enterprises and contributed to the development of local life, which strengthened regional economies.

Becattini (1991) highlighted that production technologies required constant improvement. It was crucial for enterprises to find the most rational methods of production and marketing. The economists attentively monitored Italian footwear industry and districts, where shoes were manufactured and exported. For this reason, the research team encouraged balance between persistence of product uniqueness and regular expansion of assortment. Like Alfred Marshall’s associates, they insisted on the importance of geographic proximity among firms.

Hence, it is worth noting that the Italian vision of cluster development significantly influenced the practice of business clustering, despite the fact that representatives of this approach did not propose full-fledged theories. The research findings, however, were dominantly descriptive than advisory in nature.

4.3. American Approach to Business Clustering

Michael Porter is considered as the founder of modern cluster theory (OECD, 2007). Porter was the first to replace the concept of industrial districts and zones with the term “cluster”. The economist’s vision revolutionized research circles of the USA. Not less importantly, Porter put an irreplaceable impact on the practice of cluster formation. Through years researchers accepted Porter’s approach as undeniable. In that respect clusters became associated with various sectors of economy, apart from industrial field. Porter (1998a) considered it useful for clusters to encompass firms, which were located on the same territories not far from each other. Importance was given to special suppliers of goods and services, as well as to organizations from related fields, including universities, standardization agencies and trade associations. Thus, firms were nurtured to compete and cooperate simultaneously.

Porter (1998b) implemented categorization of cluster members, which maintained its relevance and applicability until today. The economist proposed the categorization based on a range of successfully operating agglomerations, including wine clusters. The first group comprises core enterprises that functioned in a certain sector. For instance, in case of wine clusters, core members engaged grape farms, individual wine growers and wine producers. The second category includes enterprises from related fields, which improve core members. For the approach to be structured, the above-mentioned types of enterprises are divided into particular subcategories.

- **Enterprises from related fields that directly contribute to strengthening of core firms.** These include companies that produce fertilizers, machinery for planting and harvesting, packagers of products.

- **Enterprises from related fields that provide support services to core firms.** These involve companies that popularize clusters, like tourism businesses, which organize various trips to wine clusters and other close touristic destinations in case of their existence.

- **Enterprises from related fields that improve economic conditions.** These encompass universities, which provide clusters with professional human capital, public agencies, R&D agencies, financial and non-commercial organizations.

Porter (2003) highlighted the appropriateness of integrating SME’s in the cluster’s core and justified it by the fact that small- and medium-sized firms are exposed to changes in the external organizational environment. Cluster management enabled to stimulate cooperation and mutual aid among cluster members. Although Porter (2009) did not deny the fact that clusters could be formed by integration of large enterprises, the economist noted that as SME’s were in most cases unable to face hazards on their own, it was more reasonable to include small- and medium-sized enterprises in the clusters’ cores. Such activities were expected to improve economic health of regions, as well as regional business environments.

It is worth mentioning that Porter’s associates advanced the researcher’s theories. For instance, Michael Enright is regarded as the economist who strengthened Porter’s theory, but also disputed the statement that the key to cluster success lied in competitiveness of nations. In contrast, Enright stated that regions played the most crucial role in the development of clusters. Enright (2001, pp.12-13) claimed that “Regional clusters encompass greater cooperation and competition among direct competitors rather than among representatives of different industries, which are dispersed across geographic areas. Cooperation is justified by a range of interconnections that originate as a result of close proximity between firms, which carry out bulk purchases and jointly invest in environmental control, infrastructure and training sessions”.

Unlike many specialists, Enright (2003, p.121) supported participation of private enterprises and institutions rather than public ones. That was because of bureaucratic repercussions, which public workers used to form in organizational structures. Choosing among three approaches to clustering, the economist pointed at the bottom-up mechanism as the most perspective.

Enright and Roberts (2001) considered that new firms entered markets as clusters expanded, which fostered regional business activity. Clusters enabled firms to unite their strengths in order to share information, values, infrastructure, logistics, finances, human resources and technologies.

Thus, the American approach revolutionized the theory and practice of business clustering. Research findings of representatives of this vision were prescriptive in nature. Authors highlighted the significance of geographic proximity among firms and distinguished a range of categories of cluster members from core and related industries.

4.4. Scandinavian Approach to Business Clustering

Although representatives of this concept relied on cluster theory of Porter, the researchers advanced the American approach and made it more sophisticated. The Scandinavian approach to cluster formation is still being developed. First of all, priority is given to integration of innovative component in enterprises and their associations. According to this vision, innovation is the key to organizational success. The more innovative the climate in which firms operate, the higher their productivity. Innovation is interpreted as the accumulation of experience and knowledge with their further implementation.

According to the Scandinavian vision, cluster members need to be engaged in R&D and should continuously improve production technologies. Technological aspect of cluster formation and management plays a vital role in this approach. Representatives of this vision suggest the idea of preliminary testing of innovative developments before their application.
After the implementation of procedures, it is essential to record the obtained results in order to share them with other cluster members. This concept fosters accumulation of innovative knowledge, as well as saves time and money that each cluster member might have presumably spent on similar research findings instead of contributing to more useful projects. In this regard, the attractiveness of clusters increases, as firms intend to have access to latest information on new research findings in specific areas, aiming to increase their competitiveness. Thus, firms are stimulated to have direct connection with clusters.

The Scandinavian vision of business clustering emphasizes on the fact that the output of firms will not remain high in the long-term perspective if they do not strengthen their relationships with universities (research field) and public bodies (state field). It is worth mentioning that the concept of triple helix of Henry Etzkowitz and Loet Leydesdorff (2000) put a significant influence on business clustering. It was introduced by Etzkowitz & Leydesdorff (1997) and advanced by Leydesdorff & Etzkowitz (1998). The concept is based on cooperation between three groups of members.

- **I. Scientific research fields.** This category encompasses representatives of universities and research institutions that work in laboratories, as well as in study groups and take the lead in knowledge-based economic development.

- **II. SME’s and large enterprises.** This group of members unites firms that produce goods and/or deliver services at different levels of tech development.

- **III. Public bodies.** These cluster members provide initiatives from research institutions, university, SME’s and large enterprises with financial assistance.

As a consequence of active interactions among these groups, innovative environment becomes more conducive to create breakthroughs. The concept of triple helix is still being improved due to its high applicability and unique nature. The role of cluster formation, management and development has increased in Scandinavian countries, where theory and practice of clustering are strengthened and advanced (The Globalisation Council, 2009; ESCA, 2014; Socio-Economic Analysis AS, 2017; McPhillips, 2020). This approach does not emphasize the significance of geographic proximity among firms and allows for the possibility of long-distance placement of enterprises due to the emergence of technological advancements.

Thus, it should be noted that the Scandinavian approach to business clustering, unlike previously observed visions, relies on solid technological and innovative bases. Representatives of this approach support connections within a triple helix, which fosters manifestation of positive synergy effect.

### 4.5. Comparative Analysis of Approaches to Business Cluster Formation

Let us conduct a comparison of the observed approaches to clustering by evaluating a range of criteria. The list was described in Table 2 of Section 2. The assessment is presented in Table 3, which demonstrates the dynamics of changes in views on cluster nature. For instance, Criteria No. 6 concerns the significance of critical resources. If representatives of the British and Italian visions highlight the importance of natural resources, the American approach is based on competitive determinants, and the Scandinavian builds on innovations.

<table>
<thead>
<tr>
<th>No.</th>
<th>Approach / Criterion</th>
<th>British approach</th>
<th>Italian approach</th>
<th>American approach</th>
<th>Scandinavian approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Structure of core enterprise (small/medium/large)</td>
<td>Mainly small- and medium-sized enterprises</td>
<td>Mainly small- and medium-sized enterprises</td>
<td>Preferably SME’s; but also large enterprises</td>
<td>Preferably SME’s; but also large enterprises</td>
</tr>
<tr>
<td>2</td>
<td>Importance of geographic concentration</td>
<td>Very high</td>
<td>Very high</td>
<td>Very high</td>
<td>Relatively lower due to tech advancements</td>
</tr>
<tr>
<td>3</td>
<td>Likelihood of sectors, in which enterprises operate</td>
<td>Relatively high; likeliness is considered as an advantage</td>
<td>Relatively high; likeliness is considered as an advantage</td>
<td>Relatively not high due to the concept of core enterprises and firms from related fields</td>
<td>Relatively not high due to firms that specialize at various fields with a focus on innovations</td>
</tr>
<tr>
<td>4</td>
<td>Level of employee specialization</td>
<td>High</td>
<td>High</td>
<td>High; accent on improvement of value chain</td>
<td>High; accent on improvement of business processes</td>
</tr>
<tr>
<td>5</td>
<td>Key components for smooth operation</td>
<td>Infrastructure for production and export</td>
<td>Production and other capacities</td>
<td>Infrastructure, as well as production and other capacities</td>
<td>Representatives of three groups of member of the triple helix concept</td>
</tr>
<tr>
<td>6</td>
<td>Critical resources</td>
<td>Natural resources</td>
<td>Natural resources</td>
<td>National determinants of competitiveness; vary depending on countries and regions</td>
<td>National determinants of competitiveness; especially intellectual capital and innovations</td>
</tr>
<tr>
<td>7</td>
<td>Objects of export (goods/services)</td>
<td>Goods</td>
<td>Goods</td>
<td>Goods and Services</td>
<td>Goods and Services</td>
</tr>
<tr>
<td>8</td>
<td>Elements of exchange between enterprises</td>
<td>Knowledge, values, experience</td>
<td>Knowledge, values, experience</td>
<td>Knowledge, values, experience, business networking</td>
<td>Knowledge, values, experience, business networking, know-how</td>
</tr>
<tr>
<td>9</td>
<td>Importance of popularization and its main techniques</td>
<td>Not high; attention is not paid to how firms are perceived by the community</td>
<td>Relatively not high; firms popularize regions by producing quality products</td>
<td>Relatively high; enterprises work on improvement of value chain and enhancement of reputation</td>
<td>Relatively high; enterprises work on improvement of value chain and enhancement of market positions</td>
</tr>
</tbody>
</table>

Source: Author
Thus, it can be concluded that the role of business clustering should not be underestimated. Being formed spontaneously or deliberately, with top-down, bottom-up or combined methods, supported by public or private authorities, clusters represent groups of enterprises that unite competition along with cooperation and are capable of boosting the economic growth of regions and countries where they operate.

The review shows that initially the term “cluster” was not applied in business literature. There existed concentrations of enterprises, which were located on the same territories and operated in similar economic sectors. By doing this, firms developed synergy effect that gained great return. Representatives of the British vision (1920’s) referred to such agglomerations with the term “industrial districts”, while researchers who represent the Italian approach (1970’s) applied the term “industrial zones” to these groups of firms. The American vision (late 1990’s) on clustering made a scientific revolution in the practice of management. For the first time the term “cluster” appeared in economic literature, defining the nature of cluster models that can be found in regions even today. Later the cluster theory was advanced by representatives of the Scandinavian approach (2000’s), which still remains the most contemporary vision on the essence of business clusters.

The comparative analysis demonstrates that cluster models have been modified according to demands and challenges of times. If early approaches were supplied with limited types of assets (mainly natural resources), current models require combinations of human capital and technologies. Through years, the significance of clusters has increased dramatically. Modern concepts of formation and clusters mainly depend on interactions among elements from state, business and research sectors that not only exchange knowledge, values and experience, but also strengthen business networks and create favourable conditions for implementation of innovation and development of know-how.

REFERENCES


