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Business clusters formation in Latvia

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Abstract

The research paper is devoted to the issue – business clusters formation in Latvia. The purpose of this paper is to research aspects which have influenced the emergence of the business clusters in Latvia as well identify opportunities and challenges during the formation of Latvian clusters. In this research paper theoretical and empirical research methods are used, e.g. literature review and the survey of Latvian clusters representatives. The findings suggest that the most clusters in Latvia have emerged with the purpose to increase export volume and competitiveness of the cluster companies. The opportunity for the cluster formation is existing cooperation and contacts between partner companies because many cluster companies are members of industry association. The challenges for the cluster formation are lack of financial resources in the regions for the cluster development and poor understanding of the society what the cluster is.

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1. Introduction

Economists, researchers and policy makers emphasize an important role of business clusters for the state, region economic development and cluster companies' growth. Although in last ten years several dozen clusters initiatives have been launched in Latvia, the state of the cluster development in Latvia is poorly developed. According to the Global Competitiveness Report (2012) Latvia is ranked 99th from 144 countries in terms of cluster development state. In this research paper the author considers the cluster formation process in Latvia as an important stage of the cluster development. The object of this research paper is business cluster formation process in Latvia. The aim of the

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paper is to research aspects which have influenced the emergence of the business clusters in Latvia as well identify opportunities and challenges which have occurred during the formation of Latvian clusters. In this research paper following theoretical and empirical research methods are applied: review of the research papers and publications on the cluster issue and the survey of Latvian clusters' representatives. The tasks of this research are to analyze the definition of the cluster provided by different researchers and identify the role of the business cluster, determine stages of cluster formation process and factors influencing cluster formation. Based on the research of the scientific articles make the survey of Latvian clusters with the purpose to identify factors which have influenced the emergence of clusters in Latvia as well identify opportunities and challenges during the formation of Latvian clusters.

This paper consists of three parts. In the first part the definition of business cluster is provided and its role for the companies' development is analyzed. In the second part the theoretical aspects of the cluster formation are considered by analyzing the research papers of different authors devoted to the cluster formation. In the third part of this research the results of the survey of Latvian clusters on the issue of cluster formation are presented and analyzed. As result conclusions on the cluster formation, namely on the factors which positively and negatively influence emergence of clusters in Latvia are pointed out and recommendations for development of potential clusters in Latvia are provided.

2. Cluster definition and cluster role

There is growing interest on business clusters which became a subject of many research papers and studies and on clusters role on the economic growth. Already in 19th century Marshall (1920) has described the advantages of agglomeration of economic activities. Marshall believed that due to the concentration in close geographical proximity within "industrial districts" the companies get the benefit of large – scale industrial production and of technical and organizational innovations. Based on the Marshall theory Porter has developed and popularized cluster concept. According to the Porter's (2008) definition clusters are geographic concentrations of interconnected companies, specialised suppliers, service providers, firms in related industries and associated institutions (e.g. universities, standards agencies and trade associations) in a particular field that compete but also cooperate. It is to emphasize that in a number of contemporary scientific articles and publications the researchers, e.g., Boja (2011), Kassalis (2011), Boronenko and Zeibote (2011) etc. explaining cluster concept provide Michel Porter's **definition of the business cluster**.

Rosenfeld (1997) additionally explains that the term "cluster" is used to represent concentrations of companies that produce synergy because of their geographic proximity and interdependence. Sölvell et al (2003) indicate that clusters consist of five actors: co-located and linked industries, government, academia, finance and institutions for collaboration. Boronenko, Zeibote (2011) point out that main features of a cluster are following: a cluster is an economic subject rather than a juridical person (participants of a cluster are juridical persons themselves); although participants of a cluster have legal independence, they are economically interrelated; participants of a cluster differ in the type of activity and economic status and participants of a cluster are geographically proximate and work in the same region. According to the European Cluster Memorandum (2007) clusters are regional concentrations of specialised companies and institutions linked through multiple linkages and spill-overs, which provide an environment conducive to innovation. Kowalski, A. M. (2012) argues that the concept of clusters is a turning point in the traditional approach to co-operation between enterprises, as well as between business and science.

Porter (2008) notes that growing cluster opportunity and its success stories have attracted the best talents. People with ideas or relevant skills come from other locations to work in or for the cluster companies. Specialized suppliers emerge; information accumulates; local institutions develop specialized training, research and infrastructure. Porter points out that numerous case studies suggest that clusters require a decade or more to develop real competitive advantage.

Waits (2000) emphasizes that clusters, rather than individual companies or simple industries, are the source of jobs, income, and export growth. Boja (2011) points out that economic development based on cluster models brings multiple benefits into regional development and competitiveness in an industry. Delgado, Porter (2011) indicate that industries located within a strong cluster are associated with higher employment growth and strong clusters foster growth in wages, the number of establishments and patenting. Sölvell Ö. (2009) points out that clusters can be

described along four key dimensions: type of agglomeration, level of dynamism, stage in the life cycle, and level of political involvement.

Kassalis (2011) concludes that the cluster environment increases competitiveness of companies within the cluster by stimulating competition, innovation, collaboration, interaction and increasing efficiency. Newlands (2003) indicates that cluster companies together can get cheaper finance, purchase materials for a better price, conduct common research and other cooperative activities based on trust.

Porter (1998) indicates that clusters affect competition in three ways: first, by increasing the productivity of companies based in the area, second, by driving the innovation, and third, by stimulating the formation of new businesses, which expands and strengthens the cluster itself.

2.1. Clusters and productivity

Cluster companies perform more productively in accessing information, technology and needed institutions, coordinating with related companies. Porter (1998) indicates that working in cluster insures different benefits, e.g.:

- *Access to specialized information.* Extensive market, technical and competitive information accumulates within a cluster and members have preferred access to it. Additionally personal relationships and community ties create trust and facilitate the flow of information.
- *Better Access to Employees and Suppliers.* Porter (1998) argues that cluster companies have better access to employees and suppliers. Cluster companies can choose from an existing pool of specialized and experienced employees, thereby lowering their search and transaction costs in recruiting. Porter notes that sourcing locally instead of from distant suppliers lowers transaction costs. It minimizes the need for inventory, eliminates importing costs and delays and due to importance of local reputation lowers the risk that suppliers will overprice or break commitments. Proximity improves communications and makes it easier for suppliers to provide support services, e.g. installation.
- *Access to institutions and public goods.* Investments made by government or other public institutions, e.g. public spending for educational programs can boost company's productivity. The possibility to recruit employees trained in the framework of local programs, for example, lowers the cost of internal training. It is not just governments that create public goods that foster productivity in the private sector. Investments by companies in training programs, infrastructure, quality centers, testing laboratories etc. also contribute to increased productivity. Such private investments are often made collectively because cluster participants recognize the potential for collective benefits.
- *Complementarities.* Porter (1998) points out that complementarities come in many forms. The most obvious is when products complement one another in meeting customers' needs. In a typical tourism cluster, for example, the quality of a visitor's experience depends on the quality and efficiency of complementary businesses such as hotels, restaurants, shopping outlets, and transportation facilities. Because members of the cluster are mutually dependent, good performance of one member can boost the success of the others. Another form is the coordination of activities across companies to optimize their collective productivity. In wood products, for instance, the efficiency of sawmills depends on reliable supply of high-quality timber and the ability to put all the timber to use in furniture.
- *Better motivation and measurement.* Porter (1998) explains that local rivalry and competitive pressure within a cluster, even among noncompeting or indirectly competing companies is highly motivating. Pride and the desire to look good in the local community contribute to desire of the cluster companies to outdo one another. Clusters also often make it easier to measure and compare performances because local rivals share general information, e.g. labor costs and local market access and they perform similar activities. Companies within clusters typically have better knowledge of their suppliers' costs. Managers are able to compare costs and employees' performance with other local companies. Additionally, financial institutions can accumulate information about the cluster that can be used to monitor and compare performance.

2.2. Clusters, Innovation and New Business Formation

Porter (1998) indicates that clusters play a significant role in a company's ability to innovate. Some of the same aspects that increase current productivity have even more bigger impact on innovation. Buyers are often part of a cluster therefore companies inside clusters usually have a better view on the market than isolated competitors. The relationships with other cluster companies and involved organizations also help companies to learn early about evolving technology, component and machinery availability, service and marketing concepts etc. Such learning is facilitated by frequent face-to-face contact. Cluster provides the capacity and the possibility to act rapidly. A company within a cluster often can understand earlier which innovations it needs to implement more faster. Local suppliers and partners can be closely involved in the innovation process, thus ensuring a better match with customers' requirements. Companies within a cluster can experiment at lower cost and can delay large commitments until they are more assured that a given innovation will succeed. In contrast, a company relying on distant suppliers faces greater challenges in every activity. The other advantages for innovation are the competitive pressure and constant comparison that is in a cluster.

It is to note that some researchers express criticism on the cluster concept. For example, Martin and Sunley (2003) point out that the evidence of a positive association between clustering and innovation is not consistent.

According to Porter (1998) it is not surprising that many new companies grow up within an existing cluster rather than at isolated locations. Clusters contribute to new business formation for a variety of reasons. Individuals working within a cluster can more easily perceive gaps in products or services around which they can build businesses. Additionally, barriers to entry are lower. Needed assets, skills, inputs, and staff are often available at the cluster location, ready to be integrated into a new enterprise. Local financial institutions and investors, already familiar with the cluster, are more open for the cluster companies to give credits under better conditions. In addition, the cluster often presents a significant local market, and an entrepreneur may benefit from established relationships. All of these factors reduce the perceived risks of entry and of exit, if the enterprise fails.

To sum up the companies in the cluster have advantage to rivals outside the cluster and to other locations.

3. Clusters emerging

Porter (1998) admits that cluster emergence can influence different factors. For example cluster formation can be connected with historical circumstances. In Massachusetts, for example, several clusters had their beginnings in research done at Harvard. The Dutch transportation cluster owes much to Holland's central location within Europe, and extensive network of waterways, the efficiency of the port of Rotterdam, and the skills accumulated by the Dutch through Holland's long maritime history.

Clusters may also arise from unusual or great local demand. Israel's cluster in irrigation equipment and other advanced agricultural technologies reflects nation's strong desire for self-sufficiency in food together with a scarcity of water and hot arid growing conditions. The environmental cluster in Finland emerged as a result of pollution problems created by local process industries such as metals, forestry, chemicals and energy.

Related industries or even whole related clusters can create new clusters. The golf equipment cluster near San Diego has its roots in southern California's aerospace cluster. That cluster created a pool of suppliers for castings and advanced materials.

New clusters may also arise from one or two innovative companies that stimulate the growth of many others.

Porter (2008) emphasizes that once a cluster begins to form, the support of local institutions can promote a growth of the cluster. With the growth of the cluster expands its influence on government and on public and private institutions.

Atherton and Johnston (2008) indicate that there are two types of cluster formation "top-down" and "bottom-up".

Atherton and Johnston (2008) explain that typically starting from a regional or national perspective, "top-down" approaches tend to use administrative units, in particular regions, as the geographical basis for clusters development policies and plans. The authors argue that such approach does not reflect the dynamics of cluster formation as a function of increasing cooperation between companies.

According to the "bottom-up" approach clusters form when groups of businesses start to cooperate and through cooperation develop ties, interdependencies and trust that enable them to operate with greater economies of scale and

scope. Cooke and Morgan (1998) are convinced that clusters cannot be created by political injunctions or through pure physical proximity. Clusters form as a result of a self-selection process of companies which see advantages in collaborating for mutual benefit, a process which can be encouraged but not ordered by public agencies.

Therefore Atherton (2003) emphasises that effective clusters development policies are likely to be “bottom-up”, in that they emerge out of sustained cooperation between companies.

Atherton and Johnston (2008) point out that cluster emergence influence three aspects: geographical or spatial proximity, transactional proximity and knowledge centres.

The researchers explain that *geographical or spatial proximity* means co-location in certain business spaces; shared location around key infrastructure; location to gain access to natural resources and location in cities and major settlements.

Transactional proximity means sectorial and market concentration based on shared, overlapping or complementary niches and specializations (horizontal specialization); “vertical” production and trading relationships, including buyer-supplier linkages, subcontracting supply chains; concentrations around larger firms that offer supplier and subcontracting opportunities.

Clusters can emerge around *knowledge creation and distribution centers*, such as universities and research centers, as well as associations and other forms of business membership organization.

Atherton (2003) identifies five stages of the cluster formation process. The transition from stage to stage is related with greater level of mutual commitment and cooperation. The nature of cluster, the dynamics of collaboration and joint action within it are likely to change during the process of its formation. In the early stages there is greater emphasis on creating and building awareness and trust between the firms based on desire to solve common issue or problem. When the cooperation between firms starts to emerge, the focus shifts to project collaboration and developing rules and patterns of group interaction. The next stage is development of formalized agreements and conventions that guide and provide a structure for cooperation within the group. The author identifies following 5 stages of cluster formation process.

Stage 1 is identification of a common issue or problem that individual companies cannot solve alone. When an issue or problem is shared by companies the potential for cluster formation exists. Companies combined resources provide opportunities to overcome a common problem and barrier.

Stage 2 is recognition of a need or opportunity to cooperate.

It is to admit that many companies experience similar problems that concern their development or create them additional operating challenges and costs. However Atherton and Johnston (2008) admit that this aspect does not itself lead to firms’ collaboration. Clusters start to form when the potential to work together transforms into active interaction and cooperation, in order to address shared concerns. Therefore the second stage of cluster emergence occurs when companies are encouraged and stimulated to cooperate with like-minded companies and organizations. External factors which influence the company operation, e.g. new market entrants and innovation in the field can be a stimulus for collaboration. Additionally regulation and standards or certain industrial and market norms can also stimulate companies towards cooperation. Atherton and Johnston (2008) indicate that clusters start to form when the pressures or need to resolve shared issues or problems become significant enough to drive individual companies to involve in collaboration. In the stage 2 is the transition from sharing a problem or issue with other companies (whether mutually recognised or not in the first stage) to agreement among the group of companies that there is a need or opportunity to work together on the particular issue. The authors point out that this transition requires a shared recognition that the issue or problem cannot be resolved without cooperation. It is also based on mutual recognition of the need and opportunity to collaborate to address and resolve the issue or problem.

Stage 3 is development of an initial collaborative project. Once a group or network of companies that have a common issue has recognised a need and agreed to cooperate, the next step is to determine the form, scale and nature of cooperation. In the framework of this stage of the cluster emergence it is observed the transition from exploration of the collaboration opportunities to actual cooperation by the group engaging into shared activities. The initial form of group collaboration tends to be a joint project with a certain goal. Atherton and Johnston (2008) point out that a project is preferred by companies for several reasons. Firstly, companies’ cooperation in a project reduces the risk associated with cooperation in situations when the companies have not collaborated and have not been working together before. Usually cooperation starts with lower-risk activities. Secondly, engagement in a “test” project

allows companies to learn more about the partner companies that they are cooperating with, consequently increasing awareness of the activities and capabilities of others companies involved in the project. Working in one project provides opportunities for the development of trust and familiarity between the collaborating companies. Thirdly, an initial project helps cooperating companies to develop protocols and shared rules for engagement and cooperation. Atherton and Johnston (2008) emphasise that a pilot project creates the mechanisms and trust for future tight cooperation.

Stage 4 is emergence of on-going group cooperation through multiple projects. If the cooperation in the initial project has been successful the next step in the cluster formation is the initiation of multiple projects. Working in multiple projects makes companies more aware and familiar with each other and their individual and organizational capabilities. Through on-going collaboration via projects the participating companies are able to develop higher levels of trust and, as a result, become more mutually dependent. Increase in mutual awareness, familiarity and trust within a group of cooperating companies rises opportunities and further scope for collaboration. In this way, on-going collaboration through multiple projects creates the conditions for greater levels of cooperation.

Stage 5 is formalization of the group and its collaborative activities. Engagement in multiple projects can lead to more explicit and formalized forms and approaches to cooperation. The formalization of group cooperation represents a final stage in the cluster formation process. In the framework of this stage the cooperating companies make cooperation agreements and sign contracts. Over time such agreements are likely to develop into forms of cross-investment and cross-ownership. The transition to formalization of previous informal ties represents a shift to more explicit investment and commitment to the group as the basis for creation of competitive advantage and competing against other companies.

4. Methodology

Analyzing the state of cluster development in Latvia it is to note that from several dozen clusters initiatives launched in last ten years in Latvia the oldest are IT cluster and Latvian Forest Industries cluster. Coordinating institutions of a number of Latvian clusters are industry associations.

In the framework of this research the survey of Latvian clusters was conducted with the purpose to identify factors which have influenced the emergence of clusters in Latvia. Besides positive factors and barriers which have occurred during the cluster formation process were researched and analyzed.

It is to emphasize that at the national level the official register of Latvian clusters is not kept and the official data on all Latvian clusters is not available. Therefore the author of this research paper has sent the questionnaire to following 15 clusters which are more active in Latvia: Latvian IT Cluster, Food Production Quality Cluster, Latvian Metalworking Cluster, Latvian Supply Chain Cluster, Life Science Cluster of Latvia, Sustainable Tourism Cluster of Latvia, Gauja National Park Tourism Cluster, Latvian Electrical Engineering and Electronics Industry Cluster, Latvian Health Tourism Cluster, Wood Construction Cluster, Green-tech Cluster, Vidzeme Food Cluster “LATinnofood”, CleanTech Cluster Latvia, Industrial Energy Efficiency Cluster and Space Technology Cluster. The response was received from 9 clusters or response rate is 60%.

Reliability and permissible inaccuracy of the survey: although response rate is 60% and the official data on all Latvian clusters is not available the author of this research paper considers that survey results are reliable, taking into account that response was received from business clusters which are big and more active in Latvia.

During the survey the cluster representatives were asked to identify factors which have influenced the emergence of their cluster. It is to note that the cluster representatives had possibility to choose several options by choosing factors which have influenced the cluster emergence. The answers are reflected in the Figure 1. Examining the survey results it is to indicate that most of the cluster representatives or 89% are convinced that cluster emergence was influenced by the desire to increase export volume of cluster companies. 78% of all cluster representatives have responded that the emergence of the cluster was influenced by the possibility to increase the competitiveness of cluster companies. The emergence of 67% clusters was influenced by the possibility to get co-financing by the ERDF or another financial instrument for the cluster development. 44% of respondents think that the opportunity to increase the productivity of the cluster companies had impact on the cluster emergence. 22% of all respondents have mentioned another factor which has influenced the emergence of cluster, namely existing cooperation between cluster members and possibility to strengthen it, as well desire to develop and popularize Latvia abroad as the goal for the health tourism.

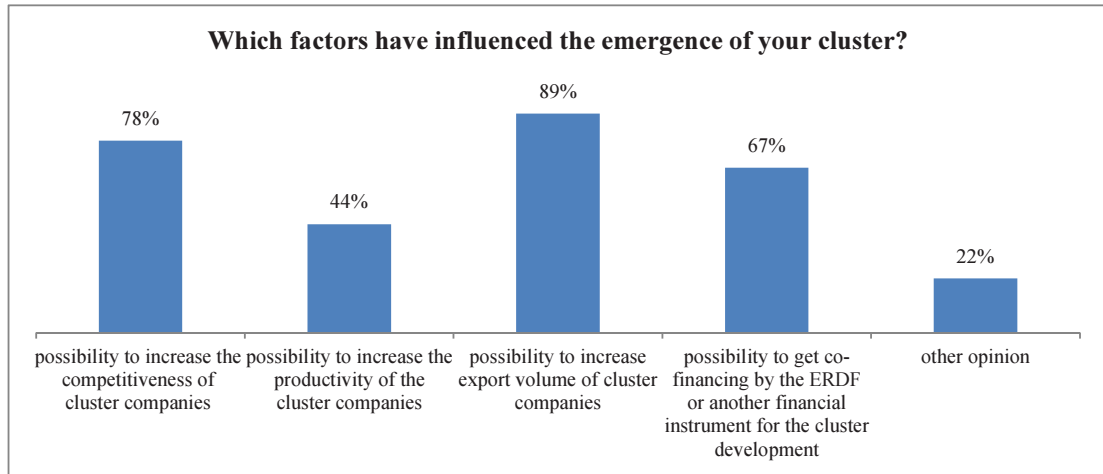


Fig.1. Factors which have influenced emergence of the clusters in Latvia

Analyzing the survey results it is to note that following factors which have positively influenced the cluster formation process in Latvia were mentioned by the cluster representatives:

- a great interest of entrepreneurs on participation and collaboration in cluster;
- existing cooperation and contacts between partner companies because many cluster companies are members of industry association, unity in strategic goals;
- possibility to apply for co-financing by the European Regional Development Fund (ERDF) has motivated the founder and developer of the cluster;
- geographical proximity of the cluster members to each other;
- active role of the region in cluster initiation and coordination;
- the potential for international cooperation: cluster is interesting cooperation partner for other clusters in the field;
- working in a cluster is a new opportunity for the companies development and growth.

As barriers which have occurred during the new cluster formation in Latvia were mentioned:

- lack of financial resources in the region for the cluster development, which hampers cluster growth;
- state support for the cluster development is poor;
- in the society there is less understanding what the cluster is, which role it plays and what added value for the regional development it gives;
- identification of common activities of the cluster companies;
- finding of common solutions and measures to improve competitiveness of the cluster companies which are at once competitors;
- difficulties to find partners during the cluster formation process which were ready to become cluster members mainly because of knowledge lack on the cluster issue. When the cluster has started to work the entrepreneurs have joined the cluster more active;
- bureaucracy and a big amount of the documents needed by applying for the Cluster program co-financed by the ERDF.

5. Conclusions and recommendations

Analysing the survey results with the Latvian clusters representatives the author of this research paper makes following conclusions and proposes following recommendations for cluster development in Latvia:

- Although in last ten years several dozen clusters initiatives have been launched in Latvia, the state of the cluster development in Latvia is poorly developed.
- Positive factors for the cluster emergence in Latvia are potential for international cooperation: cluster is interesting cooperation partner for other clusters in the field, interest of entrepreneurs on participation and collaboration in cluster, existing cooperation and contacts between partner companies because many cluster companies are members of industry association and possibility to apply for co-financing by the ERDF.
- There is lack of financial resources especially in Latvian regions for the cluster development, which hampers cluster growth in Latvia.
- Therefore the author of this research paper recommends to the Ministry of Economics of Latvia as policy maker of cluster issues to create financial support instruments for development of the clusters in the regions.
- Latvian society has less understanding what the cluster is, which role it plays and what added value for the regional development it gives.
- Therefore the author of this research paper recommends to the Ministry of Economics of Latvia to prepare and distribute information booklets with the information on the business clusters.
- By the formation of cluster some clusters had difficulties to find partners during the cluster formation process which were ready to become cluster members mainly because of knowledge lack on the cluster issue.
- Therefore the author of this research paper recommends to the Ministry of Economics of Latvia to develop a common clusters internet portal with information on activities of emerging and established clusters in Latvia.
- The emergence of the majority of Latvian clusters was influenced by the possibility to increase export volume and competitiveness of the cluster companies.
- Findings of this research paper could be useful for cluster policy makers and emerging clusters in Latvia.

References

- Atherton, A. (2003). Examining clusters formation from the “bottom-up”: an analysis of four cases in the North of England. *Environment and Planning C: Government and Policy*, 21–35. <http://dx.doi.org/10.1068/c0115>
- Atherton, A., & Johnston, A. (2008). Cluster formation from the “bottom-up”: a process perspective in *Handbook of Research on Cluster Theory*, edited by Charlie Karlsson (pp. 93–113). Northampton: Edward Elgar Publishing.
- Boja, C. (2011). Clusters models, factors and characteristics. *International Journal of Economic Practices and Theories*, 1, 34–43.
- Boronenko, V., & Zeibote, Z. (2011). The potential of cluster development and the role of cluster support policies in Latvia. *Economic annals*, LVI, 191, 35–67. <http://dx.doi.org/10.2298/EKA1191035B>
- Cooke, P., & Morgan, K. (1998). *The Associational Economy*. Oxford: Oxford University Press. <http://dx.doi.org/10.1093/acprof:oso/9780198290186.001.0001>
- Delgado, M., & Porter, M. (2011). Clusters, Convergence, and Economic Performance [online]. http://www.isc.hbs.edu/pdf/DPS_Clusters_Performance_2011-0311.pdf (downloaded November 3, 2013).
- Kassalis, I. (2011). Industrial clusters: a coefficient factor for integrated development. *Intellectual economics*, 212–223.
- Kowalski, A. M. (2012). The Impact of Industrial Clusters on the Innovativeness of Business Firms in Poland. *European Business Research Conference Proceedings 2012* [online]. <http://ssrn.com/abstract=2129190> (downloaded November 1, 2013).
- Marshall, A. (1920). *Principles of economics* (8th. ed.), London: Macmillan and Co.
- Martin, R., & Sunley, P. (2003). Deconstructing clusters: chaotic concept or policy panacea? *Journal of Economic Geography*, 5–35. <http://dx.doi.org/10.1093/jeg/3.1.5>
- Montana, J.P., & Nenide, B. (2008). The evolution of regional industry clusters and their implications for sustainable economic development: two case illustrations. *Economic Development Quarterly*, 22, 4, 290–302. <http://dx.doi.org/10.1177/0891242408324084>
- Newlands, D. (2003). Competition and Cooperation in Industrial Clusters: The Implications for Public Policy. *European Planning Studies*, 11(5), 521–532. <http://dx.doi.org/10.1080/09654310303649>
- Porter, M. (1998). Clusters and the new economics of competition. *Harvard Business Review*, 77–90.
- Porter, M. (2008). Clusters and Competition: New Agendas for Companies, Governments and Institutions. *On Competition* (pp. 213–303), Harvard business press.
- Rosenfeld, S.A. (1997). Bringing business clusters into the mainstream of economic development. *European Planning Studies*, 5, 1, 3–23. <http://dx.doi.org/10.1080/09654319708720381>
- Sölvell, Ö. (2009). Clusters Balancing Evolutionary and Constructive Forces (pp. 13–40). (2. ed.), Ödeshög: Danagårds grafiska.
- Sölvell, Ö., Lindqvist, G., & Ketels, C. (2003). *The Cluster Initiative Greenbook*. (pp.18). Stockholm: Bromma tryck AB.
- The High Level Advisory Group on Clusters (2007). *The European Cluster Memorandum, Promoting European Innovation through Clusters: an Agenda for Policy Action* (pp. 2).
- Waits, M. (2000). The added value of the industry cluster approach to economic analysis, strategy development and service delivery. *Economic Development Quarterly*, 14, 1, 35–50. <http://dx.doi.org/10.1177/089124240001400106>
- World Economic Forum (2012). *Global Competitiveness Report 2012–2013* (pp. 227). Geneva, Switzerland.