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THE POTENTIAL OF CLUSTER DEVELOPMENT AND THE ROLE OF CLUSTER SUPPORT POLICIES IN LATVIA

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ABSTRACT: *The objective of this paper is to examine the role of institutional and policy support for cluster development, and the competitive advantages of regions based on regional labour force concentration. The tool of cluster identification in regional economies - Location Quotient (LQ) - has been applied to measure the concentration of the labour force in the main economic sectors of Latvia and Finland. This comparative analysis has shown that Finland has much stronger regional labour force concentration in certain sectors of the economy, which is not typical for Latvia and reveals that the regional economy of Latvia has much lower potential for cluster development and competitiveness in*

global markets. The results of this research confirm that governments should support cluster development to achieve sustainable long-term development based on natural growth poles, exploiting the potential of regional comparative advantages such as specific concentration of skills and knowledge (labour force), concentration of industries, natural resources, etc., but not concentrate on short-term priorities in cluster development.

KEY WORDS: *cluster support policies, regional competitive advantages, cluster development, labour force concentration, location quotient (LQ).*

JEL CLASSIFICATION: H83, J21, J58, L16, O41, R12, R38.

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1. INTRODUCTION

There has been a very lively discussion about business clusters during the last two decades, especially taking into account globalisation processes and their impact on economic development. In many countries the knowledge- and technology-intensive economy is increasingly becoming an engine for economic growth, promoting discussion amongst economic policy makers and researchers about competitiveness and sustainable development, including the development of business clusters. Currently the promotion of the development of business clusters - networks of companies, learning institutions, and other related organizations - is internationally recognized as a way of improving competitiveness and innovation, especially for those businesses trying to enter international markets.

The objective of this paper is to examine the role of institutional and policy support for cluster development, and the competitive advantages of regions based on regional labour force concentration. In order to show the impact of clusters on regional economies the Localization Quotient (LQ) will be applied as the instrument of cluster identification. The authors have performed an analysis of regional economically active labour force concentration in Latvia and Finland. This analysis makes it possible to compare regional labour force concentration features that are especially important for cluster research in different sectors of both the Latvian and Finnish economies. The conclusions suggest that regional economies can achieve practical benefits by employing the concept of clusters, and provide recommendations for further improvement of cluster performance.

The paper is structured as follows. An overview summarizes the cluster-related literature and presents the discussion on the benefits of localisation and specialisation of industrial activities. In the methodology section research methods are outlined. This paper then presents an analysis of the role of institutions and relevant policies in supporting cluster development. The findings of the data analysis and survey are presented in the third section. Finally, the paper concludes with the main findings of the research, as well as the observed impacts of cluster framework conditions on company performance.

2. OVERVIEW OF THE DEVELOPMENT OF THE CLUSTER CONCEPT

The benefits of localisation of industries or geographic proximity have been widely discussed among researchers and practitioners. Many researchers (O'Brien, 1992; Cairncross, 1997; Gray, 1998) tried to show that concentration of economic activity

in certain areas as a result of globalisation is becoming less important as a result of rapid technological development. Others (Krugman, 1990, 1991; Ohmae, 1995; Porter, 1998b; Coyle, 2001; Scott, 2001; Solvell, 2008) prove exactly the opposite, instead emphasizing that globalisation increases the importance of localisation or concentration of economic activities within regions. It is becoming more important than national-level economic development for international trade and added-value creation. With the development of the knowledge economy at the beginning of the 21st century there has been an increasingly active discussion on achieving long-term economic competitiveness. In this respect the discussion of specialised regional clusters as a tool for promoting economic development and improving competitiveness has increasingly become the focus of the economic policy debate and academic research.

The concept of clusters is a polysemantic one and characterizes the form of a phenomenon (group, aggregate) rather than its contents. Thus the general scientific interpretation of a cluster is as follows: an aggregate of several homogeneous elements, which can be perceived as an independent unit with particular specific features. In this meaning, 'cluster' is similar to the concept 'region', which also has a common physical form but different content according to the subject of each science (Boronenko, 2009).

Professor Michael Porter of Harvard Business School (HBS) actualised the concept of clusters in business management and practice in his book *The Competitive Advantage of Nations* (Porter, 1990). He concluded that when several highly competitive economic subjects appear in a regional economy they foster the growth of competitiveness in the suppliers and consumers operating in that regional territory. Porter argued that in the modern global market competition is implemented not by means of separate economic subjects, but with the help of groups of economic subjects (clusters). Porter's concept of the cluster describes an industrial cluster as the unification of several industries based on buyer-supplier relations, similar technologies, distribution channels, or similar employee qualifications. In his book Porter offers definitions of vertical and horizontal clusters, but does not take into account the importance of geographic location. After further development of the cluster concept in his numerous publications (Porter, 1998a, 1998b, 1998c, 2000, 2001, 2003), clusters are described as groups of interconnected firms, suppliers, related industries, and institutions that arise in certain locations. These clusters are the geographical concentration of interconnected companies, specialised suppliers, service providers, and associated institutions in a particular field. Specialised regional clusters have been arising

in locations with enough resources and competence to enable companies to fully exploit their competitive advantages over other places.

Academic discussions of the benefits of economic specialisation and localisation started long before Porter developed his concept. At the end of the nineteenth century Alfred Marshall's work *The Principles of Economics* (Marshall, 1880) outlined observations on the concentration of specialised industries. The book reflects the results of research on industrial districts in Great Britain, and although there are no modern-specific terms in the work, it actually reviews a cluster in which participants divide the work. More than 100 years ago Marshall focused his attention on the synergic effect, which appears when small economic subjects unite and broaden their specialization. Regional economic subjects sign most of their contracts with the same suppliers and consumers, and this naturally leads to the formation of a particular group of interrelated partners, who work in local networks. Later studies (Brusco, 1982; Piore et al, 1984; Czamanski et al, 1979) on industrial districts and industrial and regional economics describe clusters as groups of industries related by flows of goods and services.

Porter's cluster theory was reviewed by another American scientist, M. Enright, who substantiated the essence of the regional cluster and defined it in the following way: "A regional cluster is an industrial cluster, in which the enterprises - participants of the cluster - are geographically proximate to each other. A regional cluster is a geographical conglomeration of enterprises and organisations, which function in one or several close branches of economy" (Enright, 1992). During the 1990s Porter's first cluster concept was used as a basis by other researchers (e.g., Redman, 1994; Rosenfeld, 1995, 1997; Jacobs et al, 1996) in discussing and further elaborating the concept of the cluster. There has also been criticism of Porter's cluster concept (Rosenfeld, 1995, 1997; Hernesniemi et al, 1996; Martin et al, 2003), emphasizing lack of precise formulation of the most important concepts used in the cluster definition, such as regional proximity or collaborative and competitive linkages, as well as expressing other concerns; for example, that cluster industries might become overspecialised.

The phenomenon of the appearance of clusters and their development is historically determined. The cluster concept came from American economists in the 1970s, and Porter then developed the cluster theory. These events coincided with the beginning of the economic globalisation process, which was encouraged by fast development of new information technologies, especially the Internet. Therefore this stage of cluster development is based on the development of the information society.

In the 20th century the economy was connected by a high level of production concentration, sales, and bank deals, and the level of concentration continued to grow. During the last 20 years the principle of economic cooperation has become a symbol of radical changes in the administration of competitive economic subjects. Its main idea is to substitute a hierarchy consisting of many levels with clusters or specialised business units, which are coordinated by means of market mechanisms (rather than administrative ones). Thus, in the new conditions of economic globalisation and increased flows of information, the necessity to have various integrated forms of economic cooperation transforms into the search for more rational, effective, and profitable ways of business administration. Clusters are one of such forms that appeared in economic theory as a result of the formation of the regional economy as a separate direction of economic theory. While analysing the history of clusters, Porter makes reference to W. Isard, the founder of regional economic theory, who encouraged the formation and institutionalisation of regional economy in the 1960s. The notion 'cluster' embraces the territorial aspect, which has become topical during the development of regional economy. That is why clusters can be considered as a form of economic interaction, which appears during the development of regional economy.

From the point of view of authors, the main features of a cluster, which are determined on the basis of Porter's classical definition, are as follows:

- 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;
- participants of a cluster are geographically proximate and work in the same region;
- all of the above-mentioned features have to be present simultaneously in the cluster.

Although the conceptual essence of a cluster is shown in Porter's classical definition, the large number of definitions of a cluster, together with an insufficient understanding of its economic character, proves that Porter failed to present his theory clearly. It contains a great number of unclear and vague phrases, such as "clusters are a significant form with complex multi-centred organization having peculiar features typical of market economy" (Porter, 1998b). In order to single out the main differences, conceptualisation of the 'cluster' requires consideration of other forms of economic interaction mentioned in scientific literature, such

as strategic alliances, industrial regions, concerns, cartels, holding companies, corporations, networks, hierarchies, technological parks, logistic centres, etc.

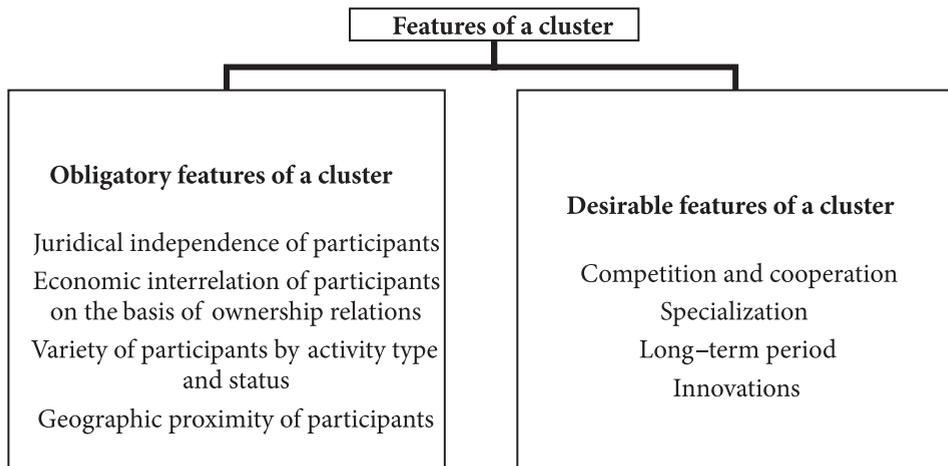
The main thing that should be realised while defining and studying clusters is that a cluster is one form of economic interaction, with occasional deals on the one hand and mergers and acquisitions on the other. However, further analysis reveals several unclear aspects. First of all, it is not clear what distinguishes a cluster from other forms of economic interaction; moreover, the economic interconnection essence of cluster participants is not determined. In order to eliminate these shortcomings it is necessary to compare the forms of economic interaction mentioned in economic literature. As the comparative analysis of clusters and other forms of interaction of economic subjects (such as corporations, financial industry groups, syndicates, cartels, holdings, concern, networks, strategic alliance, economic associations, logistic centres, technological parks, business incubators, etc.) shows (Boroņenko, 2007), it is difficult to spot the precise border among the afore-mentioned forms, since specific combinations of various forms are possible. The most evident distinctive feature of clusters is the variety of participants and diversity of their statuses, which show that it is impossible to develop economic activity beyond the production sphere or to become economically effective without partner relations with 'non-production' structures. Another distinctive feature of a cluster is its attachment to a particular region, which means that the appearance of a cluster in economic science and practice is closely connected with the necessity of separate regions to develop their competitive advantages in the modern conditions of globalisation. In Latvia the expert Uldis Osis was the first person to mention these basic features of clusters in his report "On the National Programme on Latvian Forests and the Related Businesses" (Osis, 2004).

Consequently, the answer to the question of whether clusters are economically useful or advantageous in comparison with other forms of economic interaction is as follows: clusters are important because if local production is organized in clusters, regional economic subjects can be competitive in the global market; i.e., can manufacture goods and offer services for export. Export is an aim and empirical index of the work of a cluster whose efficiency can be quantitatively evaluated.

For conceptualisation of the notion 'cluster', it is also possible to use the definition offered within the framework of the Swedish project, Cluster Policies Whitebook. The project researchers, having admitted the objective multi-dimension of the concept of a cluster, suggest not giving a definition but pointing out basic

characteristics by means of which it would be possible to identify it. Contrary to Porter, they offer a broad list of basic characteristics. The synthesis of the elaborations of Porter and the Swedish researchers, as well as the comparative analysis of different forms of economic interaction mentioned above, allow authors to make a schematic model of the 'cluster' concept.

Figure 1. The conceptual model of the notion 'cluster' in economics



Source: elaborated by the authors from analysis of the relevant economic works.

Apart from compulsory basic characteristics there can also be the following features:

- specialisation – basic activity, which stipulates formation of a cluster;
- competition and cooperation: this combination characterizes the link between participants of a cluster;
- cluster 'life-cycle': clusters and cluster initiatives are not short-term phenomena, but are created with long-term prospects;
- innovation: participants forming a cluster are involved in the process of technological, commercial, and knowledge exchange.

Although the presence of all elements is not compulsory, the presence of some of them is desirable. For instance, innovation is very important, because it gives certain advantages to the cluster.

As a conclusion of this overview of the development of the cluster concept, we suggest our own definition of a cluster: a cluster is a form of economic interaction

of judicially independent economic actors with different statuses concentrated in an economic region, which is formed in order to make its participants competitive in the global market. This definition has been elaborated in order to specify the main differences of a cluster in comparison with other forms of economic interaction.

3. METHODOLOGY OF CLUSTER DEVELOPMENT BASED ON REGIONAL LABOUR FORCE CONCENTRATION

This paper's authors conducted research on regional concentration of the Latvian labour force, following research on industrial clusters (Boroņenko, 2007, 2009; Zeibote, 2009, 2010a, 2010b). The findings of this research work, as well as practical experience in implementing different state supported programmes promoting the development of clusters in Latvia, stress the necessity of working out a methodology for identifying clusters as regional growth poles and structures, which require support and attention in the Latvian economic development processes.

International scientific literature on cluster identification (Lindqvist et al, 2003; Karlsson, 2008; Solvell et al, 2009) has developed methodology based on the territorial concentration of such economic indicators as enterprises, labour force, or added value, which can be measured by sectors, segments, branches, or industries (depending on the availability of statistical data) using the framework of territorial division - regions, states, landers, etc. (Kaminska and Mularczyk, 2006; Andersen et al, 2006; Maggioni and Riggi, 2008).

The phenomenon of regional concentration is a basis for the process of identification of Latvian clusters, using labour market statistics from 2008 and 2009 provided by the Central Statistical Bureau (CSB) of Latvia. This data allows investigation of the labour force concentration specifics of the Latvian economy based on ten sectors, grouped according to NACE2. For a deeper understanding of the specifics of the labour force's regional concentration in the Latvian economy, the authors have performed a comparative analysis with the regional labour force concentration in Finland, which has a highly clustered economy (Hernesniemi et al, 1996).

According to the identified methodology, the degree of regional labour force concentration, divided by sectors of the economy, can be measured by the geographical re-aggregation of the national statistical data on the labour force,

targeted to estimate the space distribution of X_{ir} , where X is the number of employed in the sector i in the region r (Maggioni, Riggi 2008).

By analysing the geographically re-aggregated data of the national labour force it is possible to observe if there is an increased concentration of the labour force of any given sector in any concrete region. This requires a comparison of the number of employees working in a concrete sector of the economy of the targeted region, with the average number of employees of the same sector of the economy of all regions of a country: $\bar{X}_{ir} = X_{ir}/N$, where N is a number of regions in a country R , and $X_{iR} = \sum_{r=1}^N X_{ir}$. In other words X_{ir} is an inter-regional amount of employees of a given sector of the economy of a country, to be compared with the number of employees of a given sector of the economy of the targeted region to draw conclusions about the degree of labour force concentration in specified sectors of the economy in the targeted region.

The degree of labour force regional concentration by sectors of the targeted regions can be also measured as % according to the formula $AX_{ir} = X_{ir} \setminus X_{iR}$, which shows the concentration of the labour force in indicators of unit weight employed by the sectors of the economy in each region.

An important and principal drawback of this approach is that indicators showing the degree of labour force concentration obtained by the above method do not take into account that the number of people living in every region can be different, and correspondingly the absolute amount of the labour force can also differ. For instance, in Latvia, where around one third of the total population lives and works in Riga, the estimated indicators of the labour force will be greater in all sectors of economy, except for the agriculture sector. To avoid such deformation it is necessary to operate by relative measures, taking into account the amount of the labour force in the targeted region in comparison to other regions of the country. The simplest and the most popular way for solving this problem is to weight regional employment in the specific sector i according to the total number of the labour force in the region X_{ir} . In this way the degree of labour force concentration in more populated regions will not be overestimated. Thus $PX_{ir} = X_{ir} \setminus P_r$ - so X_{ir} is weighted in terms of total population or the number of employed in the specific region.

By applying such simplified methods of normalisation it is taken into account that spatial distribution of the population or employment are not independent variables, and industrially developed regions usually have greater density of population than a country on average. It is also true that in smaller space units

and/or in bordering territories, such methodology will not include daily flows of the labour force from one region to another in cases where, for example, employees live in one region but work elsewhere, because this could also provide incorrect results.

More complete methodology can use the Location Quotient LQ_{irR} , which allows specialised measuring of the targeted region in relation to the whole country (Maggioli and Riggi 2008). In other words, if we want to measure the degree of attributable specialisation of the region r in sector of the economy i in relation to bigger territory R (usually this is a country) and in the whole economy I (i.e., all sectors of the economy of a country) by indicator X (amount of enterprises, number of employed, added value), then the respective Localisation Quotient can be found according to the formula:

$$LQ_{irR} = \frac{\left(\frac{X_{ir}}{X_{Ir}} \right)}{\left(\frac{X_{iR}}{X_{IR}} \right)} \quad (1)$$

where:

- X_{ir} - regional employment in the sector (segment, branch, industry);
- X_{Ir} - total regional employment;
- X_{iR} - total employment in the sector (segment, branch, industry);
- X_{IR} - total employment in the country.

Of course, absolute values of the spatial concentration of economic indicators - the number of enterprises, number of employed persons, added value, etc. - are also very important for economic research, as they show the degree of absolute concentration of resources by territory. In addition, David Ricardo's classical economic theory of the concept of comparative territorial advantage was more progressive than Adam Smith's previous concept of absolute advantage, providing that relative indicators of the concentration of economic resources LQ are more appropriate for searching the regional growth pole. This is especially true in the case of a country such as Latvia, where practically all resources in absolute terms appear to be concentrated in Riga. This result will be true, but functionally it is not applicable for the development of regions, because it does not allow the finding and evaluation of potential for the development of regions.

Modern research practice already has a classification for value LQ according to which:

- $LQ < 1$ – points out sectors of the economy of a region with some potential for business development;
- $LQ > 1$ – a region has a proportionally higher unit weight of people employed in a targeted sector of the economy in comparison with the whole country;
- $LQ \geq 1,25$ – this sector of the economy has a potential for cluster development and competitiveness in the global market (Florida State University, 2010).

4. COMPARATIVE ANALYSIS OF THE REGIONAL LABOUR FORCE CONCENTRATION IN LATVIA AND FINLAND AS THE PLATFORM FOR POTENTIAL CLUSTER DEVELOPMENT

Before beginning the comparative analysis of the regional concentration of the labour force by economic sectors in Latvia and Finland, it is important to note that statistics for Finland provide incomparably more publicly accessible data for researchers, such as annual data on the labour force distribution by 28 sectors in 21 regions of the country. The Latvian statistics provide some selected data (17,995 people in 2008 and 16,677 people in 2009) on the economically active labour force for ten sectors of the economy only (Labour Force Survey, 2008, 2009). These drawbacks have seriously influenced research results. To make the Finnish statistical data compatible with the Latvian data it was necessary to combine the Finnish statistical data (Statistics of Finland, 2006, 2007) in ten sectors of the economy to make them compatible with the structure of the Latvian statistical system.

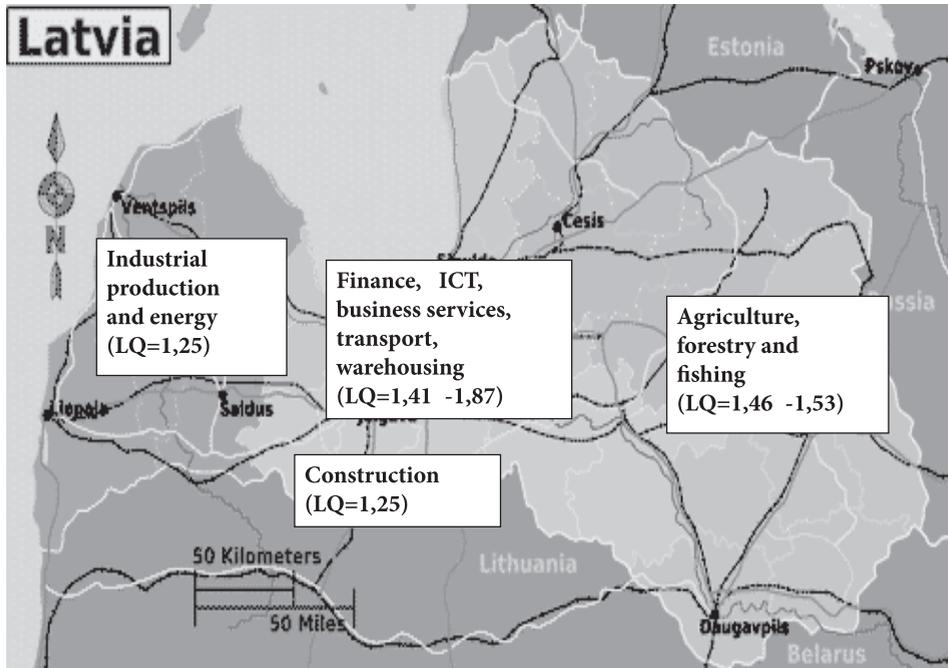
Because of the above-mentioned factors, first the regional Localisation Quotient (LQ) of the labour force in ten sectors of the Latvia economy in 2008 and 2009 was measured. Second, the amplitude of concentration was evaluated, showing the degree of regional concentration in the specific sectors of Latvia.

Table 1. Concentration of the economically active labour force by sectors of economy in the regions of Latvia,*
Localisation Quotient (LQ), 2008 (17,991 people) and 2009 (16,673 people)

Sector of economy	Riga		Pieriga (Riga Region)		Vidzeme (Central Latvia)		Kurzeme (Western Latvia)		Zemgale (Lower Latvia)		Latgale (Eastern Latvia)		Degree of concentration	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009
Agriculture, forestry, fisheries (A)	0.03	0.03	0.69	0.71	1.53	1.46	1.20	1.12	1.03	1.17	1.50	1.47	1.50	1.44
Finances, insurance, science and management, real estate business (K-N)	1.87	1.86	1.10	1.14	0.93	0.76	0.75	0.88	0.92	0.74	0.60	0.70	1.27	1.16
Transportation, warehousing, information and communication (H, J)	1.43	1.41	0.92	0.82	0.75	0.77	1.11	1.09	0.81	0.88	0.99	1.05	0.68	0.64
Other (R-U)	1.04	1.22	1.26	1.19	0.79	0.72	0.98	0.86	1.09	1.21	0.78	0.76	0.48	0.50
Trade, hotels and restaurants (G, I)	1.22	1.27	1.21	1.13	1.05	1.04	0.75	0.85	1.02	0.95	0.78	0.82	0.47	0.45
Industrial production and energy (B-E)	0.99	0.83	0.94	1.09	0.87	0.95	1.21	1.25	0.99	0.92	0.99	0.92	0.34	0.42
Construction (F)	1.02	1.07	1.08	1.06	0.89	0.80	0.89	0.95	1.25	1.20	0.85	0.89	0.40	0.40
Health and social work (Q)	0.92	1.02	0.97	0.96	1.02	1.12	0.89	0.76	0.92	0.99	1.23	1.16	0.34	0.40
Education (P)	0.75	0.84	0.93	0.93	1.17	1.15	1.07	0.96	0.89	1.08	1.18	1.05	0.43	0.31
State administration and defence, social insurance (O)	0.89	0.90	0.93	0.99	0.89	0.91	1.04	1.00	1.01	0.99	1.17	1.15	0.28	0.25

Source: authors' calculations using the data of the Labour Force Surveys of the CSB of Latvia 2008, 2009.* Arranged according to the degree of concentration in 2009.

Figure 2. Sectors of the economy in the regions of Latvia with a real potential for creation of clusters, $LQ > 1,25$ (according to the labour concentration data), 2008-2009

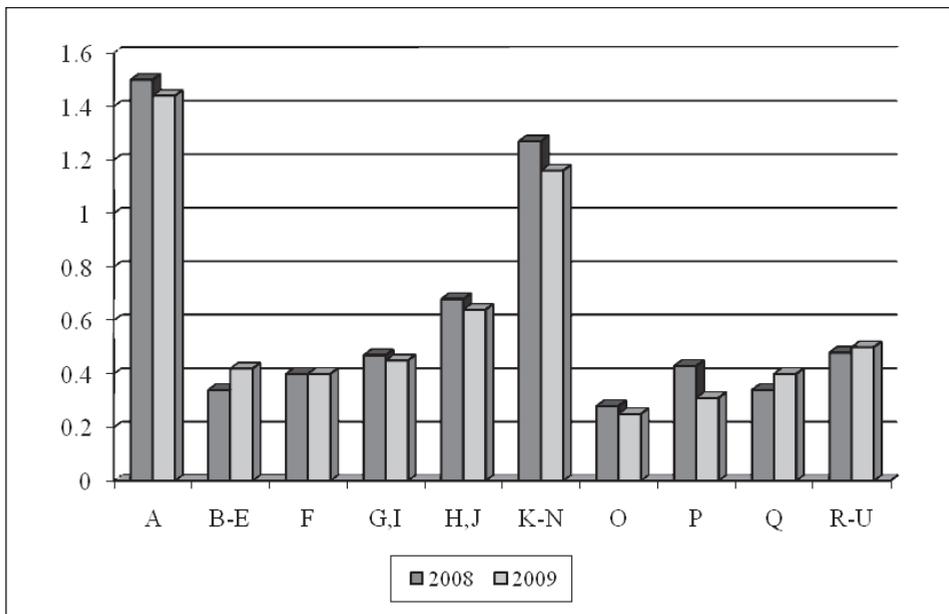


Source: the authors' own calculations according to data of the Labour Force Survey of the CSB of Latvia, 2008, 2009.

The analysis of the Location Quotient by ten sectors of the economy in the Latvian regions shows that the strongest degree of regional concentration of the labour force is observed in such sectors of the Latvian economy as agriculture, forestry, and fishing (the degree of concentration is 1.50 in 2008 and 1.44 in 2009), as well as finance, insurance, science, management, and real estate business (the degree of concentration is 1.27 in 2008 and 1.16 in 2009). The first of the above-mentioned sectors, which is mainly concentrated in the Vidzeme (Central Latvia) and Latgale (Eastern Latvia) regions, is the only sector of the economy having a real potential for cluster development in these regions, as well as a capacity to compete in the international market. Finance, insurance, science, management, and real estate business are mainly concentrated in the capital city of Riga, supporting the hypothesis that Latvia is divided into two economic regions – Riga and the rest of Latvia. This hypothesis has been previously tested by one of the authors of this research (Boronenko 2005, 2007, 2009; Boronenko 2006).

It is important to note that there is also development potential for clusters in the Kurzeme (Western Latvia) region in the industrial production and energy sectors (LQ=1.25 in 2009) and for the construction sector in the Zemgale (Lower Latvia) region (LQ=1.25 in 2008). In total, as reflected by the degree of labour force concentration, most of the sectors of the Latvian economy are equally distributed among the regions of the country, which does not allow the creation of a strong and natural basis for cluster development across different sectors in these regions, and the turning of these clusters into competitive regional growth poles. The creation of clusters probably takes place at the industry level (more detailed classification of the economic activity), but statistical shortages in Latvia limit possibilities of performing further investigations.

Figure 3. Dynamics and degree of economically active labour force concentration by sectors of the economy* in the regions of Latvia, 2008-2009



Source: created by authors according to data from the last column of Table 1.

* See the classification of sectors of the economy of Latvia in Table 1.

The analysis presented in Figure 3 shows that the degree of concentration of the economically active labour force in such sectors of the Latvian economy as agriculture, forestry, and fisheries, as well as finance, insurance, and real estate has a tendency to decrease (from 1.50 in 2008 to 1.44 in 2009 for the first sector, and from 1.27 in 2008 to 1.16 in 2009 for the second sector). At the same time the

amplitude of concentration of such less regionally concentrated economic sectors of Latvia as industry and energy and health and social works increases (from 0.34 in 2008 to 0.42 in 2009 for the first sector, and from 0.34 in 2008 to 0.40 in 2009 for the second sector).

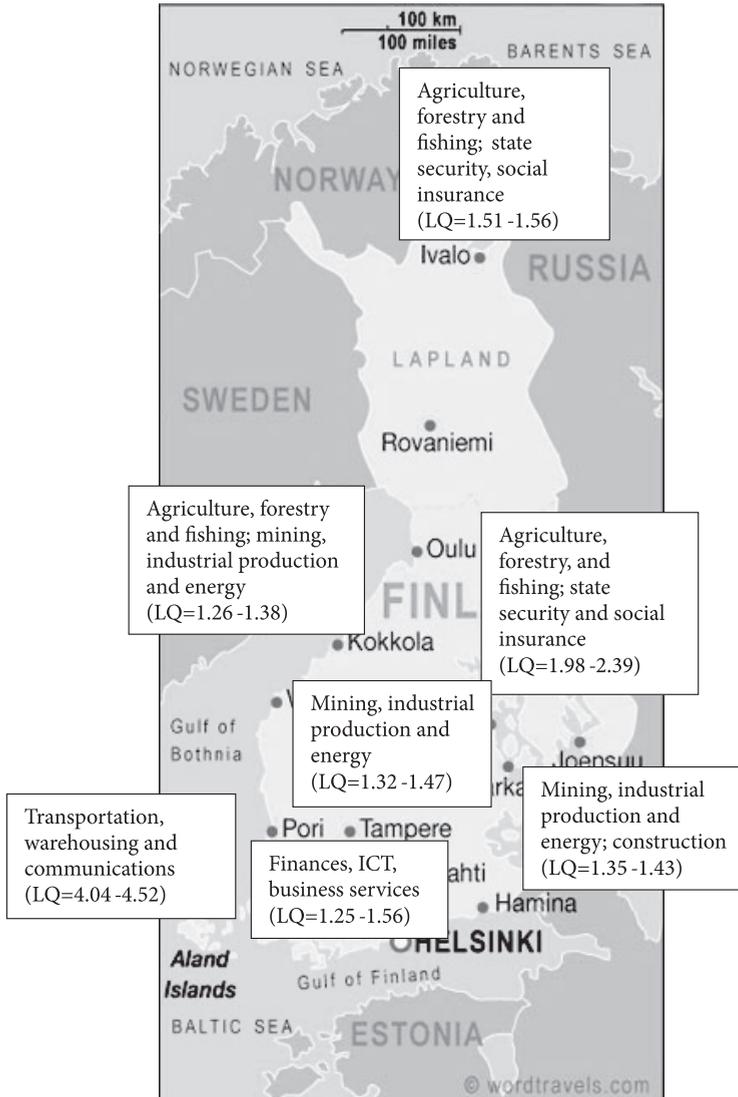
In total, the degree of labour force concentration shows that there is not a strong and natural basis for cluster development by evaluated sectors in these regions, or for turning these clusters into competitive regional growth poles. It also means that clusters can be identified on the basis of more detailed industry, sub-industry, and sub-sub-industry concentration of economic actors (for instance, enterprises). The observed changing trends in degree of labour force concentration in the Latvian economic sectors provide evidence that spatial localisation of economic activity in Latvia is not a constant value but a dynamically developing indicator, which is subject to change and can be influenced by different factors, beyond the focus of the Latvian cluster research at this stage.

To achieve the objective of a more systemic understanding of regional labour force concentration in the Latvian economy, the authors of this paper performed a trial to compare the Latvian labour force concentration with combined economic sectors of the regions of Finland (the necessity to combine the economic sectors of Finland to be able to compare them with the available statistical data of Latvia was explained above).

Analysis of the Finnish data has indicated that, in sharp difference to Latvia, practically every region of Finland has the potential for cluster development and competitiveness in the global market, at least in some sectors of the economy. In addition, the concentration of the labour force in these sectors in specific regions is two, three and sometimes even four times greater than the average concentration in the whole of Finland. For instance, the Helsinki region shows a relatively high concentration of economically active labour force in the sector of financial intermediation, real estate, and other business services (1.56 in 2006 and 1.55 in 2007). Another two sectors of the Helsinki region, wholesale and retail business and hotels and restaurants, as well as other public, social, and individual services, are on the baseline of the Localization Quotient, equal to 1.25. It is interesting to note that the specialisation of the capital region of Finland is not as striking as in the case of Latvia, and that different sectors of the economy of the regions of Finland are internationally competitive while developing regional specialization. For instance, the region of South Ostrobothnia (Etelä-Pohjanmaa) has developed some degree of labour force concentration in agriculture, forestry, and fisheries, up to 2.78 in 2006 and 2.77 in 2007, but the Åland Islands have a labour force

concentration in transportation, warehousing, and communications, equal to 4.52 in 2006 and 4.04 in 2007.

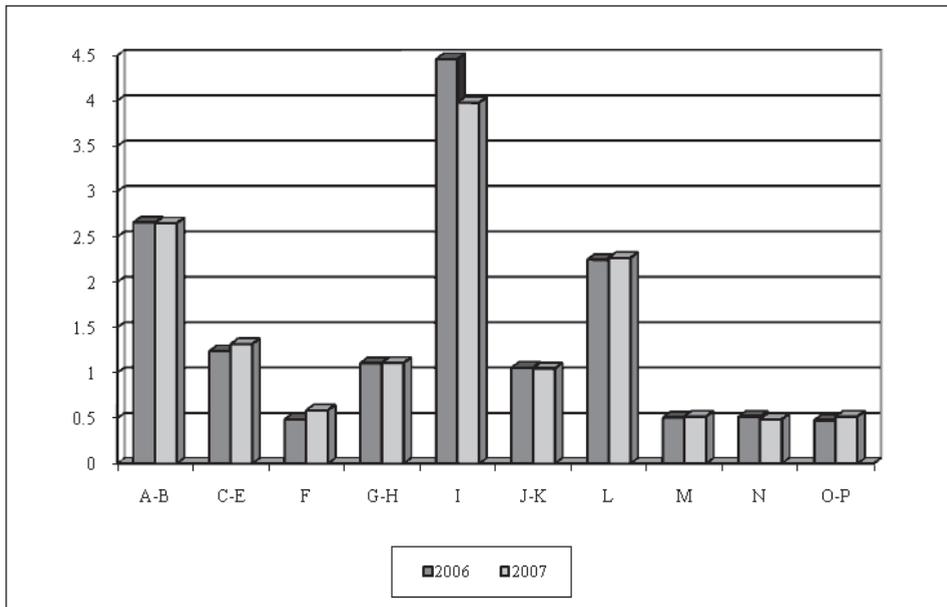
Figure 4. Sectors of the regions of Finland with real potential for creation of clusters, $LQ > 1.25$ (according to the indicator of economically active labour force concentration), 2006-2007



Source: the authors' own calculations according to data of the Statistics of Finland 2006, 2007.

The analysis presented in Figure 4 shows that in the regions of Finland the value of the degree of concentration is much more stable than in the regions of Latvia, except for the sectors of transport and communications (the degree of concentration in 2006 4.46, and in 2007 3.98), which has a much higher degree of regional concentration according to the economically active labour force data. It is possible to assume that this sector of the Finnish economy has reached such a high level of regional concentration that it has entered the stage of the natural cyclical process of de-concentration. However, the authors of this research do not have strong empirical arguments for proving this assumption.

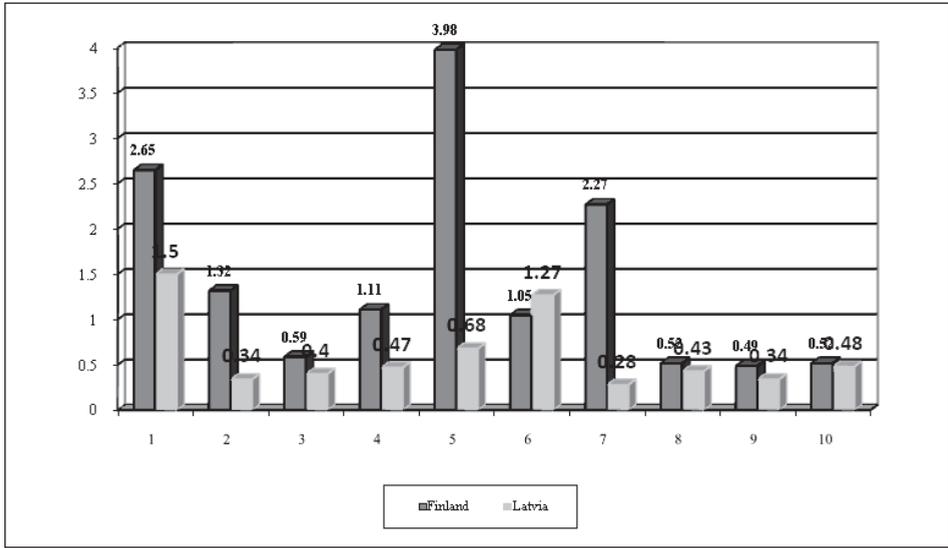
Figure 5. Dynamics of the degree of economically active labour force concentration by sectors of economy (Appendix 1) in the regions of Finland, 2006-2007



Source: the authors' own calculations according to data of the Statistics of Finland 2006, 2007.

Furthermore, the comparison presented in Figure 6 once again confirms that regions of Latvia and Finland differ essentially in the degree of economically active labour force concentration. The regions of Finland which have multiple regional growth centres in different economic sectors themselves represent an example of a clustered regional economy, where regions have international competitiveness potential and are comparable with the capital region of a country.

Figure 6. Comparison of the degrees of concentration of economically active labour force by economic sector (Appendix 2) in the regions of Finland (2007) and Latvia (2008)



Source: prepared by the authors.

The results of this research have shown that, firstly, regional concentration of the economically active labour force can be measured with the Location Quotient (LQ), which indicates the level of regional labour force concentration in different economic sectors. Secondly, in comparison with Finland, which has quite a strong regional labour force concentration in certain sectors of the economy, regional concentration of the labour force is not typical for Latvia, meaning that the regional economy of Latvia has much lower potential for cluster development and competitive advantages in global markets than Finland.

Therefore it is important to promote the development of clusters in regional economies using available support instruments. To encourage the creation of new clusters or co-operation networks, governments must define and implement the optimal policy for stimulating and supporting economic clustering.

5. THE ROLE OF INSTITUTIONS AND POLICIES IN CLUSTER DEVELOPMENT

The cluster approach provides the possibility of policy makers influencing processes of economic development and increased competitiveness, including

innovation, in a more target-oriented way. They can develop much closer dialogue with enterprises and academic and scientific research institutions, focusing on the needs of specific industries in order to reduce those barriers and obstacles which hinder economic development. Cluster support policy is a significant instrument for creating strong innovation systems, which, in turn, are critical preconditions for the creation of growth and new jobs.

The data of the European Innovation Scoreboard (ProInno Europe, 2009) confirm that there is a strong link between national innovation systems and innovation indicators. This provides evidence that state support is important for cluster development and promotion of innovation using the cluster approach. Cluster support instruments differ in various European countries and regions, due to factors such as differences in economic development levels and co-operative traditions between the state and private sectors. Cluster support policy could be one of the indicators of state or regional competitiveness, reflecting the ability of the state to mobilize and invite main economic players to cooperate in promoting growth and developing innovation.

Table 2. Policy trends supporting clusters and regional innovation systems

Policy stream	Old approach	New approach	Cluster programme focus
Regional policy	Redistribution from leading to lagging regions.	Building competitive regions by bringing local actors and assets together.	Target or often include lagging regions. Focus on smaller firms as opposed to larger firms, if not explicitly then de facto. Broad approach to sector and innovation targets. Emphasis on engagement of actors.
Science and technology policy	Financing of individual, single-sector projects in basic research.	Financing of collaborative research involving networks with industry and links with commercialization.	Both take advantage of and reinforce the spatial impacts of R&D investment. Promote collaborative R&D instruments to support commercialization. Include both large and small firms (often spin-off and start-up firms). Usually high-technology focus.
Industrial and enterprise policy	Subsidies to firms; national champions.	Supporting common needs of firm groups and technology absorption (especially SMEs).	Programmes often adopt one of the following approaches: <ul style="list-style-type: none"> • Target the drivers of national growth. • Support industries undergoing transition and thus shedding jobs. • Help small firms overcome obstacles to technology absorption and growth. • Create competitive advantages to attract inward investment and brand for exports.

Source: OECD, 2007, Competitive Regional Clusters: National Policy Approaches, Policy Brief, May 2007, OECD: Paris, p. 3.

According to the European Cluster Observatory survey conducted in 31 countries (Europe Innova, 2008), half of the respondents started to use cluster policies only after 2000. For this reason cluster support policies in many European countries are still in the early stages. Approximately half of national cluster support programmes can be classified as related to industrial or entrepreneurship policies, and the other half to development of science and technology. Almost every cluster support programme focuses on entrepreneurs as their main target group, followed by science and research institutions.

The fact that cluster initiatives are relatively new in most European regions is also recognized by Landbaso and Rosenfeld in their paper “Public policies for industrial districts and clusters” (Landbaso and Rosenfeld, 2009). They conclude that these new cluster initiatives have influenced the creation of new support policy instruments which are based on private and public partnerships, as well as business co-operation or networking. According to the authors it is important to encourage regions to exchange information on success and failure of the application of cluster support instruments to make them even more efficient.

Since cluster support programmes have appeared comparatively recently it is too early to evaluate their economic impact. It will take at least 10 to 15 years before the results of such programmes become apparent.

Despite the fact that many clusters have been created without any special external support, most entrepreneurs consider that the state sector plays a significant role in promoting cluster creation and their development. The Innobarometer (European Commission, 2006), in its 2006 research, concluded that approximately 68% of enterprise managers that operate in cluster environments consider that state institutions have an important or even fundamental role in cluster development. Results of this research indicate that state sector support is principally expected by entrepreneurs in Southern European countries – Portugal, Spain, and Italy, and to a lesser extent in the countries that joined the EU in 2004 and later. This tendency in new EU member states could be related to a low level of understanding of clusters and their role in increasing growth and competitiveness, as the Innobarometer research indicates that only 41% of respondents from new EU member states were informed about the cluster concept.

Cluster development in Latvia was supported by the EU PHARE programme¹ during the period from 1999 to 2002 (Vanags A. et al, 2002). According to the

¹ PHARE – Poland, Hungary Assistance Restructuring Economies.

research findings, the following sectors of the Latvian economy were recognized as sectors having cluster development potential: IT, forests, machine building, and new materials. Cluster initiatives were established in these sectors, but only two of the initiatives started in 2001 succeeded and are still operating as cluster initiatives today.

The EU PHARE support for cluster development activities had several significant results, such as an increased understanding of the importance of clusters and their development, facilitating mutual co-operation between players of different sectors, and initiating the development of long-term activities and objectives of mutual co-operation. From analysis of cluster development processes in Latvia and the role of clusters in Latvian economic development, it is apparent that the role of clusters has not yet been fully recognized and understood.

The Government of Latvia has expressed its support for the European Cluster Memorandum (ProInno Europe, 2007), which emphasises that regions having necessary skills, good research capacities, access to risk capital, and strong clusters have a greater possibility of becoming centres of innovation than those with isolated research work and without clusters. Clusters can become the main factors which attract capital, a labour force, and knowledge. The Memorandum stresses that the accent of discussions in Europe must be changed from facilitating state support to promoting a wider innovative ecology that includes the support for cluster creation and development. Several European countries, especially Great Britain, the Czech Republic, and several regions of Austria, France, Germany, have actively started to create cluster initiatives.

Unfortunately Latvia has the least initiatives in the European Union regarding the development of enterprise clusters, cluster branding, organizing different cluster support activities, and providing direct financial support for different cluster-related activities. The authors of this paper are confident that applying the cluster approach to the development of different sectors of the economy would increase the competitiveness of Latvian enterprises, because clusters encourage concentration of resources and their effective utilization.

The cluster model, based on competitive advantage, has been recognized in many countries as one of the most effective ways to strengthen international competitiveness, innovation, and enterprise development. The importance of cluster development is mentioned in the Latvian National Development Plan 2007-2013 (Ministry for Regional Development and Local Government Affairs of the Republic of Latvia, 2006), the Latvian Industrial Development

Guidelines (Ministry of Economics of the Republic of Latvia, 2004) and the National Innovation Programme 2003-2006 (Ministry of Economics of the Republic of Latvia, 2003). In addition, the Latvian National Lisbon Programme 2008-2010 recognises the importance of cluster development in stimulating the competitiveness and increase in productivity of enterprises by stimulating their mutual co-operation and collaboration with education, science, and research and other related institutions. The programme has been designed to evaluate cluster development potential in Latvia and to support the development of the three clusters with the greatest potential (Ministry of Economics of the Republic of Latvia, 2005). The Ministry of Economy of Latvia is responsible for cluster support policy in Latvia and ensures its implementation in co-operation with the Latvian Investment and Development Agency.

On June 28, 2007 the Cabinet of Ministers of Latvia, with Decree No. 406, adopted the Programme for Promoting Commercial Innovation and Competitiveness 2007-2013, worked out by the Ministry of Economy of Latvia. It states that the creation of clusters is lagging behind, despite the current favourable industrial environment in Latvia, and more active co-ordination of state and business policies to promote cluster development is necessary.

Until 2009, when the Government of Latvia started to provide financial support for cluster development, the only Latvian clusters were the IT cluster and the Latvian Forest Industries cluster. Clearly the establishment of new clusters would help to create an environment which would facilitate innovation, knowledge transfer from local or foreign research institutions to the production sector, increased demand of industries for new technologies, and concentrate economic policy measures in specific industries or segments (Ministry of Economics of the Republic of Latvia, 2007).

In the Programme for Promoting Commercial Innovation and Competitiveness 2007-2013 a special support programme for clusters was adopted by the Ministry of Economy within the 'Entrepreneurship and Innovation' programme. The Cluster programme is implemented with co-financing from the EU Structural and Cohesion Funds, and its objective is to promote co-operation of enterprises and related education, research, and state institutions, to support implementation of joint projects to facilitate a more rapid increase of industry and enterprise competitiveness, and to promote exports, innovation, and production of new products. The most important requirements for clusters wishing to receive state support under the cluster programme are the following:

- Correspondence of the cluster with priority sectors defined by the Government documents;
- Clarity and measurability of the project objectives, planned activities, indicators and planned results;
- Introduction of the value added chain into cluster and expected results;
- International co-operation;
- Cluster orientation on exports;
- Competence of the cluster co-ordinator;
- Cluster guarantees the involvement of an expert with experience in implementing international projects.

The Cluster Programme supported nine cluster initiatives in 2009, nine cluster initiatives in 2010, and seven cluster initiatives in 2011. The supported cluster initiatives are the following: IT cluster (2009, 2010, 2011), metalworking and related industries cluster (2009, 2010, 2011), electronics and electro-technical cluster (2009, 2010, 2011), pharmacy, chemistry, and related industries cluster (2009, 2010, 2011), furniture and related industries cluster (2009, 2010, 2011), Cosmos technologies cluster (2009, 2010, 2011), manufacturing products for export cluster (2009), supply chain cluster (2010, 2011), textile and related industries cluster (2009, 2010, 2011), and food industry cluster (2009, 2010). The Cluster Programme implemented by the Ministry of Economy (MoE) will continue in 2012-13, because, as experience shows, it has not been possible to create new cluster initiatives in Latvia without specially targeted state support.

The fact that many new cluster initiatives have appeared in Latvia over the last few years indicates that enterprises have acknowledged their importance and the co-operation opportunities they provide. In 2010 the following cluster initiatives, at different stages of development, have been registered in Latvia:

Table 3. Cluster initiatives in Latvia, 2010

Cluster initiative (CI)	Sector, industry or full name, remarks
Association “Latvian Furniture”	Woodworking, design. “Furniture production and related industries cluster development programme”. Supported by the MoE Cluster Programme
Audio visual CI	Creative industries
Biofuel CI	Energy (lack of human resources and capacity)
Biotechnologies CI	Biotechnologies
Electronics& electro-technical CI	Electronics and electro-technical cluster development project, supported by the MoE Cluster Programme
E-text-textiles CI	Creative industries (working on a project basis)
E-transport CI	Transport, metalworking, design
Pharmacy and related industries CI	Pharmacy and related industries, “Promotion of co-operation between participants of pharmacy and related cluster for creating new export products, introducing new technologies in production and attracting investors”. Supported by the MoE Cluster Programme.
Inspiration Riga	Tourism
IT cluster initiative	IT, “Promotion of international recognition of the Latvian IT cluster”, self-financed cluster, Supported by the MoE Cluster Programme.
Latvian Acoustic society CI	Electro-technical and construction
Latvian Chamber of Crafts CI	Crafts and arts (micro enterprises)
Latvian Construction materials’ association CI	Production of construction materials
Latvian Polygraph enterprises association CI	Polygraph
Latvian Underwear manufacturers association CI	Textile sector

Linen and canopies CI	Textile sector (Gradual development of business Project in full cycle linen and canopy production), CI established in 2010.
Metalworking CI	Metalworking and design “Development of Metalworking and related industries cluster”, Supported by the MoE Cluster.
Forest industries CI	Woodworking (Operates as a Federation, not planning to establish a separate CI or foundation).
Food production CI	“Food sector cluster for export promotion”. Supported by the MoE Cluster Programme
Creative industries CI	Creative industries (basically operates as an incubator)
Ventspils High Technology Park, satellite technologies	“Co-operation measure for establishing the Cosmos Technology cluster”. Supported by the MoE Cluster Programme.
Latvian Supply Chain CI	“Establishment of CI for certain manufacturing products’ export”. Supported by the MoE Cluster Programme.
Latvian Light Industry Enterprises Association CI	“Development of the business plan of the Textile and related industries cluster, for innovative textile materials production. Development, conception, and implementation for enterprises working in the felt sector. Supported by the MoE Cluster Programme.
Car parts production	Machine building, production of car parts.

Actively working
Not active
Having some development potential

Source: authors’ compilation using information provided by the Ministry of Economy and the Latvian Investment and Development Agency.

According to the European Cluster Observatory (ECO) research that evaluates cluster potential in European countries takes into account employment indicators. Latvia has good potential for cluster development in such sectors as construction tools, equipment and services, the chemical industry, construction, education, entertainment, furniture production, heavy industry, the maritime (ports) sector, transport, and logistics. Since 2010 the ECO has performed separate evaluation for such sectors as creative industries, knowledge intensive sectors, and life

sciences, emphasising their considerable potential for economic development. Latvia has good potential for the development of clusters in the creative industries, which, according to ECO estimations, are advertising, museums and historical monuments, radio and TV, distribution and retail (see table 4 on pages 25 – 26). ECO methodology marks cluster potential by one, two, or three stars, according to the concentration of enterprises and labour (European Cluster Observatory, 2007).

Table 4. Statistical clusters in Latvia identified by the European Cluster Observatory, 2009

No.	Clusters	Number of employed	Number of enterprises	Marking (stars)
Traditional sectors				
1.	Construction tools, equipment, services	15,352	756	2
2.	Chemical industry	2,266	96	1
3.	Construction	50,605	2,711	1
4.	Education	29,572	436	3
5.	Entertainment	11,505	747	2
6.	Furniture production	10,713	474	2
7.	Heavy industry	2,839	44	1
8.	Maritime sector	8,585	348	2
9.	Transport and logistics	42,080	1,201	2
Creative sectors				
1.	Advertising	5,157	1,147	1.2
2.	Museums and historical monuments	6,609	9	3
3.	Radio and TV	2,931	226	2
4.	Retail and distribution	3,280	291	1

Source: data compiled by the author from the European Cluster Observatory, 2010.

Latvia also has other very important sectors with a significant share of employment, such as financial services and the food-processing sector, but they are not identified as potential clusters according to the methodology of ECO and the applied criteria. However these sectors are very important for Latvia and there is no doubt that they have the potential for cluster development. The economic policy makers in Latvia have not foreseen cluster support measures in the policy documents relating to Small and Medium Enterprises (SMEs) and

entrepreneurship support, the promotion of innovation, investment policy, etc. So far cluster support policy has not been target-oriented and -implemented.

It is not possible for territorially small countries such as Latvia to be successful in competitive international markets by sustaining the full production cycle. Therefore they need to specialize in offering specific products and services. Prof. C. Ketels of Harvard Business School, who has visited Latvia several times, has emphasised that clusters should be created in the context of the Baltic Sea Region, because there is a need for regional specialization here. For example, if we see potential for the development of the design industry, we need to think how we will co-operate with partners in Scandinavia, Lithuania, Estonia, Poland, etc., to become more competitive as a region.

6. CONCLUSIONS

In the Europe 2020 Strategy on Regional Policy in Europe (European Commission, 2010), The European Commission (EC) named the development of a regional “strategy for competitive specialization” (Landabaso, 2010) as one of the most important areas for more effective and faster use of European Union Structural Funds for supporting innovation. This initiative calls on regions to identify the most realistic factors of their competitiveness based on the concentration of a “critical mass” of specific resources, in order to create a natural environment for innovative development. “The strategies of competitive specialization” of regions will allow EU funds to concentrate on resourcing one or two priorities, which will help to create regional growth poles in a natural way.

In working out “the strategy of competitive specialization” of each region, the European Commission emphasizes that regional clusters are providing increasingly ecological bases for the development of innovation (Landabaso, 2010). This means that our research results comparing regional labour force concentration in the Latvian economy can provide input towards a clearer understanding of the qualitative and quantitative potential of the Latvian regions for cluster development, and can be used as an instrument for creating a more favourable, natural, and ecological environment for innovation development.

The results of this research also show that the government should support cluster development based on natural growth poles, exploiting the potential of regional comparative advantages such as specific concentration of skills and knowledge (labour force), industry concentration, natural resources, geographic position,

etc., to achieve sustainable long-term development by applying the cluster approach. Current cluster support policies, which support specific priority actions undertaken by clusters such as export promotion or product development, are beneficial in the short term but may not have a long term impact on company and cluster performance.

Furthermore, the authors of this research intend to research the regional specialization of Latvia according to the concentration of enterprises, added value, etc. In line with the Europe 2020 strategy, this will help the regions of Latvia by providing a clear development perspective, and by focusing on the regional distribution of a 'critical mass' of different resources which have been naturally developing in the regional growth poles of the Latvian economy and form the base of its comparative advantage. Results of such research could also be useful and applicable in the case of other countries.

REFERENCES



Andersen, T., Bjerre, M., Hansson, E. (2006). *The Cluster Benchmarking Project: Pilot Project Report - Benchmarking Clusters in the Knowledge Based Economy*. Copenhagen, DE: FORA. Retrieved from http://www.insme.org/documenti/Cluster_Benchmarking_Project.pdf.

Boroņenko, V. (2005). Ekonomiskie reģioni Latvijā. *Reģionālais ziņojums*, 2, pp. 76-111.

Boroņenko, V. (2006). Alternative View on Economical Regions in Latvia. *Proceedings of the International Scientific Conference "Economic science for rural development"*, Jelgava, LV, No.10: *Agriculture. Regional development*, pp. 247-256.

Boroņenko, V. (2007). *Klasteru pieeja reģionu attīstībai zināšanu ekonomikas apstākļos*. Daugavpils, LV: Daugavpils University publishing house "Saule".

Boroņenko, V. (2009). *Klasteru loma reģiona konkurētspējas paaugstināšanā*: Doctoral thesis for the scientific degree Dr. oec. (scientific supervisor A.Vilciņa). Jelgava, LV: LLU.

Brusco, S. (1982). The Emilian Model: Productive Decentralisation and Social Integration. *Cambridge Journal of Economics*, 6 (2), pp. 167-184.

Cairncross, F. (1997). *The Death of Distance: How the Communications Revolution Is Changing Our Lives*. Boston, USA: Harvard Business School Press.

- Coyle, D. (2001). *Paradoxes of Prosperity: Why the New Capitalism Benefits All*. London, UK: Texere Publishing.
- Czamanski, S., Ablas, L. A. (1979). Identification of Industrial Clusters and Complexes: a Comparison of Methods and Findings. *Urban Studies*, 16 (1), pp.61–80.
- Enright, M. (1992). Why Local Clusters are the Way to Win the Game. *World Link*, 5, p.82
- Enright, M.J. (1996). Regional Clusters and Economic Development: A Research Agenda. In U. H. Staber, N. V. Schaefer and B. Sharma (Eds.), *Business Networks: Prospects for Regional Development* (pp. 88-114). Berlin, GE, New York, USA: de Gruyter.
- European Commission. (2006). *Innobarometer on Cluster's Role in Facilitating Innovation in Europe*: Analytical Report of the Directorate-General for Enterprise and Industry. Brussels, BE: EC.
- European Commission. (2010). *The Europe 2020. Strategy on the Regional Policy in Europe*. Retrieved from http://ec.europa.eu/regional_policy/policy/future/eu2020_en.htm.
- Europe Innova. (2008). *Cluster Policy in Europe. A Brief Summary of Cluster Policies in 31 European Countries*: Europe Innova Cluster Mapping Project. Oxford, UK: Oxford Research AS. Retrieved from http://www.clusterobservatory.eu/upload/Synthesis_report_cluster_mapping.pdf.
- Europe Innova. (2010). *European Cluster Observatory*. Retrieved from <http://www.clusterobservatory.eu>.
- Florida State University. (2010). *Location Quotient Technique*. Retrieved from <http://mailer.fsu.edu/~tchapin/garnet-tchapin/urp5261/topics/econbase/lq.htm>
- Gray, J. (1998). *False Dawn: The Delusions of Global Capitalism*. London, UK: Granta Books.
- Hernesniemi, H., Lammi, M., Yla-Anttila, P. (1996). *Advantage Finland – The Future of Finnish Industries*: ETLA [the Research Institute of the Finnish Economy] report on the Finnish cluster study. Helsinki, FI: Taloustieto Oy.
- Jacobs, D., Ard-Pieter, D. M. (1996). Clusters, Industrial Policy and Firm Strategy: A Menu Approach. *Technology Analysis and Strategic Management*, 8 (4), pp. 425-437.
- Kaminska, W., Mularczyk, M. (2006). Development and Distribution of Private Microfirms in Mid-Size Polish Towns During the Transformation Period. *Miscellanea Geographica*, 12, pp. 175-184.
- Karlsson, C. (Ed.). (2008). *Handbook of Research on Innovation and Clusters: Cases and Policies*. Retrieved from http://www.amazon.com/Handbook-Research-Innovation-Cluster-Policies/dp/1847208428#reader_1847208428.

Ketels, C., Lindqvist, G., Solvel, O. (2006). *Cluster Initiatives in Developing and Transition Economies*. Stockholm, SW: Center for Strategy and Competitiveness.

Krugman, P. (1990). *The Age of Diminished Expectations*. Cambridge, UK: MIT Press.

Krugman, P. (1991). *Geography and Trade*. Cambridge, UK: MIT Press

CSB of Latvia. (2008, 2009). *Labour Force Survey*: selected anonymous individualized data. Riga: LR Central Statistical Bureau.

Landabaso, M. (2010). *Regional Policy Contributing to Smart Growth in Europe 2020*. Retrieved from <http://www.em.gov.lv/em/2nd/?cat=30149>.

Landabaso, M., Rosenfeld, S. A. (2009). Public Policies for Industrial Districts and Clusters. In G. Becattini, M. Bellandi and L. Propris (Eds.), *A Handbook of Industrial Districts* (pp. 134-68). Nottingham, UK: Edward Elger.

Lindqvist, G., Malmberg, A., Solvell, O. (2003). *Swedish Clusters*. Uppsala, SW: CIND, Uppsala University.

Maggioni, M., Riggi, M. (2008). High-Tech Firms and the Dynamics of Innovative Industrial Clusters. In C. Karlsson (Ed.), *Handbook of Research on Innovation and Clusters: Cases and Policies* (pp. 54-78). Retrieved from http://www.amazon.com/Handbook-Research-Innovation-Cluster-Policies/dp/1847208428#reader_1847208428.

Marshall, A. (1890). *Principles of Economics*: An introductory volume, London, UK: Macmillan.

Martin, R., Sunley, P. (2003). Deconstructing Clusters: Chaotic Concept or Policy Panacea? *Journal of Economic Geography*, 3 (1), pp. 5-35.

Ministry of Economics of the Republic of Latvia. (2003). *Nacionālās inovācijas programma 2003.-2006. gadam* (The Latvian National Innovation Programme, 2003-2006). Riga, LV: Latvia.

Ministry of Economics of the Republic of Latvia. (2004). *Latvijas rūpniecības pamatnostādnes 2004.-2013. gadam*. (The Latvian Industrial Development Guidelines, 2004-2013). Riga, LV: Latvia.

Ministry of Economics of the Republic of Latvia. (2005). *Latvijas nacionālā Lisabonas programma 2005.-2008. gadam* (The Latvian National Lisbon Programme 2005-2008). Riga, LV: Latvia.

Ministry of Economics of the Republic of Latvia. (2007). *Komerccarbības konkurētspējas un inovācijas veicināšanas programma 2007.-2013. gadam*. (The Entrepreneurship Competitiveness and Innovation Promotion Programme, 2007-2013). Riga, LV: Latvia.

Ministry for Regional Development and Local Government Affairs of the Republic of Latvia. (2006). *Latvijas Nacionālais attīstības plāns 2007.- 2013. gadam* (The Latvian National Development Plan, 2007-2013). Riga, LV: Latvia.

- O'Brien, R. (1992). *Global Financial Integration: The End of Geography?* London, UK: Pinter.
- Ohmae, K. (1995). *The End of the Nation State: The Rise of Regional Economies*. London, UK: Harper Collins.
- OECD. (2007). *Competitive Regional Clusters: National Policy Approaches*. Policy Brief. Paris, FR: OECD.
- Osis, U. (2004). *Par Latvijas meža un saistīto nozaru nacionālo programmu: starpnozaru stratēģiskās plānošanas eksperta ziņojums*. Riga, LV: Ministry of Economics.
- Piore, M. J., Sabel, C. F. (1984). *The Second Industrial Divide: Possibilities for Prosperity*. New York, USA: Basic Books.
- Porter, M. E. (1990). *The Competitive Advantage of Nations*. New Edition. New York, USA: Palgrave.
- Porter, M. E. (1998a). *Clusters and Competition: New Agendas for Companies, Governments and Institutions*. Boston, USA: Harvard Business School Press.
- Porter, M. E. (1998b). *On Competition*. Boston, USA: Harvard Business School Press.
- Porter, M. E. (1998c). *Clusters and the New Economics of Competition*. Boston, USA: Harvard Business School Press.
- Porter, M. E. (2000). Location, Clusters, and Company Strategy. In G. L. Clark, M. P. Feldman and M. S. Gertler (Eds.), *The Oxford Handbook of Economic Geography* (pp. 253-274). New York, USA: Oxford University Press.
- Porter, M. E. (2001). *Council of Competitiveness and Monitor Group, Clusters of Innovation Initiative: Regional Foundations of U.S. Competitiveness*. Washington DC, USA: Council of Competitiveness.
- Porter, M. E. (2003). The Economic Performance of Regions. *Regional Studies*, 37 (6&7), pp. 549-678.
- ProInno Europe. (2007). *European Cluster Memorandum*. Retrieved from www.proinno-europe.eu/NWEV/uploaded.../Cluster_Memorandum.pdf.
- ProInno Europe. (2009). *European Innovation Scoreboard*. Retrieved from <http://www.proinno-europe.eu/page/european-innovation-scoreboard-2009>.
- Redman, J. M. (1994). *Understanding State Economies Through Industry Studies*. Washington, DC, USA: National Governors' Association.
- Rosenfeld, S. A. (1995). *Industrial Strength Strategies: Regional Business Cluster and Public Policy*. Washington, DC, USA: The Aspen Institute.

- Rosenfeld, S. A. (1997). Bringing Business Clusters into Mainstream of Economic Development. *European Planning Studies*, 5 (1), pp. 3-23.
- Schwab, K. (2010). *The Global Competitiveness Report 2009-2010*. Yeneva, SW: World Economic Forum. Retrieved from <http://www.weforum.org/pdf/GCR09/GCR20092010fullreport.pdf>.
- Schwab, K. (2011). *The Global Competitiveness Report 2010-2011*. Yeneva, SW: World Economic Forum. Retrieved from http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2010-11.pdf.
- Scott, A.J. (Ed.) (2001). *Global City Regions: Trends, Theory and Policy*. Oxford, UK: Oxford University Press.
- Solvell, O. (2008). *Clusters. Balancing Evolutionary and Constructive Forces*. Stockholm, SW: Ivory Tower Publishers.
- Solvell, O., Lindqvist, G., Ketels C. (2003). *The Cluster Initiative Greenbook*. Gothenburg, SW: The Competitiveness Institute (TCI)/Vinnova.
- Solvell, O., Lindqvist, G., Ketels, C. (2009). *The European Cluster Observatory: EU Cluster Mapping and Strengthening Clusters in Europe*. Luxembourg, LU: Publications Office of the European Union.
- Statistics of Finland. (2006, 2007). *Transactions and employment by industries and NUTS3 regions 2000-2007*. Retrieved from http://www.stat.fi/til/altp/tau_en.html.
- Vanags, A., Basarova, J., Titova, N. (2002). *Industrial and Intellectual Capital Clusters in the Baltic States*. Retrieved from <http://www-sre.wu-wien.ac.at/ersa/ersaconfs/ersa02/cd-rom/papers/248.pdf>.
- Volkova, T. (Ed.) (2010). *Bizness pāri robežām: praktiskais ceļvedis jaunu tirgu apgūšanā*. Rīga, LV: Latvian University Publishing House.
- Zeibote, Z. (2009). Role of the Latvian IT Cluster in Modern Business. *Proceedings of 4th Scientific Conference "Information Society and Modern Business. The Role of Regional Centers in Business Development"*. Ventspils, LV: Ventspils University College (CD disc).
- Zeibote, Z. (2010a). The Impact of Business Clusters on Competitiveness of Enterprises – Experience of Latvia. In A. Balcerzak (Ed.), *Policies for Improving Growth Potential: International Perspective* (pp.309-321). Torun, PL: Nicolaus Copernicus University.
- Zeibote, Z. (2010b). Biznesa klasteri uzņēmējdarbības konkurētspējas un ilgtspējīgas attīstības veicināšanai. *Proceedings of XI International Scientific Conference "Cilvēks, sabiedrība, valsts mūsdienai mainīgajos ekonomiskajos apstākļos"*. Rīga, LV: Bizness High School "Turība", pp. 269-275.

APPENDIX

- 1) Sectors of the Finnish economy are classified in the following way:
 - A – agriculture and forestry
 - B – fisheries
 - C – mining and processing natural resources
 - D – industrial production
 - E – electricity, gas, and water supply
 - F – construction
 - G – wholesale and retail trade
 - H – hotels and restaurants
 - I – transportation, warehousing, and communication
 - J – financial intermediation
 - K – real estate business and other business services
 - L – state security and management, mandatory social insurance
 - M – education
 - N – health and social works
 - O-P – other public, social, and individual services

- 2) For the purpose of comparison the economic sectors of Finland and Latvia are classified in the following way:
 - 1 – agriculture, forestry, and fisheries
 - 2 – industrial production and energy
 - 3 – construction
 - 4 – trade, hotels and restaurants
 - 5 – transport, warehousing, and communications
 - 6 – financial intermediation, real estate business and other business services
 - 7 – state security and management, mandatory social insurance
 - 8 – education
 - 9 – health and social works
 - 10 – other public, social, and individual services

Received: September 29, 2011

Accepted: October 21, 2011

