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## THE ANALYSIS OF REGIONAL CLUSTER DEVELOPMENT IN EUROPE AND CROATIA

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# THE ANALYSIS OF REGIONAL CLUSTER DEVELOPMENT IN EUROPE AND CROATIA

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## *Abstract*

This paper investigates the main characteristics of regional clusters in EU 27 and Croatia. The special interest is focused on the economic performance of regional clusters in the Croatian economy. The main research question is: what characterises regional clusters in EU 27 and Croatia, and what are the main tendencies in cluster development? The cluster survey in this paper is focused on (i) the size and nature of the cluster, (ii) and which industrial activities in the clusters are performed. The purpose of this research is to analyse the importance of clusters and their influence on employment growth. The analysis is based on the theoretical framework of the cluster development and experiences in some old and new EU countries.

The research shows that clusters in EU 27 and Croatia differ in many dimensions: the point they arise, the type of products and services they produce, their stage of development, and the business environment that surrounds them. The analysis of European regional clusters shows that most of European clusters are rather young. A large majority of them were created after 1970 and the development of regional clusters in Croatia begun even later. Namely, expansion of Croatian regional clusters mainly started after year 2005. The innovative activity of European clusters is relatively concentrated in few areas in Europe (West Germany and most regions of Austria, the North and East of France, the South-east part of United Kingdom, the Netherlands and in some Scandinavian countries, mostly in Sweden).

Our research selected the most dominated clusters in EU-27 and Croatia: the agricultural products cluster, the construction cluster, the IT cluster, the tourism and hospitality cluster and the transportation and logistics cluster. The investigation confirms that in the agricultural products cluster the highest number of employees has the region of the Mediterranean Spain, and in the construction cluster, the IT cluster, the tourism and hospitality cluster and the transportation and logistics cluster has Italy. Majority of clusters in Croatia function in manufacturing and agriculture sector, have more than 500 employees (40% of all), mainly are financed by membership (68%), and produce for Croatian market (72%).

**Key words:** *regional clusters, development, Croatia, EU 27*

**JEL classification:** L10, L25

## **Introduction**

A regional cluster approach is becoming increasingly recognised as a valuable tool to foster economic development. Therefore, the interest in regional clusters and their role in economic development have grown substantially over the last several years among academics, economic development professionals, and firm managers. A much larger number of countries and regions are inspired by cluster theories and use elements of it to foster growth. Even though still a new phenomenon as an economic development strategy there is a number of European

cluster success stories showing that significant positive effects can be achieved when implementing cluster concepts in a consequent manner. It seems that after nearly two decades of study and debate, it is probably impossible to agree on a single, universal definition of different kinds of clusters. One key to understanding clusters is to recognize that there are multiple dimensions to cluster relationships, including geography, social distance, technology, and production flows (Cortright, 2006, 4). Yet many policymakers and practitioners have only limited understanding of what regional clusters are and where they are mostly developed. Therefore, this paper reviews the academic literature on regional clusters firstly giving their most popular definitions and secondly explains their main risks and benefits.

The research analysis in this paper investigates the main characteristics of regional clusters in EU 27 and Croatia. Therefore, this research is especially valuable, because there are rather few scientific articles written about clusters in Croatia. The source of data is based on a databank set by *the European Cluster Observatory* and last survey about clusters in Croatia, named "*Clusters in Croatia in 2009.*". *The European Cluster Observatory*<sup>1</sup> gives information and analysis of regional clusters and cluster policy in Europe. It is based on a fully comparable and consistent methodology. It provides data and analysis on clusters and competitiveness, a cluster library, and a classroom for cluster education also produces analysis and reports on regional competitiveness conditions, transnational cluster networks, clusters in emerging industries and studies on better practices in cluster organisations. The purpose of the observatory is to inform policy makers and government officials at the European, national, regional and local levels, cluster practitioners, academics and researchers, throughout the world about European clusters, cluster policies and cluster initiatives.<sup>2</sup> The "*Clusters in Croatia in 2009.*", is the most recent survey about clusters in Croatia, conducted by entrepreneur incubator BIOS from Osijek and agency for market research and public opinion Audeo at the end of 2009.

The paper is divided into five main parts. After introductory part, the second part of this article explains the concept and some stylized facts of regional clusters and indicates regional clusters benefits and risks. Descriptive analysis of regional clusters in Europe follows in the third part. The fourth section explains development of regional clusters in Croatia and

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<sup>1</sup> Online platform.

<sup>2</sup> <http://www.clusterobservatory.eu/index.html>

examines their difference in relation to European ones. Conclusions regarding the regional clusters are drawn in the fifth section.

## **1. Theoretical Background**

Regional clusters have attracted growing interest among both academics and policy-makers during the last decades. In the 1970s and 1980s clusters established a strong position in the world market for both more traditional products (e.g. „Third Italy“) and high technology products (e.g. the information technology cluster Silicon Valley, the automotive clusters in Southern Germany and Detroit, the telecom clusters in Stockholm and Finland). During the 1990s clusters were widely recognized as an important setting in stimulating the productivity and innovativeness of companies and the formation of new businesses (European Commission, 2002, 9).

In global economy, which boasts rapid transportation, high-speed communication, and accessible markets, one would expect location to diminish in importance. But, Belleflamme, Picard and Thisse, have shown that the impact of localization economies rises as transport costs between regions fall. The formation of regional clusters seems to obey the same general principles: “full or partial agglomeration of firms into one region occurs when transport costs are low, when products are differentiated enough, and when localization economies are strong” (Belleflamme, et al., 2000, 161). This suggests that agglomeration is more likely to occur in the global economy because firms are able to enjoy a higher level of localization economies while still being able to sell a substantial fraction of their output on distant markets (Belleflamme, et al., 2000, 181).

### **1.1. Definitions of Regional Clusters**

Regional clusters refer to geographically bounded concentrations of interdependent firms, and may be used as a catchword for older concepts like industrial districts, specialised industrial agglomerations and local production systems (European Commission, 2002, 9). Regional clusters are limited geographical areas with a relatively large number of firms and employees within a small number of related industrial sectors. Thus, the clusters are specialised in a small number of industries. This reflects the more general point that economic, entrepreneurial and technological activities in specific industrial sectors tend to agglomerate at certain places (European Commission, 2002, 13). Regional clusters arise in the presence of so-called *Marshallian externalities*, which states that firms benefit from the production and

innovation activities of neighbouring firms in the same and related industries. There is abundant evidence that such externalities exist and lead to industry-level agglomeration (Rosenthal and Strange, 2004).

Porter, employs a somewhat wider meaning of clusters, as “geographic concentrations of interconnected companies and institutions in a particular field” and Parker’s definition consider a regional cluster as “a concentration of “interdependent” firms within the same or adjacent industrial sectors in a small geographical area” (European Commission, 2002, 13). The rationales for the geographic concentration of industries into regional clusters have been explored by a number of authors dating back to Weber (1929) and Marshall (1920)<sup>3</sup>. They include the presence of unique natural resources, economies of scale in production, proximity to markets, labour pooling, the presence of local input or equipment suppliers, shared infrastructure, reduced transition costs, and other localized externalities. Unique natural resources and extreme economies of scale in production provide the most straight forward, and perhaps least interesting, rationale for localization (Enright, 2001, 6).

Regional clusters often attract sophisticated buyers from outside the region that can provide additional insights into advanced market demands. They often become repositories for industry-specific skills and capabilities that add to the innovation process. They provide crucial points for investment and new business activities and exhibit greater levels of cooperation and competition than might be found among dispersed firms (Enright, 2001, 9).

Governance frameworks and the spatial nature of the benefits of clusters both play a role in the development and implementation of policies to effectively promote regional specialisation and clusters. For such programmes, there are economic justifications for all levels of government (local, regional, national and in some cases supra-national) to support them. These justifications are based on different perspectives on the value of clusters, for example, as the basis for EU competitiveness policy or a national growth programme at macro-level *versus* as a local employment centre for regions (OECD, 2007, 14).

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<sup>3</sup> See more detailed in: Marshall, A. (1920) *Principals of Economics*; 8th Edition; London: Macmillan and Weber, A. (1929) *Theory of the Location of Industries*; Chicago: University of Chicago Press.

## 1.2. Clusters benefits and risks

Clusters offer a number of potential positive benefits, beyond lower production costs, that lead to innovation and productivity growth. Such benefits include their role as a useful platform for knowledge sharing, an environment favouring greater specialisation and a heightened level of firm challenge motivating competition, among other benefits (OECD, 2007, 24). The principal reason for policy interest in clusters is that productivity, wages and employment levels appear, in least in some cases, to be higher in these clusters than in the economy as a whole (OECD, 2007, 30). According to Porter, “regions compete in providing the most productive environment. It is not the industry that matters but the way the firm competes, its use of the advantages that the local environment brings” (Porter, 1998, 82). Being part of cluster allows companies to operate more productively in sourcing inputs; accessing information, technology, and needed institutions; coordinating with related companies; and measuring and motivating improvement (Porter, 1998, 81).

Regional clusters entail both greater cooperation and greater competition among direct competitors than geographically dispersed industries. Greater cooperation in regional clusters can come about through the fact that there are simply more activities that firms in close proximity can share, such as bulk purchasing, joint infrastructure investments, environmental control, and basic training, than can be shared by dispersed firms (Enright, 2001, 12-13). The success stories show that clusters, by increasing the competitiveness of individual companies, provide macroeconomic benefits, some of which are (European Commission, 2002):

- Raising attractiveness of regions – network and cluster establishments will help stimulate competence development within the region as well as motivating people not to migrate;
- Increasing need-orientation of business supporting services – effective clusters and networks that also strongly work in the field of research and development and will therefore work together with research institutes and universities. Therefore, they contribute to further develop the regional competence and research infrastructure.
- Securing employment and fostering entrepreneurship – the production sector in Europe is a large provider of jobs and contributor to the GDP; much of this comes from SMEs supplying the large and producers.

The advantage of individual regional cluster may vary over time, but in general regional clusters allow certain flexibility in firm structure and in coordination of transactions and that

these may progress with changes in technology, tastes, firm strategy, and competitive environment. They can exhibit greater levels of cooperation and competition than might be found among dispersed firms. Regional clusters can benefit from the presence of foreign multinationals and foreign multinationals can benefit from a presence in regional clusters (Enright, 2002, 20).

A discussion of the benefits to specialisation and clusters would not be complete without mentioning the possible risks associated with a policy strategy in favour of clustering. The notion of risk has many dimensions. With respect to strategy, the appeal of high-growth industries can lead to a cluster approach that attempts, often unrealistically, to generate critical mass in fields such as life sciences and ICT in which competition is particularly fierce and public investment requirements relatively high. This raises the question of whether clusters can be created and, if so, at what cost. There are also risks related to the cluster's structure. Regional economies based on small firms working in the same or related sectors can be vulnerable to market shocks that undermine simultaneously all firms in the cluster. Hub and spoke, platform and state industry clusters can also be seen as vulnerable if the core firm leaves or downsizes. Another form of risks is that firms in a cluster may become too inward looking or rigid, resulting in what are termed lock-in-effects (where the major investments to support specific sectors or clusters make it difficult to adjust strategies to new circumstances later) because the cluster is less open to adaptation (OECD, 2007, 33).

Enright, concludes that in fact many regional clusters of firms and industries do not succeed and that many that do succeed for a time eventually fail. Therefore, he stresses five basic failure mechanisms: falling demand for a cluster's products, organizational obsolescence, competition from similar clusters, loss of the ability to coordinate activities, and loss of internal dynamism (Enright, 2001, 15). Cluster policies linked to regional policy often focus on so-called lagging regions, including regions undergoing industrial restructuring and geographically peripheral regions (OECD, 2007, 12). Focusing on leading regions that drive national growth is perhaps an efficient means to boost national economic performance. However lagging regions detract from social cohesion and can be a pull on national growth. Supporting dynamic sectors may give them a competitive frame with important technological spillovers for the wider economy, while refocusing exposed sectors to new opportunities can preserve employment and promote restructuring of regional economies (OECD, 2007, 13). Porter's findings highlight the need for regional economic development policies to be

particularly adjusted to traded clusters, because these not only support higher wages but also appear to drive local employment and especially local wages (Porter, 2003, 571).

Considering these mentioned clusters' benefits and risks, there are still many unanswered questions regarding the benefits and risks of clusters themselves as well as the effectiveness and efficiency of cluster policies seeking to influence their development. The second part of our paper makes an overview of the European regional clusters existing today according to statistical mapping of regional clusters in EU 27 countries.

## **2. European Regional Clusters**

Over the last decade, there has been an increasing interest in regional cluster development in EU countries, as regional clusters are considered to be the instrument that might foster innovation and competitiveness of enterprises. More specifically, research showed that enterprises within a cluster are among the most competitive in the national economy and also quite efficient in creating new employment. The great interest in regional clusters and initiatives for cluster development in the EU arises from experiences and studies of industrial districts in Italy. These areas are distinguished by high concentration of very small (mainly traditional) companies in the processing industry, by a well-developed division of labour among local companies, and a high level of entrepreneurship (Dragičević, Obadić, 2009, 4).

In particular, many industries of Northern Italy are mentioned as role models for regional clusters. Well-known clusters in Northern Italy are furniture and shoe making in the Veneto region and ceramics in Emilia-Romagna. As second cluster stronghold is Austria. In the regions of Styria and Upper Austria regional economic development is entirely cluster-based. A particularly strong cluster in both regions is the automobile sector (European Commission, 2002, 13). Sölvell, Ketels and Lindqvist, have analyzed regional clusters within ten European Union member states, EU10. Regions were defined according to the NUTS2 classification with a total of 41 regions within EU10. It was identified 19 “three-star”<sup>4</sup> regional clusters, 92 “two-star” regional clusters and 313 “one-star” regional clusters. The largest regional clusters in the EU10 included Warszawa (Poland) Financial Services with 74,000 jobs and Warszawa transportation and logistics cluster with 60,000 jobs. Budapest (Hungary) transportation and logistics cluster was also identified as large. Ostrava (Czech Republic) included over 50,000

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<sup>4</sup> The largest and most specialized clusters receive three stars (Sölvell, Ketels and Lindqvist, 2008, 104).



jobs in metal manufacturing cluster. Metal manufacturing cluster was identified as the largest cluster in Slovakia and Slovenia, heavy construction services cluster in Lithuania, transportation and logistics cluster in Estonia and Latvia, and hospitality and tourism cluster in Cyprus and Malta (Sölvell, Ketels and Lindqvist, 2008, 104-105).

The data for this part of analysis are mainly taken from *the European Cluster Observatory*<sup>5</sup>. The statistical mapping of regional clusters has identified regional clusters in the EU's 27 countries, Bosnia and Herzegovina, Croatia, Iceland, Norway, Russia, Serbia, Switzerland, Turkey, and Ukraine. The cluster mapping approach used involves measuring the effects that linkages and spill-overs have on a company's choice of location. Beyond cluster mapping, *the European Cluster Observatory* provides information about policies and programmes relating to clusters. In addition, it includes a comprehensive database and mapping of cluster organizations.

*The European Cluster Observatory* database is based on regions and cluster sectors in Europe. The data is divided in 404 regions; mostly NUTS2 regions, NUTS1 regions in Ireland, Slovenia, Bosnia and Herzegovina and Croatia because of data availability, three of the German regions and one Italian region are NUTS1 regions because the NUTS definitions have been changing over time, Russia and Ukraine are not covered by the NUTS classification and therefore for these countries the classification of local statistical offices is used. Regions according to *the European Cluster Observatory* are as follows: Alpine Space, Atlantic Coast, Baltic Sea Region, Central Europe, Danube Region, Mediterranean, North Sea, North West Europe Northern Periphery, South East Europe and South West Europe.<sup>6</sup>

Cluster sectors according to *the European Cluster Observatory* are given in Table 1. Cluster indicators of *the European Cluster Observatory* are as follows: number of employees in full time equivalent units, growth rate of employment (%), number of persons employed per enterprise, number of enterprises, growth rate of number of enterprises, wages per employee FTE (thousand EUR), observatory star rating, size (%), specialisation and focus.<sup>7</sup>

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<sup>5</sup> <http://www.clusterobservatory.eu/index.html>

<sup>6</sup> <http://www.clusterobservatory.eu/index.html>

<sup>7</sup> <http://www.clusterobservatory.eu/index.html>

Table 1. Organization of cluster sectors according to *the European Cluster Observatory*

Standard sectors	Aerospace Agricultural products Apparel Automotive Biotech Building fixtures, equipment and services Business services Chemical products Construction Construction materials Distribution Education and knowledge creation Entertainment Farming and animal husbandry Financial services Footwear Furniture Heavy machinery Instruments IT Jewellery and precious metals Leather products Lighting and electrical equipment Maritime Media and publishing Medical devices Metal manufacturing Oil and gas Paper products Pharmaceuticals Plastic Power generation and transmission Processed food Production technology Sporting, recreational and children's goods Stone quarries Telecom Textiles Tobacco Tourism and hospitality Transportation and logistics
Creative and cultural industries	Advertising Artistic creation and literary creation Museums and preservation of historical sites and buildings Other Printing and publishing Radio and television Retail and distribution Software
Knowledge-intensive business services	Business services Education and knowledge creation Financial services IT
Life-science	Biotech Medical devices Pharmaceuticals

Source: organized by authors according to the European Cluster Observatory – <http://www.clusterobservatory.eu>

With the growing recognition that cluster-form organisations could help enhance the competitiveness and innovation capabilities of SMEs, countries are more eager to support the creation and/or development of clusters, especially innovative ones. Innovation activity is mainly concentrated in the very core of Europe, a cluster of regions which includes West Germany and most regions of Austria. There are also some other hot spots of innovation in the North and East of France, the South-east part of United Kingdom, in the Netherlands and in some Scandinavian countries, mostly in Sweden. None or modest technological activity is documented in most regions of the South of Europe: Spain, Greece, Portugal and South of Italy. Innovative backwardness is also documented for some northern countries such as Norway and Ireland (Moreno et al., 2005, 720). Moreno and others, conclude that more regions are obtaining output in the innovative activity at the beginning of 2000s than at the beginning of the 1980s. For example, among the catching up process, it is worth highlighting the most brilliant one shown by Finland, which in the 1990s manages to reach the fourth position in the country rankings and to put its capital region Uusimaa among the first producers of innovation in Europe. This region was 49<sup>th</sup> at the beginning of the 1980s and 6<sup>th</sup> at the end of the 1990s, originating one of the most remarkable catching up performance in Europe in the last 20 years (Moreno et al., 2005, 724). Their empirical investigation also suggests that innovation tends to cluster more in sectors in which the neighbouring regions are also technologically specialised (Moreno et al., 2005, 734).

The EU Mediterranean region was chosen to analyse the data of *the European Cluster Observatory*<sup>8</sup>. One of the analyzed indicators was observatory “star” rating. *The European Cluster Observatory* assigned to each cluster 0, 1, 2 or 3 “stars” based on criteria of size<sup>9</sup>, specialization<sup>10</sup> and focus<sup>11</sup>. Table 2 shows observatory “star” rating of selected regions for the agricultural products cluster, the construction cluster, the IT cluster, the tourism and

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<sup>8</sup> <http://www.clusterobservatory.eu>

<sup>9</sup> It shows whether a cluster is in the top 10% of all clusters in Europe according to the number of employees. One “star” is awarded to the clusters that are in the top 10%.

<sup>10</sup> It indicates a cluster specialization quotient (comparison of the proportion of employment in a cluster category in a region over the total employment in the same region and the proportion of total European employment in that cluster category over total European employment). If cluster has the specialization quotient 2 or more it receives a “star”.

<sup>11</sup> It indicates whether a cluster is in the top 10% with respect to the employment in the cluster in relation to total employment in the region. One “star” is awarded to the clusters that are in the top 10% of clusters which account for the largest proportion of their region's total employment.

hospitality cluster and the transportation and logistics cluster<sup>12</sup>. It can be seen that Croatia has 3 “star” rating for the transportation and logistics cluster which is also the highest in the selected region. Croatia has a 0 “star” rating for the agricultural products cluster and IT cluster. Greece has the highest “star” rating for the agricultural products cluster, (1,65), Mediterranean Spain for the construction cluster (2,55), France for the IT cluster (1,49) and Cyprus for the tourism and hospitality cluster. It is also evident that the IT cluster has the lowest “star” ratings.

Table 2. Observatory cluster rating with a “star”

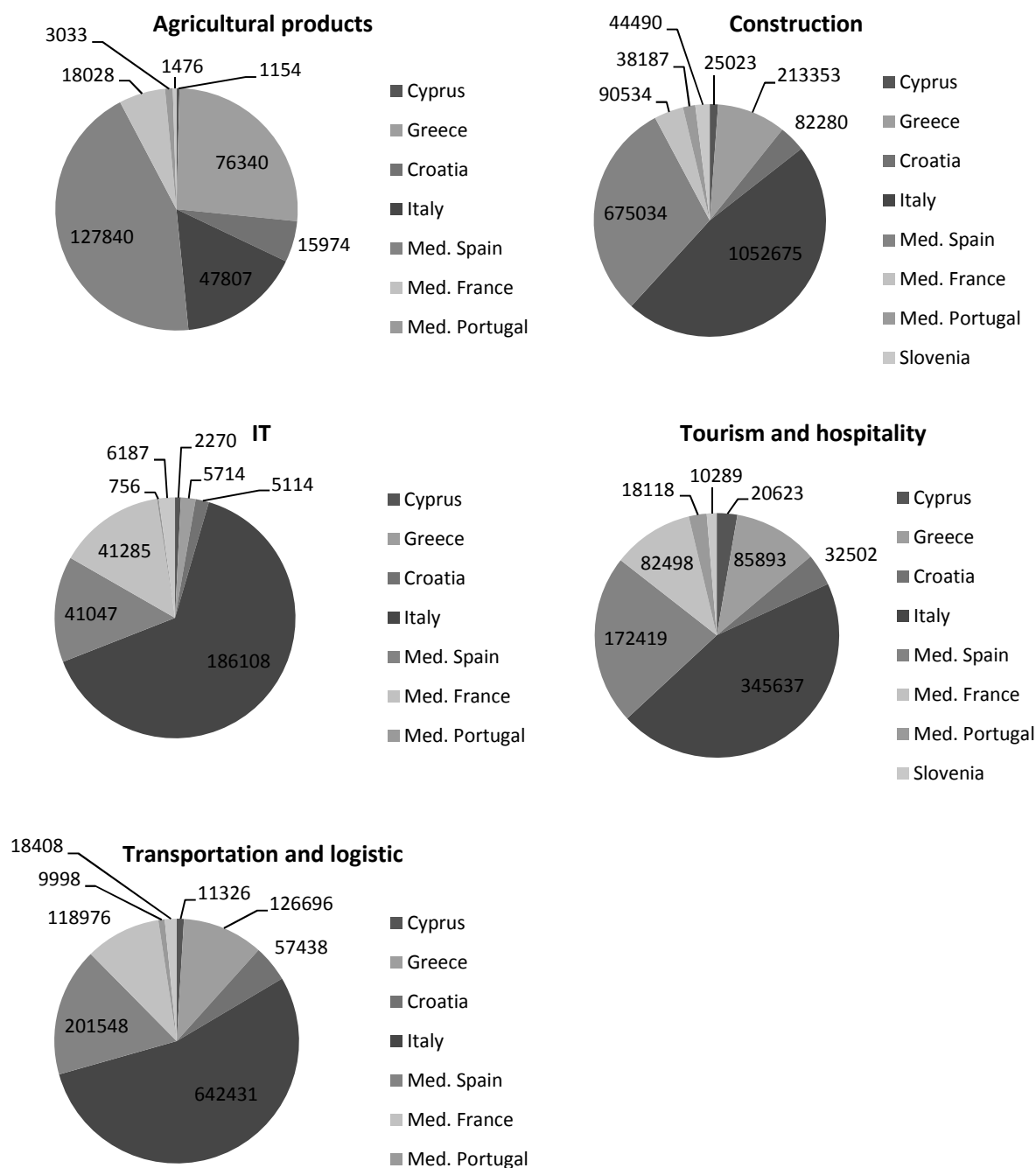
	<b>Agricultural products</b>	<b>Construction</b>	<b>IT</b>	<b>Tourism and hospitality</b>	<b>Transportation and logistics</b>
Cyprus	0.00	1.00	0.00	2.00	2.00
Greece	1.65	1.22	0.00	0.77	1.99
Croatia	0.00	2.00	0.00	1.00	3.00
Italy	0.69	2.14	0.70	0.97	2.37
Mediterranean Spain	1.48	2.55	0.56	0.93	0.45
Mediterranean France	0.26	0.51	1.49	1.05	0.52
Mediterranean Portugal	1.00	2.00	0.00	1.63	1.58
Slovenia	0.00	2.00	0.00	0.00	1.00

Source: organized by authors according to the European Cluster Observatory – <http://www.clusterobservatory.eu>

Further analysis shows the number of employees for 5 selected clusters in year 2009 (see Figure 1.). It can be concluded that in the agricultural products cluster the highest number of employees has the region of the Mediterranean Spain, and in the construction cluster, the IT cluster, the tourism and hospitality cluster and the transportation and logistics cluster has Italy.

<sup>12</sup> Clusters are selected in accordance with the analyzed Croatian clusters that are presented in the fourth part of the paper *Croatian Regional Clusters*.

Figure 1. Number of employees in five selected clusters in 2009



Source: constructed by authors according to the *European Cluster Observatory* – <http://www.clusterobservatory.eu>

The analysis of European regional clusters shows that most of European clusters are rather young. A large majority of them were created after 1970. Also most of the clusters are still growing. Many of the clusters have increased the number of employees over the last ten years as well as a growing number over firms. The firms in the clusters can mainly be characterised

as SMEs. In most cases SMEs are the dominating type of firms. Over the last ten years this has been increasingly the case. Numerous activities in European clusters take place inside the geographic boundaries of the clusters. Most often applied R&D and supporting services are performed inside the clusters. Administrative and strategic activities (such as strategy formulation and logistics management) are also often carried out by firms in the cluster. On the other hand, capital equipment production is carried out in very few clusters.

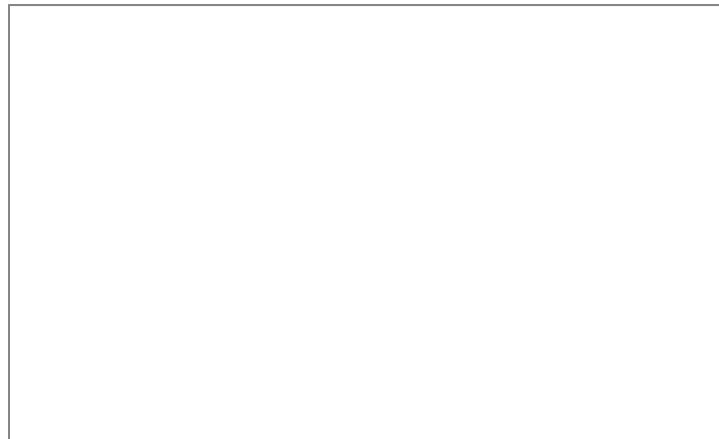
Next part of our paper analysis the development of regional clusters in Croatia, which expansion mainly started after year 2005.

### **3. Croatian Regional Clusters**

To date, no systematic mapping of Croatian clusters has been done. The last survey about clusters in Croatia (together with one under run in 2007), named “*Clusters in Croatia in 2009.*”, has been conducted by entrepreneur incubator BIOS from Osijek and agency for market research and public opinion Audeo at the end of 2009. So, the data used in this analysis are taken from this research.

Compared to European regional clusters, the nature of current cluster’s form in Croatia (different structure of linked Croatian companies) is of recent date. The majority of clusters are established in the period between 2006 and 2009. More than half clusters that have participated in the BIOS study are established in 2006 and 2007 period in which the formation of clusters was strongly encouraged by the institutions of central government. Croatian clusters vary according to number of employees. The most numerous categories between clusters are those above 500 employees. The minimum total number of employees in one cluster is 20, while companies in the largest cluster are employing 3.400 people (see Figure 2.)

Figure 2.

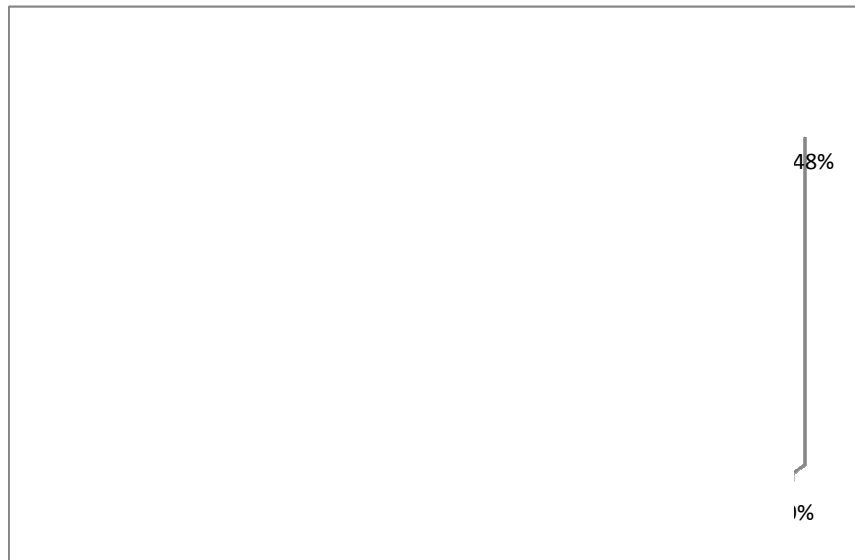


Source: BIOS (2009).

The smallest total number of employees in one cluster is 20, when the companies in the largest cluster employ 3 400 people. Average number of employees per cluster in Croatia is 260. Total number of employees is not highly correlated to the number of firm members. The largest clusters in the total number of employees have an average number of members, there are clusters that have a large number of members but do not employ large number of people. The largest number of clusters decided to organize in the form of association (52%).

Majority of clusters in Croatia function in manufacturing (in 48% of cases) and agriculture sector (28%). Tourism and hospitality (24%) and informatics (24%) are second popular sector and wholesale and retail (16%) third popular sector in which clusters are operating (see Figure 3.).

Figure 3.



Source: BIOS (2009).

As clusters vary by type of products and services they produce and business sector where they are performing, they also differ by main activities they perform. Inside the cluster different activities are present. The most common forms of joint activities within the cluster in Croatia are:

- Exchange of information among members (all clusters)
- Joint promotion (84%)
- Lobbying (80%)

Joint procurement and distribution and opening of joint offices in the country and abroad are rarely present, but these activities clusters are planning to start in the future. The collaboration between clusters and other organizations should be still improved. Next table shows what activities are managers of single clusters planning to do in the near future and how industrial activities in the clusters are performed (see Table 2.).



Table 3. Cooperation with other clusters

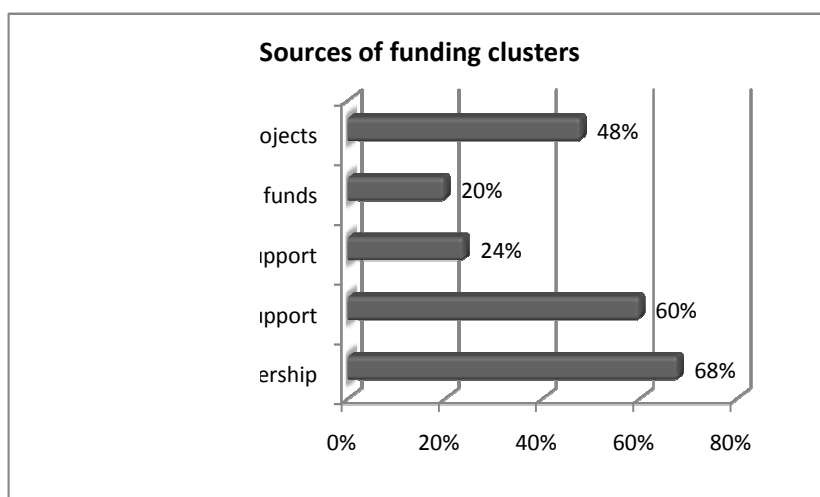
Type of activity	YES	NO, but we are planning in the next several years	NO, and we are not planning
Conferences and seminars	48.0%	40.0%	12.0%
Information exchange	56.0%	40.0%	4.0%
Joint media appearance	16.0%	52.0%	32.0%
Lobbying	20.0%	72.0%	8.0%
Joint approach to new market	4.0%	76.0%	20.0%
Common market research	0.0%	80.0%	20.0%
Technology transfer	8.0%	72.0%	20.0%

Source: BIOS (2009).

Majority of managers are cooperating with other clusters in the field of information exchange (in 56,0% of cases) and conferences and seminars (48,0%), but in the next several years they are planning to cooperate in common market research (80,0%) and joint approach to new market (76,0%). They are not planning to cooperate in joint media appearance (32,0%).

The most clusters in Croatia are financed by membership (68%) and central government budget support (60%), but generally they are using different sources for their financing. For example, commercial projects and local government support and in smallest proportion EU funds (see Figure 4.).

Figure 4.

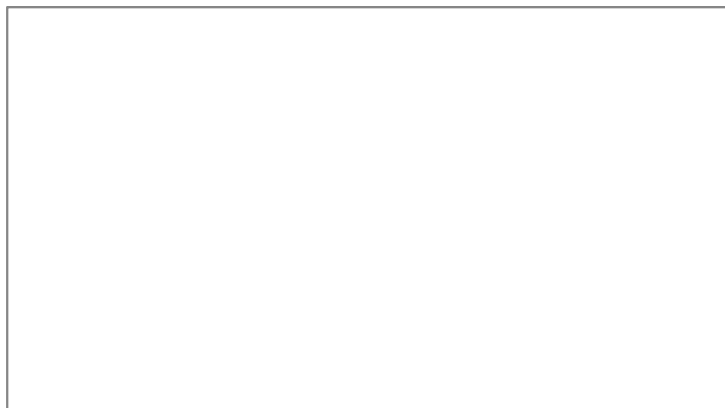


Source: BIOS (2009).

As the majority of clusters in Croatia are rather young (five or less years), they are still mainly operating at the domestic market. With their development and higher stage of clusters life-

cycle they are planning to expand their production and selling to other regional, primarily European markets and not mainly Croatian one (72%) (see Figure 5.).

Figure 5.



Source: BIOS (2009).

If Croatia, wants to catch up as soon as possible with European Union, which wants to become the most competitive and innovative region in the world economy, policy makers at different levels must involve clusters in their thinking. In such way, Croatian clusters for their funding should use more EU funds and develop more competitive products and services developed for European market.

## Concluding Remarks

The growing interest and academic and professional literature on regional clustering inspired this paper. Nowadays, regional clusters are everywhere, appearing in most economies and most types of industries. They make an important contribution to the world's economies and provide paths to developing national and regional economies. The analysis of European clusters show that innovative activity is relatively concentrated in few areas in Europe (West Germany and most regions of Austria, the North and East of France, the South-east part of United Kingdom, the Netherlands and in some Scandinavian countries, mostly in Sweden). The analysis of European regional clusters shows that most of European clusters are rather young. A large majority of them were created after 1970 and the development of regional clusters in Croatia begun even later (mainly started after year 2005).

Our research selected the most dominated clusters in EU-27 and Croatia: the agricultural products cluster, the construction cluster, the IT cluster, the tourism and hospitality cluster and the transportation and logistics cluster. The investigation confirms that in the agricultural products cluster the highest number of employees has the region of the Mediterranean Spain, and in the construction cluster, the IT cluster, the tourism and hospitality cluster and the transportation and logistics cluster has Italy. Many of the clusters have increased the number of employees over the last ten years as well as a growing number over firms. Majority of clusters in Croatia, function in manufacturing and agriculture sector, have more than 500 employees (40% of all), mainly are financed by membership (68%), and produce for Croatian market (72%).

For future research, the aim is to extend this study in several dimensions. By analyzing time series, it should be possible to study how regional clusters evolve over time, and see which ones are on the rise and which are on the fall. Another extension is to include performance in the study, such as measures for export activity, productivity, patents, and other output measures.

## References

1. Belleflamme, P. , Picard, P., Thisse, J. (2000) An Economic Theory of Regional Clusters; *Journal of Urban Economics* 48: 158-184.
2. BIOS (2009) Klasteri u Republici Hrvatskoj; Poduzetnički inkubator BIOS, Osijek i agencija za istraživanje tržišta i ispitivanje javnog mnijenja Audeo; [http://www.inkubator.hr/images/stories/projekti/analiza\\_klasteri\\_2009.pdf](http://www.inkubator.hr/images/stories/projekti/analiza_klasteri_2009.pdf)
3. Cortright, J. (2006) Making Sense of Clusters: Regional Competitiveness and Economic Development; *A Discussion Paper prepared for the The Brookings Institution Metropolitan Policy Program*: 1-58; March 2006.
4. Dragičević, M., Obadić, A. (2009) Influence of Clusters on Competitiveness Growth: Some Experiences in EU and Post-Transition Countries; *Global Business&Economics Anthology*; Selected Papers January 2009 Business&Society International Conference; Volume I, March 2009; ISSN: 1553-1392; The Business&Economics Society International (Editor: Demetri Kantarelis): 109-120.

5. Enright, M.J. (2001) Regional clusters: What we know and what we should know; *Paper* prepared for the Kiel Institute International Workshop on Innovation Clusters and International Competition 12-13, November, 2001.  
<http://www.fbe.hku.hk/~mjenright/pmba2241/enrightkiel2002-3.pdf>
6. European Cluster Observatory - <http://www.clusterobservatory.eu>
7. European Commission (2002) Regional clusters in Europe; *Observatory of European SMEs* 2002/No.3; Enterprise publications.
8. Marshall, A. (1920) *Principals of Economics*; 8th Edition; London: Macmillan.
9. Moreno, R., Paci, R., Usai, S. (2005) Geographical and sectoral clusters of innovation in Europe; *Ann Reg Sci* 39: 715-739.
10. OECD (2007) Competitive Regional Clusters – National Policy Approaches; OECD Reviews of Regional Innovation, Paris.
11. Porter, M. (1998) Clusters and the New Economics of Competition; *Harvard Business Review*; November-December: 77-90.
12. Porter, M. (2003) The Economic Performance of Regions; *Regional Studies*, Vol. 37, August/October: pp. 549-578.
13. Rosenthal, S.S. and Strange, W.C. (2004) Evidence on the Nature and Sources of Agglomeration Economies, in J.V. Henderson and J.-F. Thisse (Eds.), *Handbook of Regional and Urban Economics*, Vol. 4, Elsevier Publishers.
14. Sölvell, Ö., Ketels, C., Lindqvist, G. (2008) Industrial specialization and regional clusters in the ten new EU member states; *Competitiveness Review*; 18, ½: 104-130.
15. Weber, A. (1929) *Theory of the Location of Industries*; Chicago: University of Chicago Press.