INNOVATION CLUSTERS IN EUROPE

A STATISTICAL ANALYSIS AND OVERVIEW OF CURRENT POLICY SUPPORT

DG Enterprise and Industry report

Europe INNOVA

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1. Introduction

Following the **Commission's communication "Putting knowledge into practice: A broad-based innovation strategy for the EU"**[1] [COM(2006) 502 final] of September 2006, the Council invited the Commission "to prepare an analysis on how to promote the trans-national dimension of clusters in Europe." The present **ENTR report** responds to this request.

- First, it analyses on the basis of the best available data the presence of clusters in Europe and their **role as drivers of innovation and economic growth. In this respect policy support to clusters is an integral part** of the Growth and Jobs strategy;
- Second, it describes **national and regional approaches in support of clusters** and identifies the main challenges still to be addressed to exploit their full potential;
- Thirdly, it presents the **main Community instruments** that are currently used in support of cluster policies of the Member States and regions.

This ENTR report takes into account the views of a **High Level Advisory Group** on clusters that has been recently established, bringing together expertise on clusters and cluster policy development from public authorities, firms, regional organisations and industrial associations and drawing from recent international work in this field. This document is of a strictly analytical nature and does not express any views or commitments of the Commission on any future development of new or existing instruments. Its main purpose is to provide background to the **European Cluster Memorandum,** which is currently being prepared under the auspices of the European Cluster Alliance with the view to create synergies between regional, national and European efforts in support of clusters.

The **"European Cluster Alliance"**, as created under the PRO INNO Europe[4] initiative, provides a platform bringing together regional, national and European actors, with the objective to define and implement a European cluster policy agenda. The role of the Commission in this process is mainly to facilitate all forms of cooperation that could lead to more competitive clusters in Europe, by providing neutral economic analysis on existing and emerging clusters, identifying good practice, providing intelligence on opportunities for cooperation and facilitating networking at practical and strategic levels. Ongoing **European policies are complementary to regional and national efforts** to build strong clusters in Europe, thereby contributing to a consolidation of the scattered cluster picture in Europe, including the facilitation of cooperation between regions of unequal development.

This ENTR report presents the **first statistical findings** on the location of clusters in Europe. This work, performed under the recently established European Cluster Observatory[5], is based on employment data and uses an internationally and widely accepted methodology. As the analysis is only based on the co-location of industrial activity and employment, it does not provide a full picture and needs to be supplemented by other work that will highlight the knowledge components of clusters. An assessment of regional knowledge specialisation profiles is currently underway

[1] http://eur-lex.europa.eu/LexUriServ/site/en/com/2006/com2006_0502en01.pdf

[2] http://www.europe-innova.org/index.jsp; the composition of the High Level Advisory Group on clusters is given under the section "cluster mapping".

[3] See for example the OECD study "Competitive Regional Clusters: National Policy Approaches", May 2007 at: http://www.oecd.org/document/2/0,2340,en_2649_33735_38174082_1_1_1_1,00.html

[4] http://www.proinno-europe.eu/

[5] www.clusterobservatory.eu

to fill this information gap. Nevertheless, the current findings offer a good first insight about the location of clusters in Europe and represent a basis for further analysis and improvement.

With the publication of a Green Paper on future perspectives for the European Research Area[6], the Commission has launched a complementary debate on the fragmentation of research activities in Europe. The vision outlined in the Green Paper suggests that, in order to strengthen its competitive position, Europe should pool its forces by developing regional specialisations and by allowing research driven clusters of global excellence emerge. The Green Paper suggests that further concentration and specialisation of research efforts are needed in order for Europe to address the challenge of globalisation, and that this cannot be pursued effectively without a better integration of the science base with private R&D in new and existing clusters. Knowledge-based clusters of interlinked innovative enterprises and excellent research institutes could be among the main levers to foster EU competitiveness in the knowledge-based economy.

It is worthwhile to note that the current database includes only information about clusters in statistical terms, while cluster policy initiatives such as those selected and launched through governmental actions will be included in the database at a later stage. The European Cluster Observatory will complete its database by performing a number of **case studies** across Europe to better analyse the successful framework conditions and the innovation potential of a representative sample of cluster initiatives in Europe. Evidence collected in this process suggests that **trans-national cooperation between clusters can further strengthen European clusters**, acting as bridge-builders across regions in important ways. By building bridges through European programmes, new business and research contacts can be established, allowing for cross-border learning and innovation. Increased cross-border interaction between clusters enables benchmarking and learning about how to establish and manage clusters, which would otherwise remain unnoticed. Finally, it seems that cross-border programmes and initiatives can improve the mobility of people across Europe, including students, scientists, entrepreneurs and expatriates within larger firms, thus increasing the international aspect of regional and national cluster initiatives.

[6] http://ec.europa.eu/research/era/consultation-era_en.html

2. Clusters in Europe – the statistical picture

Clusters are defined by the co-location of producers, services providers, educational and research institutions, financial institutions and other private and government institutions related through linkages of different types. There is huge diversity among clusters: they differ in terms of their stage of development along the cluster life cycle; some are networks of SMEs, some are organized around key anchor firms, and yet others have developed around universities.

Europe's relatively weak innovation performance has been the topic of many recent analyses and reports. It is an important concern for Europe, because **innovation tends to become the key driver of prosperity and growth as countries reach higher levels of income.** While poorer countries can grow by investing in productive capacity and adopting technology developed elsewhere, richer countries need to move the productivity frontier and introduce new products, services, or ways to serve customer needs to sustain their prosperity. To this end, clusters can be instrumental.

Innovation is increasingly characterised as an open process, in which many different actors—companies, customers, investors, universities, and other organisations—cooperate in a complex ways. Ideas move across institutional boundaries more frequently. The traditional linear model of innovation with clearly assigned roles for basic research at the university, and applied research in a company R&D centre, is no longer relevant. Innovation can benefit from geographic proximity which facilitates the flows of tacit knowledge and the unplanned interactions that are critical parts of the innovation process. This is one of the reasons why innovation occurs locally whereas its benefits spread more widely through productivity gains. **Clusters may embody the characteristics of the modern innovation process:** they can be considered as "reduced scale innovation systems"[7]. Successful clusters encapsulate all the activities needed to deliver a particular value to customers; they cross the traditional definitions of industries and of manufacturing versus services. They can emerge even where companies' locations are not determined by the location of markets or natural resources. Their specific nature, including their spatial coverage, differs according to technology, market conditions, and other factors that influence the geographic extent and relative strength of linkages.

This chapter analyses the role of clusters in promoting economic prosperity and highlights their current presence in Europe. It presents the first results of the **European Cluster Observatory[8],** which is mainly based on the currently available employment data. Section 2.3 presents some of the persisting methodological challenges related to this approach. While further deepening the methodology, the Observatory will collect more information about cluster initiatives in the coming years and further analyse additional indicators of cluster strength in Europe, thus supporting the development of regional and national cluster policies. Such policies can be defined as the policy mixes and support to self-organisation that enhance the success of cluster dynamics. This initiative was launched under Europe INNOVA and has been publicly accessible since July 2007.

2.1. Clusters as drivers of prosperity in a global economy

Globalisation has, somewhat paradoxically, strengthened the role of clusters and furthered their development. Companies face increasing choices for locating their

[7] "Innovative Clusters. Drivers of National Innovative Systems". OECD, 2001,
[8] http://www.clusterobservatory.eu/

activities in places that provide the best business environment for their specific needs. **The more markets globalise, the more likely it is that resources will flow to more attractive regions**, reinforcing the role of clusters and driving regional specialisation. In this process, clusters tend to become increasingly specialised and increasingly connected with other clusters providing complementary activities. Silicon Valley in the US is an archetypical example of a region that breeds strong clusters in many high-tech domains. Due to clusters, many European regions have developed competitive advantages in specialised activities such as financial services (London), petrochemicals (Antwerp), flowers (Holland), and biopharma (the Danish-Swedish border region). Successful clusters have also significantly increased their global reach – attracting people, technology and investments, serving global markets, and connecting with other regional clusters that provide complementary activities in global value chains. Economic activity within a specific cluster tends to get more concentrated in a few locations. Individual **regions may get more specialised in specific clusters** becoming more different but also more connected. This allows overall economic activity to remain distributed relatively equally across locations, even though individual regions change what they do.

Regions that do not specialise may be in danger of falling behind. Therefore all of them need to be provided with the conditions and opportunities to participate successfully in this process. **Clusters can be part of what makes a region prosperous** but they are not the only explanation for competitive advantages**.** The presence and depth of clusters in a regional economy is one aspect of the overall business environment that companies face in the location. Factor conditions, the context for rivalry, and demand conditions are other aspects that have to be considered. Clusters are more likely to emerge, prosper, and survive where these conditions support high productivity and innovation.

Clusters and regional specialisation are empirically associated with higher levels of innovation and prosperity. The European Cluster Observatory and other cluster mapping efforts, e.g. the profiling of specialisation patterns across cluster categories (groups of industries that empirically co-locate) in regional economies in Europe, North America, and a few other countries has provided systematic evidence on these links. **Between 30% and 40% of all employment is in industries that concentrate, or 'cluster', regionally**.

Figure 1: Cluster Strength and Prosperity (EU15)

Note: Strong clusters defined by a Localisation Quotient (LQ)>2; NUTS Regions excluding Portugal and Greece. The localisation quotient for a given industry measures the extent to which a region is more specialised in an industry compared to the geographical area in question.

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070510

Regions with a higher share of employment in industries that belong to strong clusters[9] are generally more prosperous. If employment reflects activities in many industries that belong to such clusters, then prosperity rises further. Positions in groups of clusters linked through common industries or in clusters that are also present in neighbouring regions provide additional benefits. While many other factors other than clustering can have an impact on prosperity, the data provides clear **evidence that clusters are significantly related to prosperity** and there is therefore a need to consider clusters as a central part of any economic strategy. A more extended analysis of these factors will be performed by the European Cluster Observatory on the basis of recent academic works on this topic.

It is important to note that cluster policy should not be taken as a pretext for one-sided regional specialisation which makes regions more vulnerable to demand shocks. The emerging evidence suggests, however, that a cluster-based regional economy generates better outcomes. First, the economic costs of lower productivity due to a lack of specialisation have dramatically increased as the global economy has integrated markets. Second, dynamic clusters that are open to outside trends are better at dealing with external shocks, for example by transferring existing skills into new market areas. And third, new research indicates that the most successful regions tend to have a portfolio of clusters related through linkages that ease the trade-offs between specialisation and diversification. There is therefore a need for cluster policy to be pro-active in reducing the risks of cluster-specific demand shocks on regional economic performance.

2.2. Cluster presence in Europe: first results from the European Cluster Observatory

The European Cluster Observatory allows, for the first time, a quantitative analysis of European clusters based on a fully comparable methodology.[10] This shows that clusters are an important part of the European economic reality. Based on this analysis it can be assumed that roughly **38% of all European employees work in enterprises that are part of the cluster sector**. In some regions, this share goes up to over 50% while in others it drops to 25%. About one fifth (21%) of these employees are employed in regions that are more than twice as specialised in a particular cluster category as the average region.

The nucleus of the European Cluster Observatory is a database that includes information about clusters as they have been statistically identified in 32 countries, as well as cluster policies that have been developed in these countries at national or regional level. At a later stage the database will also provide information about cluster initiatives. The cluster portfolio strengths of each of the 32 analysed countries are summarised in the Annex, providing a summary of the statistical results obtained through this analysis.

The relation between clusters and innovation is clearly complex. A comparison between the regions having the most stars with the best performing innovation regions in Europe, as measured by the Regional Innovation Scoreboard[11] (RIS) 2006 shows that 7 out of 19 regions having a strong cluster portfolio (the highest total number of stars, equalling 25 stars or more, see Figure 2) are among the top third most innovative regions. The RIS benchmarks 208 European regions on the basis of 7 indicators, including human resources in science and technology, patent applications and employment in medium-high and high-tech manufacturing. This result suggests that a positive correlation may exist between the strength of regional

[9] Strong clusters are defined by a localisation quotient larger than 2.

[10] A description of the different cluster concepts, the statistical methodology as well as the list of the cluster categories examined through this analysis can be found at the European Cluster Observatory's web page at: www.clusterobservatory.eu

[11] http://www.proinno-europe.eu/doc/eis_2006_regional_innovation_scoreboard.pdf

The European Cluster Observatory: Some key elements

Industries differ empirically in the distribution of their employment across regions. Some industries are present essentially everywhere; because they mainly serve local markets. This part of the economy may be called the **local sector**. Other industries are present in some regions but not in others; because they 'cluster together'. Only this part of the economy may be called the **cluster sector**. Within the cluster sector, specific groups of industries tend to locate in the same places; these are the so-called **cluster categories**[1]. The term **regional cluster** is used if the employment in a given region in a particular cluster category meets cut-off criteria in terms of share of cluster sector employment, share of regional employment, and specialisation. The European Cluster Observatory currently identifies regional clusters that are located in the **EU-27 Member States, Iceland, Israel, Norway, Switzerland and Turkey**.

In order to map regional clusters, the analysis was conducted at the level of NUTS 2 regions (258 regions), and the cluster sector is divided into 38 cluster categories, creating about 10,000 areas in which a regional cluster might develop. To date, the **"European Cluster Observatory" has identified more than 2000 regional clusters,** assigning one star for each of the following criteria:

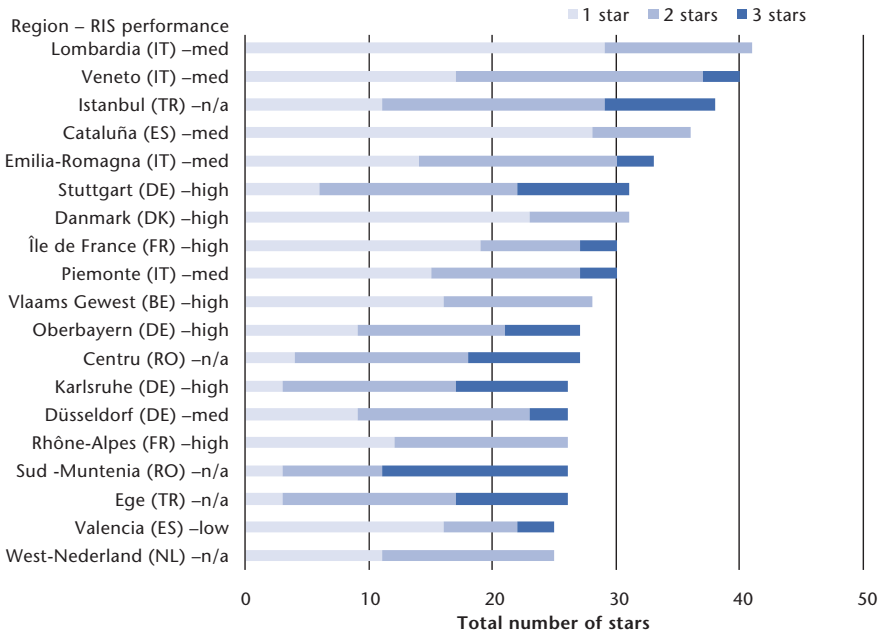
- Employment size in a particular industry cluster within a region.
- Degree of specialisation within the region.
- Cluster focus of employment within a region.

On this basis, 155 regional clusters register three stars (8%), 524 regional clusters two stars (25%), and 1338 one star (67%).

cluster portfolios and regional innovation performance. Such correlations should be further analysed in the future based on both analytical and empirical data.

Cluster categories differ significantly in the level of employment concentration across European regions. Employment in cluster categories with a

Figure 2: European Regions by Cluster Portfolio Strength



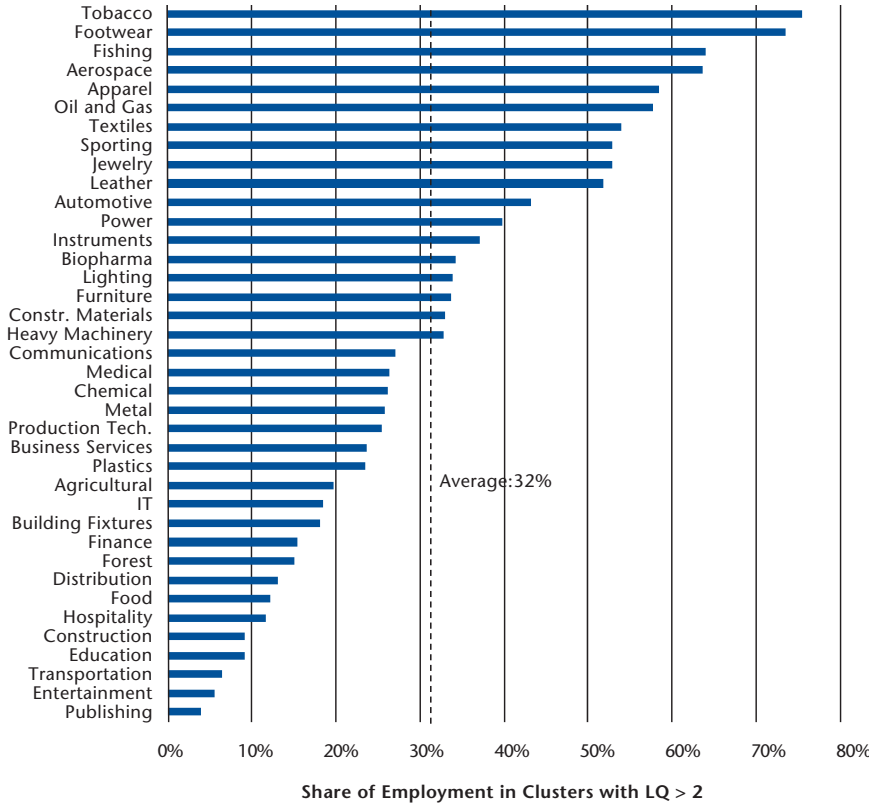
Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

relatively small overall number of employees, like footwear and aerospace, is concentrated in a few clusters that account for far more than 50% of all European employment in this category. On the other hand, employment in construction or education both with much larger absolute employment numbers is much more dispersed across Europe. On average, one fifth of all employment within a cluster category is located in regions that are more than twice as specialised in this cluster as the average European region.

Automotive is an example of a cluster category in which Europe shows clear regional specialisation. Automotive clusters, including cars, buses and truck assembly, engines and other components, are an area where Europe is among the strongest regions in the world economy. This success builds on a network of 39 regional clusters (out of a total of 259 regions) that meet two or three of the cut-off values and account for more than 50% of all European employment in the category. These regional clusters are interlinked by international strategies of manufacturers and suppliers, which can capitalise on the differentiation of local cluster conditions.

Similar European cluster maps to that in Figure 4 will be made available by the European Cluster Observatory for all sectors under investigation. This should offer an interesting statistical tool for the identification and further analysis of the regional distribution of strong clusters in different sectors in Europe. The European Cluster Observatory will provide **useful statistical data to better analyse the competitiveness of different sectors in Europe**.. In addition, cluster mapping analysis provides useful insights into the dynamics of regional development, allowing for better analysis of disruptive structural change.[12]

Figure 3: Geographic concentration of employment by cluster category



Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

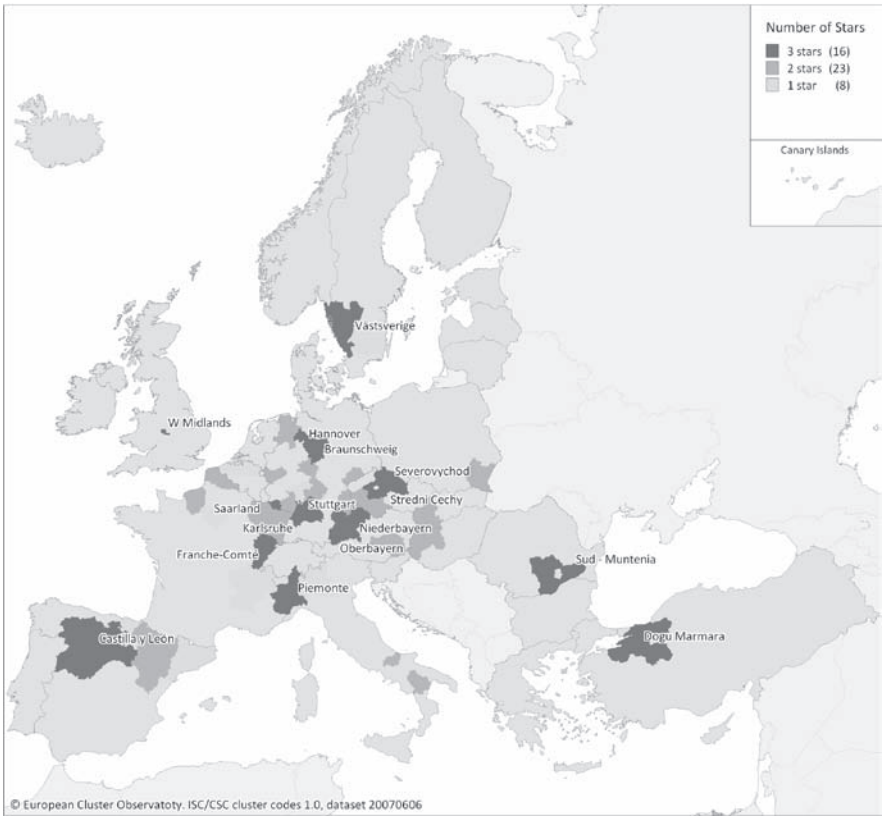
[12] Concrete examples of the dynamic nature of clusters exist. A EU10 cluster mapping shows that 26 regional clusters in these countries gained or lost two stars or more in the period 2000-04. See Ketels and Sölvell 2007: *Innovation clusters in the 10 new Member States of the European Union* (Europe INNOVA paper n° 1)

Clusters are not static and new successful clusters may emerge over time whereas previous industrial strongholds may lose their attractiveness. These **cluster dynamics need to be better understood** when defining regional development strategies or industrial policies aiming at the facilitation of structural changes. It is expected that cluster mapping will be performed by the European Cluster Observatory on a 2-year basis which will allow cluster dynamics to be analysed.

Overall the data analysed shows that **Europe lags behind the United States in terms of cluster strength,** both from a regional and industry perspective.

First, European regions tend to have a smaller share of employment in strong clusters, i.e. regional clusters in which a region is more than twice as specialised as the average region. For the average region, Europe's share is a quarter lower than in the United States. For the median region, the gap is even larger at about a third. While the European regions with the strongest cluster portfolios are comparable to their U.S. peers, the differences get larger among the weaker regions where Europe lags behind.

Figure 4: Leading European Automotive Clusters



Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Figure 5: Employment share of strong clusters (LQ>2) across regions

European Regions	
Most specialised region:	74%
Average region:	21%
Median region:	18%
Least specialised region:	0%

U.S. Regions	
Most specialised region:	70%
Average region:	28%
Median region:	27%
Least specialised region:	0%

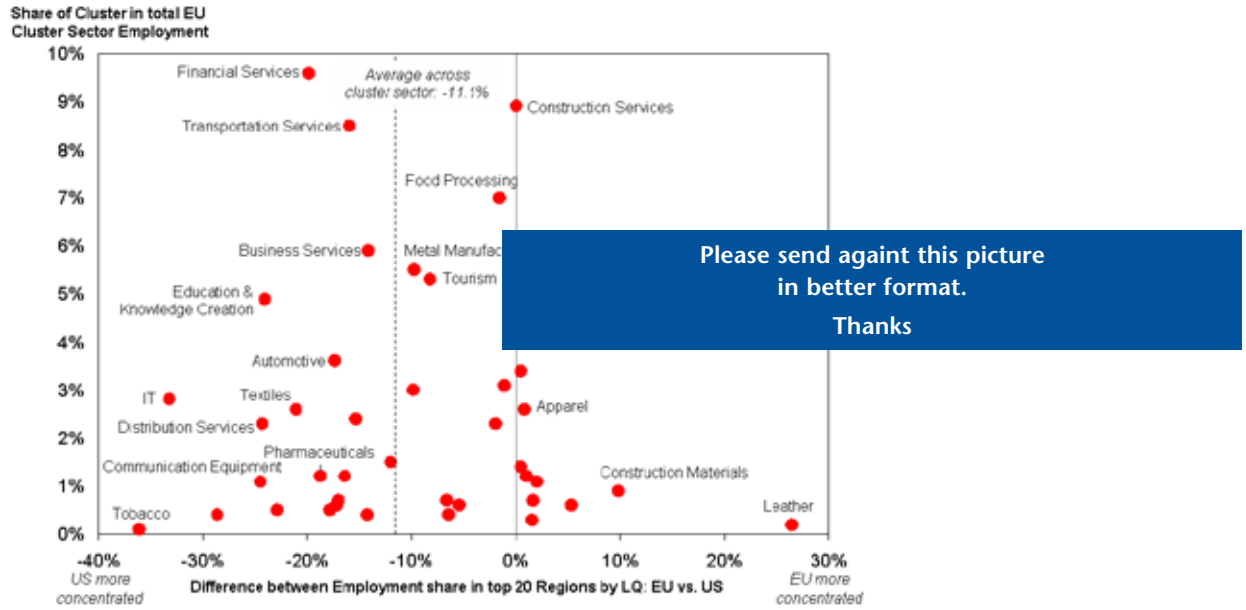
Source: European Cluster Observatory (2007)

Second, **European employment within cluster categories is geographically more dispersed than in the United States.** On average, the strongest European regions account for about 10% less of their respective total cluster category employment than the strongest U.S. regions. The gap is large in some cluster categories with high overall employment, like financial services and transportation services, and in some cluster categories with a significant importance for innovative capacity, like education and knowledge creation and information technology.

A number of recent studies[13] have indicated that Europe lags behind significantly in the use of IT, particularly in service sectors such as in retail, wholesale, transport, distribution and finance. The **low level of regional concentration of IT activities in Europe** may provide an interesting nuance to this issue. It may be the case that differences between the European and the US industrial structures have meant that in the US more than in the EU, many new R&D-intensive firms that are active in high-tech sectors have been able to develop, grow rapidly and become key economic players[14]. A network of stronger IT clusters in Europe could therefore be an important driver in the further development of IT throughout Europe. The development and use of advanced ICT tools would be expected also to facilitate the interactions between partners within a cluster as well as between clusters across Europe.

According to the comparative results shown in Figure 6, taken across all cluster categories **the top US regions account for more employment than their EU counterparts.** As a consequence, European clusters may suffer from this lower concentration in truly strong regional clusters. A second finding stems from differences across cluster categories: European employment tends to be more geographically concentrated in traditional sectors, while the knowledge intensive clusters and service-oriented clusters appear to be stronger in the US, with the exception of tourism. This leads to the question of why these differences across cluster categories exist. For services, a possible explanation could be that market integration is still relatively weak in Europe. For knowledge-intensive clusters may be because new industries emerge faster in the US than in Europe. Both explanations need further exploration.

Figure 6: Employment concentration in strong clusters by cluster category



Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

[13] Such as the work published in conjunction with the EU KLEMS project (http://www.euklems.net/) and the sectoral e-Business-watch Observatory (http://www.ebusiness-watch.org/).

[14] "Key figures 2007 on Science, Technology and Innovation", European Commission, June 2007 http://ec.europa.eu/invest-in-research/pdf/kf_2007_prepub_en.pdf

2.3. Cluster mapping: the methodological challenges ahead

Cluster mapping is a potentially powerful tool that could help identify, on a statistical basis, the existing, growing, declining and emerging industry clusters in a given geographical area. It therefore offers the possibility to build cluster policies based on the industrial strengths and weaknesses in a region. On the other hand, the analysis needs to be further improved, by considering further statistical indicators and qualitative information.

Several methodologies exist for the statistical mapping of clusters. Whereas some of them are based solely on the use of qualitative information that is available through interviews with local experts, others rely on more sophisticated economic modelling and are based on statistical methods. **Each method has its advantages and limitations.** The European Cluster Observatory follows the second approach, identifying clusters by looking at the localisation quotients based on regional employment data that are collected mainly from EUROSTAT and national or regional statistical sources. The localisation quotient is calculated as the industry's share of total employment in a given region to the industry's share of total employment in all countries considered in the analysis[15]. This method is currently widely used in many countries worldwide, mainly because employment data can be easily collected.

The main value of the European Cluster Observatory project lies in the fact that it, for the first time, maps clusters in Europe based on a common European statistical analysis using a consistent methodology across all EU countries. However, this common approach needs to be continuously further developed and refined. The most important challenge is to verify whether the assumed **patterns of co-location** across individual industries sufficiently reflect European realities, taking into account recent technological developments and new cross-sectoral patterns.

The boundaries between different sectors are constantly changing and this is not always reflected by the available statistical data. For example, it may be that some clusters do not reach the overall threshold applied for a 3-star cluster even though they are well known as strong clusters in their sector. This is for instance the case of the regions of Toulouse and Hamburg in which strong aerospace clusters (both have a LQ of about 13 in their cluster category) exist but the number of employees in this cluster sector is relatively small and therefore their share in the relevant regional economy falls short of the threshold applied for a 3-star cluster. Such cases will be better identified in the future by combining employment data with value added variables, and this work that will be carried out by the European Cluster Observatory.

The approach to cluster mapping used in this project is deliberately based on the **measurement of the revealed effects** that linkages and spill-overs have on the location decisions of companies, not on a direct measurement of such dynamic interactions between the driving forces of a cluster. This has the advantage that it is not necessary to measure all different types of interactions, such as input-output relations, knowledge spill-overs, etc., quantify them and then compare their absolute weight relative to other factors that influence locations decisions, like wages and transportation costs. If the interactions are meaningful, they should reveal themselves in the actual geographical patterns of economic activity. However, to better capture the reality and consider the emergence of the knowledge-based economy, a more integrated statistical approach should be followed combining different economic sources and data (e.g. employment and value-added), techno-

[15] A localisation quotient equal to 1 means that the given region is not specialized in the given industry. A localisation quotient equal to 1.5 means that the given industry is represented by a 50% bigger share of employment in the given region than the industry's share of employment on the level of all regions. This indicates that the region is specialized in the industry. Further information can be found for instance at: http://www.nordicinnovation.net/_img/cluster_benchmarking_project_final_report.pdf

logical activities (e.g. patents) and scientific activities (e.g. publications) that will help give a better understanding of cluster dynamics.

The revealed effects should be strongest, if the location choices of companies are not biased by barriers to trade and investment across regions. An integrated economy with the lowest level of such barriers is thus a good environment in which to observe cluster effects. This is the main conceptual reason for using US data as the main source of information to arrive at cluster definitions. In the US, a large integrated market has been a reality for many decades. Observed patterns of geographic activity in the US are thus likely to be strongly impacted by cluster effects. In Europe, the **legacy of national borders remains an important force** that may reduce the relative importance of cluster effects as a driver of location choices. Observed patterns of geographic activity in Europe are thus likely to provide a mix of cluster and legacy effects, providing less accurate information on interactions between specific industries. Differences between co-location patterns in Europe and the US are likely to reflect also the remaining barriers to cross-regional competition in Europe and there is little reason to believe that the underlying technical and economic drivers of interactions should be systematically different.

Although there are strong conceptual reasons for using U. data as the main source of information to construct cluster definitions, it would nevertheless be useful to also draw on the information available in European data: there are industries that have distinctively different structures in these two large regions and these differences might also be reflected in cluster structures. Unfortunately, **European data is of much lower quality than the U.S. data, severely limiting its use for cluster analysis**.

- First, the **regional level – NUTS 2–at which European data is available, is defined based on administrative boundaries** that may not reflect economic interactions. NUTS 2 regions differ significantly in geographic and population size. Some NUTS 2 regions, e.g. Denmark, represent nations with national policy authorities while others, e.g. the German region around Stuttgart ("Regierungsbezirk Stuttgart"), represent sub-national regions with local authorities. Data at higher granularity – NUTS 3 and higher – is not generally available. In the US, economic areas have been defined by the government based on economic linkages, in particular commuting patterns.
- Second, the industry level – **4-digit NACE – at which European data is available, is not granular enough to go beyond traditional sectors** and reflect the full richness of clusters as groupings of economic activities from different sectors. At this level, even the best allocation of industries to clusters results in cluster categories that are relatively similar to traditional industrial groupings and largely fail to capture to mix of service and manufacturing functions typical for clusters. In the U., data on the 5- and 6-digit NAICS level is available, which allows a more sophisticated analysis of cluster relations between different industries.
- Third, the **only indicator that is available in Europe across all regions and industries is employment**. In the US, additional indicators like wages and patents are available, allowing a more in-depths economic analysis of the impact of clusters on innovation and competitiveness.

Despite its higher level of granularity, the US data is also far from perfect. The biggest concern is the nature of the industrial classification system NAICS. While the last NAICS revisions have provided more detail on IT and services, there is still **much less detailed coverage of the many business services and science-related activities** that are often cluster-specific and of increasing importance in modern economies. As a consequence, clusters appear either strongly manufacturing or service-driven, whereas large clusters in business services and education and knowledge creation that are collections of activities remain hidden.

Another constraint is that the current industrial classification systems, whether NAICS (US) or NACE (Europe) do not sufficiently reflect the **emergence of new industries**, such as biotechnology. If the basic statistical data is not available, more refined cluster sectors cannot be defined neither.

The concerns about the nature of the data available in Europe and the general weaknesses of industrial classification systems need to be treated seriously. Even with its current quality, however, the data can make **important contributions to the European policy debate**. In particular, it can provide a general sense of the level of regional specialisation in Europe versus the US and add to our knowledge about the linkages between economic performance and cluster strength. Furthermore, it can provide the basis for a systematic comparison of strong clusters in specific cluster categories across Europe. The data made available by the European Cluster Observatory does not provide all the ultimate answers. But it may provide new insights that are robust in terms of their policy implications and too important to ignore while better underlying data is collected an analysed.

Nevertheless, in order to be credible, the current methodological weaknesses need to be gradually overcome. It seems to be a reasonable approach **to cross-check the results from the European Cluster Observatory with other available statistical analysis**, such as from the Regional Innovation Scoreboard or on European R&D and technological specialisations[16] in the global economy. This would certainly enrich the results and test their robustness.

Statistical cluster mapping is an important tool for identifying clusters, but it is not sufficient. **Qualitative information** from the ground is also necessary to validate the statistical findings and provide complement information that cannot be captured from statistical data, such as the framework policy conditions. In the framework of the European Cluster Observatory, a number of **cluster case studies** will be made available providing qualitative information about the success factors for cluster growth. The information is being collected by visiting public authorities and clusters operating in low and high tech sectors, and by analysing emerging or declining clusters as well as trans-national clusters in most of the 32 European and associated selected countries. A set of ten such studies covering the EU10 Member States is already available on the Europe INNOVA web site. The full report of all case studies will be available in early 2008.

[16] http://cordis.europa.eu/erawatch/index.cfm?fuseaction=intService.rdSpecialisation#analysis

3. National and regional policies for clusters: main concepts and future challenges

A wide range of government policies affect competitiveness and innovation, with different impacts on clusters. They may be politically supported at different levels and characterised by different degrees of scope and ambition. Some policies affect the general business environment conditions, while others are cluster-specific. **Cluster specific policies aim at mobilising the inherent capabilities of clusters and spurring their upgrading over time**. Many policies that have this effect are not explicitly called cluster policies, but fall under categories like regional policy, research and innovation policy, industrial policy and SME policy. Their impact on and through clusters makes them an important part of the overall cluster policy mix. Cluster initiatives[17] are defined as organised efforts to increase the growth and competitiveness of clusters within a region involving cluster firms, government, and/or the research community. Cluster policies often support the creation of cluster initiatives.

When discussing cluster policies, it is important to note that one cannot fully describe a policy measure merely in terms of what the objective is. **Typically, policies in support of cluster development are not explicitly called "cluster policies"** but are part of broader strategies aiming at regional and business development. These are in often those having the strongest impact. Similarly, different methods may be used, ranging from hands-on methods, like providing information, contacts, assistance, advice or direct funding to hands-off methods, like lobbying, marketing, monitoring and reporting. This makes it inadvisable to define "cluster policies" in a strict and uniform way, although they could in general be described as policy mixes to support the development of such regional systems.

Most European countries are currently active in developing and implementing cluster policies, either at national or regional level as part of their national policy to respond to the Lisbon objectives. According to their **National Reform Programmes[18] (NRP)** countries like Belgium, Czech Republic, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Poland, Portugal and Spain, envisage supporting clusters either through specific cluster policies or through a combination of measures developed under other policies. Within the **National Strategic Reference Frameworks** designed for the programming period 2007-2013 that will govern the use of the Community funds of Cohesion Policy, all Member States are proposing Operational Programmes devoted to investing in innovation. Clustering is one of the most frequently reported measures within this context.

This chapter provides a **framework for mapping cluster-specific policies** and the main methods used to implement them. Based on this analysis, the main problems and challenges with current cluster policies will be identified and further discussed.

3.1. A framework for mapping cluster-specific policies

Cluster-specific policies can be differentiated according to their governance structure and their activity profile. The **governance structure** is defined by a set of

[17] http://www.cluster-research.org/greenbook.htm
[18] http://ec.europa.eu/growthandjobs/key/nrp2006_en.htm

responsibilities allocated to different institutions within the process of formulating policy. At the top level, ministries tend to formulate general strategies, often defining budget targets and setting up new government bodies. Within the context thus created, specific programmes then outline concrete actions for implementation. Specific government agencies or regional governments often take a leading role in developing and managing such programmes. The programmes then include a number of specific project initiatives that apply the tools provided for a specific region or sector. Within these initiatives, a particularly important role is played by the institutions that initiate and then lead the efforts. From this picture it follows that **many actors are usually involved in the formulation and implementation of cluster policies**, requiring coordination mechanisms to be well established and efficient.

Information on specific cluster policies in Europe is being gathered through the National Reform Programmes as part of the four "priority action areas" identified by the 2006 Spring European Council[19]. Such information is also systematically collected and published by the **INNO-Policy TrendChart[20], in cooperation with ERAWATCH[21]**. Currently, more than 130 specific national measures in support of clusters have been registered. A new classification scheme for the collection of information on cluster policies is being developed. Specific emphasis will be placed on providing information on horizontal regional and national cluster strategies as well as on financial support schemes in favour of cluster development, whereas indirect cluster support measures will continue to be documented under different headings. It has to be recognised that mapping cluster policies is a rather difficult task and more advanced search tools may help to close the existing information gaps.

Specific cluster policies may cover **a broad range of different objectives and activities**, for which support is offered. A distinction can be made between the specific policies and measures to support cluster initiatives (often with 'soft policies' to support self-organisation via networking and information diffusion) on the one

Figure 7: A typical governance structure for cluster-specific policies

	Strategy	Programme	Initiative
National ministries	Define	Define Review	Review
National agencies, regional governments	Provide input	Define based on strategy Initiate Manage	Initiate Manage Participate
Local governments	Provide input	Provide input	Initiate Manage Participate
Universities	Provide input	Provide input	Initiate Manage Participate
Trade associations, Chambers of commerce	Provide input	Provide input	Initiate Manage Participate
Companies	Provide input	Provide input	Initiate Participate
Consultants, cluster organisations			Manage Participate

[19] http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/89013.pdf (see p. 5-6)
[20] http://www.proinno-europe.eu/trendchart
[21] http://cordis.europa.eu/erawatch

hand, and the use of horizontal policies and measures, which support regional development or research and innovation at large, in the specific cluster context (often 'hard' financial support) on the other. It is impossible to track all activities supported by specific cluster policies in Europe in a systematic manner, as they differ enormously in terms of their objectives, tools and methods. The **most frequent cluster activities supported by specific cluster policies** at regional and Member State level are summarised in Figure 8 and include the following.

- **Human resources upgrading** enhances the available skills pool and involves, for example, vocational training and management education. Such efforts can focus on different target groups of people. One type is intended to attract and retain students for the region—and sometimes for selected sectors—to ensure the future supply of a skilled workforce. Another type targets management through management training programmes, typically not sector-specific. A third type is sector-specific vocational training and technical training.
- **Cluster expansion** aims to increase the number of firms, through incubators or by promoting inward investment to the region. One way of doing this is to promote the formation of new firms, and attracting existing firms to the region. Incubators are popular throughout Europe and are can be a vital element of cluster policies. They often combine provision of physical facilities with assistance in setting up business plans and financial plans, and help entrepreneurs to get in touch with financiers and potential customers.
- **Business development** promotes firms' operations, for example through export promotion. The most frequent areas are promoting or directly providing general business services, and promoting exports and internationalisation. **Commercial cooperation** encourages firms to interact with each other, for example through joint purchasing.
- **R&D and innovation** objectives promote product, service and process innovation, for example through increased commercialisation of academic research. There are two general approaches to innovation, and they are often combined. One is to promote innovation through enhanced cooperation between firms.

Figure 8: Objectives and activities of cluster-specific programmes and initiatives

upgrading	HR upgrading	Cluster Expansion	Business Development	Commercial collaboration	R&D and Innovation	Business environment
Information and contact brokerage	●	● ● ●	●	● ● ●	● ●	
Practical assistance and device	● ●	● ● ●	● ● ●	●	●	
Direct financing and facilities	●	● ● ●	● ●	●	● ●	
Events and training	● ● ●	● ●	●	● ● ●	● ●	
Networking-Organising events	●	●	● ● ●	● ● ●	● ● ●	● ●
Lobbying						● ● ●
Marketing	●	● ●			●	●
Monitoring and reporting	● ●	● ●	●	●	● ● ●	● ● ●

● ● ● Frequently used; ● ● Sometimes used; ● Occasionally used

The other is to enhance cooperation between the business sector and the research/university sector in order to develop and commercialise academic research.

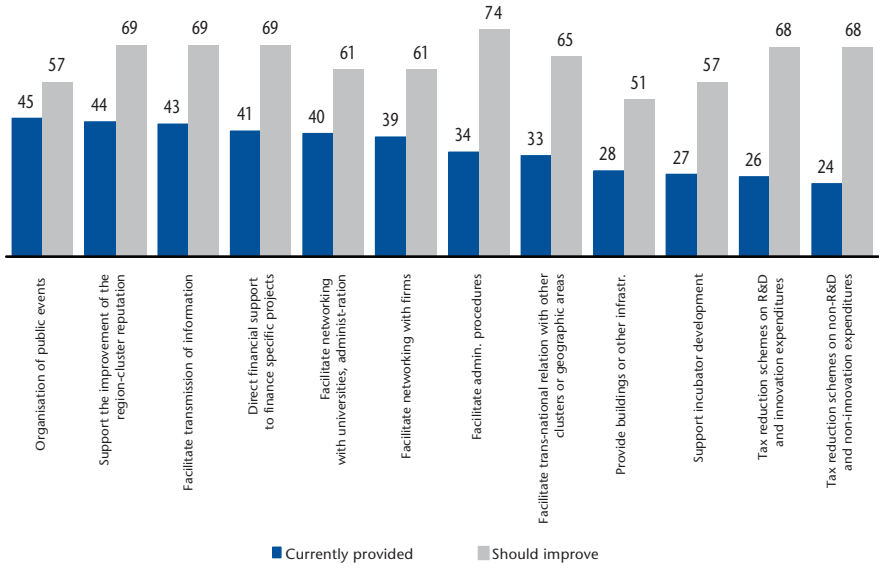
- **Business environment** objectives, finally, aim at enhancing the conditions for business, through improving the legal and institutional setting or improving the physical infrastructure. Improving the business environment means that conditions outside firms are improved. Business environment objectives therefore focus on issues that are in the control of government, rather than working with firms directly. There are two main aspects of the environment that can be addressed: the physical/ technical infrastructure, and the legal/institutional setting. In addition, region branding is an objective that can be assigned to this category.

According to the Innobarometer 2006[22] survey, the **most important areas where cluster firms would prefer to get more support from the public domain** are in facilitating administrative procedures, in facilitating information flow, in getting more finance for carrying out specific projects, and in improving the branding of their region. Furthermore, tax reduction, both for R&D and non-R&D expenditures, is another area where the cluster firms saw room for improvement. With respect to support for trans-national activities, 65% of the interviewed cluster firms responded that the public authorities could further support them to increase their cooperation with other clusters; only one third of them believing that they were currently sufficiently supported in this domain.

These observations on the perceived need for support coincide with the conclusions that can be reached on the **rationale** for cluster policies, starting from a theoretical analysis of observed market and system failures. Clusters can increase collective productivity by developing interdependencies and complementarities which are not always well exploited in a competitive market environment; cluster initiatives help to build up trust and engage in cooperation by enhancing mutual learning and common strategies. Therefore there is a role for governments to support these initiatives and to complement their strategies with an appropriate policy mix to improve the productivity of clustered resources.

Figure 9: Support activities of public authorities

Support activities of public authorities: assessment of current levels and desire for improvement



[22] http://www.proinno-europe.eu/metrics>

3.2. The impact of cluster policies: some preliminary results

The **impact of cluster policies on the development of clusters is difficult to assess**, taking into account that regional clusters are the result of many factors that work together over time. Some clusters emerge spontaneously without governmental support, while some cluster initiatives do not or have not yet resulted in statistically significant clusters, as measured for example by the European Cluster Observatory.

European countries and regions have launched **a wide range of cluster initiatives** in recent years. Despite this high level of activity, there is a sense that cluster-specific policies have yet to show their full power. This might be just a temporal issue, as cluster development takes many years and many of the initiatives are still relatively young. But the analysis of available case studies also indicates a number of more **widespread challenges** that may limit the potential impact of these policies.

- In many countries, cluster efforts have emerged out of SME policies and thus tend to focus on smaller companies and start-ups. Most often, there are no explicit restrictions on domestic owned-companies, but a **low presence of larger companies may limit the economic impact of clusters.** While such efforts have benefits, there is clear evidence that full cluster effects can only develop if all types of companies are actively engaged, independent of size or ownership. Similarly, the participation of companies is often limited to companies that have a direct need for the available government support. While this is natural, successful cluster initiatives also require 'opportunity-based' participation where successful companies see additional benefits.
- In many of the cluster initiatives the **role of the government is limited to the provision of financial incentives**. While this support is useful and often crucial to initiate joint activities, it does not necessarily engage the public sector in addressing the barriers to higher competitiveness and innovation that clusters face. Even worse, some cluster initiatives are designed in a process that bypasses the regional governments which leads to a lack of integration of the cluster and the cluster initiative in an overall regional economic strategy. Without the integration in such a strategy, cluster initiatives are typically less effective. Regional strategies on the other hand should anticipate the international strategies of key actors and stimulate cluster initiatives to position themselves in a European and global context. Without this international alignment, cluster initiatives and the cluster policies that support them are likely to be less effective because of unnecessary duplication and sub-critical mass.
- At least some of the initiatives focus on **emerging clusters where only a few companies** and maybe one research institution are present. While such efforts can be part of an overall cluster strategy, they should be only one element in a portfolio of activities and are likely to have limited impact and a significant failure rate. The cooperation of regional clusters is often limited to a general exchange of operational practices. While this is useful, it does not fully explore the opportunities of creating networks of regional clusters that play complementary roles along the value chain of their economic sectors.
- There is often a **bias towards technology-intensive clusters**. It is positive that these areas of the economy are targeted but more potential may lie in service-intensive activities. Service clusters, such as on construction, transportation and logistics, financial services, tourism or entertainment are among the larger cluster categories within Europe but tend to be less supported by specific cluster policies. Service clusters may also be fundamental for the balanced development of European regions.

- Relatively few cluster initiatives are targeting the development of internationally competitive clusters. The aspiration level of many cluster policy initiatives may be low. This goes together with an **inflationary use of the term "cluster"**, which is often attributed to all kinds of networking between research and industry.
- There is **insufficient integration of cluster initiatives at the regional level**. At the regional level, policies often do not exploit existing or potential linkages between clusters within a strong portfolio of clusters at different stages of development. And there is not enough dialogue between cross-cutting policies to strengthen regions and cluster-specific efforts.

These challenges should be properly addressed in order to develop strong clusters in Europe. At the same time, new methodologies could be developed and practically tested **to better measure the practical impact of specific cluster policies**. It is in particular important to **assess the impact** of regional and national measures (including State Aids and Structural Funds) aiming at cluster expansion, as they could drive the specialisation process in Europe towards more competitive clusters worldwide.

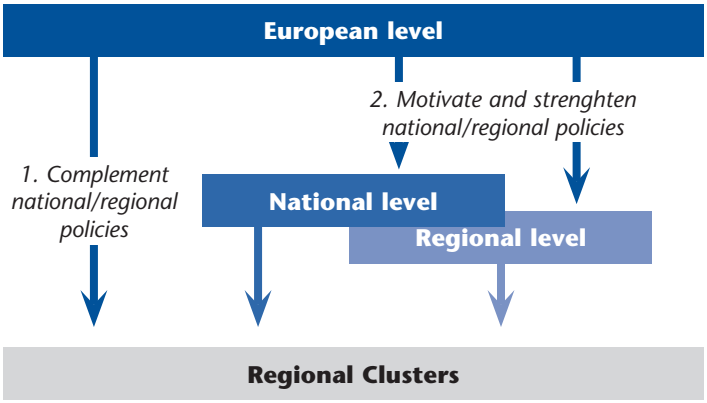
3.3. Complementarities between regional, national and European cluster policies

To build a more competitive and innovative Europe, policies and actions from the EU level as well as from the national and regional levels should support and strengthen each other. Although clusters are predominantly a regional or national phenomenon, the **European level** can contribute in a number of ways to their success, as noted by the Competitiveness Council. In particular, Articles 13-15 of the Competitiveness and Innovation Programme allow for the implementation of cluster support actions, including support for policy cooperation and for mutual learning for excellence in national and regional administrations.

The current **role of the European Commission** in support of the development of strong clusters in Europe can be categorised as follows.

- **First, to complement regional and national cluster policies**, by further removing barriers to trade, investment and migration within Europe. This remains a critical factor for achieving a more efficient geographical distribution of economic activity as the emergence of clusters depends on open competition across European regions. The process of implementing a single European market is a sophisticated tool for opening up markets for competition, allowing for the reallocation of resources, enhancing geographical specialisation patterns and clustering.

Figure 10: The policy mix of European, national and regional cluster policies



- **Second, to motivate and strengthen regional and national cluster policies**, by developing and promoting a strategic approach to cluster policy in Europe. The strengthening of cluster initiatives depends on a consistent and fact-based approach to cluster policy, including for impact assessment. A lot has been learned in this respect in the last few years, and Europe has the opportunity to integrate these lessons more systematically into its actions. Supporting clusters is also part of the SME policy[23] developed at Community level. Trans-national cooperation between clusters can further strengthen European clusters, acting as bridge-builders across regions in important ways.
- **Third, to support the creation of regional and national clusters** by strengthening the knowledge base in Europe and enabling better exploitation of research for innovation, such as through the Framework Programme for Research and Development, the new lead market initiative[24] and Cohesion policy programmes[25]. In addition, the Commission has recently started to launch policies that are directly targeted at clusters. Different parts of the Commission offer relevant programmes and initiatives in support of clusters that could in future be further aligned to regional and national cluster policies so as to maximise their potential impact.
- **Fourth, to stimulate in particular the development of cross-border clusters** and the emergence and reinforcement of strong European clusters through trans-European cluster policies. Sharing strategic information is a key characteristic of successful cluster initiatives.

European initiatives in support of clusters should be, as much as possible, complementary to national and regional efforts, in order **to better exploit synergies** and to support country-specific priorities. On the other hand, regions and Member States should take maximum advantage of the financial instruments available at Community level to strengthen their clusters and to open them to trans-national cooperation. This ENTR report does not address the issue of how this could be done most effectively while taking into account European interests. The European Cluster Memorandum is expected to prepare for such a debate on common areas of interest that should be supported by concerted efforts at regional, national and European level.

[23] Forthcoming Mid-Term Review of the Communication "*Implementing the Community Lisbon Programme Modern SME Policy For growth and Employment*", COM(2005) 551 final

[24] As announced in the Commission's communication "Putting knowledge into practice: A broad-based innovation strategy for the EU", COM(2006) 502 final.

[25] Commission's communication "Competitive European Regions through research and innovation" COM(2007) 474 final.

4. The complementary role of Community instruments

Possible activities to strengthen a more efficient geographic distribution of economic activities across Europe can be grouped into **three broad objectives**: better cluster policy design at national and EU level, strengthening cluster initiatives more efficiently and connecting clusters better through trans-national cluster cooperation and exchange. There is a European dimension in all three elements. Whereas the main responsibility for cluster policy design remains with regional and national policies, mutual policy learning at European level can strongly contribute to better cluster policies as further explained under Section 4.1. Furthermore, a number of Community instruments are available to further implement such policies at national level (Section 4.2) or through trans-national cooperation (Section 4.3).

For each of these objectives, relevant **instruments are already available at European level** but their use could be further streamlined towards better exploiting synergies with the regional and national level. The process initiated by the European Cluster Alliance will explore the optimal prioritisation of Community actions in support of clusters and how they might be integrating into an overall European cluster strategy, as a basis for further work to define such a strategy and seek political endorsement.

4.1. Community instruments supporting better cluster policy design at national and regional level

The process of clustering can occur naturally, through many individual decision makers across companies, organisations, research institutions, and public bodies making independent decisions. In addition, the experience of many countries[26] and regions suggests that public **cluster policies can be an effective tool** to steer and improve the outcomes of structural change. Cluster initiatives can now be found everywhere around the world, and many such initiatives exist or are being launched throughout the EU.

Cluster policies are most often a tool of regional development policy used by national and regional authorities, aiming at fostering regional strength and creating new or better jobs in the region. **National programmes for cluster support established through open competitions**, such as in France[27], Germany[28] or Sweden[29], may provide effective incentives for rising the profile and excellence of regional cluster policies, thus also contributing to the creation of globally competitive clusters in Europe. Consideration should be given to the extent to which such an approach could also be followed at European level in order to target cluster support activities on the basis of a **better defined overall European strategy**.

At a more practical level, efforts to define and set-up **more efficient cluster policies** in Europe are currently being supported in particular by:

- The provision of neutral and comparable data on the strength of European clusters and their regional distribution and the analysis of success stories. This is the task of the **European Cluster Observatory**, which could be more widely used by national and regional governments to define regional strengths and

[26] As a recent example see the report "Success story: 15 years of cluster initiatives in Austria", June 2007 published on behalf of the Federal Ministry of Economy and Labour (BMWA), (in German) that is found at: http://www.bmwa.gv.at/NR/rdonlyres/A4B418E3-D6EE-4FAA-927A-FCFDC9520AB6/0/ClusterEndberichtWCL13062007.pdf

[27] http://www.competitivite.gouv.fr/

[28] http://www.kompetenznetze.de/navi/de/root.html

[29] Such as the Vinnväxt cluster program.

unique opportunities for a particular region. The strong point of the European cluster mapping is that it is based on a common approach using quantitative statistical data. This is not only a good starting point for identifying on which industrial basis cluster initiatives could be built, but it also allows for a later assessment of the success or failure of such initiatives. Ultimately, cluster initiatives aim at creating new jobs and for this measurable targets can be set.

- The provision of policy learning platforms which allow Member States and regions to learn from others in the design of cluster policies. Examples include the ongoing **Regional Innovation Strategies[30] (RIS)** scheme that, since 1994, have helped many lagging EU regions to upgrade their innovation strategies**,** the **Innovative Actions** programme 2000-2006[31] co-financed by the European Regional Development Fund (ERDF) as well as the new **Regions for Economic Change[32]** initiative. This new initiative launched under Cohesion Policy, aims to leverage the experience of advanced regions to other regions wishing to improve. Successful practice in the area of cluster policy development could be a challenging area to be exploited through this scheme helping regions to improve their cluster policies by learning from others. In addition, the Seventh Research Framework Programme's OMC-NET initiative concerning policy learning and coordination in the domain of research and development could be exploited for improving cluster policies.
- Pilot projects and networking activities under different Community programmes, aiming at identifying "good practice examples" and developing tool boxes for establishing cluster initiatives. Under the **PAXIS[33] initiative,** for example, a number of successful practices have been identified and transferred to other regions in key areas, such as start-up development, innovation financing, technology transfer, incubation and entrepreneurship. The "PAXIS Manual for Innovation Policy makers and practitioners", which describes these practices in detail, can also provide useful guidance for the set-up and management of clusters.

Given these various policies and schemes, it appears to be **no obvious lack of Community support for the development of new or better cluster policies at regional or national leve**l. However, there may be a need for information about identified or developed good practice examples and toolboxes to be systematically collected and presented to Member States and regions in a more consolidated and user-friendly manner. A fundamental challenge here is that the design of regional cluster policies is motivated by diverse interests and aspirations. Clearly, one size does not fit all. This raises the question of who can best learn what from whom, calling for different configurations in cluster policy learning.

In the further development of the Commission innovation policy, these aspects of policy learning could be specifically taken into account in pursuit of **"better innovation policy governance"**. Existing guidance material for the set-up of national and regional cluster policies could be further discussed and tested with governmental experts from all levels and maintained over time. The **Innovating Regions of Europe[34] (IRE**) network may play an important role to further disseminate this information material as well as the publication "**Results from 15 years of Experimentation**" that provides a synthesis of experience from the Innovative actions programmes of the Structural Funds and guidance as to how innovation and experimentation should be continued in the programming period 2007-13[35].

[30] http://www.innovating-regions.org/network/regionalstrat/index.cfm
[31] http://ec.europa.eu/regional_policy/innovation/intro_en.htm
[32] http://ec.europa.eu/regional_policy/cooperation/interregional/ecochange/index_en.cfm?nmenu=1
[33] http://cordis.europa.eu/paxis/src/home.htm
[34] http://www.innovating-regions.org/index.cfm
[35] http://ec.europa.eu/regional_policy/innovation/2007/guide_innovation_en.pdf

4.1. Community instruments supporting cluster development at national and regional level

Experience shows that successful cluster policies at national or regional level typically go beyond classical subsidies to individual firms or the principle of spreading regional grants evenly across space, but are more focussed, eventually on projects selected in **competitions between individual regional cluster initiatives**. This requires an openness to cooperate across traditional ministerial and agency borders in order to focus on enhancing cluster competitiveness. For this, regional strengths and unique opportunities for a particular region must be identified, resulting in a **prioritising of leading clusters**.

At **European level**, these efforts to successfully implement ambitious cluster policies in Europe could be further supported, in particular by:

- **Cohesion Policy[36]:** according to current estimates, circa 24% of the total budget of €308 billion of the Structural Funds allocated for the programming period 2007-2013, including the European Regional Development Fund (ERDF), the European Social Fund (ESF) and the Cohesion Fund (CF), is expected to be spent on activities addressing innovation (RTDI, support to entrepreneurship and innovative ICT) proposed by the Member States and their regions. In the context of clusters, Structural Funds can be used to improve educational and training schemes applied in the regions, to stimulate research demand within a cluster, and to strengthen the links between research and private cluster firms. Structural Funds can also be used to strengthen the entire cluster infrastructure, including the upgrade of research infrastructures, the development of cluster support services, the development of incubators or even the upgrade of the physical environment (science parks, etc.) within and around a cluster area. The approach to integrated regional development is well embedded in Cohesion Policy.
- **The new State Aid framework[37]**: the new 2006 Community Framework for State aid in research, development and innovation has opened a number of new possibilities for Member States to support cluster development in Europe, including cluster investment aid and aid for cluster animation**.** The first may be granted to any legal entity setting-up or expanding an innovation cluster for facilities, such as for training, research infrastructure and testing while the second may be granted to a legal entity operating an innovation cluster to cover the animation of the cluster for a period of five years. Operating aid may cover personnel and administrative costs concerning for example cluster management, marketing of the cluster, training programs.
- The development of **cluster policy impact assessment tools:** with cluster initiatives and other cluster-based economic policies becoming increasingly common across Member States, there is a growing demand for a systematic assessment of their impact. Individual countries, like Austria and Sweden, and some European regions, like Catalonia and Yorkshire, have already initiated such efforts. So far, the European Cluster Observatory only provides raw data on cluster organisations, cluster programmes, agencies and polices, but lacks data to evaluate the success of the different programmes and initiatives. This is a priority for the next stage of its activities which should take into account the results from the IRE benchmarking projects for Regional Innovation Strategies.[38]

Cluster initiatives are not a panacea and they are not a substitute for efforts to remove weaknesses in the general business environment or the overall context. But evidence suggests that if they are part of an integrated strategy for competiti-

[36] http://ec.europa.eu/regional_policy/sources/docoffic/official/deci_en.htm
[37] http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/c_323/c_32320061230en00010026.pdf
[38] http://www.innovating-regions.org/network/presentation/projects.cfm?project_id=2

veness upgrading, they can be effective tools to achieve an impact that cross-cutting policies alone will be unable to match. In addition they can provide a powerful bottom up input to refine cross-cutting horizontal polices at the regional, national, and European level. In this spirit, cluster policies are an integral part of innovation policy and the Growth and Jobs Strategy.

4.1. Community instruments supporting networking between clusters and collaboration between cluster-relevant organisations across Europe

Although clusters compete against each other, in particular those which belong to the same sector of activities, there are many reasons justifying competition and cooperation at the same time. The analysis conducted so far shows that the **advantages of cooperation between clusters are numerous** and that cooperation between clusters facilitates information exchange between them. This is particularly useful for SMEs that do not have the necessary human and financial resources to conduct expensive market analyses and surveys. Cluster cooperation facilitates mutual learning and the exchange of good practice as well as helping joint business opportunities to be explored and the development of common strategies.

In a similar way, cooperation can facilitate the exchange of qualified staff and the mobility of firms by sharing incubation facilities between clusters. Furthermore, cooperation between clusters allows mutually sharing access to networks and international partnerships developed by other clusters. This facilitates access to international markets and business development in new markets, particularly where clusters operate in different sectors. Cooperation allows clusters to mutually exchange technical competences and to share research infrastructure and production facilities, making possible economies of scale.

Despite all these obvious and well documented advantages, **cooperation between clusters across regional or national borders** seems neither systematically supported by cluster policies nor easy to achieve in practice. There are many reasons that explain why clusters are not always keen to develop business relationships with clusters from other Member States or regions. Most importantly, cluster policies are often seen as an instrument to improve national or regional competitiveness, which seems to be in contradiction with cooperation with others. Many clusters consider themselves as autonomous, trying to find suppliers and qualified labour locally even if this may not be the best choice in terms of quality and cost. On the other hand, practical barriers linked to different legislations and administrative systems, such as a lack of harmonisation of social security, fiscal and social protection systems and different IPR ownership regimes, may combine to represent an important factor for discouraging trans-national cooperation. Finally, language and cultural barriers could contribute to an inward looking attitude, especially for those lacking international experience.

The **European Commission contributes to strengthening trans-national cooperation between clusters**, where there is mutual interest, in a number of ways.

- Facilitating networking between cluster policies at policy or programme level: such activities are currently funded under the **PRO INNO Europe initiative** that aims at promoting trans-national policy cooperation in the area of innovation. Currently, four such cluster networks have been set up at policy level. Two such initiatives deal with bringing together the cluster programmes of regions located in a given geographical area, such as the Baltic Sea Region and Central Europe, while the two other initiatives aim at developing joint actions in the area of technology transfer, technology take up, and internationalisation, specifically for SMEs involved in clusters. These initiatives form the European

Cluster Alliance which facilitates cooperation between the partners involved in these initiatives in working on a number of horizontal issues such as cluster management, cluster support funding, and exploitation of cluster mapping results for policy purposes.

- Facilitating networking between regional authorities, enterprises and research entities at European level: the **"Regions of Knowledge"** initiative, part of the 7th Framework Programme on Research and Development, aims at strengthening the research potential and competitiveness of EU regions, in particular by encouraging and supporting the development and trans-national networking of regional research-driven clusters. The initiative aims at increasing the level of research investment in Europe as part of the objective of devoting 3% of GDP to research through the definition of joint action plans.
- Facilitating interregional cooperation**:** Cohesion policy has recently launched a new initiative, **Regions for Economic Change**[39] as a further step in the efforts to enhance its contribution to growth and jobs. This aligns with the modernisation objectives of the Lisbon Agenda and keeps the focus on the need for innovation. Cluster relevant themes included in this initiative include 'bringing innovation quickly to the market', 'improving the capacity for research and innovation, ' improving monitoring of environment and security by and for the regions', 'improving knowledge and innovation for growth' and 'improving the capacity of regions for research and innovation'. This initiative capitalises on experience in the period 2000-2006 under the INTERREG IIIC initiative supporting interregional cooperation and the URBACT network for exchange of best practice between European cities. These two programmes created numerous networks linking regional and local actors throughout Europe. This know-how provides a valuable asset that regional policy can bring to economic development in Europe – in the form of "relationship capital".
- Facilitating networking between clusters at operational level: such activities are currently funded under the **Europe INNOVA initiative** where a total of 11 networks of clusters from different sectors are supported. The aim of this action is helping clusters to cooperate with other clusters across Europe to exchange experience, explore opportunities for strategic cooperation between them and develop joint strategic partnerships to join forces, streamline business activities, minimise costs and become more competitive in the global market. For example, some 45 automotive regions have agreed to work together in a 'European Automotive Strategy Network' that aims at bridging governmental and industry-driven activities in this sector in Europe. A similar initiative between three Europe INNOVA projects is under development in the space sector and in particular in the area of satellite navigation applications based on the Galileo system.
- Facilitating better strategic intelligence to support decision-making that takes better into account the differentiation and complementarities between European clusters in a global context: the policy monitoring under the **PRO INNO Europe** and **ERAWATCH** initiatives aims to contribute to the development of a better understanding and diffusion of information about cluster programmes and about priority-setting in Member States. The provision of common strategic intelligence to cluster managers and cluster policy makers on long-term research and innovation horizons (e.g. through Technology Platforms and lead market initiatives) enables these actors to identify better future investment opportunities and allows governments at different levels to align further their support policies to local strengths.
- Exploring synergies with the **European Technology Platforms** (ETPs) which bring together industry, research, finance, regulators and representatives from Member State ministries in a specific technology or industry sector. ETPs have

[39] COM(2006) 675 final of 8 November 2006.

proven to function as strategic interfaces between actors in the development of a common vision. ETPs could be further encouraged to map and analyse research and innovation activities in Europe, including cluster activities. ETPs could be important instruments to stimulate trans-national cooperation between regional clusters and better integrate the science base with industrial R&D activities across the EU.

There is therefore no lack of Community initiatives in support of trans-national cooperation at both operational and policy level. The facilitation of networking is among the most popular instruments used by the European Commission in support of clusters. A strong point of these initiatives is that they can help in **shaping a European innovation space**, complementing Community efforts to build a European Research Area, by motivating innovation stakeholders from different Member States to work together. This has helped to better understand practical barriers and to take first, pragmatic steps to remove them. However, this traditional networking approach alone may not be sufficient to create highly competitive clusters in Europe. To make a real contribution to addressing this challenge, **a more strategic approach to trans-national cooperation could be necessary** in order to achieve the bundling of complementary policies at all levels. Trans-national co-operation could be used to achieve a specific purpose, for example linking clusters with complementary strengths and should not be viewed as a goal per se.

At the **level of cooperation between different regional and national cluster policy initiatives**, the future ambitions could be further raised, taking into account the positive experience from the current INNO-Nets. The potential barriers for trans-national cooperation at policy or programme level are well known. Interesting ideas for joint initiatives have been developed and are currently being further tested. What may be necessary now are clear policy targets to be achieved through trans-national cooperation at programme level. At the same time, the geographical focus of trans-national cooperation could be sharpened. Trans-national cooperation, like in the Baltic Sea region, can be very effective because proximity enables linkages to be established easily between actors and policy makers.

At the **practical level of cluster cooperation,** more concrete targets and priorities could therefore be set for funded cluster networking activities, such as Europe INNOVA, together with more clearly defined horizontal actions.

5. Towards a better valorisation of the concept of clusters for innovation

Whereas regional and national cluster initiatives often lack a European dimension, the Commission's instruments in support of clusters as described in section 4 seem to strongly focus on cross-national collaboration. This may create a bias towards identifying cross-national collaboration as the main problem for the creation of more competitive clusters in Europe.

In its conclusions of 4 December 2006, the Competitiveness Council has recognised clusters as one of the 9 strategic priorities at EU level for innovation. To fully respond to this challenge a political response at EU level bringing together national and regional efforts in a more strategic way has to be provided. The analysis presented in this document points to **a general lack of integration between policy development and execution**. A number of European initiatives aim to enable strategy development, an element sometimes missing elsewhere. However, there is a lack of guidance on what makes a good strategy; this is difficult, because "good practice" is difficult to apply in an area which is about being different from others. What may therefore be missing in Europe is **a common policy framework that brings together the three roads:** enabling cluster emergence, supporting cluster initiatives, and connecting clusters through trans-national cluster cooperation and exchange.

The assessment made in this ENTR report could be complemented by further work to identify the full potential benefit of the cluster concept for more innovation in Europe. The combination of both efforts will allow a more comprehensive picture of cluster dynamics in Europe, helping to identify the systemic failures which prevent optimal policy support to the development of clusters.

The **European Cluster Alliance** is a first important step in this direction. It is an open platform created under the PRO INNO Europe initiative that brings together over 50 European partners such as ministries, regional authorities and innovation agencies which are responsible for developing and implementing cluster activities in their territories. The involved partners have agreed to work together in developing new tools and instruments in support of clusters and to test joint actions. To broaden these efforts to other cluster policies and initiatives, a "European Cluster Memorandum" is being prepared, identifying fields of common interest and articulating the interest in working together towards a common agenda.

The European Cluster Alliance that was welcomed by the Competitiveness Council of December 2006 is a bottom-up initiative driven by regional and national actors under the umbrella of PRO INNO Europe. The **European Cluster Memorandum** is a new way to deal with the challenge of bridging between regional, national and European policy levels. It aims at strategic commitment from as many institutions across Europe as possible to pursue cluster mobilisation efforts as a means to increase innovative capacity. The Memorandum could help shaping a common policy framework for cluster efforts in Europe, so that individual institutions can base their plans on the knowledge that others will take parallel steps that are likely to increase the impact of cluster efforts. The European Cluster Memorandum will be open for signature from October 2007 onwards. The text is being finalised by the High Level Advisory Group on clusters, established under the Europe INNOVA initiative, taking into account the results of the open consultation organised under the PRO INNO Europe initiative[40]. The Memorandum will be further discussed at the **European Cluster Conference** that will be organised in January 2008 by the Swedish government and the Slovenian presidency.

[40] http://www.proinno-europe.eu/index.cfm?fuseaction=page.display&topicID=277&parentID=0

6. Annex

Cluster Portfolio Strengths per Country

Source: European Cluster Observatory.
ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Austria

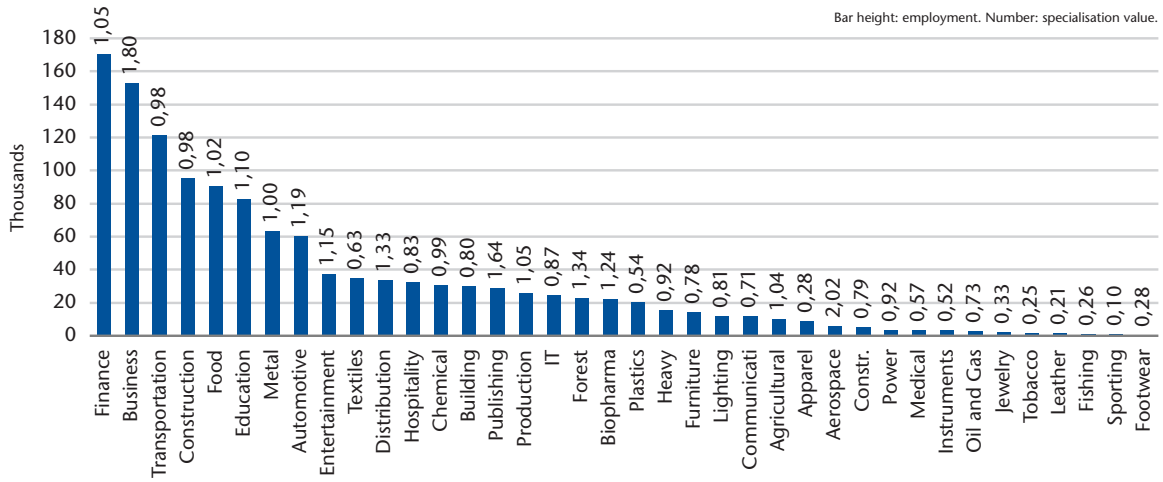


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Transportation	Wien	80 002	2.69	★★
Hospitality	Tirol	29 486	5.36	★★★
Finance	Wien	64 639	1.89	★★
Production Tech.	Oberösterreich	17 695	2.54	★★
Hospitality	Salzburg	17 152	3.17	★★
Communications	Wien	14 224	3.70	★★
Automotive	Steiermark	12 781	2.10	★★
Hospitality	Kärnten	11 238	2.89	★★
Hospitality	Vorarlberg	7 057	2.35	★★
Textiles	Vorarlberg	5 488	3.71	★★
Sporting	Oberösterreich	3 210	4.92	★★
Sporting	Salzburg	1 738	5.54	★★
Business Services	Wien	33 482	1.61	★★
Construction	Oberösterreich	23 645	1.18	★
Transportation	Wien	80 002	2.69	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Vorarlberg	12	69.70%
Oberösterreich	12	60.46%
Tirol	9	63.52%
Steiermark	9	60.38%
Wien	8	53.77%
Salzburg	6	42.31%
Kärnten	6	53.25%
Burgenland	4	43.10%
Niederösterreich	2	22.30%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070828

Country Fact-Sheet: Belgium

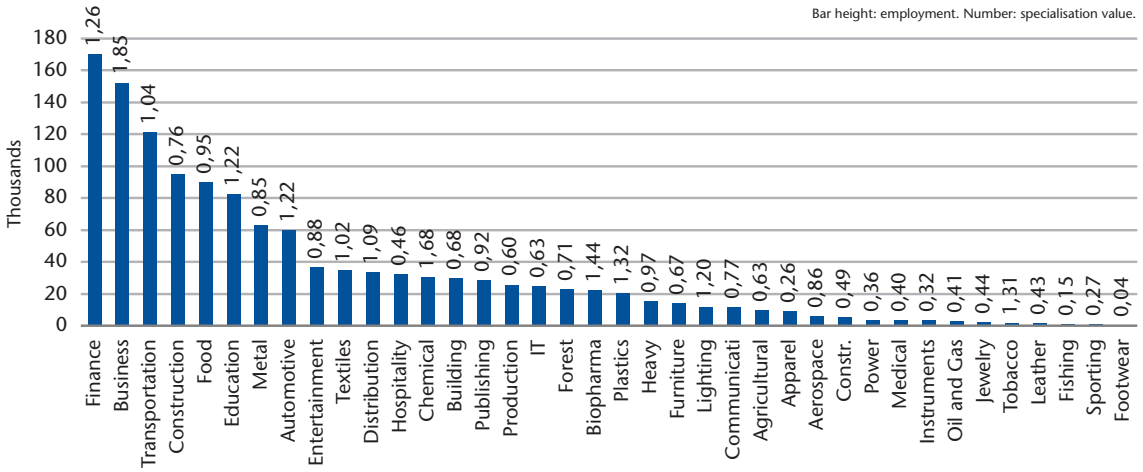


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Finance	Brussels	87 579	3.70	★★★
Business Services	Vlaams Gewest	91 853	1.97	★★
Transportation	Vlaams Gewest	77 437	1.17	★★
Food	Vlaams Gewest	64 903	1.21	★★
Construction	Vlaams Gewest	61 013	0.86	★★
Business Services	Brussels	30 309	2.11	★★
Chemical	Vlaams Gewest	21 937	2.11	★★
Biopharma	Région Wallonne	9 454	2.32	★★
Tobacco	Vlaams Gewest	1 692	2.10	★★
Finance	Vlaams Gewest	57 904	0.75	★
Automotive	Vlaams Gewest	46 084	1.64	★
Education	Vlaams Gewest	42 110	1.10	★
Metal	Vlaams Gewest	38 879	0.92	★
Textiles	Vlaams Gewest	31 583	1.62	★
Business Services	Région Wallonne	30 490	1.42	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Vlaams Gewest	28	89.00%
Région Wallonne	8	46.85%
Brussels	7	70.09%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Bulgaria

Bar height: employment. Number: specialisation value.

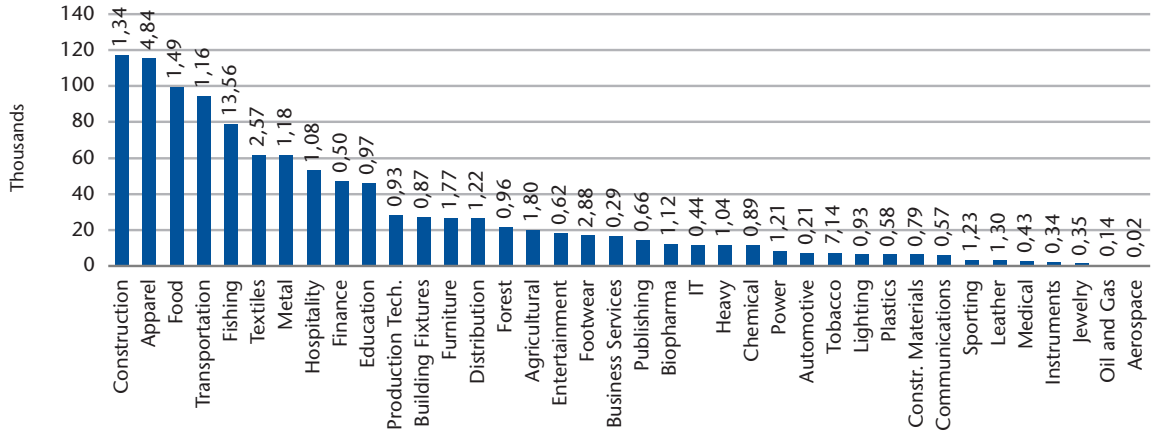


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Apparel	Yuzhen tsentralen	33 572	6.44	★★★
Apparel	Yugozapaden	29 388	3.55	★★★
Apparel	Severen tsentralen	27 034	8.32	★★★
Textiles	Yuzhen tsentralen	18 456	3.52	★★★
Textiles	Yugozapaden	19 388	2.33	★★
Distribution	Yugozapaden	15 456	2.05	★★
Apparel	Severoiztochen	14 741	4.44	★★
Furniture	Severen tsentralen	9 344	4.55	★★
Textiles	Severen tsentralen	9 298	2.84	★★
Footwear	Yugozapaden	7 312	3.63	★★
Textiles	Yugoiztochen	5 962	2.99	★★
Apparel	Severozapaden	5 840	3.12	★★
Footwear	Yuzhen tsentralen	5 586	4.40	★★
Tobacco	Yuzhen tsentralen	4 381	20.21	★★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Yuzhen tsentralen	18	64.46%
Yugozapaden	16	64.88%
Severen tsentralen	13	65.39%
Yugoiztochen	8	68.08%
Severoiztochen	7	59.47%
Severozapaden	6	74.71%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Cyprus

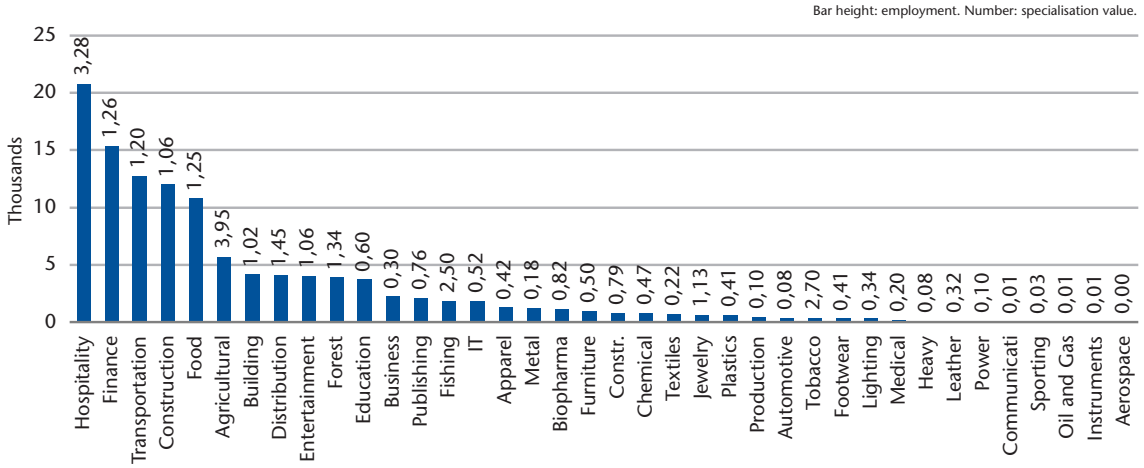


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Hospitality	Cyprus	20 758	3.28	★★
Finance	Cyprus	15 418	1.26	★
Transportation	Cyprus	12 734	1.20	★
Construction	Cyprus	12 006	1.06	★
Food	Cyprus	10 800	1.25	★
Agricultural	Cyprus	5 697	3.95	★
Fishing	Cyprus	1 878	2.50	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Cyprus	8	68.56%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Czech Republic

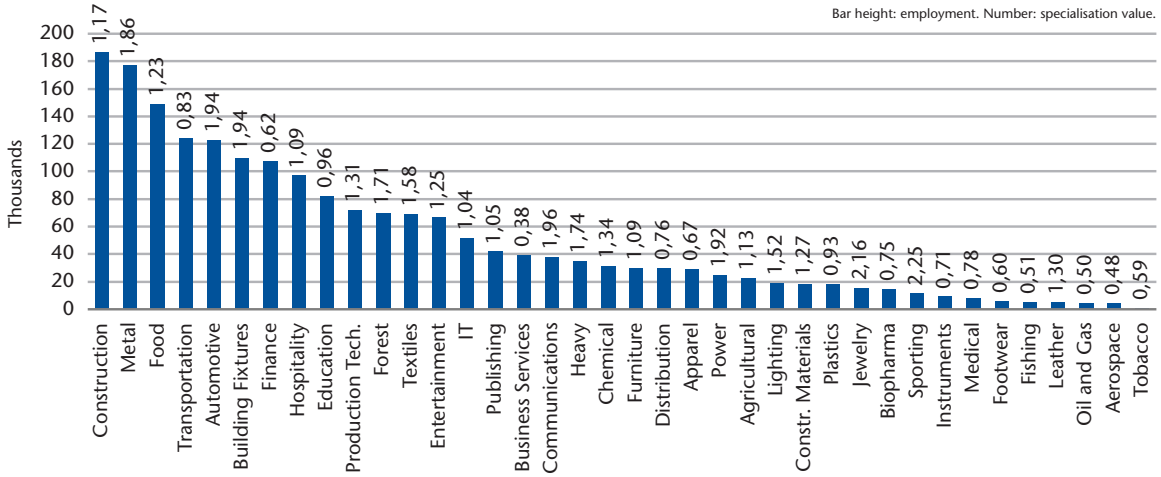


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Metal	Moravskoslezsko	51 741	4.96	★★★
Automotive	Severovychod	31 578	3.40	★★★
Automotive	Stredni Cechy	29 511	4.02	★★★
Textiles	Severovychod	24 143	3.74	★★★
Entertainment	Praha	19 712	2.73	★★★
Education	Praha	26 472	2.27	★★
Metal	Stredni Morava	22 310	2.05	★★
Automotive	Jihozapad	17 203	2.30	★★
Building Fixtures	Jihozapad	16 711	2.49	★★
Building Fixtures	Stredni Morava	15 689	2.42	★★
Building Fixtures	Moravskoslezsko	13 791	2.22	★★
Building Fixtures	Severozapad	13 149	2.22	★★
Communications	Jihozapad	9 578	4.18	★★
Communications	Severovychod	9 489	3.33	★★
Heavy Machinery	Severovychod	9 059	3.05	★★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Severovychod	19	60.43%
Jihozapad	16	55.90%
Stredni Morava	15	50.07%
Jihovychod	14	45.25%
Severozapad	12	60.42%
Stredni Cechy	10	47.96%
Praha	9	64.56%
Moravskoslezsko	8	44.28%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Denmark

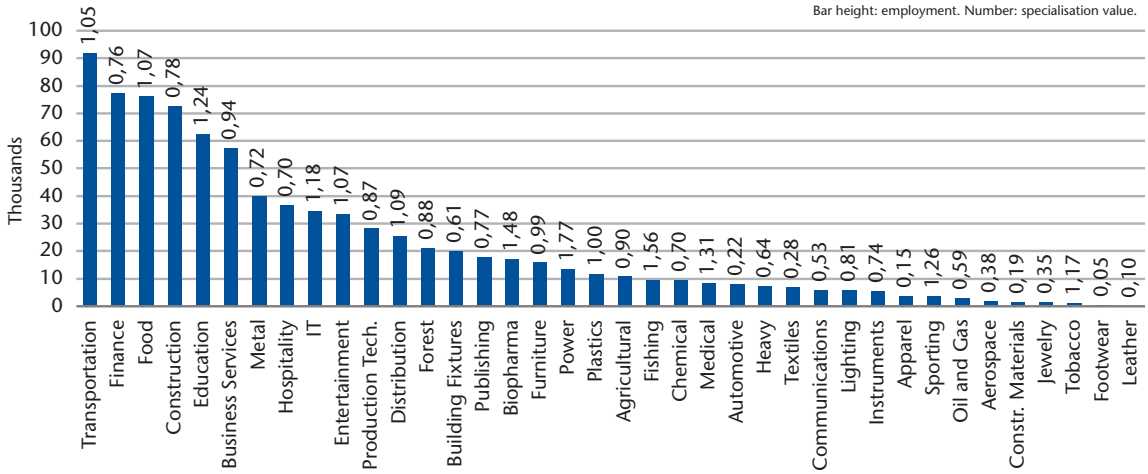


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Transportation	Danmark	91 756	1.05	★★
Finance	Danmark	77 230	0.76	★★
Food	Danmark	76 203	1.07	★★
Construction	Danmark	72 847	0.78	★★
Education	Danmark	62 585	1.24	★
Business Services	Danmark	57 675	0.94	★
Metal	Danmark	40 283	0.72	★
Hospitality	Danmark	36 600	0.70	★
IT	Danmark	34 465	1.18	★
Entertainment	Danmark	33 501	1.07	★
Production Tech.	Danmark	28 273	0.87	★
Distribution	Danmark	25 281	1.09	★
Forest	Danmark	21 144	0.88	★
Building Fixtures	Danmark	20 191	0.61	★
Publishing	Danmark	17 893	0.77	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Danmark	31	95.88%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Estonia

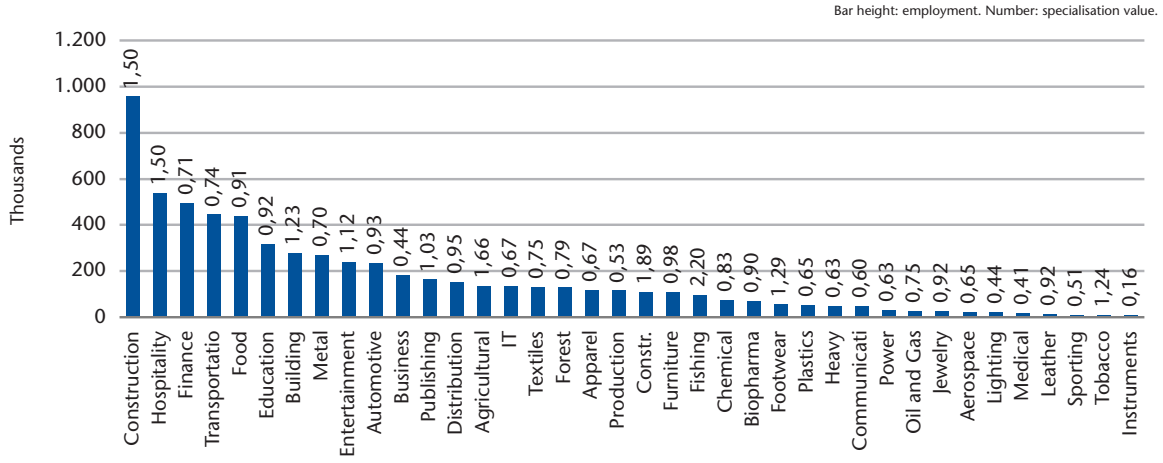


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Furniture	Eesti	13 272	3.98	★★
Fishing	Eesti	7 361	5.74	★★
Oil and Gas	Eesti	5 440	4.90	★★
Construction	Eesti	28 752	1.49	★
Transportation	Eesti	22 121	1.23	★
Education	Eesti	17 026	1.63	★
Food	Eesti	14 921	1.02	★
Apparel	Eesti	12 115	2.30	★
Textiles	Eesti	11 234	2.11	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Eesti	12	56.85%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Finland

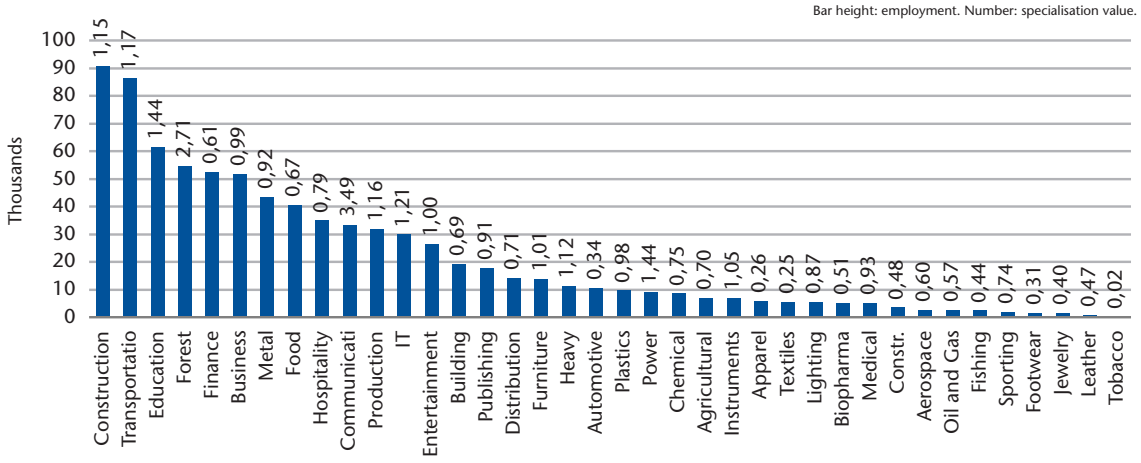


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Forest	Länsi-Suomi	19 720	3.98	★★★
Communications	Pohjois-Suomi	7 725	7.41	★★★
Transportation	Etelä-Suomi	58 005	1.47	★★
Education	Etelä-Suomi	37 062	1.62	★★
Forest	Etelä-Suomi	22 858	2.11	★★
Communications	Etelä-Suomi	18 465	3.60	★★
Construction	Etelä-Suomi	46 242	1.09	★
Finance	Etelä-Suomi	36 689	0.80	★
Business Services	Etelä-Suomi	34 965	1.26	★
Construction	Länsi-Suomi	23 340	1.21	★
IT	Etelä-Suomi	19 819	1.50	★
Transportation	Länsi-Suomi	16 526	0.91	★
Construction	Pohjois-Suomi	10 751	1.25	★
Construction	Itä-Suomi	10 335	1.19	★
Metal	Pohjois-Suomi	8 859	1.72	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Etelä-Suomi	13	62.01%
Pohjois-Suomi	7	48.77%
Länsi-Suomi	7	34.13%
Itä-Suomi	3	25.27%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: France

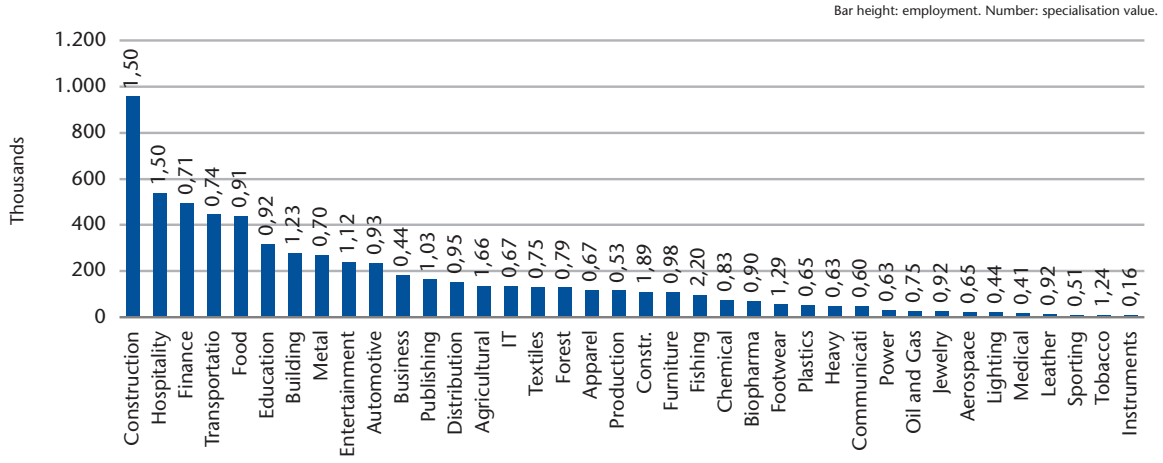


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Finance	Île de France	426 596	2.35	★★★
Food	Bretagne	67 830	2.89	★★★
Food	Pays de la Loire	61 321	2.15	★★★
Automotive	Franche-Comté	24 767	5.38	★★★
Transportation	Île de France	252 540	1.61	★★★
Business Services	Île de France	215 845	1.96	★★
Finance	Rhône-Alpes	89 264	1.20	★★
Transportation	Rhône-Alpes	77 177	1.20	★★
Metal	Rhône-Alpes	69 727	1.70	★★
Transportation	Provence-Alpes-Côte d'Azur	67 511	1.50	★★
Finance	Nord–Pas-de-Calais	62 620	1.45	★★
Food	Rhône-Alpes	51 608	0.99	★★
Biopharma	Île de France	47 493	2.27	★★
Food	Nord–Pas-de-Calais	42 596	1.41	★★
Automotive	Nord–Pas-de-Calais	30 989	1.96	★★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Île de France	30	96.06%
Rhône-Alpes	26	71.63%
Haute-Normandie	13	64.37%
Pays de la Loire	12	48.34%
Franche-Comté	12	68.50%
Nord–Pas-de-Calais	11	57.92%
Bretagne	8	54.92%
Picardie	8	52.85%
Provence-Alpes-Côte d'Azur	7	46.60%
Auvergne	7	50.62%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Germany

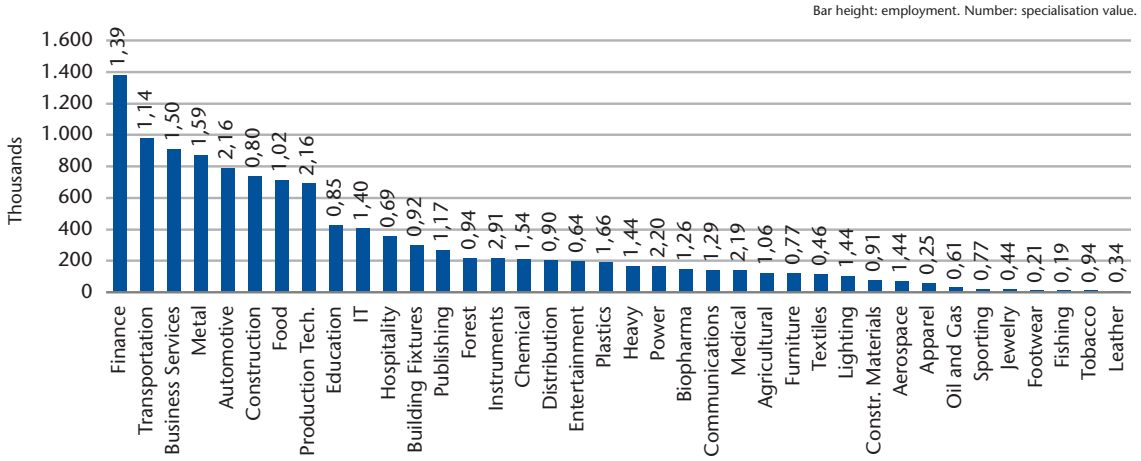


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Automotive	Stuttgart	136 353	6.62	★★★
Finance	Darmstadt	135 793	2.51	★★★
Metal	Arnsberg	118 659	5.12	★★★
Metal	Düsseldorf	91 038	2.58	★★★
Production Tech.	Stuttgart	82 471	4.58	★★★
Automotive	Oberbayern	82 339	3.70	★★★
Automotive	Braunschweig	79 997	10.73	★★★
Finance	Hamburg	69 331	2.41	★★★
Metal	Stuttgart	69 044	2.22	★★★
Business Services	Darmstadt	66 806	2.04	★★★
Transportation	Hamburg	59 929	2.42	★★★
Metal	Freiburg	45 351	3.07	★★★
IT	Oberbayern	45 026	2.56	★★★
Automotive	Karlsruhe	40 694	3.03	★★★
Production Tech.	Tübingen	40 301	5.56	★★★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Stuttgart	31	82.72%
Oberbayern	27	73.52%
Karlsruhe	26	65.42%
Düsseldorf	26	72.90%
Darmstadt	22	72.70%
Detmold	21	71.38%
Mittelfranken	19	62.56%
Oberfranken	19	66.87%
Tübingen	19	56.70%
Köln	19	62.99%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Greece

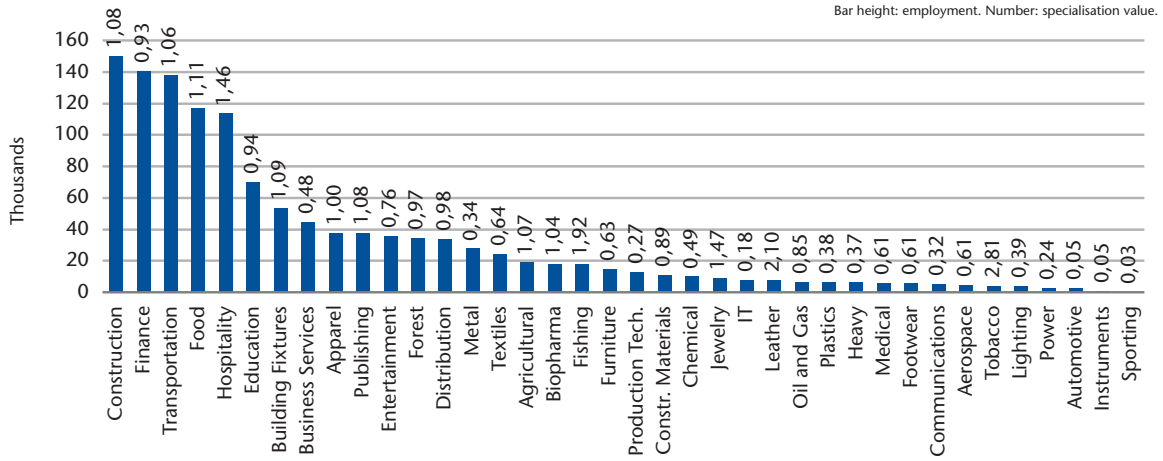


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Transportation	Attiki	83 329	1.53	★★
Finance	Attiki	81 649	1.29	★★
Construction	Attiki	48 907	0.84	★★
Food	Voreia Ellada	45 855	1.47	★★
Hospitality	Nisia Aigaiou, Kriti	28 093	3.81	★★
Fishing	Kentriki Ellada	6 472	3.67	★★
Leather	Voreia Ellada	6 376	5.99	★★
Jewelry	Attiki	5 514	2.09	★★
Tobacco	Voreia Ellada	3 426	7.33	★★
Construction	Voreia Ellada	46 701	1.14	★
Construction	Kentriki Ellada	38 325	1.44	★
Hospitality	Attiki	37 386	1.15	★
Food	Kentriki Ellada	29 056	1.44	★
Publishing	Attiki	25 563	1.76	★
Hospitality	Kentriki Ellada	24 774	1.67	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Attiki	15	63.81%
Voreia Ellada	11	43.08%
Kentriki Ellada	7	61.43%
Nisia Aigaiou, Kriti	5	56.81%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Hungary

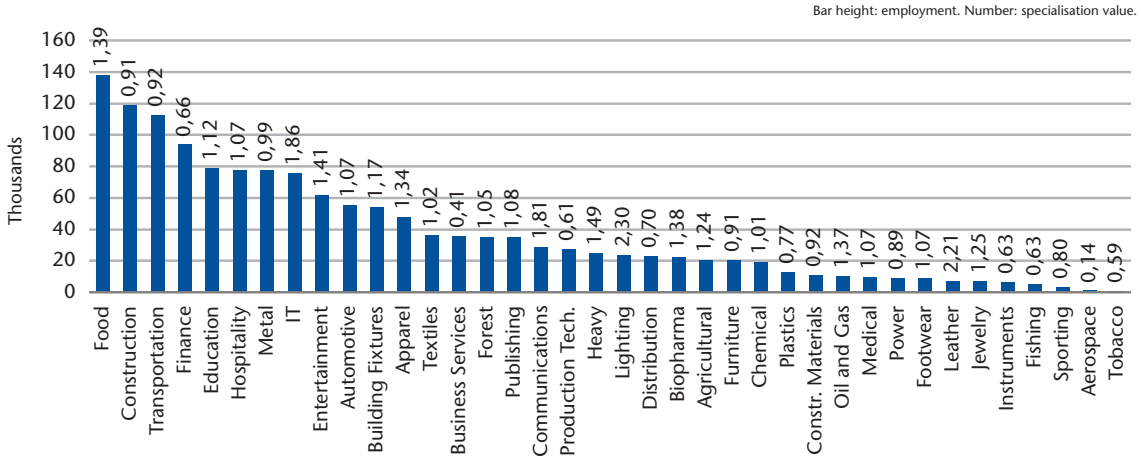


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Transportation	Kozep-Magyarorszag	50 163	1.24	★★
Education	Kozep-Magyarorszag	44 476	1.90	★★
Food	Del-Alfold	34 101	2.90	★★
IT	Kozep-Magyarorszag	30 735	2.27	★★
Automotive	Kozep-Dunantul	17 091	2.86	★★
Automotive	Nyugat-Dunantul	16 741	2.98	★★
Biopharma	Kozep-Magyarorszag	14 197	2.62	★★
IT	Kozep-Dunantul	12 535	2.65	★★
Building Fixtures	Kozep-Dunantul	11 702	2.18	★★
IT	Nyugat-Dunantul	10 995	2.48	★★
Lighting	Nyugat-Dunantul	6 888	6.18	★★
Lighting	Kozep-Magyarorszag	6 832	2.00	★★
Leather	Del-Dunantul	3 086	10.33	★★
Finance	Kozep-Magyarorszag	43 439	0.93	★
Entertainment	Kozep-Magyarorszag	28 559	1.97	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Kozep-Magyarorszag	14	52.64%
Nyugat-Dunantul	12	49.17%
Kozep-Dunantul	11	55.75%
Eszak-Magyarorszag	6	39.18%
Eszak-Alfold	6	30.20%
Del-Dunantul	6	33.46%
Del-Alfold	5	31.67%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Iceland

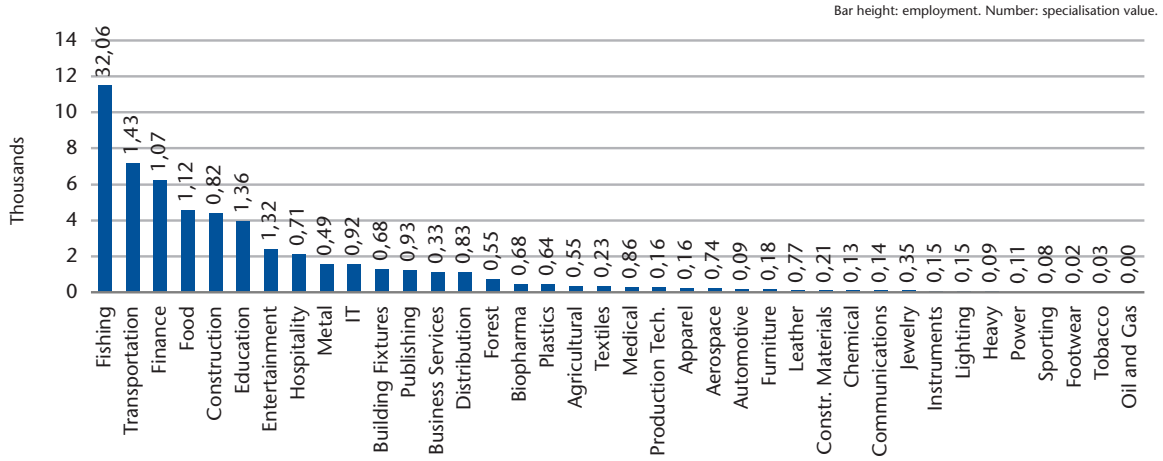


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Fishing	Ísland	11 499	32.06	★★
Transportation	Ísland	7 205	1.43	★★
Finance	Ísland	6 254	1.07	★★
Food	Ísland	4 594	1.12	★★
Construction	Ísland	4 433	0.82	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Ísland	7	61.77%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Ireland

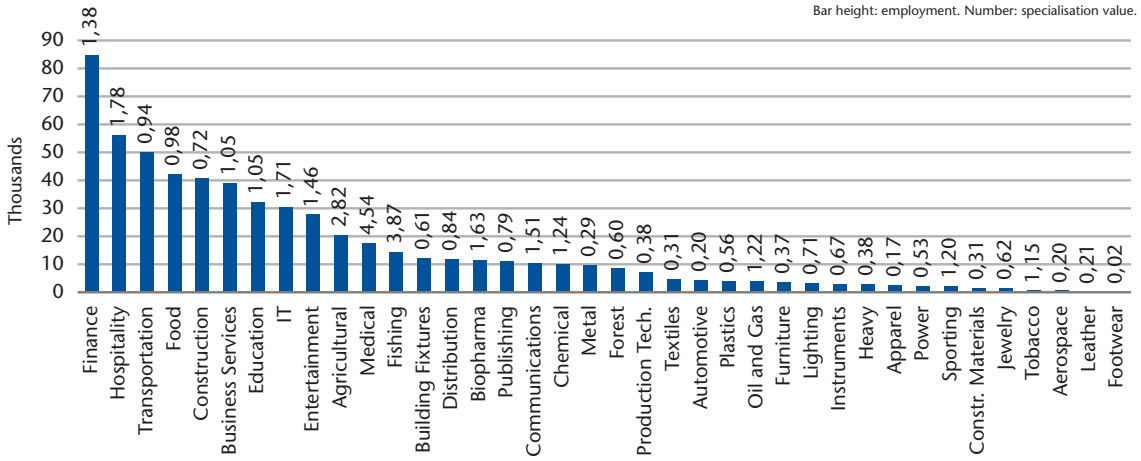


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Finance	Ireland	84 843	1.38	★★
Hospitality	Ireland	56 346	1.78	★★
Food	Ireland	42 333	0.98	★★
Agricultural	Ireland	20 377	2.82	★★
Medical	Ireland	17 509	4.54	★★
Fishing	Ireland	14 597	3.87	★★
Transportation	Ireland	50 144	0.94	★
IT	Ireland	30 353	1.71	★
Entertainment	Ireland	27 741	1.46	★
Biopharma	Ireland	11 584	1.63	★
Communications	Ireland	10 401	1.51	★
Chemical	Ireland	10 294	1.24	★
Oil and Gas	Ireland	3 967	1.22	★
Sporting	Ireland	2 214	1.20	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Ireland	20	64.59%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Italy

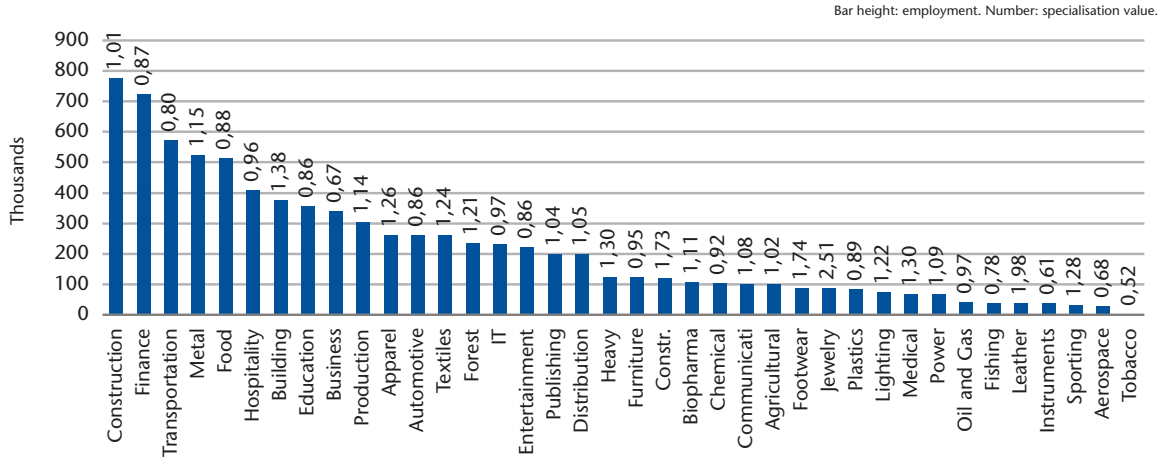


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Automotive	Piemonte	85 914	3.49	★★★
Production Tech.	Emilia-Romagna	60 722	2.76	★★★
Building Fixtures	Veneto	55 023	2.19	★★★
Footwear	Marche	29 772	20.57	★★★
Furniture	Friuli-Venezia Giulia	14 390	4.80	★★★
Finance	Lombardia	174 101	1.10	★★
Metal	Lombardia	166 590	1.91	★★
Construction	Lombardia	145 687	1.00	★★
Textiles	Lombardia	91 468	2.28	★★
Finance	Lazio	85 767	1.08	★★
Construction	Veneto	72 723	1.03	★★
Metal	Veneto	69 847	1.66	★★
Transportation	Lazio	68 884	1.01	★★
Finance	Emilia-Romagna	67 184	0.98	★★
Construction	Campania	66 548	1.14	★★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Lombardia	41	99.74%
Veneto	40	87.63%
Emilia-Romagna	33	75.22%
Piemonte	30	74.16%
Toscana	22	64.42%
Lazio	16	76.87%
Campania	15	33.35%
Marche	13	50.19%
Friuli-Venezia Giulia	10	56.46%
Puglia	9	29.74%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Latvia

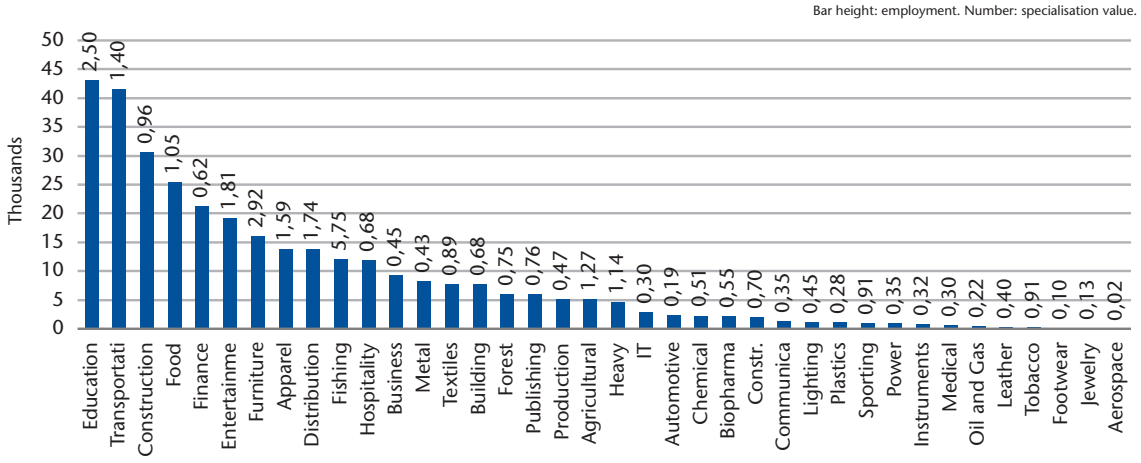


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Education	Latvija	43 105	2.50	★★★
Furniture	Latvija	16 082	2.92	★★
Fishing	Latvija	12 158	5.75	★★
Transportation	Latvija	41 697	1.40	★
Construction	Latvija	30 582	0.96	★
Food	Latvija	25 385	1.05	★
Entertainment	Latvija	19 294	1.81	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Latvija	11	57.09%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Lithuania

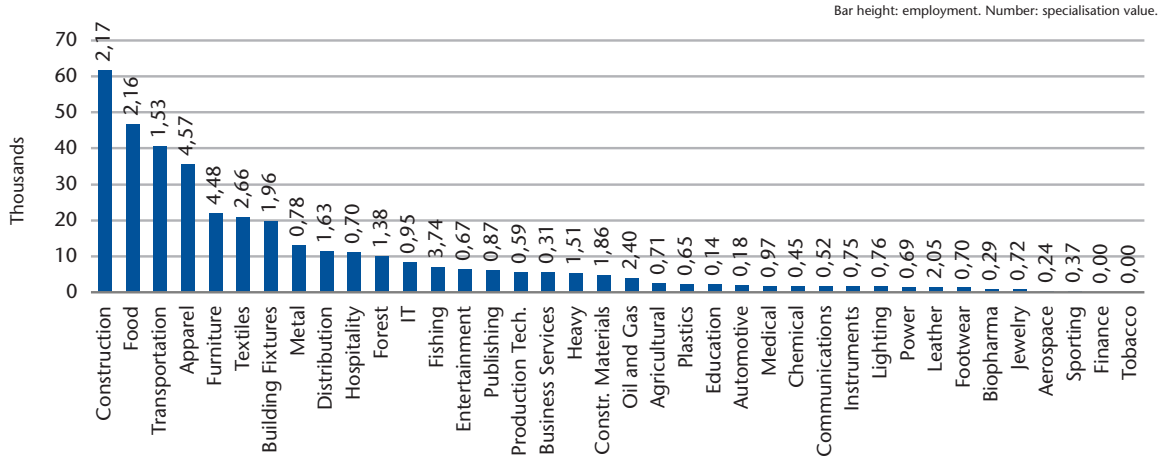


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Construction	Lietuva	61 903	2.17	★★★
Food	Lietuva	46 712	2.16	★★★
Apparel	Lietuva	35 623	4.57	★★★
Furniture	Lietuva	22 049	4.48	★★★
Textiles	Lietuva	20 892	2.66	★★
Fishing	Lietuva	7 080	3.74	★★
Transportation	Lietuva	40 663	1.53	★
Building Fixtures	Lietuva	19 825	1.96	★
Constr. Materials	Lietuva	4 849	1.86	★
Oil and Gas	Lietuva	3 925	2.40	★
Leather	Lietuva	1 513	2.05	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Lietuva	21	71.05%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Luxembourg

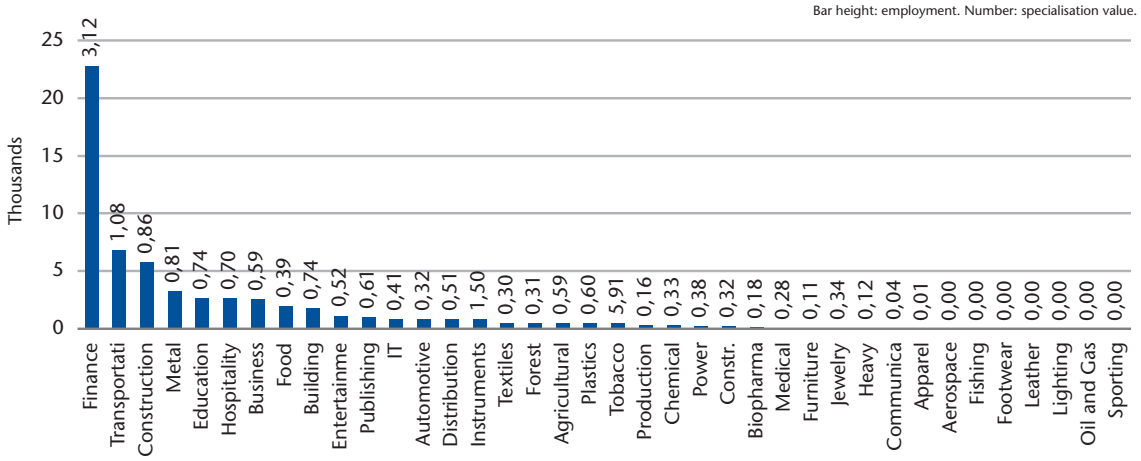


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Finance	Luxembourg	22 778	3.12	★★
Transportation	Luxembourg	6 782	1.08	★
Construction	Luxembourg	5 820	0.86	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Luxembourg	4	58.70%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Malta

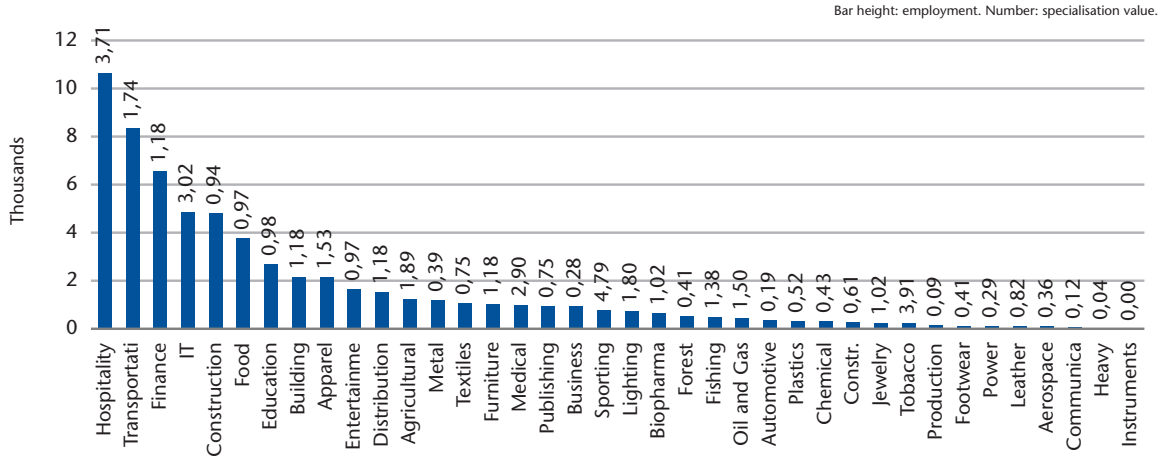


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Hospitality	Malta	10 650	3.71	★★
IT	Malta	4 858	3.02	★★
Transportation	Malta	8 343	1.74	★
Finance	Malta	6 570	1.18	★
Construction	Malta	4 824	0.94	★
Medical	Malta	1 014	2.90	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Malta	8	57.68%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Netherlands

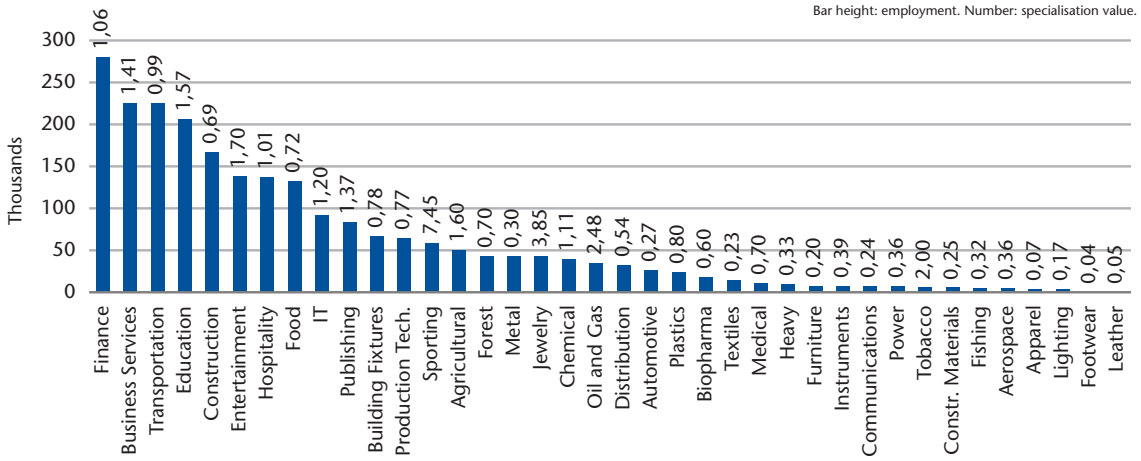


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Entertainment	Zuid-Nederland	41 657	2.36	★★★
Finance	West-Nederland	157 810	1.27	★★
Transportation	West-Nederland	125 749	1.17	★★
Business Services	West-Nederland	123 420	1.64	★★
Education	West-Nederland	112 809	1.82	★★
Business Services	Zuid-Nederland	45 569	1.32	★★
Education	Oost-Nederland	38 782	1.41	★★
Sporting	West-Nederland	19 900	5.35	★★
Oil and Gas	West-Nederland	19 368	2.94	★★
Sporting	Oost-Nederland	17 724	10.74	★★
Sporting	Zuid-Nederland	17 425	10.22	★★
Jewelry	West-Nederland	13 177	2.53	★★
Jewelry	Zuid-Nederland	10 999	4.61	★★
Jewelry	Oost-Nederland	9 449	4.09	★★
Jewelry	Noord-Nederland	8 946	7.82	★★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
West-Nederland	25	92.03%
Zuid-Nederland	24	78.71%
Oost-Nederland	14	55.32%
Noord-Nederland	9	35.52%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Norway

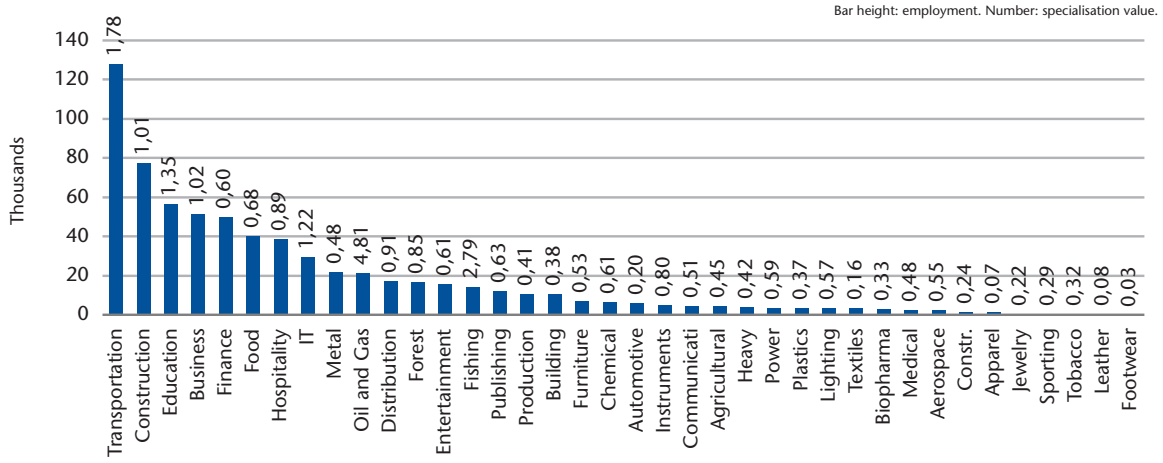


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Oil and Gas	Agder og Rogaland	13 572	21.65	★★★
Fishing	Nord-Norge	5 291	11.37	★★★
Transportation	Vestlandet	31 598	2.62	★★
Transportation	Agder og Rogaland	23 213	2.27	★★
IT	Oslo og Akershus	16 256	2.42	★★
Education	Trøndelag	10 060	2.87	★★
Fishing	Vestlandet	5 275	6.15	★★
Oil and Gas	Vestlandet	4 545	6.12	★★
Transportation	Oslo og Akershus	37 660	1.88	★
Business Services	Oslo og Akershus	23 326	1.65	★
Finance	Oslo og Akershus	20 883	0.90	★
Education	Oslo og Akershus	20 537	1.77	★
Construction	Sør-Østlandet	15 855	1.21	★
Construction	Vestlandet	13 680	1.06	★
Transportation	Sør-Østlandet	12 834	1.05	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Vestlandet	8	51.49%
Trøndelag	6	49.32%
Oslo og Akershus	6	62.61%
Nord-Norge	6	58.66%
Agder og Rogaland	6	45.10%
Sør-Østlandet	3	28.99%
Hedmark og Oppland	3	38.36%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Poland

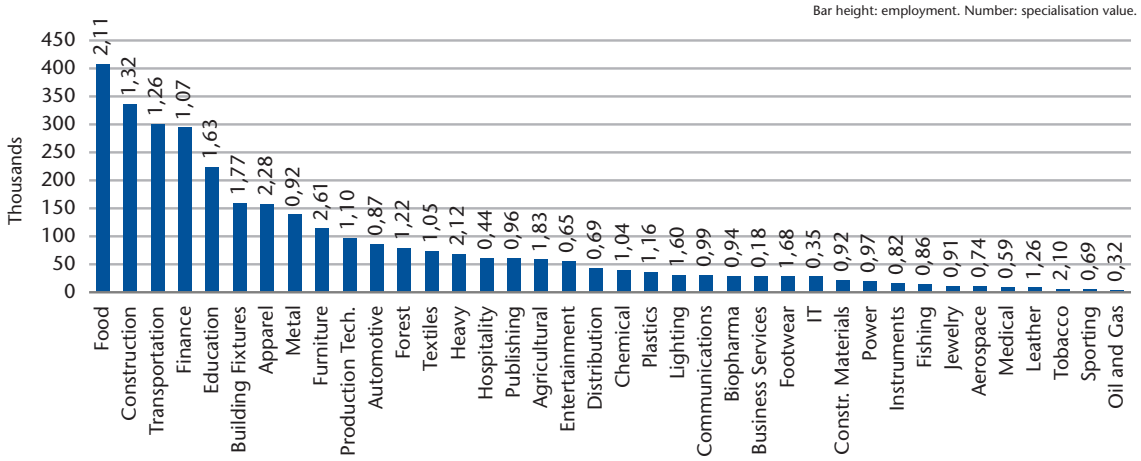


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Education	Mazowieckie	52 758	2.41	★★★
Food	Wielkopolskie	51 813	2.83	★★★
Metal	Slaskie	44 713	2.29	★★★
Apparel	Lodzkie	32 453	6.74	★★★
Building Fixtures	Slaskie	25 174	2.17	★★★
Production Tech.	Slaskie	24 707	2.18	★★★
Textiles	Lodzkie	20 181	4.17	★★★
Apparel	Wielkopolskie	19 999	3.04	★★★
Furniture	Wielkopolskie	19 695	4.74	★★★
Furniture	Warminsko-Mazurskie	13 623	9.27	★★★
Finance	Mazowieckie	71 391	1.63	★★
Food	Mazowieckie	55 653	1.81	★★
Construction	Slaskie	53 751	1.65	★★
Transportation	Pomorskie	45 279	3.18	★★
Food	Lodzkie	32 952	2.46	★★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Mazowieckie	20	72.02%
Wielkopolskie	19	63.65%
Slaskie	18	66.15%
Lodzkie	17	70.65%
Malopolskie	14	60.20%
Opolskie	13	72.57%
Warminsko-Mazurskie	13	71.40%
Lubelskie	12	75.63%
Kujawsko-Pomorskie	12	60.53%
Pomorskie	11	64.42%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Portugal

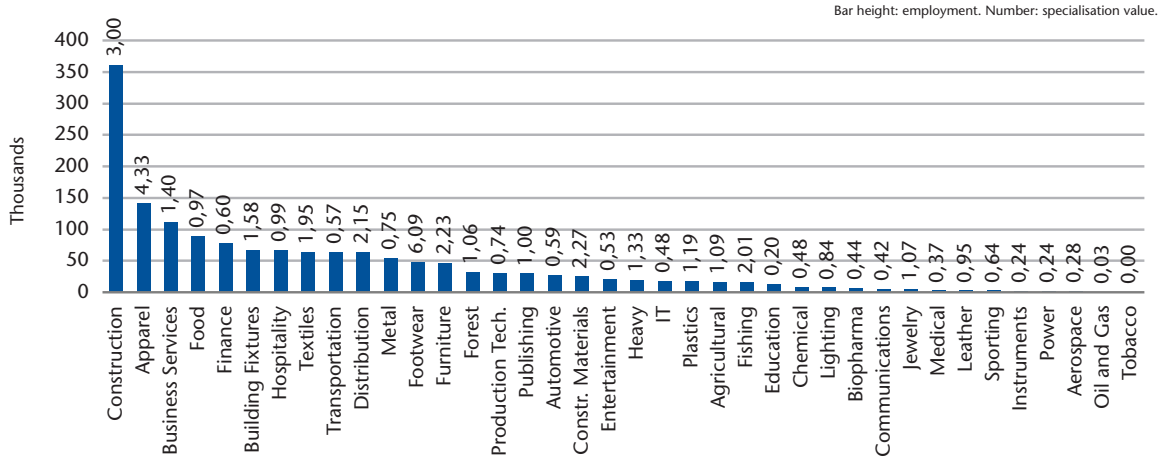


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Construction	Norte	132 141	3.13	★★★
Apparel	Norte	117 579	10.18	★★★
Construction	Lisboa	97 839	2.24	★★★
Construction	Centro	90 386	3.85	★★★
Business Services	Lisboa	87 506	3.05	★★★
Textiles	Norte	51 205	4.41	★★★
Footwear	Norte	46 377	16.51	★★★
Building Fixtures	Centro	26 659	3.19	★★★
Furniture	Norte	29 270	4.01	★★
Distribution	Lisboa	25 673	2.36	★★
Distribution	Norte	21 624	2.06	★★
Construction	Alentejo	20 627	3.44	★★
Construction	Algarve	19 390	3.98	★★
Apparel	Centro	18 304	2.84	★★
Hospitality	Algarve	14 013	5.15	★★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Norte	23	70.87%
Centro	18	65.86%
Lisboa	11	64.96%
Alentejo	8	56.49%
Algarve	6	73.25%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Romania

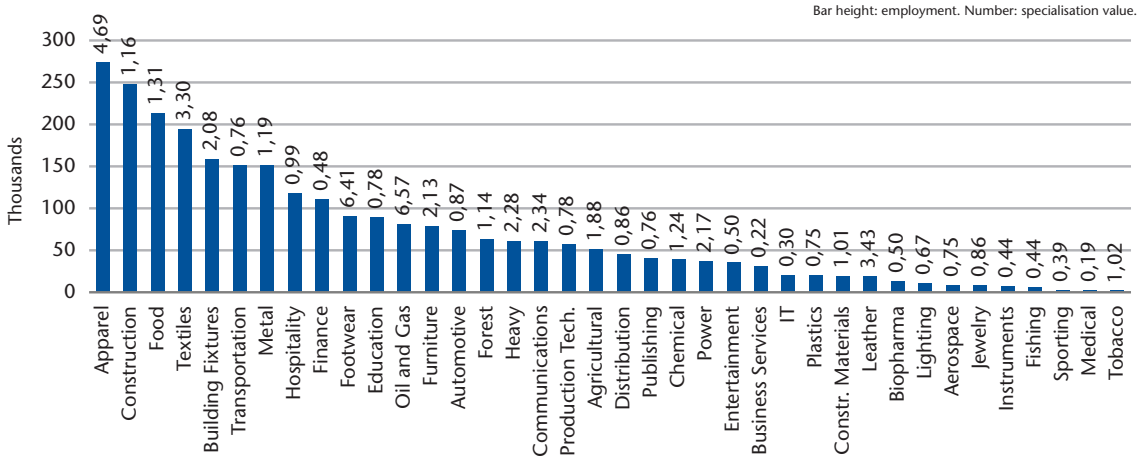


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Apparel	Nord-Est	53 835	6.64	★★★
Textiles	Nord-Est	45 786	5.61	★★★
Apparel	Centru	42 396	5.65	★★★
Apparel	Sud-Est	41 401	5.65	★★★
Apparel	Nord-Vest	40 798	5.51	★★★
Apparel	Sud–Muntenia	38 710	4.61	★★★
Textiles	Centru	38 378	5.08	★★★
Communications	Vest	36 431	14.10	★★★
Oil and Gas	Sud–Muntenia	36 383	20.61	★★★
Metal	Sud-Est	36 040	2.25	★★★
Automotive	Sud–Muntenia	32 935	2.71	★★★
Building Fixtures	Nord-Vest	30 919	3.21	★★★
Footwear	Nord-Vest	28 200	15.67	★★★
Textiles	Sud–Muntenia	25 884	3.06	★★★
Building Fixtures	Sud–Muntenia	23 113	2.12	★★★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Centru	27	71.25%
Sud–Muntenia	26	71.43%
Vest	22	62.53%
Nord-Vest	19	63.06%
Sud-Est	17	77.59%
Nord-Est	17	60.47%
Sud-Vest Oltenia	15	50.75%
Bucuresti–Ilfov	15	54.92%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Slovakia

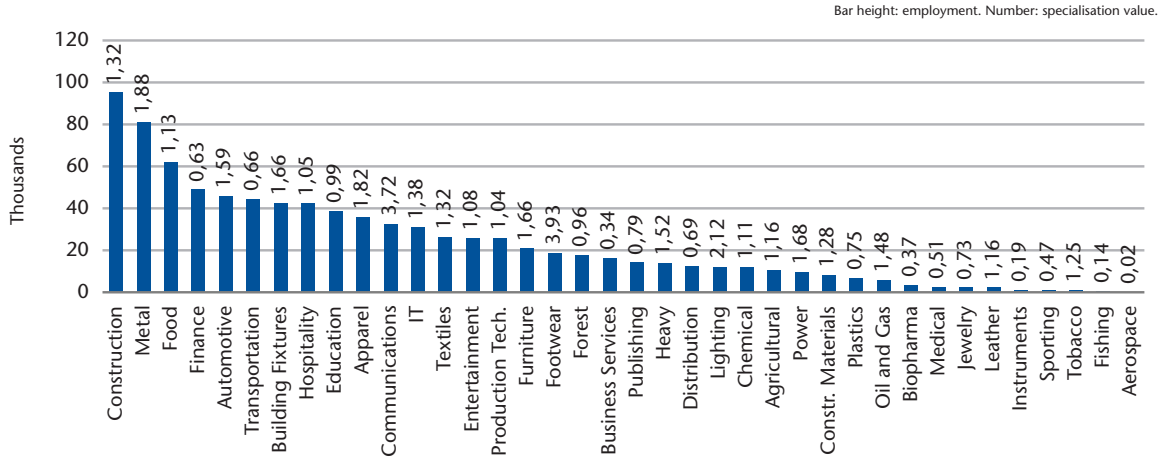


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Metal	Vychodne Slovensko	35 897	3.23	★★★
Communications	Zapadne Slovensko	25 022	7.79	★★★
Metal	Stredne Slovensko	21 808	2.15	★★
Automotive	Zapadne Slovensko	21 261	2.03	★★
Footwear	Zapadne Slovensko	12 931	7.34	★★
Education	Bratislavsky kraj	12 762	2.28	★★
Automotive	Bratislavsky kraj	11 468	2.80	★★
Lighting	Zapadne Slovensko	5 461	2.62	★★
Power	Zapadne Slovensko	4 471	2.08	★★
Construction	Zapadne Slovensko	37 759	1.43	★
Construction	Vychodne Slovensko	30 406	1.64	★
Food	Zapadne Slovensko	29 123	1.45	★
Construction	Stredne Slovensko	22 108	1.30	★
Metal	Zapadne Slovensko	20 956	1.32	★
Finance	Bratislavsky kraj	17 435	1.55	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Zapadne Slovensko	15	50.97%
Stredne Slovensko	8	38.90%
Vychodne Slovensko	7	39.02%
Bratislavsky kraj	7	47.70%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Slovenia

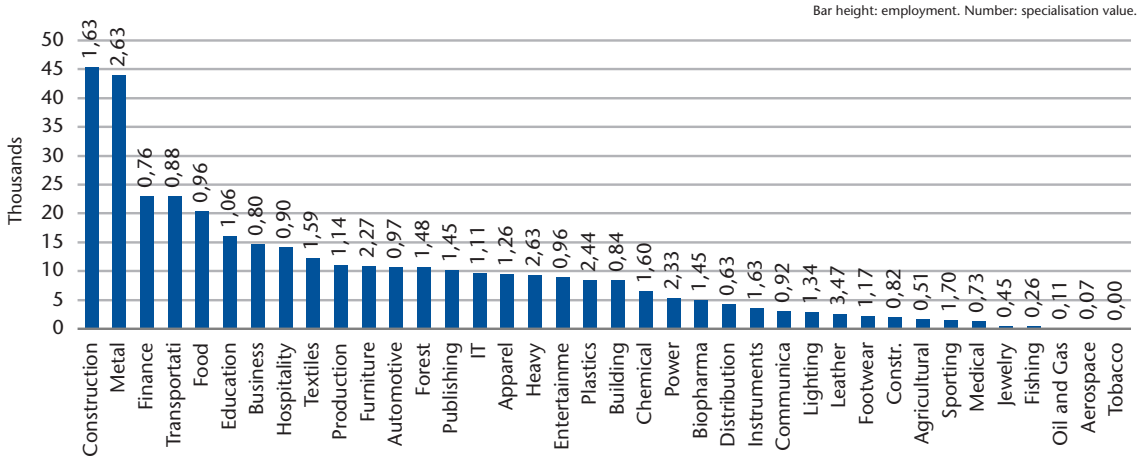


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Metal	Slovenija	43 984	2.63	★★★
Furniture	Slovenija	10 970	2.27	★★
Heavy Machinery	Slovenija	9 330	2.63	★★
Plastics	Slovenija	8 491	2.44	★★
Power	Slovenija	5 268	2.33	★★
Leather	Slovenija	2 512	3.47	★★
Construction	Slovenija	45 474	1.63	★
Finance	Slovenija	23 054	0.76	★
Transportation	Slovenija	23 021	0.88	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Slovenija	16	47.14%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Spain

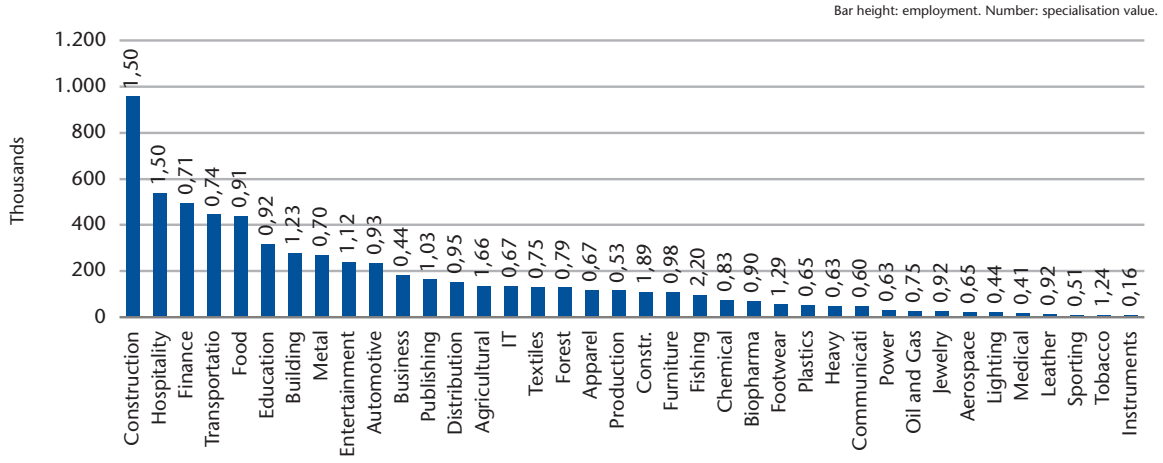


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Hospitality	Canarias	82 099	5.11	★★★
Metal	País Vasco	65 442	3.27	★★★
Constr. Materials	Valencia	53 098	8.25	★★★
Construction	Castilla-La Mancha	52 489	2.11	★★★
Fishing	Galicia	48 703	19.96	★★★
Hospitality	Illes Balears	47 180	5.15	★★★
Automotive	Castilla y León	27 136	2.07	★★★
Construction	Andalucía	179 380	1.84	★★
Construction	Cataluña	138 089	1.21	★★
Construction	Madrid	122 201	1.22	★★
Finance	Madrid	117 019	1.07	★★
Construction	Valencia	112 581	1.60	★★
Food	Cataluña	103 066	1.19	★★
Finance	Cataluña	97 597	0.79	★★
Transportation	Cataluña	95 261	0.89	★★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Cataluña	36	96.95%
Valencia	25	70.43%
Madrid	24	84.27%
Andalucía	19	74.84%
Castilla y León	11	53.03%
Galicia	11	48.18%
País Vasco	10	44.89%
La Rioja	9	48.15%
Illes Balears	7	64.47%
Canarias	7	61.67%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Sweden

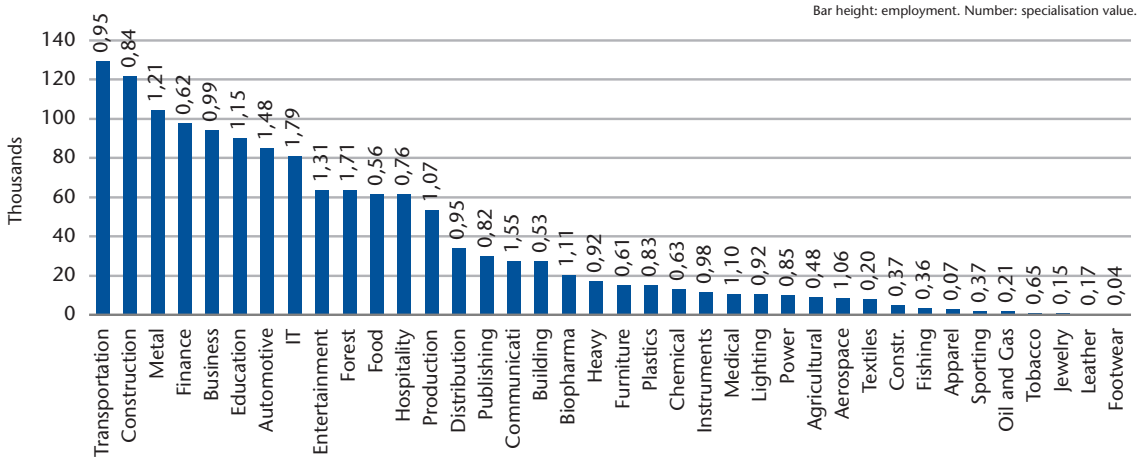


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Automotive	Västsverige	42 832	3.66	★★★
IT	Stockholm	34 633	3.21	★★★
Forest	Norra Mellansverige	14 084	4.42	★★★
Business Services	Stockholm	41 041	1.81	★★
Metal	Östra Mellansverige	28 708	2.13	★★
Metal	Norra Mellansverige	22 167	2.98	★★
Metal	Småland med öarna	16 359	2.13	★★
Communications	Stockholm	11 455	2.74	★★
Biopharma	Stockholm	10 325	2.39	★★
Forest	Småland med öarna	10 095	3.07	★★
Forest	Mellersta Norrland	5 502	3.74	★★
Finance	Stockholm	45 765	1.23	★
Transportation	Stockholm	40 880	1.27	★
Transportation	Västsverige	28 895	1.05	★
Education	Stockholm	27 167	1.46	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Stockholm	13	67.62%
Småland med öarna	9	56.42%
Östra Mellansverige	8	40.41%
Norra Mellansverige	7	44.97%
Västsverige	6	36.40%
Mellersta Norrland	5	42.51%
Sydsverige	3	20.06%
Övre Norrland	2	23.97%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Switzerland

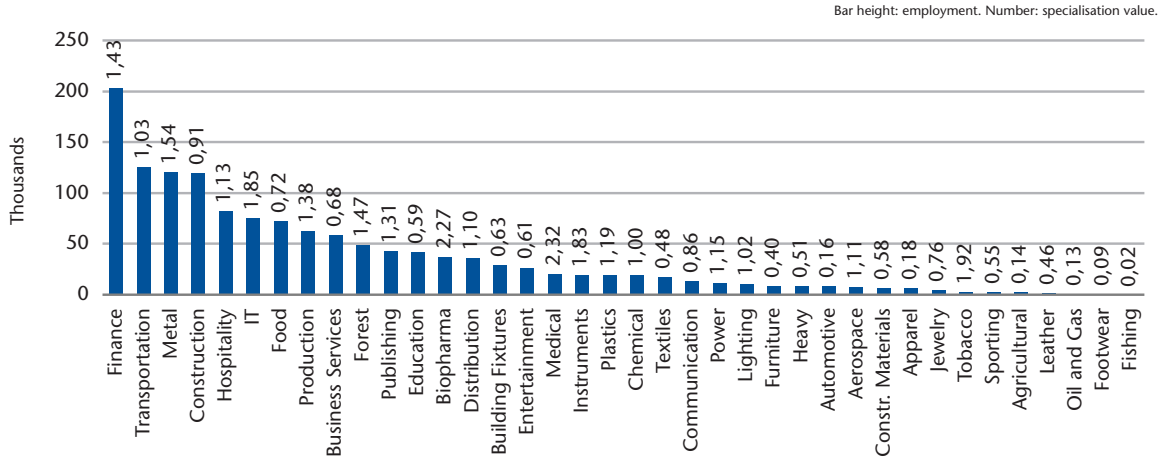


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Finance	Zürich	93 572	3.19	★★★
Transportation	Espace Mittelland	59 677	2.10	★★★
Metal	Espace Mittelland	52 310	2.88	★★★
IT	Zürich	23 685	2.80	★★★
Biopharma	Nordwestschweiz	21 741	8.88	★★★
Production Tech.	Ostschweiz	12 367	2.22	★★
Production Tech.	Zentralschweiz	8 569	2.15	★★
Chemical	Nordwestschweiz	8 549	2.98	★★
Medical	Espace Mittelland	6 317	3.06	★★
Power	Nordwestschweiz	5 952	3.76	★★
Hospitality	Ticino	5 675	2.01	★★
Instruments	Zürich	5 362	2.43	★★
Tobacco	Espace Mittelland	2 151	6.23	★★
Finance	Région lémanique	35 549	1.53	★
Transportation	Zürich	25 399	1.00	★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Nordwestschweiz	12	49.36%
Espace Mittelland	12	52.35%
Zürich	11	51.55%
Ostschweiz	9	55.53%
Zentralschweiz	8	41.39%
Ticino	8	56.13%
Région lémanique	4	46.21%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: Turkey

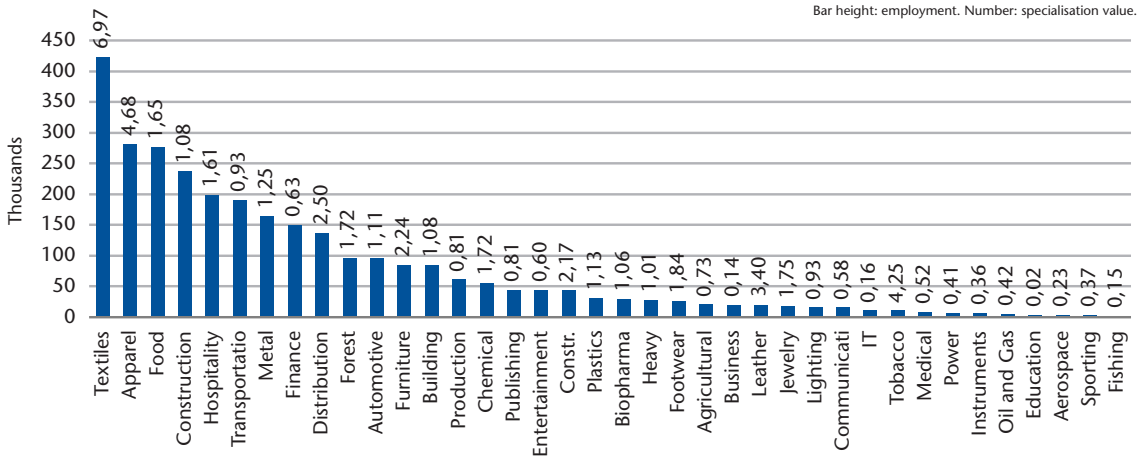


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Textiles	Istanbul	156 072	9.18	★★★
Apparel	Istanbul	139 542	8.26	★★★
Textiles	Ege	76 437	8.22	★★★
Construction	Bati Anadolu	70 346	2.90	★★★
Textiles	Dogu Marmara	69 464	10.33	★★★
Distribution	Istanbul	69 340	4.51	★★★
Hospitality	Akdeniz	57 924	4.50	★★★
Hospitality	Ege	45 571	2.41	★★★
Automotive	Dogu Marmara	44 901	4.64	★★★
Apparel	Ege	37 277	4.04	★★★
Textiles	Guneydogu Anadolu	31 897	11.98	★★★
Textiles	Akdeniz	30 219	4.77	★★★
Apparel	Dogu Marmara	29 956	4.48	★★★
Apparel	Bati Marmara	28 843	9.93	★★★
Textiles	Bati Marmara	26 403	9.04	★★★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Istanbul	38	91.20%
Ege	26	74.26%
Dogu Marmara	19	72.47%
Bati Marmara	12	60.21%
Akdeniz	12	72.70%
Guneydogu Anadolu	11	71.30%
Orta Anadolu	10	64.11%
Bati Karadeniz	10	63.09%
Bati Anadolu	9	56.87%
Dogu Karadeniz	7	73.64%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

Country Fact-Sheet: United Kingdom

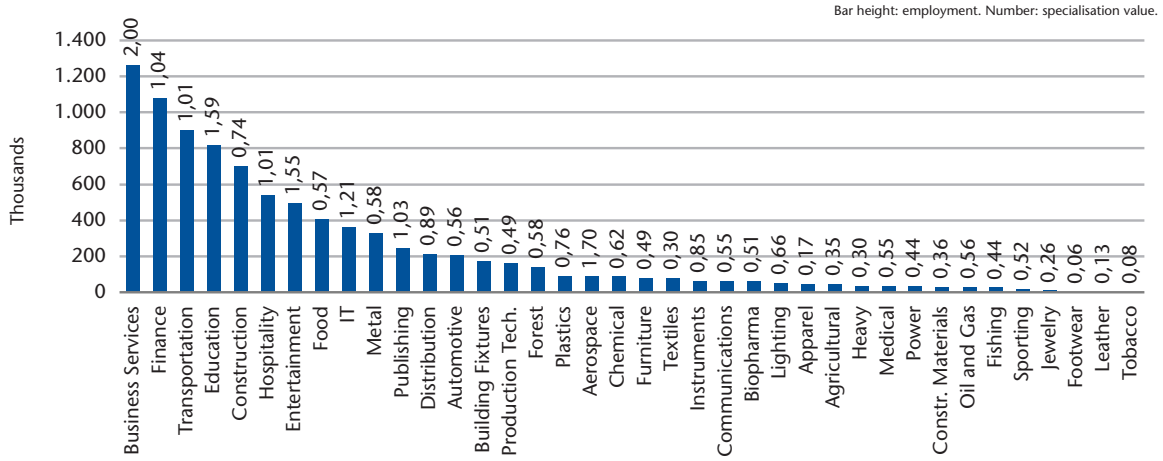


Table 1. Top-15 clusters by stars, employment and specialisation

Cluster	Region	Employees	Specialisation	Stars
Finance	Inner London	254 760	2.77	★★★
Business Services	Inner London	186 696	3.35	★★★
Transportation	Outer London	117 606	2.11	★★★
Business Services	Outer London	105 373	2.69	★★★
Business Services	Berks, Bucks and Oxon	73 865	2.87	★★★
Business Services	Surrey, E and W Sussex	66 558	2.51	★★★
Education	Berks, Bucks and Oxon	61 200	2.89	★★★
Business Services	Greater Manchester	54 394	2.00	★★★
Business Services	Beds and Herts	53 807	3.10	★★★
Business Services	Hants and Isle of Wight	50 972	2.62	★★★
Business Services	Gloucs, Wilts and N Som	50 581	2.05	★★★
IT	Berks, Bucks and Oxon	45 071	3.68	★★★
Education	E Anglia	38 150	2.07	★★★
Automotive	W Midlands	37 913	2.27	★★★
Education	E Scotland	35 846	2.07	★★★

Table 2. Top-10 regions by total number of stars and share of employment in clusters with stars

Region	Total number of stars	Share of employment in clusters with stars
Inner London	16	93.40%
Outer London	12	74.63%
Berks, Bucks and Oxon	11	59.82%
W Midlands	11	62.02%
Gloucs, Wilts and N Som	10	50.35%
Greater Manchester	10	58.21%
Hants and Isle of Wight	10	56.84%
E Anglia	9	63.26%
Surrey, E and W Sussex	9	67.23%
NE Scotland	9	63.34%

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070606

European Commission

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