

# Business Clusters and Innovativeness of the EU Economies

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## Abstract

Business clusters are considered as key drivers shaping competitiveness of local, regional as well as national economies. Supporters of this view argue that business clusters are vehicles to increase productivity, hence development of such economic structures is crucial to assure economic prosperity. One of the more specific reasons pointed out quite recently in the literature is that business clusters stimulate creation and diffusion of innovations. In this paper we test validity of this statement looking at cluster strength and state of cluster development in the EU-28 economies and their innovativeness. The research question we focus on is whether a measurable relationship exists between these two different phenomena. In order to answer this question data on occurrence of business clusters in the EU provided by European Cluster Observatory (ECO) and results of the three types of innovativeness rankings, i.e. Global Innovation Index (GII), Summary Innovation Index (SII), and 12<sup>th</sup> pillar in the Global Competitiveness Index (GCI), were analyzed. It was found that the level of innovativeness of the EU economies is clearly related to the state of cluster development. This means that innovation and cluster policies should be treated as complementary ones and implemented in a well harmonized manner.

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**Keywords:** Business clusters, innovativeness, competitiveness, EU

## Introduction

Business clusters, meant as geographic concentrations of companies, specialized suppliers, service providers, companies in related industries as well as associated institutions (Porter, 1998), are widely considered as drivers of competitiveness. Competition and cooperation occurring simultaneously within those structures cause positive economic effects, such

as higher productivity, increased efficiency, and better product and service quality. Based on such reasoning development of business clusters has also for some time now become a part of policy agendas of the EU at local, regional, and national levels. This is because policy makers started to believe that business clusters are drivers of economic prosperity. This view is accompanied by another mainstream topic, which is innovations and their role in building modern economies. The issue of innovativeness has also been introduced into policy agendas around the world. It is particularly recognized in leading economies as well as those aspiring to boost their global standing. Calls for innovation have been present in the EU's development strategies. Innovation is part of the Europe 2020 strategy that aims at creating smart, sustainable, and inclusive growth. It is widely claimed that "Europe's future is connected to its power to innovate" (European Commission, 2013). The importance of innovation manifests itself in many dimensions in the EU. The creation of the Innovation Union initiative is one of them. In this context, a research question arises whether occurrence of such economic structures as business clusters has an impact on number of innovations that emerge and translate into greater innovativeness of national economies?

The main goal of this paper is to look for an empirical evidence that occurrence of strong clusters is positively related to the measures of innovativeness of national economies. The geographic scope of the research was limited to the EU-28 member states, mainly due to availability of data on clusters occurrence. The sources of the data utilized in the analysis include most recent country rankings according to the Global Innovation Index, the European Innovation Scoreboard, and the Global Competitiveness Report by the World Economic Forum as well as information from the European Cluster Observatory.

### **Strength and development of clusters in the EU economies**

Clusters are composed of a set of relationships established among different entities. Its identification in space must consist of finding and separating key interactions that are taking place and are vital for the cluster. The network of relations is the necessary condition for clusters to exist. When looking into the emergence of the cluster concept three main phases of its development can be distinguished. The first one was started by Marshall. He postulated that geographical proximity of companies in an industry followed by proximity of companies from related industries forming industrial districts is a source of positive effects and externalities (Marshall, 1920). Becattini picked up those findings several years later when addressing the topic of the reasons of growth in Terza Italia. His work can be considered as a trigger for the second wave of research followed by the third one when

Porter addressed the topic of spatial agglomeration which takes form of business clusters.

Location of businesses does not occur in a single pattern. Each decision in this regard is to some extent unique and its effects are different. Given that, different locations are characterized by an exclusive in its form set of companies. These companies become allies and rivals, form industries, or if the circumstances are right, they form clusters. Research on business clusters has been carried out relatively extensively throughout the last two decades. Since the beginning the concept was on the one hand an interesting new approach within economics of agglomeration, but on the other hand many questions arose concerning its nature and potential applications. The “academic skepticism” towards clusters stems from “the eclecticism involved in the way ideas have been used” (Benneworth, Danson, Raines & Whittam, 2003). Although the concept resembles certain theoretical ideas from the past there is some novelty to its characteristics. In many cases it is emphasized that through clusters one can achieve an in-depth analysis of the real-life phenomena taking place between companies and other entities that engage in competitive and cooperative behavior.

Considering the research studies on business clusters that have been conducted until now, the task of cluster mapping seems to be particularly difficult. There are many reasons for obstacles associated with the development of a consistent and widely applicable cluster mapping methodology. As different economies represent different levels of development it seems crucial to identify key factors determining such diversity. Economic systems are known for their heterogeneity and complexity, and whether at national, regional or local level, they consist of different sets of enterprises. Each location with its unique features is a home for a different set of entities that form industries. Cluster mapping is helpful for understanding and explaining the processes that influence the occurrence of spatial diversity in economic activities as well as its consequences. Such knowledge is valuable not only for scientists, but also for policy makers interested in development of strong business clusters related to various sectors (Figiel, Kuberska & Kufel, 2014).

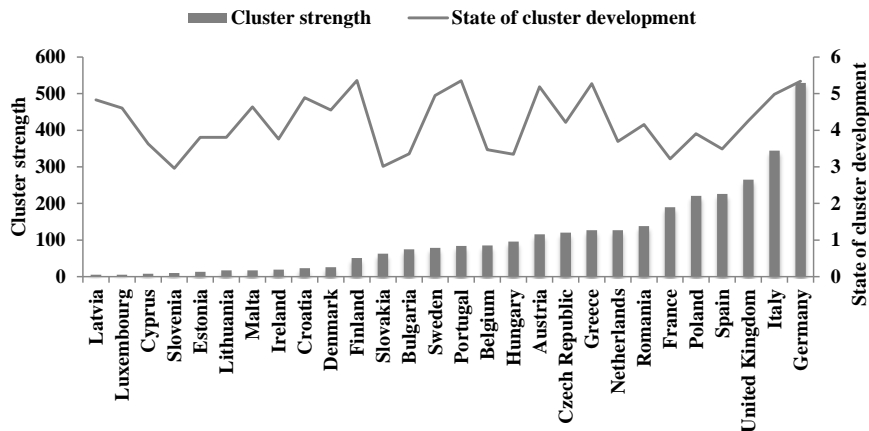
The most complex method of cluster mapping was originally proposed by Porter and later applied in the European context by researchers from the Stockholm School of Economics. Apart from translating Porter’s industry definitions for the European perspective, they have also established a unique methodology for measuring cluster strength. Each country is awarded a number of “stars” to its cluster structures (European Cluster Observatory).

As presented in figure 1 the star numbers vary very significantly between the EU-28 countries, which is mainly due to different sizes of the

compared economies. Consequently, Germany is the country with the strongest clusters awarded 529 stars altogether, which is over 100 times more than in Latvia or Luxembourg awarded the least number of stars (only 5 each). This evaluation, although very useful to depict the cross-country distribution of business clusters according to their strength in the EU-28, is sort of strongly biased towards employment numbers highly correlated with the population and total GDP of a country. In other words overall size of an economy clearly matters, so the larger the economy is, the more stars it can likely receive.

Number of stars cannot not be treated as a measure of the level of a country economic development. It reflects specializations of compared national economies, which may be structurally different in terms of clusters' industry profiles potentially influencing the level of economic development. For instance, strong clusters in Latvia include maritime as well as education and knowledge creation, whereas in Luxembourg these are business services and financial services.

Figure 1. The cluster strength and the state of cluster development in the EU-28 economies



Source: own elaboration based on data of the European Cluster Observatory and World Economic Forum, 2016

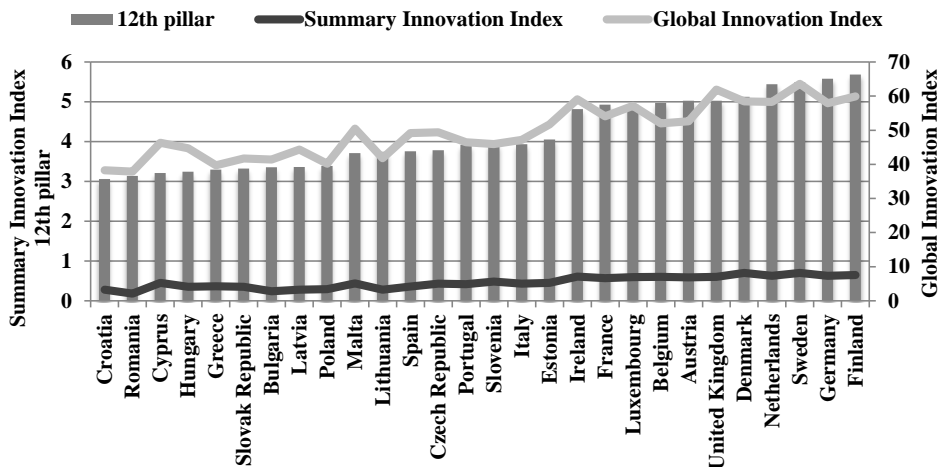
Another measure, called state of cluster development, employed in the analysis to evaluate development of business clusters comes from the Global Competitiveness Report (the 11th pillar of competitiveness – business sophistication). As a measure based on business community assessment of how deep and well-developed clusters are it allows for global comparisons between countries. Values of this measure for 2016 are ranging from 2.96 (Croatia) to 5.36 (Germany) with the mean amounting to 4.22 and coefficient of variation equal to 18.36%. It should be mentioned that distribution of the values reflecting the state of cluster development in the countries included in the WEF ranking is not dependent on the scale of the economies.

### Innovativeness of the EU-28 economies and its connectedness with the state of cluster development

There are many indicators of innovativeness, which can be evaluated from a company, regional, national, or global perspective. In the paper results of three international rankings are considered, which refer to national economies. The World Economic Forum calculating Global Competitiveness Index and its 12th pillar (innovation) distinguishes three types of economies with regard to their stage of development. Among the EU-28 member states Bulgaria and Romania are considered efficiency-driven economies, whereas Croatia, Hungary, Latvia, Lithuania, Poland, and the Slovak Republic are economies in transition. The other countries are innovation-driven economies.

According to the results of the European Innovation Scoreboard ranking (Summary Innovation Index, SII) 12 out of the EU countries are strong innovators or innovation leaders and the other are moderate innovators (14) or modest innovators (2). The level of the innovativeness of the EU-28 economies can also be assessed using Global Innovation Index (GII) developed by INSEAD. In general, no matter of what kind of measure or index is used we can find that the current level of innovativeness of the EU-28 economies varies significantly (figure 2).

Figure 2. Innovativeness of the EU-28 economies in 2016

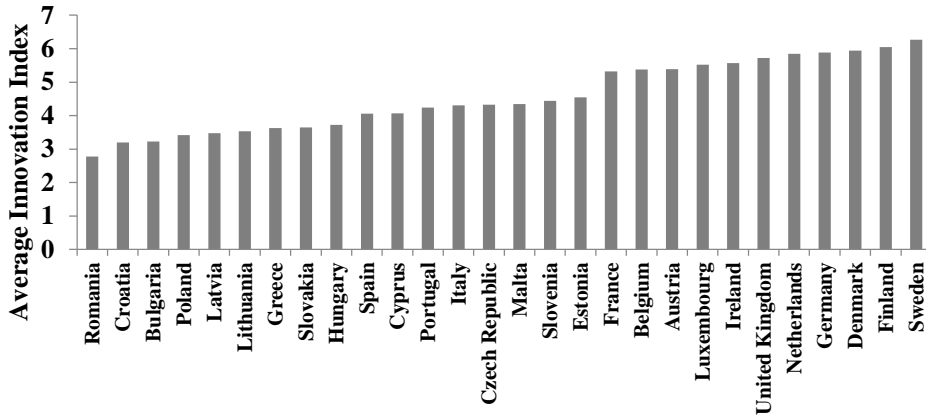


Source: own elaboration based on data of INSEAD, 2016, European Commission, 2016, World Economic Forum, 2016

Moreover, these indices are highly correlated with each other (all three correlation coefficients appeared to be above 0.9), therefore to avoid deciding which one of them is better suited to evaluate innovativeness Average Innovation Index (AII) was computed as a geometric mean of their values for particular countries, namely:  $AII_i = \sqrt[3]{GII_i \times SII_i \times GCI12_i}$ ,

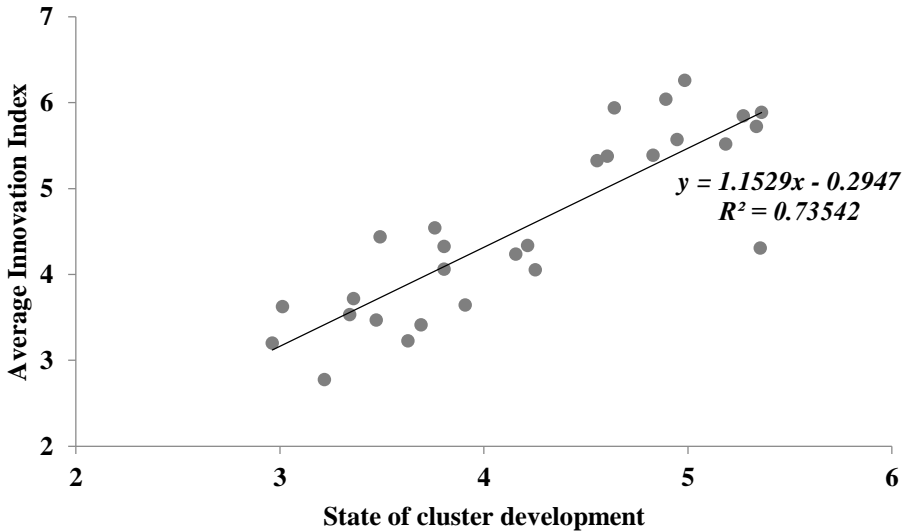
where  $GII_i$ ,  $SII_i$ , and  $GCI2_i$  are values of Global Innovation Index, Summary Innovation Index, and the 12th pillar in the Global Competitiveness Index, respectively, for country  $i$ . Results of these calculations are presented in figure 3.

Figure 3. Values of the Average Innovation Index for the EU-28 economies in 2016



Source: own elaboration based on data of INSEAD, 2016, European Commission, 2016, and the World Economic Forum, 2016.

Figure 4. Cluster development and the level of innovativeness of the EU-28 economies



Source: own elaboration based on data of INSEAD, 2016, European Commission, 2016, and the World Economic Forum, 2016.

Such countries as Sweden, Finland, Denmark, Germany, and the Netherlands are among the five most innovative EU-28 economies. The five least innovative economies are that of Romania, Croatia, Bulgaria, Poland,

and Latvia. This shows that most of the countries, which have only recently joined the EU are below its average level of innovativeness. Of course, the causes of this situation are rather complex but one of them might be related to differences in development of business clusters. In order to shed some light on this problem, a statistically significant relationship between values for the state of cluster development measure, which is better suited for cross-country comparisons, and values of the Average Innovation Index (AII) is presented in figure 4.

There appears to be a very clear, positive connectedness between the state of cluster development in the EU-28 economies and the level of their innovativeness, as over 73% of variability of the AII values is explained by variability of the state of cluster development. So, it is very likely that existence of well developed business clusters may play an important role in shaping innovativeness of the EU-28 national economies.

## Conclusion

Potential impact of business clusters on economic development is discussed in a vast body of literature. Many authors argue that clusters are vehicles to increase competitiveness and improve economic prosperity due to various positive effects arising as results of their occurrence. One of these effects is supposed to be higher innovativeness of the economies characterized by well-developed clusters. Looking at the cluster strength and state of cluster development in the EU-28 economies and their innovativeness this assumption can be confirmed. A fairly high variation of the innovativeness levels of the EU-28 economies, measured by Average Innovation Index (AII), appeared to be related to the state of cluster development. This empirical evidence suggests that innovation and cluster policies should be treated as complementary ones and implemented in a well harmonized manner.

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