COMPETITIVENESS OF THE EU ECONOMIES AND DEVELOPMENT OF CLUSTERS

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Abstract:

The role of business clusters in building competitive advantage of national economies is a subject of numerous discussions. It is rather quite commonly agreed that well developed business clusters are supposed to be drivers of innovation and competitiveness of economy in multifold dimensions. In the article a hypothesis, which states that occurrence of numerous and strong clusters in a country is positively related to competitiveness of its economy is being tested. Using a dataset on cluster mapping in Europe from the European Cluster Observatory and results of the country competitiveness rankings published by the World Economic Forum in the Global Competitiveness Reports as well as data on the levels of Gross Domestic Product (GDP) from World Bank we have looked for a relationship between occurrence and relative strength of clusters in the EU-27 countries and the measures of competiveness such as the competitive potential and productivity of the EU national economies. It appeared from the analysis that those countries differ in terms of both occurrence and relative strength of business clusters as well as levels measures of their competitiveness such GDP per capita and the competitive potential. Nevertheless, statistical evidence for relationships between variables under consideration was not found what leads to some suggestions regarding cluster mapping methodology and further studies in this area, which could result in formulating useful recommendations for public policies aimed at development of clusters.

Key Words: Economic development, competitiveness, clusters, the EU

Introduction

A need for efforts to increase competitiveness of the EU economy have been emphasized in many policy agendas including recent Europe 2020 growth strategy for the coming decade (e.g. European Commission, 2010). As pointed out in one of the communications from the EU Commission a very important way to improve competitiveness is through the development of "world-class clusters" (European Commission, 2008). Such recommendation stems from a widely spread view that not companies themselves but strong clusters are vehicles for competitiveness and innovations.

The concept of clusters is not completely new and has evolved over time. Ever since Marshall's considerations on "thickly peopled industrial districts" (Marshall, 1920) location and concentration have played a significant role in economic thought. The works of Italian scientists on distretti industriali (e.g. Becattini, 1979, Becattini, 1991) have also contributed to today's relevance of spatial economics theory and practice among scientists and policymakers. This article is based on the currently most accepted concept of clusters defined as geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (for example universities, standards agencies, and trade associations) in particular fields that compete but also cooperate (Porter, 1998).

Spatial distribution of economic activity stems from uneven distribution of human population, among other reasons. Certain industries choose specific locations due to the existence of various factors, e.g. the existence of natural endowments. Industrial concentration occurs in certain regions and is explored by many authors (Krugman, 1991, Ellison and Glaeser, 1997, Porter, 1998). In some cases geographic concentration of companies results in the form of clusters. Clusters can be part of

every economy, irrespective of its stage of development, and are formed by and in numerous industries. Their role in innovation and economic development is under great scrutiny. The concept is also frequently brought into the debate on gaining and sustaining competitiveness at country, industry and microeconomic levels. Externalities play a significant role in cluster performance as they link its elements (Porter, 2003). Hence, one of the main characteristics of this concept is the importance of intercompany relations – a particular trait that differentiates clusters from other types of agglomerations and puts stress on related as well as supporting activities.

Clusters are present throughout Europe. Some have developed over centuries, others are a result of rapid changes in contemporary times. European clusters vary among each other in many dimensions, such as their geographic scope or number of industries that form them. The disparities that occur result from differences among particular regions and countries (Ketels and Sölvell, 2006). One of the first steps of cluster analysis is the identification of their existence, which consists of separating cluster-type interdependencies among industries. Fundamental dimension of a cluster occurrence is the level of employment. If in certain sectors or types of economic activities it is noticeably higher than in other parts of a national or regional economy a cluster-type relationships develop. This can also be seen as sign of economic specialization resulting from comparative advantage. Therefore, if clusters are supposed to be important for building competitiveness their development should eventually translate into observable economic effects such as, for instance, a strong competitive position and high productivity of an economy. Having considered this assumption implausible would seriously undermine rationale of policies aimed at development of clusters. In this context the objectives of the article are to identify distribution and relative strength of business clusters in the EU member countries and compare them with the competitiveness of their economies. The key research question is whether the existence of strong clusters is positively related to the measures of competiveness of national economies. If so, a hypothesis that development of clusters contributes to improvement of competitiveness would be empirically supported.

Competitiveness of the EU economies

Competitiveness of the economy can be evaluated from various perspectives. In our analysis we consider two partly interrelated dimensions such as competitive potential and productivity of the economy. With regard to the first dimension we use results of widely known and very comprehensive study published on the yearly basis by the World Economic Forum as the Global Competitiveness Report (GCR). The GCR examines national competitiveness of many economies. GCR's definition of competitiveness states that it is the set of institutions, policies, and factors that determine the level of productivity of a country. The measure it employs to estimate competitiveness is the Global Competitiveness Index (GCI), within which numerous factors are taken into consideration. The GCI is a weighted average of components that belong to 12 groups named pillars of competitiveness named as follows: institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness, market size, business sophistication, innovation. The final score of the GCI for a country is based on successive aggregations according to the structure of the Index starting at the indicator level. Figure 1 illustrates the average country scores for the period 2006/07-2012/13 (horizontal line is the mean value).

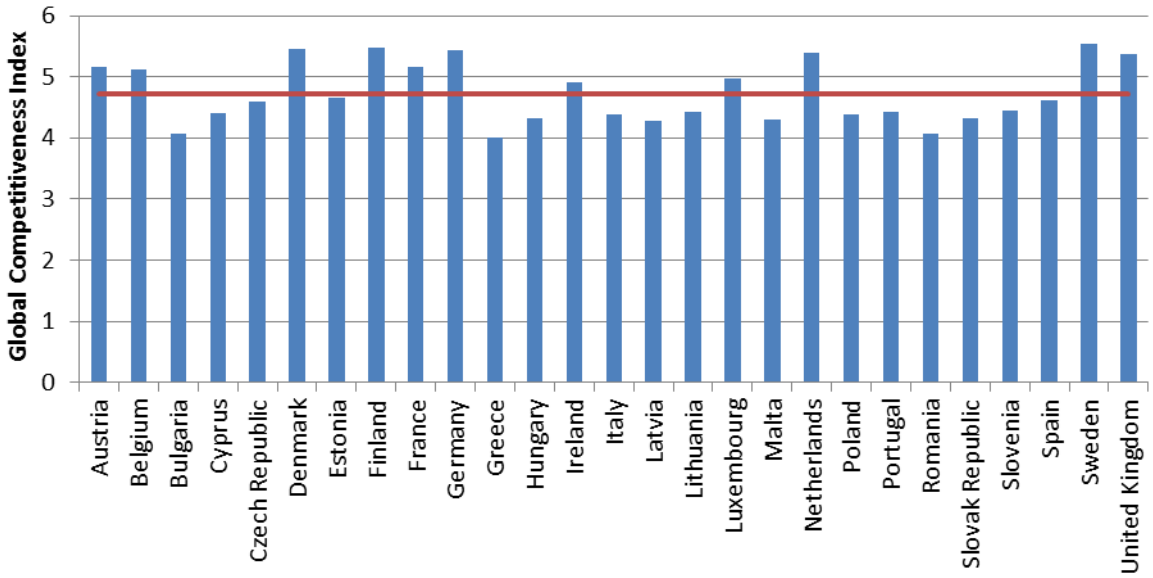

Figure 1. The average GCI scores of the EU countries for the period 2006/07-2012/13

As it can be noticed eleven countries have the values of the GCI above the mean, which accounts for 4.73, whereas sixteen of them have values below it. However, the differences between the EU economies in this respect are relatively small considering the GCI standard deviation of 0.5 and coefficient of variation of 10,5%.

Regarding the second dimension of the competiveness, which is productivity of the EU national economies, it is shown in figure 2 using the average levels of GDP per for the period from 2005 to 2011 (horizontal line is the mean value).

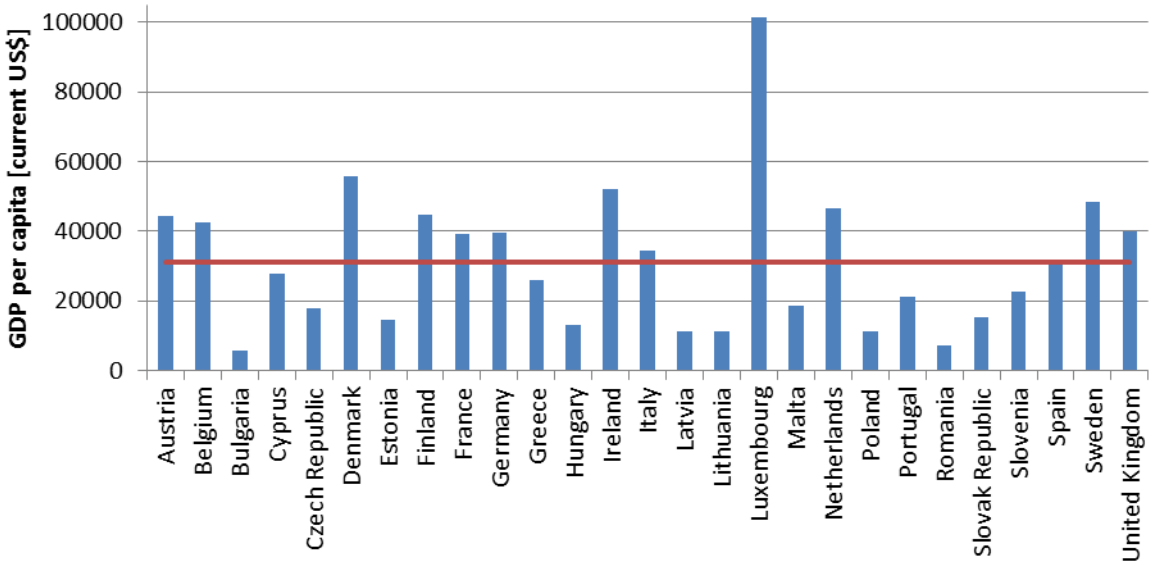

Figure 2. The average GDP levels of the EU countries for the period 2006/07-2012/13

The GDP per capita levels are much more differentiated with a mean of 31.2 thousand US$ and a standard deviation of 20.6 (coefficient of variation of 65,9%). What might be considered interesting, there is a quite strong and statistically significant (at the level of $\alpha < 0{,}01$) relationship between the GCI scores values and GDP per capita levels (figure 3). On one hand it may mean that competitive potential translates somehow into productivity of an economy, and thus, economic welfare of a country. But, on the other hand this also suggests that not all the EU countries use fully or effectively their competitive potential since a fairly big portion of the GDP variation remains unexplained by the variation of the GCI scores.

Occurrence of clusters in the EU economies and their competitiveness

The European Cluster Observatory (ECO) dataset on cluster mapping provides information about regions and sectors in selected European economies in which NUTS2 regions are the basic level of analysis. Sectors are statistically converted into clusters based on agglomerations of employment using data predominantly on the 4-digit level of NACE.

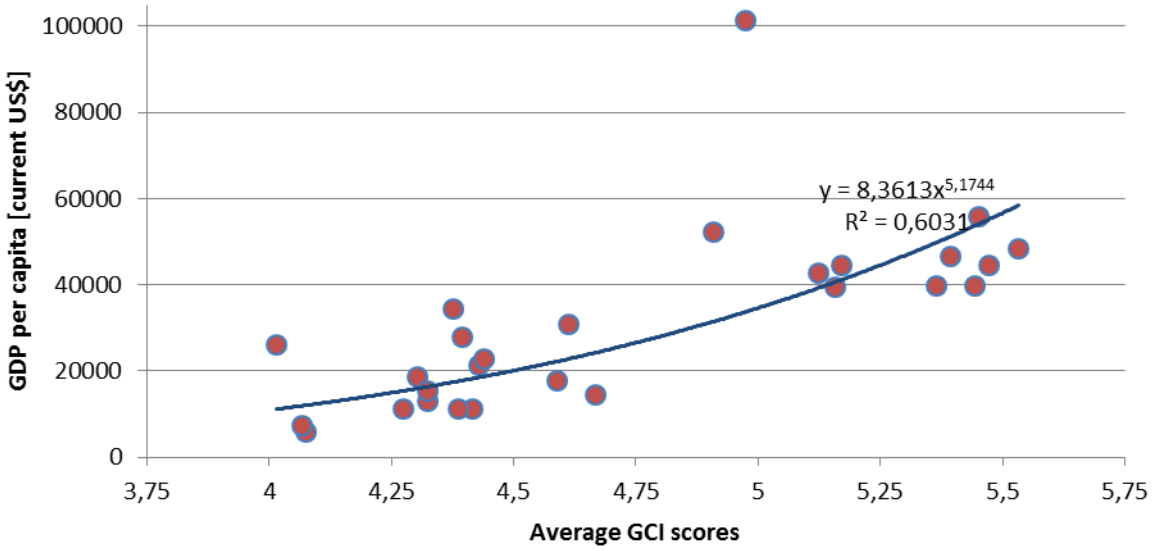

Figure 3. The relationship between the GCI scores and GDP levels of the EU countries

The ECO methodology of measuring cluster strength is based on three dimensions in which if a criterion is met a star is given to a cluster. Altogether each cluster can be given one, two, or three stars. The first dimension taken into consideration is the size of a cluster. A star is awarded to a cluster if the agglomeration of employment within the cluster category in a region is among top 10% of the given type of cluster in Europe. The second dimension uses the location quotient as a measure of specialization. LQ at a level of at least two grants a star to a cluster. The third dimension refers to the share of cluster employment within overall employment of a region. The 10% of clusters with the largest share in region's employment receive a star. Figure 4 illustrates the number of clusters and their strength by countries.

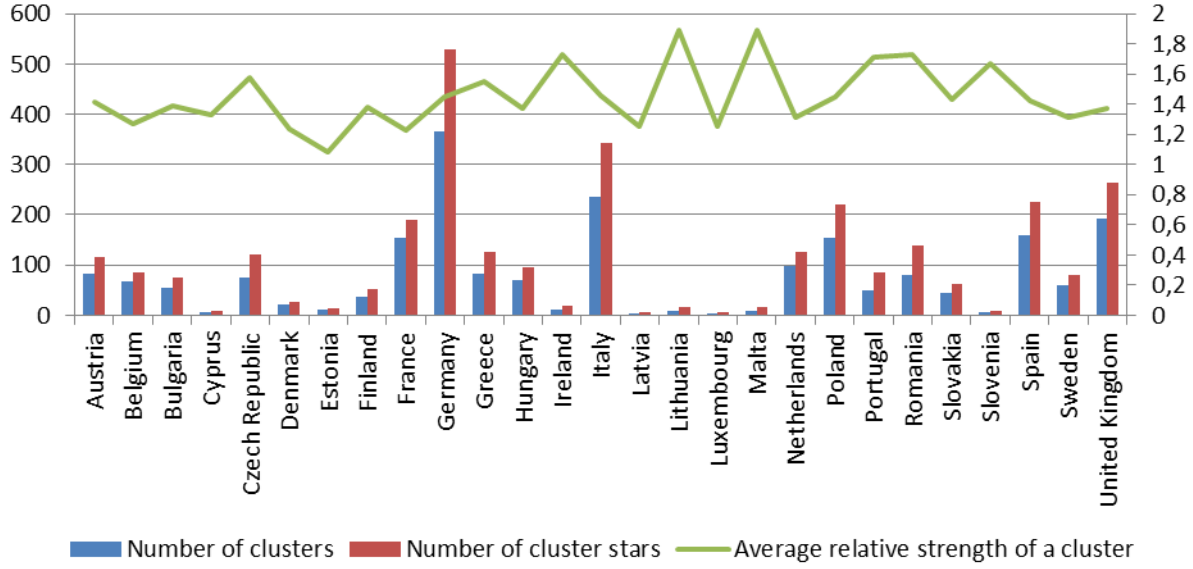

Figure 4. The occurrence of clusters and their relative strength in the EU countries

A great variation can be observed among the EU countries considering both the number of clusters and total number of stars granted to them according to the ECO methodology. The number of identified clusters ranges from only 4 in Latvia to as many as 365 in Germany, whereas the total number of stars granted to the all clusters in a country is even in a wider range i.e. from 5 to 529, again in Latvia and Germany, respectively. Both the number clusters and the total number of stars appeared to be very highly correlated with countries GDP. In the first case coefficient of correlation amounted 0.9 and in the second one to 0.88. It is a clear evidence that occurrence of clusters is dependent on the size of economy. This seems to be understandable as larger economies are likely to have much more diverse specialization profiles than the smaller ones.

Looking for a connectedness between occurrence and relative strength of clusters in the EU economies and their competitiveness we tested for correlations between the number of clusters and the number of granted stars and the GCI scores and GDP per capita levels. Table 1 includes the results. In addition, figure 5 depicts positioning of the EU economies taking into the number of identified clusters and GDP per capita levels.

Table 1. Coefficients of correlation between the number of clusters and the total number of stars granted and measures of competitiveness of the EU national economies

Measures of competiveness	Occurrence and relative strength of clusters	
	Number of clusters	Number of stars granted
The GCI scores	O.26	0.21
The GDP per capita levels	0.04	0.01

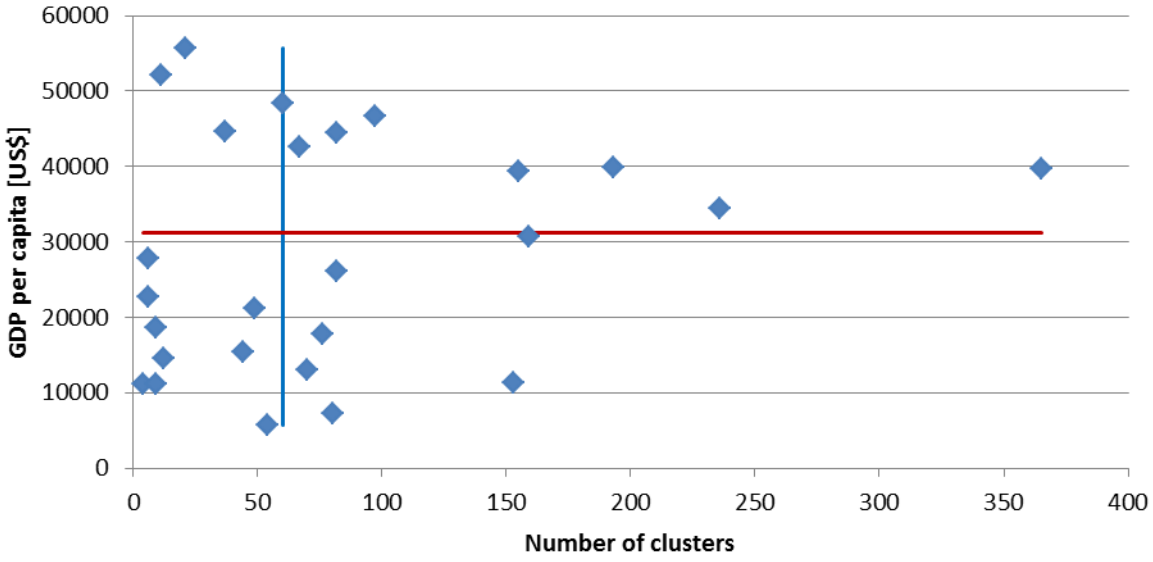

Figure 5. The number of business clusters versus GDP levels of the EU countries

Although the calculated correlation coefficients take expected positive signs they should be disregarded as being statistically insignificant (especially the ones for the GDP per capita levels). An explanation for the lack of statistically proven connectedness between occurrence and relative strength of clusters and the applied measures of competitiveness of the economies can be drawn from figure 5, which in a sense presents a four parts matrix showing where particular countries (Luxembourg was omitted as an outlier) can be allocated with reference to the number of clusters (below or above the median value represented by the vertical line) and the levels of GDP per capita (below or above the mean value represented by the horizontal line). As it can be seen the countries are distributed in the matrix in such a manner that existence of a relationship cannot be really expected.

Conclusion

According to some opinion makers development of business clusters and supporting cluster initiatives is an obvious solution to improve competitiveness of the EU national economies. Unquestioned acceptance of such a view seems to be taken for granted without critical assessment of

the impact of clusters on the competitiveness of economies. Unfortunately, our findings do no support this type of view if cluster phenomenon analyzed at a macroeconomic level. A direct relationship between the occurrence and relative strengths of clusters and the competitiveness of the EU national economies member was not found. Hence, a hypothesis that existence of strong business clusters may have a positive impacts on competitiveness of the EU national economies cannot be confirmed. However, it has to be stressed that our analysis is not free from caveats. First of all the classification of clusters used in the analysis can be considered debatable as the employment data may be inadequate to properly identify existence of clusters and assess their strength. Other economic variables and qualitative factors like cooperation within the clusters and level of social capital, which may play important role are simply omitted. Finally, the connection between existence of clusters and competitiveness of economies may not be direct, therefore, when designing policies aimed at supporting cluster development all potentially important linkages should be examined with great scrutiny.

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