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## Article

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**Clusters and regional development: the dynamics of agglomeration processes and its contribution to the development of North East region of Romania**

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**Abstract**

**Purpose** – This paper aims to analyze the dynamics of agglomeration processes in the North East region of Romania and to connect the results with the process of deepening of Romania's European integration.

**Design/methodology/approach** - The research method includes an analysis in dynamic of two economic sectors: agriculture and IT&C. Firstly, I analyzed the transformation of the GDP from 2000 to 2011 so as to gain insights from the evolution of the North East region during the EU accession and economic crisis. Secondly, I used the Location Quotient method in order to assess the agriculture and IT&C sectors in the North East in comparison with the other regions of Romania.

**Findings** – The results show a strong specialization degree in agriculture, where the North East region has the higher value of the Location Quotient in comparison with the other regions, and a weak specialization in IT&C, where the region ranked 5 from 7 in 2011. At the same time, regarding the IT&C we can see a positive tendency during the years, possibly explained by the presence of one of the most important university centers from the country and by the multinationals that have started to come after the EU accession. The over-representation of the agriculture in the regional economic structure is not specific for the North East region; other four Romanian regions had in 2011 a strong relative specialization in this field.

**Research limitations/implications** – The analysis can be completed using more quantitative indicators like the export value of the sector as compared to total regional export value. The limitation is that in Romania there are no data on exports at the regional level.

**Originality/value** – This analysis uses Location Quotient method in order to compare the levels of specialization across the Romanian regions.

**Keywords:** Regional development, clusters, cluster policies

**JEL Classification:** R110

**1. Introduction**

The economic agglomeration processes have been studied over time with the aim to explain why production and commercial activities tend to concentrate in some areas. The cluster concept derives from Alfred Marshall's theory about the economic space around London where companies were interconnected by three elements: labor force, specialized suppliers and accessible knowledge. The theoretical base comprises traditional trade theories where the regional specialization is brought on by the comparative advantages; regional economics' polarization theory that emphasizes the potential cumulative causation or factor agglomeration in the center and backwash effects for peripheral regions; and New Economic Geography explains the concentration through transaction costs and economies of scale (Stirboeck, 2002). In the 90s, the concept of cluster was brought by Michael Porter through his "diamond economic model". He demonstrates that in order to

explain the economic success of a country or region is not enough to just analyze the factors of production, it is also necessary to assess the interaction between the following factors: demand, business strategy and competition, factors of production, supply chains and horizontal integration. Porter describes the concentration of economic activities as a result of the competitive advantages of companies to identify new ways to compete in an industry and to bring innovation to market (Porter, 1998).

The industrial clustering has become a subject for more and more studies after the success of some industrial groups like Silicon Valley. Observing the phenomenon of geographical concentration of economic activities caused discussions about the impact that public sector can play in stimulating innovation and economic growth. Although clusters are structures that occur spontaneously due to market forces, public sector recognized the potential that they have, especially for the regional economies, and decided to

intervene in order to facilitate their establishment and spread best practices. This activation of the cluster public sector came largely due to the expansion of regional development field where the concern is to find ways and opportunities for economic and social development of the regions.

Cluster development model is based on a comprehensive approach, involving all relevant actors to increase the region's competitiveness. Clusters have the potential to become forums for collaboration between the private sector, public authorities and universities in order to create constructive dialogue mechanisms for finding the problems and solutions. Moreover, in the context of public policy, the concept of cluster represents a good model for economic organization of the regions. The cluster policies have the capacity to reorient economic policies from industries or individual firms to groups of firms linked around a common field, which contributes to regional specialization. However, there is a risk related to the flexibility of the concept, which can be used in an inappropriate manner by policy makers. Thus, especially in Romania, the academia needs to pay more attention for the research of industrial clustering. The international literature focuses mainly on developed countries, where clusters are the subject of public policy for a long time. For Romania and its regions, the approach must be specific and adjusted to the national and regional characteristics.

Thus, the article aims to explore the attempts of analyzing the potential clusters in the North East region and to use the Location Quotient method in order to assess the dynamics of the agglomeration in two economic areas selected to be specialization sectors: agriculture and IT&C. These two sectors were selected due to their inclusion in the Smart Specialization Strategy of the North East Region for 2014-2020.

## 2. Clusters and regional development in Romania

In the literature about Romania's agglomeration processes there are papers focusing on the exploration of the changes in the spatial agglomeration across Romanian regions after the communist period. Some results show a strong decline of the industrial sector and a growing proportion of employment in agriculture during the 1990s (Dirzu, 2013). A number of studies have tried to identify potential clusters in Romania. The first serious attempt was a study coordinated by the International Centre for Entrepreneurial Studies from Bucharest in 1998 that used a methodology based on the diamond model of Michael Porter. The results showed three potential clusters in software production, marine industry and wood industry. Another research in this field was the paper of Marco Riccardo Ferrari from 1999 that analyzed companies at the county's level and identified also three clusters in the early form: wood, textiles and ceramics industries. Also, there was a project between 2003 and 2004 that had the aim to realize an analysis of the potential clusters. The methodology was based on using macroeconomic data about the industrial structure of the country. As a result, the project has identified potential clusters in textiles

(North East region and West region), software (West region and Bucharest), chemical industry (Centre region), etc. The WEID project has represented another attempt to analyze clusters from Banat-Crișana and Arad-Timișoara.

North East region is the largest of the eight development regions of Romania, both in terms of territory and population. At the same time, it ranks last in terms of GDP per capita, due to low productivity and weak infrastructure development. The overall objective of the North East Regional Strategy is to reduce the gap compared to the developed regions of Romania by increasing regional competitiveness and attractiveness. The most important regional actor is the Regional Development Agency of North East that has undertaken a number of measures in order to analyze the region's potential and to create strategies and development plans. The Agency has identified in 2013 few potential clusters in agro-food, IT&C, textiles and health. The problems of the clusters development are related to the lack of companies that would complete the value chain and weak interaction between companies.

There were several studies that aimed to identify specialization fields and potential clusters in the North East region. The Center for Strategy and Competitiveness from the Stockholm School of Economics has realized in 2011 a report about the potential clusters in Romania. The research methodology focused on three factors: the size of clusters, the level of specialization and the extent to which the region is dependent on the activity of clusters. For the North East region, the selected specialization sectors were clothing, agriculture, furniture production and textiles. Also in 2011, the project "Support for management authority in formulating and implementing policies on competitiveness operation" funded by European Commission had the aim to analyze the situation on existing and potential competitiveness poles in the regions of Romania. After a qualitative analysis at regional level, the researchers had identified the following fields as specialization areas in the North East region: textiles, tourism, agro food, and automotive.

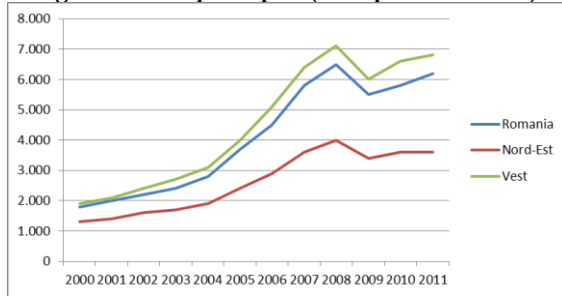
More recently, the Regional Development Agency has selected the economic sectors relevant to the development of clusters in the context of the regional economy. Thus, the Regional Development Strategy for 2014-2020 has included the action "support for the creation of new clusters that may lead to increased regional competitiveness: IT&C, food industry, creative industries, tourism". In this context, the existing clusters require a process of expansion and development and the potential clusters have to be assisted. The responsibility for the implementing and monitoring of the strategy is assumed by the Regional Development Agency, but this institution has serious limitations that can be overcome only through a process of decentralization that can empower the agency in terms of broadening the prerogatives that can create effective policies at regional level for the public sector intervention in the field of clusters development.

## CLUSTERS FROM NORTH EAST REGION

In the socialist period, the planned industrial structure of Romania didn't allow a development of dynamic industrial agglomeration and subsequently led to a less efficient spatial allocation of economic activities at regional level. (Dirzu, 2013)

Firstly, we'll look at the transformation of the GDP from 2000 to 2011 so as to gain insights into the process of becoming member of European Union and confronting the economic crisis. The North East region had the smallest GDP per capita during the years, increasing to 4.000 Euro in 2008, and decreasing during the economic crisis to 3.600 Euro in 2011. When we compare the North East region with the West region and with the average of Romania, we can see that the growth rate of the poorest region from the country was smaller, possibly showing that the effects of European economic integration was disproportionate. The fall of the GDP per capita during the crisis show us the poor connection between the economy of North East region and the global market that, in comparison the fall of the same indicator at the West region and national level was higher.

Figure 1: GDP per capita (EUR per inhabitant)



Source: Eurostat

Secondly, I'll use the Location Quotient indicator in order to assess the agriculture and IT&C sectors in the North East in comparison with the other regions. Location Quotient (LQ) allows us evaluating the relative degree of concentration of a given activity in a given region. The rationale underlying this index is that if  $LQ > 1$ , the industry is „over-represented” in the case study region compared with the rest of the regions. If  $LQ < 1$ , the sector is „under-represented” in the region.

Change in LQ over a period of time is seen as a valuable insight in regional economic activity and provides information about the growing or declining of a regional clusters compared with other regions (Sambidi, 2008).

Figure 2: Location Quotient formula

$$LQ_i = (e_i/e) / (E_i/E)$$

where,

$LQ_i$  = location quotient for sector in the regional economy

$e_i$  = employment in sector i in the regional economy

$e$  = total employment in the local region

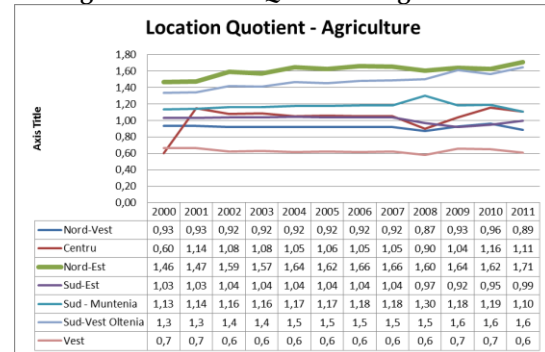
$E_i$  = employment in industry i in the national economy

$E$  = total employment in the national economy

In order to diagnose the position of the North-East region in the national structure in terms of differences in investment and employment structure, indices of relative specialization were calculated for each region and each year. The sectorial investment and employment shares are analyzed in relation to the national average.

The results of LQ calculations show the variation of spatial agglomerations in terms of employment change in two individual sectors between 2000 and 2011. Measuring an average location quotient index helped us in providing an overview of the transformations regarding the evolution of regional industrial agglomerations. The period was selected due to the availability of data and allows us to analyze the fluctuations during two major events: the European accession and the global crisis.

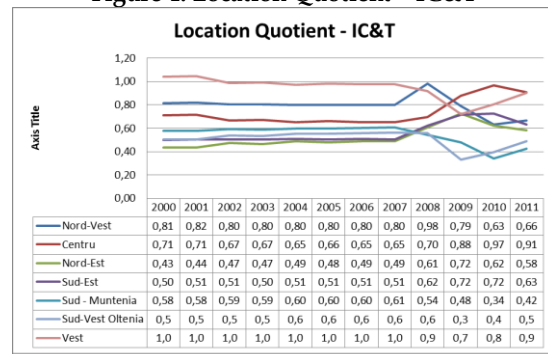
Figure 3: Location Quotient - Agriculture



Source: own calculation based on Eurostat data

According to this specialization index, the agriculture is „over-represented” in the North-East region. Even if it is a traditional sector and there were some critics related to its inclusion in the Smart Specialization Strategy, we can't ignore the weight that it has for the region. The agro-food topic is recognized as a specialization regional sector in five Romanian regions. In this field there is one cluster present in the region, IND-AGRO-POLE (Food & Agricultural Cluster). In 2011, there were 2.060 firms and 18.173 employees in agriculture. Also, at the North East level the share of employees in agriculture from total population is 42% higher than at the national level (Strategy for Smart Specialization of the North East Region).

Figure 4: Location Quotient - IC&T



Source: own calculation based on Eurostat data

The Location Quotient in IT&C is „under-represented” in the North-East region, but still, in 2011 the region ranked 5th from the 7 analyzed regions, while in 2000 was the last one compared with the other regions. The evolution of this indication over time is due to the presence of a university center in Iași, the biggest city of the region. Another possible explanation is that after the European economic integration the multinational came in the Romanian cities with more IT graduates. The problems claimed in this field are related to a weak cooperation between the universities and business, the knowledge is not with the labor market demands (Rotaru, 2015). In this field the region has two clusters, ICONIC (Interactive Cluster of New-media Industry City of Iași) and EURONEST IT&C HUB (IT&C Regional Innovative Cluster).

The analysis can be completed using more quantitative indicators like the numbers of firms in the sector relative to total number of firms in region and export value of the sector as compared to total regional export value. Also, the analysis can be realized at the county level (NUTS III) in order to have a better image of the clusters position inside the region.

### 3. Conclusions

The aim of this paper was to explore the agglomeration processes in the North East region of Romania. The agriculture and IT&C sectors were selected because they are two of the specialization sectors proposed in the Smart Specialization Strategy of North East region for 2014-2020. The used indicator was Location Quotient that allows us to measure the relative specialization using the employment data. The analyzed period was 2000-2011, a period with two significant events: the EU accession and the economic crisis. The specialization indicator was calculated for the North East region and for the other six regions of Romania, except Bucharest, year by year.

The results show a strong specialization degree in agriculture, where the North East regions has the higher value of the Location Quotient in comparison with the other regions, and a weak specialization in IT&C, where the region ranked 5 from 7 in 2011. At the same time, regarding the IT&C we can see a positive tendency during the years, possibly explained by the presence of one of the most important university centers from the country and by the multinationals that have started to come after the EU accession. The over-representation of the agriculture in the regional economic structure is not specific for the North East region; other four Romanian regions had in 2011 a strong relative specialization in this field.

In the future works, the analysis will be extended in order to include more economic sectors and also, other indicators as the number of firms and the export value.

### Acknowledgement

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