Industrial Agglomerations and Clusters.
The Textile and Textile Products Industry from Romania

Monica DUDIAN[1]
Liliana CRĂCIUN[2]

ABSTRACT
The objective of this article is to identify the formal clusters and potential clusters from the textile and the textile products from Romania. The statistical method has been used to delimit the potential clusters. In addition, there have been studied all the available works and internal and international reports on Romania, having as topic this type of industrial organization. The research conclusions are the following: (1) there are two young formal clusters, holding the premises of a "triple helix": Astrico North-East and TMV South-East; (2) the spreading of the textile organizations, next to the structure of formal clusters, suggests the possibility of the natural building of three clusters: a common one for the North Eastern and Eastern regions, another one for the Central region and the third for the North-Western and Western regions. With reference to the professional literature, this work brings the picture of the spatial distribution of the textile industry in Romania.

KEYWORDS: *cluster, textile industry, region, agglomeration*

JEL Classification: L67

Introduction

The organization of clusters is regarded as a key element in the economic policy for the regional development. The economic literature is abundant in works on clusters and their impact on the regional economic stability, creation of value added, jobs and innovation. The objective of this article is to identify the formal clusters and potential clusters from the textile and the textile products from Romania.

In the review of the Romanian textile industry, there has been used the cluster definition given by Porter (1998), as this sector is considered a traditional one, where the geographical proximity is important. The county has been the analysis unit for the geographical area. Starting from it, the statistical data have been integrated to region level. In order to identify the agglomerations of enterprises the statistical method has been used, having as source the Amadeus database. The starting point has been the distribution of enterprises into the textile industry from Romania and there have been identified the counties and regions with the highest number of companies and the highest business volume. As the number of

---

[1] *Monica DUDIAN,* The Bucharest Academy of Economic Studies, Romania,
E-mail: monica.dudian@gmail.com
[2] *Liliana CRĂCIUN,* The Bucharest Academy of Economic Studies, Romania,
E-mail: craciun_lili@yahoo.com

enterprises is not relevant for their market power, the company ranking for each county has been done in accordance with the turnover. Then, there have been taken the first four companies, fact allowing the determination of the industrial concentration indicator as the market share of the first four companies. The indicator determination has had as grounds the argument that cooperation is more likely to appear into an oligopoly structure, and the powerful the oligopoly is, the higher the inclination towards cooperation is (Shephard & Shephard, 2004). Therefore, there have been determined the counties and regions with high probability of cooperation, considered as holding the potential of natural clusters. In respect of the official clusters, there have been used information available on their web-sites and into the economic media from Romania.

The work comprises, besides introduction and conclusions, two parts: the first one is a review of the literature, and the second one is the proper research. The main conclusions of the article are: (1) there are two very young formal clusters gathering the premises of a "triple helix": Astrico North-East and TMV South-East; (2) the spreading of the textile organizations, next to the structure of formal clusters, suggests the possibility of the natural building of three clusters: a common one for the North Eastern and Eastern regions, another one for the Central region and the third for the North Western and Western regions. With reference to the professional literature, this work confirms the findings of the studies conducted in other emergent countries and brings the picture of the spatial distribution of the textile organizations in Romania.

1. Theoretical References

1.1. The cluster concept

According to Porter (2000, p.16), the cluster is "a group of interconnected companies and associated institutions that are geographically close, within a particular field, linked by common elements and complementarities". To clarify and operationalize the concept of cluster, Porter (2000, p.3) created an analysis framework called "Porter's diamond" including four factors: the conditions generated by the production factors (the amount of production factors and their cost: natural resources, human resources, capital, physical infrastructure, administrative infrastructure, informational infrastructure, scientific and technological infrastructure), the context of the strategies of companies and the competition between them (context to encourage the appropriate investment and progress, given the intensive competition between local companies), the demand requirements ("sophisticated and strict local demand, consumers' needs to anticipate the needs of other regions, specific local demand, on specialized segments, to be globally served"), the connex industries and the sustainable ones ("presence of efficient local suppliers, existence of competitive connex local industries").

Kosfeld, Eckey and Lauridsen (2009, p.3) define cluster as a group of companies/branches geographically centralized, which *often conclude agreements and form alliances*. The geographical perspective comes out also into the European Commission definition (2002, p.13), stating that the regional cluster is "a concentration of interdependent companies within the same or similar industrial sectors". The cluster does not necessarily involve the existence of formal agreements between companies. Szanyi et al. (2010, pp.113-114) distinguishes between the cluster – institution, characterized by formal agreements and the cluster – economic phenomenon, defined as "spatial business concentrations and connex institutions with activity specialization and active cooperation relationships between

members". Bresnahan, Gambardella and Saxenian (2001, p. 836) define the clusters in a simple manner: "spatial and sectorial concentrations of companies". It seems that the geographical dimension is essential for the cluster definition, but the empirical theory and analyses question that dimension. The previous assertion is strengthened by the use of connected terms when talking about grouping the independent organizations: industrial district, production system, regional innovation system or networking (OECD, 2007, pp.29-32). *The industrial district,* economic and social concept, nominates a group of persons and organizations (enterprises, education and research units, non-governmental organizations, administrative entities and so on) belonging to a certain geographical area characterized by complementary economic concerns and common cultural values. According to OECD (2007, pp.33) the spatial geographical determination of the activity and the interactions generating positive externalities upon the competitive economic and extra-economic factors are definitive elements of the industrial district. *The production system* is another concept connected to that of cluster, and the term system refers to the connexions between the corporations which are simultaneously in competitive and cooperating relationships (Storper, 1997). *The regional innovation system* focuses on innovation, on knowledge production. In this respect, the unit of analysis is not the company any longer, but knowledge, its dissemination and effects within a region. The term *triple helix"* is used for designating the cooperation between corporations, universities and government within a regional innovation system. It is very close to it the term of *sector systems of innovation and production* defined as "a set of products and a set of agents that perform interactions of market and non-market type for creating, producing and selling those products" (Malerba, 2002, quoted in Wixted, 2009, p. 36). The concept of *"networking"*, of forming networks is a generic one, which does not necessarily refer to a geographically delimited region, but emphasizes the connexions between companies, regardless of their place of action. Therefore, the terms used to nominate the groups of connex enterprises differ in accordance with the particular aspect they try to emphasize, that is: the affiliation to a region, the economies of production costs and transaction costs, the innovation capacity or the network set-up.

The size of the cluster concept could be easily understood with the help of various classifications of clusters into the professional literature.

Table 1. Classification of clusters

Authors	Types of clusters	Description
Markusen (1994)	Marshall Clusters	Comprise medium and small local firms, strongly interconnected and significantly supported by authorities.
	"Sunshine" clusters (Hub and Spoke)	Comprise one or more big companies, round which small satellites, supliers of inputs and services gravitate. The cooperation is mainly of tenderer-customer type between the small companies and the prevailing company, but there is no cooperation between competitive companies within the innovation field or for the market regulation.
	Satellite plants	Comprise medium and big branches, relatively independent, of the externally-based multi-plant firms. The cooperation between them, including the

Authors	Types of clusters	Description
		research-development field, is minimal.
	State-anchored clusters	Networks dominated by a firm or a public entity (e.g. a military base) round which local firms gravitate. The cooperation is mainly of tenderer-customer type. Local companies do not significantly contribute to the cluster development, this depending first of all on the capacity to raise the state support.
Gordon and McCann (2000)	Genuine agglomerations	Assembly of firms belonging to the same region, without precise cooperation relationships between them.
	Industrial clusters	There are market relationships between tenderer-customer type firms, including the cooperation of the market structures with the prevailing company.
	Social network-centered clusters	Firms interconnected by complex cooperation forms developed on long term.
Porter (2003), following the USA example	Resource-dependent industry	Industries based on the natural and logistic resources belonging to a certain region. Their performance depends on the ability to exploit the human resources and the informational-technological ones.
	Local industry	Industries that meet local and regional needs. They have limited possibilities to increase performance due to the local character.
	Traded industry	Industries that do not limit themselves to the local demand but they compete with other corporations at national and mondial level. They are the most competitive and they are essential for the regional development.
OECD (2007)	Science-based	Young industries that comprise companies whose cooperation is centered on innovation.
	Traditional	Adult industries described by a cooperation record and by incremental innovation.
Hermans, Castiaux, Dejardin, and Lucas (2010) following the Belgium example	Regional clusters	Organizational networks, mainly enterprises freely created by the "bottom-up approach" and regionally competitive.
	Global clusters	Networks of heterogeneous organizations (companies, universities, research and professional training organizations), freely created and also constituted by the state technocratical selection, visible and competitive at international level.

Source: authors' adaptation on the studies mentioned into the table

The above table shows the diversity of clusters in terms of the following aspects (elements also pointed out by Enright, 1998): industrial organization and coordination mechanisms (market structures with the prevailing company or monopoly structures, governance mechanisms of market type, hierarchy or hybrid form in Williamson's view, 1996); geographical coverage (local, regional, national); development stage (young or adult) and innovation capacity (powerful or weak).

1.2. Clusters into the textile and textile products from Romania: reference studies

In Romania, the concept of cluster has really emerged into the economic literature, authorities' documents and business environment in the last ten years. The first work which tried to shape the Romanian clusters was coordinated in 1998 by the International Center for Enterprise Studies (CISA). Since then, up to 2011, to the best of our knowledge, there have been performed seven empirical researches to locate clusters. Out of these researches, only some of them have identified the incipient clusters from the textile and textile products, as it is shown into the following table:

Table 2. Potential clusters into the textile industry from Romania

Empirical research	Cluster or agglomeration to potentially become cluster (underachieving clusters)
Ferrari (1999)	Focşani region
Majocchi (2000)	Timis and Arad
WEID Project (West-Eastern Industrial Districts, 2001 – 2004)	Timiş region
INCLUD Project (Industrial Cluster Development, 2003-2004)	NE region, especially Bacau Western region, especially Timis
Cluster Mapping Report (2010)	Bucharest (clothes, fashion) Timisoara (textiles) Piatra Neamt (also in NE, clothes and footwear)
Watermode Project (2011), quoting as source the Ministry of Economy, Commerce and Affairs, Department of Industrial Policy and Competitiveness (2010)	Savinesti Bucharest

Source: Ferrari (1999) Majocchi (2000) Guth and Coşniţă (2010), Watermode Project (2011)

There are three main elements that have determined the set-up of the agglomerations describes into the previous table: (1) custom, for the clusters into the Nord-Eastern region (confirming the results of other studies, the examples of other countries, dependence on past); (2) partnership with companies from Italy, for Timiş-Arad region (3) externalities generated by the capital and national development centre status for Bucharest (according to Porter's diamond there can be mentioned: availability of capital and highly qualified labour, infrastructure and suprastructure, high and strict demand, competitive environment). All empirical researches on Romania agree that the industrial agglomerations do not take the shape of cluster understood as network of connex organizations (e.g. Guth & Cosnită, 2010, Csaba, 2007, Pîslaru & Aristide, 2004, Ferrari, 1999), assertion that stands for the textile industry, too. Guth and Coşniţă (2010) consider that the weak turn towards association and cooperation in Romania is mainly due to the communist past and imposed collectivization. As the natural voluntary cooperation is unlikely, they assert that in Romania the "Triple helix" should be replaced by "*Four clover*", and the four leaves of the clover are: universities and research institutes, companies, mainly the small and medium ones, catalyst authorities and organizations. The last ones comprise the specialized service suppliers

(charged with the know-how transfer) and the general counselors (competent into the project management, communication, knowledge transfer and others).

The next chapter confirms this assertion on clusters – institutions from Romania and it emphasizes the potential formation of several natural clusters within the North-Western and Western, Central and North-Eastern and Eastern regions.

2. Potential Clusters and Formal Clusters into the Textile and Textile Products from Romania

In order to identify the industrial agglomerations from the Romanian textile industry there has been used the Amadeus database referring to 2285 companies functioning in this country in 2009. The distribution per counties of these companies is represented in the following figure:
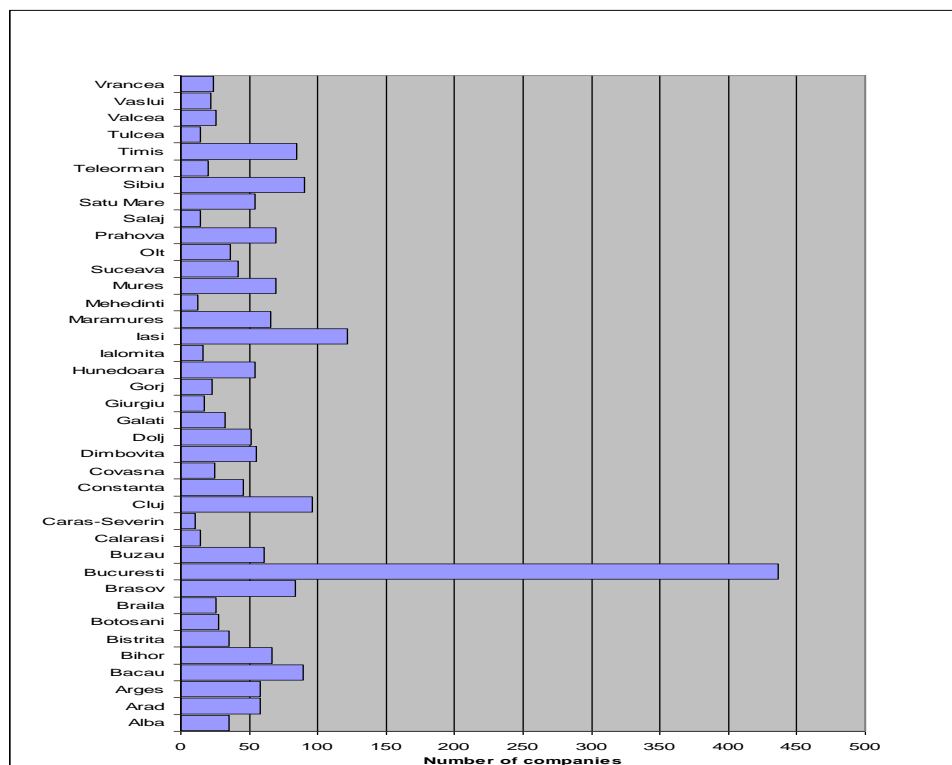
Figure 1. Textile firms distribution on the Romanian territory
Source: Amadeus, 2011

Figure 1 highlights the special status of the capital where 19% of the firms are concentrated. Also, Iaşi stands out from the counties in respect of the large number of firms (122), compared with the rest of the country. At the same time, five counties comprise each more than 84 companies: Cluj, Timiş, Braşov, Sibiu and Bacău. In terms of development regions, the largest number of companies is into the Bucharest-Ilfov region and other three

regions have more than the national average number of companies (of approximately 285), North-East, Central and North-West:
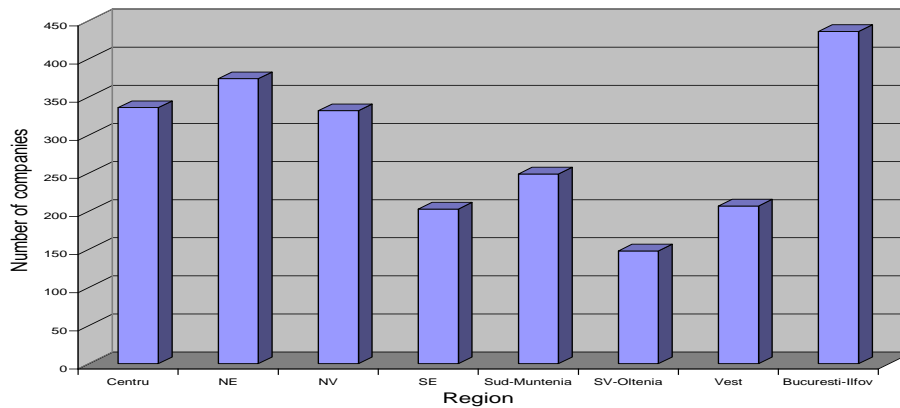

Figure 2. Grouping of textile firms per development regions
Source: Amadeus, 2011

In terms of business volume, measured by turnover, the situation is significantly different, as it shows Figure 3. Two counties have supremacy, Bucharest and Botoşani, with more than 70 million euro turnover. They are closely followed by Bistriţa and Neamţ, with more than 65 million euro turnover. The two counties from the same development region, North-Eastern: Botoşani and Neamţ stand out. Braşov and Timiş are far away, and they are followed by a larger group: Arad, Buzău, Iaşi, Mureş, Sibiu and Harghita, the last three counties belonging to the Central region. The remaining counties have the turnovers below 20 million Euro:

The situation per development regions is shown into figure 4, where there can be noticed the supremacy of the North-Eastern region. This is followed by the Central region and, very distant, by the North-West region:

The various situations reflected by the number of firms and the turnover have suggested the possibility of higher concentrations existence, of tight oligopoly type, per certain counties and regions. Therefore, we have calculated the concentration indicator for the above listed counties, the only ones overcoming the average business level (approximately 20,251 thousand Euro), where the cumulated turnover has overpassed 30 million euro, similarly to the development regions.
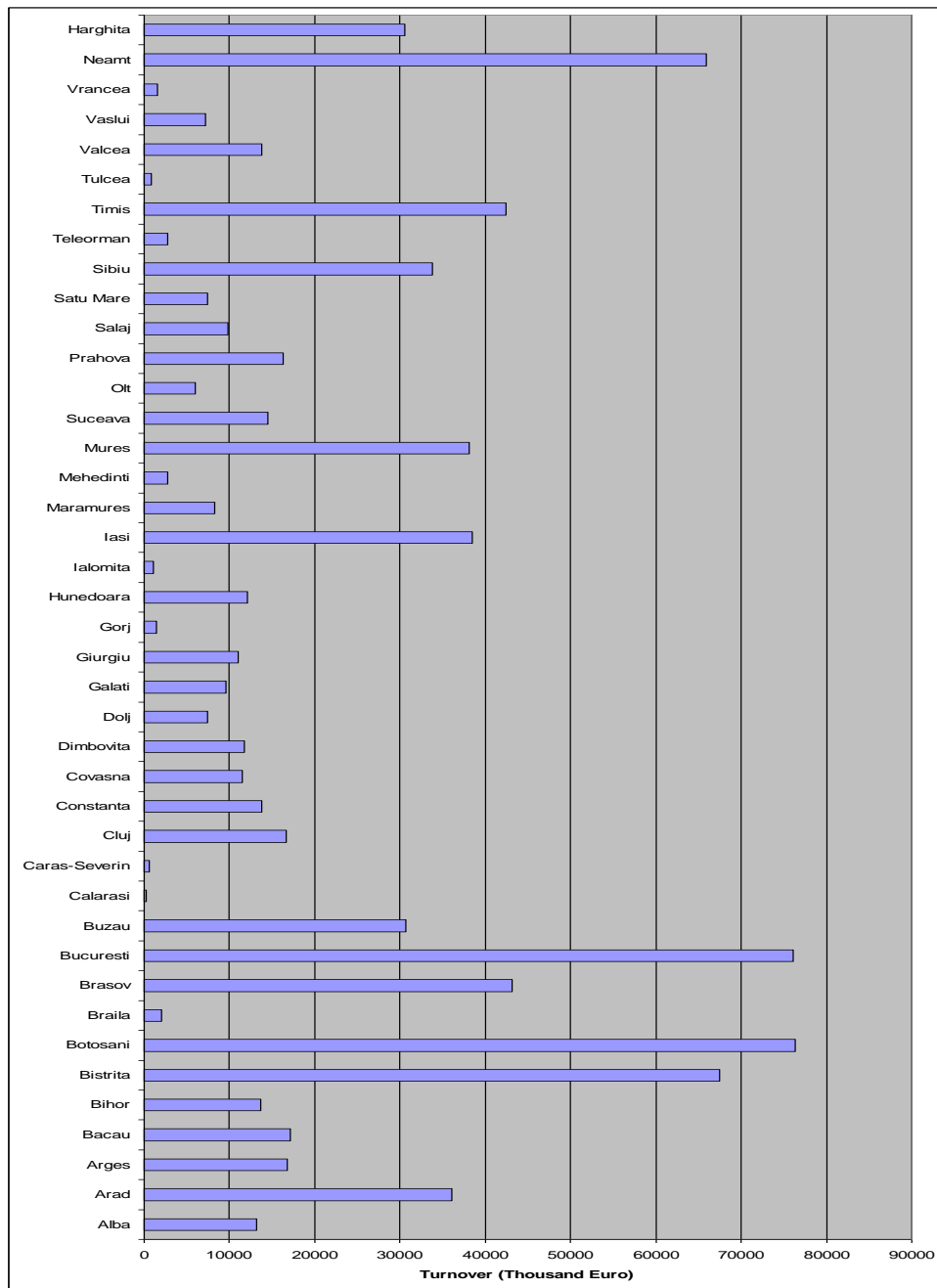
Figure 3. Textile turnover distribution per counties
Source: Amadeus, 2011
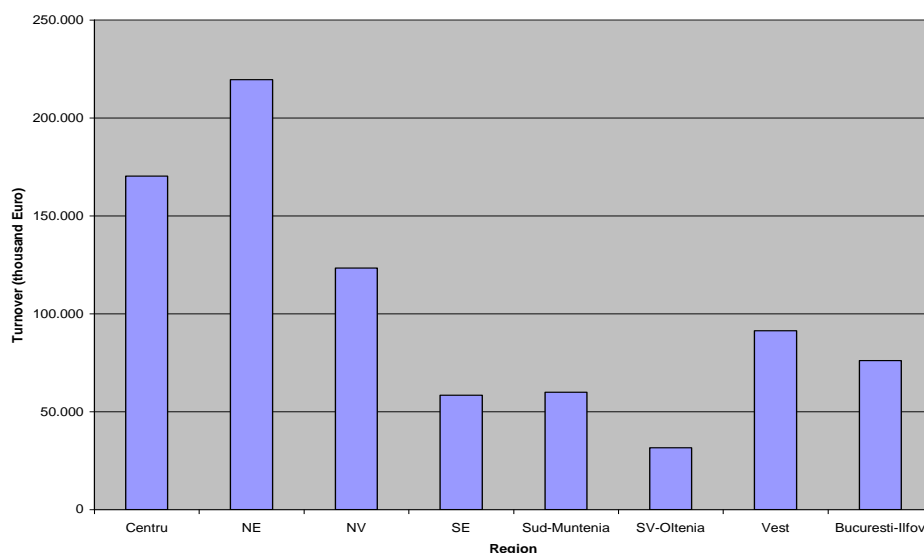
Figure 4. Textile turnover distribution per region
Source: Amadeus, 2011

Table 3. Concentration indicator into the textile industry per counties and regions

County	Concentration indicator (%)	Region	Concentration indicator (%)
Bucharest	35.14	Center	32.09
Botoşani	97.75	NE	51.87
Bistriţa	83.44	NW	45.68
Neamţ	92.35	SE	71.56
Brasov	58.17	South-Muntenia	37.93
Timis	57.84	SW-Oltenia	42.96
Arad	63.98	West	37.26
Buzău	91.12	Bucharest-Ilfov	35.14
Iaşi	73.00		
Mureş	74.20		
Sibiu	57.77		
Harghita	92.21		

Source: Amadeus, 2011

The table highlights very high concentrations, over 90%, into Botoşani, Neamţ, Buzău and Harghita counties. Moreover, as an additional observation, there can be said that in the last three counties from the above list there are prevailing firms holding over 40% of total turnover (in accordance with Amadeus, 2011). In Neamţ county there is only one powerful company at Central and Eastern Europe level (RIFIL) holding over 54%. In Buzău, Filati company, belonging to the same group as RIFIL, holds approximately 48%, and in Harghita the Coats Odorhei SRL firm has a share of 74.6%. In other four counties, Bistriţa,

Arad, Iaşi and Mureş, the concentration overpasses 60%, indicating a powerful oligopoly. In Mureş, GST Automotive Safety RO SRL can be identified as a prevailing firm, with 43.4% of the market. Therefore, the inclination towards cooperation is very powerful in eight counties overcoming the average business level, out of which three are situated in the North-Eastern region. Given that, the emergence of the formal cluster ASTRICO, comprising nine firms belonging to the North-East region, round RIFIL company, can be seen as a natural evolution of the textile industry in this area. Other three counties, Timiş, Braşov and Sibiu, have a medium to high concentration indicator, without having a prevailing firm. Therefore, there can be said that it is possible for a cluster to be built up to cover the central region, cluster which is initiated by the prevailing firms from Harghita or/and Mureş. This assertion is strengthened by the high level of concentration from the other counties of the Central region: Covasna, 93.2% and Alba, 91.16%, both with prevailing firms. Into the Western region, a cluster can be built up round two big centres: Arad and Timişoara, the concentration indicator showing preference for the first one. On the other hand, the greater fragmentation of the region suggests a possible cooperation to cover the entire western country. Besides, the North-Western region has an interesting situation: the business volume locates this region on the second place in Romania, and Bistriţa county has a concentration level over 80%, without holding a prevailing firm. The country capital has a turnover below average, obtained by the aggregation of the results of various firms. Therefore, Bucharest can be considered a "command center" rather than a production one.

The situation of the development regions emphasizes a high concentration level into the South-Eastern region. The inclination towards cooperation is confirmed by the emergence of the institutional cluster TMV South East, comprising mainly companies from Focşani, Galaţi and Buzău, with the notable absence of Filati firm. The cluster is more scattered in respect of territory than the one from the North-Eastern region, fact indicating the possibility of regrouping towards South-East, emphasized by the high level of concentration from Constanţa, county where only one firm holds more than 85% of the market. An above average level of concentration exists in the North-Eastern region, where the first institutional cluster from the Romanian textile industry is functioning.

In Romania, the two formal institutional clusters, ASTRICO and TMV South-East, have been functioning since late 2010, but the cooperation level inside them is poorly documented. The cluster structure reflects the intention and potential of the so-called "Four Clover", due to the fact that all of them comprise the following categories: authorities, companies, universities and research institutes, consulting firms. ASTRICO offers the image of a stable organization, well defined into the space, of "hub and spoke" type. The TMV South-East scattering along South-Eastern, Southern, Bucharest, North-Eastern and North-Western regions suggests instability and raises questions about its turn from an agglomeration into an effective cluster in the future.

Conclusions

In Romania, the textile and textile products industry is spatially scattered. Only approximately 25% of the firms included into the sample have a turnover of more than a million euro. The endeavour to organize clusters is only at the beginning, given that the institutional clusters were initiated in late 2010. In accordance with the official declarations, the endeavour is determined mainly by the world economic crisis, increased global

competition and the need of European fundraising. This paper also proves the natural inclination towards cluster into the North-Eastern region. The two young formal clusters comprise the premises of a "triple helix" but there are not studies or arguments to validate the interdependence and active connections between the members. The spreading of the textile industry organizations, next to the structure of formal clusters, suggests the possibility of the natural building of three clusters: a common one for the North Eastern and Eastern regions, another one for the Central region and the third for the North Western and Western regions.

Acknowledgements

References

Bresnahan, T., Gambardella, A. & Saxenian, A. (2001). "Old economy" inputs for "new economy" outcomes: Cluster formation in the new silicon valleys, *Industrial and Corporate Change*, Vol. 10, pp. 835–860.

Constantza, NC., MPA. (2011). Romania: Study case on the transferability of the clustering experiences, *Watermode Project*, Retrieved from http://www.watermode.eu/docs/1854/Clusters_Study_Clusters_Romania.pdf.

Csaba, N. (2007). Clusters in the Romanian economy, Retrieved from http://steconomice.uoradea.ro/anale/volume/2008/v2-economy-and-business-administration/049.pdf.

Delgado, M., Porter, M.E. & Stern, S. (2011). Clusters, Convergence, and Economic Performance, Retrieved from http://www.isc.hbs.edu/pdf/DPS_Clusters_Performance_2011-0311.pdf.

Enright, M.J. (1998). Regional Clusters and Firm Strategy, in Chandler Jr, A.D., Sölvell, Ö., and Hagström, P. (eds.), *The Dynamic Firm: The Role of Technology, Strategy, Organization and Regions*, Oxford, Oxford University Press.

European Commission. (2002). *Regional Clusters in Europe*, Observatory of European SMEs – EnterprisePublications, No.3, Retrieved from http://ec.europa.eu/regional_policy/innovation/pdf/library/regional_clusters.pdf.

European Commission, *Project West-East ID – WEID (Industrial Districts'Re-location Process, the under the 5thFramework Programme (FP5)*, Retrieved from http://www.west-east-id.net .

Ferrari, M.R. (1999). Small enterprise clusters for local development in a transition context: the case of Romania, Milan, Bocconi University, Retrieved from http://www.marcoferrari.net/materiali/SME_clusters_for_local_development_of_Romania.pdf.

Gordon, I.R., McCann, P. (2000). Industrial Clusters: Complexes, Agglomeration and /or social networks. *Urban Studies* Vol. 37 No. 3, pp. 513-532.

Guth, M. & Coşniţă, D. (2010). Clusters and Potential Clusters in Romania, Retrieved from http://www.minind.ro/presa_2010/iulie/MappingReport_230710.pdf.

Hermans, J., Castiaux, A., Dejardin , M. & Lucas, S. (2010). Configuration in the flesh: challenges in publicly promoted clusters, *The Journal of Technology Transfer,* Springer, Retrieved from http://www.springerlink.com/content/l51r14118m22wk15/.

INCLUD (2004). *Industrial Cluster Development*, Interreg III B CADSES Programme (Central Adriatic Danubian South Eastern European Space), Brussels.

Kosfeld, R., Eckey, H-F. & Lauridsen, J. (2009), Spatial Point Pattern Analysis and Industry Concentration, *Joint Discussion Paper Series in Economics*, Universities of Aachen Gießen ·Göttingen Kassel Marburg Siegen, Retrieved from http://www.uni-marburg.de/fb02/makro/forschung/magkspapers/16-2009_kosfeld.pdf.

Lawrence-Pietroni, C., Weijer, F., Lalude, A., Baraniak, A. & Frankle, D. (2010). Romania's Apparel Cluster, Retrieved from http://www.isc.hbs.edu/pdf/Student_ Projects/Romania_Apparel_2010.pdf.

Majocchi, A. (2000). Are industrial clusters going international? The case of Italian SMEs in Romania, *Universita Dell'Insubria*, Retrieved from http://eco.uninsubria.it.

Markusen, A.R. (1996). Sticky places in slippery space: A typology of industrial districts. *Economic Geography* Vol. 72, No.3, pp. 293–313, Retrieved from www.jstor.org.

OECD. (2005). *Business Clusters. Promoting Entreprise in Central and eastern Europe*, Retrieved from www.sourceoecd.org.

OECD. (2007). *Vers des pôles d'activités dynamiques*, Retrieved from www.sourceoecd.org

Pislaru, D., Aristide, O. (2004). Catre o politica industriala bazata pe aglomerari economice competitive – clustere, Retrieved from http://www.oeconomica.ro/files/pdf/124.pdf.

Porter, M. E. (1998). *Clusters and the new economics of competition*, Harvard Business Review, Vol. 76, No. 6, pp. 77 – 90.

Porter, M. E. (2000). Location, competition and economic development: Local clusters in a global economy, *Economic Development Quarterly*, Vol. 14 No.1, pp. 15–34.

Porter, M.E. (2003). The Economic Performance of Regions*, Presentation the Indiana Leadership Summit Indianapolis, Indiana*, Retrieved from http://www.isc.hbs.edu/pdf /Indiana_Leadership_Summit_2003.05.13.pdf.

Porter, M. E. (2005). The Porter Cluster Model, Background and Methodology, Retrieved from http://www.isc.hbs.edu/njcmp/The_Porter_Cluster_Model.pdf.

Storper, M. (1997). *The regional world: Territorial development in a global economy.* New York: Guilford Press.

Szanyi, M., Iwasaki, I., Csizmadia, P., Illésy, M. & Makó, C. (2010). Cluster Development in Hungary: Searching for a 'Critical Mass' of Business via Cluster Mapping, in Dallago, B., Guglielmetti (eds), *Local economies and Global Competitiveness*, Palgrave Macmillan, Retrieved from www.palgrave.com/PDFs/9780230252721.Pdf.

VICLI (2001). *Virtual Clustering Identification and Dissemination of Strategic Territorial Planning Best Practices for Certain Countries of Danubian and Southern Europe*, INTERREG II C – CADSES, Brusseles.

Wixted, B. (2009). *Innovations System Frontiers, Cluster Networks and Global Value*, Berlin, Springer-Verlag Berlin Heidelberg.

***. AMADEUS database, Retrieved from http://bvdinfo.com/Products/Company-Information/International/AMADEUS.aspx