

# EMPIRICAL RESEARCH ON THE CHARACTERISTICS OF CLUSTERS IN ROMANIA AND THE IMPACT ON THE ENTREPRENEURIAL ENVIRONMENT

**Tudor NISTORESCU**

University of Craiova

Email: tudor.nistorescu@yahoo.com

**Daniela FUNDEANU**

University of Craiova

Email: daniela.fundeanu@gmail.com

## **Abstract:**

*The present research focuses on the empirical study about the features of clusters in Romania and its impact on business environment. In the scientific approach we tested five research hypotheses which have been validated. Methodological framework included as main instruments: questionnaires, semi-structured interviews with persons who represent the clusters, studies reported in the specialized literature, studies conducted in other projects, examples of best practice from countries with advanced economies. Findings which emerged from our empirical research, as a result of processing of data collection from respondents, may be useful to persons who manage clusters and decision-making authorities at regional and even national level.*

**Keywords:** *clusters, competitiveness poles, european funds, entrepreneurial environment*

## **1. Introduction**

In the context of spectacular changes in the environment in which operate, small and medium enterprises and even larger ones seek solutions to increase the competitiveness on the regional, national and global markets. The examples of best practice in the European Union show that one of the solutions could be to join in clusters. By working together in an integrated system, the companies are stronger, because they have access to resources, joint activities, particularly to innovation of processes and products. The cluster enables the sharing of information and knowledge, the interconnection of members' resources in a complex system that increases the competitiveness of the components.

There are few empirical studies aimed segments of cluster management, the impact on the competitive environment or the potential of cluster development at the national level. Existing studies specifically focus on cluster policies, enabling the possibility to present a scientific framework for this issue.

The research on the economic clusters in Romania and South-West Oltenia region has overall objective to identify the characteristics, the main factors

influencing the development of the clusters in Romania and the impact analysis on business environment.

Derived objectives of the research are:

- identify the main directions, actions and ways to improve the functioning of the clusters;
- identify the advantages of association in clusters;
- identify the measure in which the representatives of economic clusters are informed about the difference between cluster and competitiveness pole;
- analysis of clusters' need to be supported by specific policies and concrete analysis of the ways to make such claims;
- analysis of the impact of clusters on entrepreneurial environment in Romania;
- identification of thematic priorities of the clusters in the forthcoming period.

## **2. Research Methodology**

In this research we have formulated several hypotheses based on the research objectives, using theories, studies, statistics, examples of best practice from European Union countries and personal observations, as follows:

Hypothesis 1 - The stage of the life cycle of the clusters and the public policy for clusters supporting influence on the size, structure and funding sources of the clusters.

Hypothesis 2 - The availability of the grants largely determine the formation of the clusters in Romania.

Hypothesis 3 - The cooperation between members, exchanging knowledge and entrepreneurship represent the most important factors influencing the appearance and development of the clusters.

Hypothesis 4 - Cluster type economic agglomerations have a positive impact on the entrepreneurial activities in the developing regions.

Hypothesis 5 - Insufficient promotion of the clusters and competitiveness pole in Romania, led to the ignorance of regulations in the romanian legislation on the cluster, and the difference between cluster and competitiveness pole.

Testing of each hypothesis was conducted by methods of statistical data analysis and hypothesis testing methods, to obtain detailed and comprehensive interpretations, following the example of research in the international literature.

The general population consists of 47 clusters in all fields with different sizes and forms of organization in Romania. The study population is composed of the general population, the reason being that the overall population is small, heterogeneous and the study was carried out by means of exhaustive research.

The method of data collection is the survey and used tool is the questionnaire. The research consisted of a questionnaire elaborating during october-december 2015, the population selection, pre-test questionnaire, data collection. An important stage of the research was pre-test of questionnaire, which took place in January 2016 performed with the help of representatives of the clusters in the South-West Oltenia region and West region, after which we checked the time allocated to complete the questionnaire and modified some of variables. The survey was conducted in February to April 2016, and for data collection we used methods depending on the availability of the respondents, respectively inquiry by email and by interview, conducted by phone or at the location of the cluster.

The questionnaire contains 28 relevant questions, which have sought to interpret and to measure the opinion of the respondents about issues concerning the identification of the respondent, the identification of economic agglomeration that he represents and the variables for cluster analysis, respectively: the structure; the organization; the goals; the elements for supporting the competitiveness of the members and cluster competitiveness; how to improve the clusters; funding sources; thematic priorities; the promotion; supporting policies and strategies.

The questionnaire was distributed by mail to all representatives of the clusters and competitiveness poles identified in an extensive research on the analysis of the competitiveness of clusters in Romania through the cluster mapping exercise (Coșniță and Iorgulescu, 2013). As the response rate was 30 %, we continued the research using the interview conducted by telephone as the clusters were located in all regions of Romania.

To achieve research objectives and to make relevant considerations about the characteristics of economic clusters in Romania, the effects on the business environment, the current situation and the possibilities for developing of new clusters in the South-West Oltenia region, we performed quantitative, qualitative and forecasting analysis. We used as a form of research, secondary analysis; data collected through questionnaire were completed by information from secondary sources: specialized literature, national and international studies, internet. We used as additional sources of data, official statistics to finalize the conceptual context in which the research is placed, providing additional opportunities to test research hypotheses.

### **3. Data Analysis and Hypotheses Testing**

The processing, analyzing data and interpreting of the results have been achieved with the programs: SPSS 20.0 (Statistical Packages for the Social Sciences) and Microsoft Office Excel and we obtained graphs, thematic maps, correlation, analyzes. The statistical methods used for data analysis and research hypothesis testing were selected and implemented taking into account of empirical research at international level regarding the clusters, the main goal was the validation of hypothesis for the romanian clusters. Quantitative and qualitative methods are complementary used to obtain a complete interpretation by Pearson parametric correlations, arithmetic mean, principal component analysis, case study and comparative analysis.

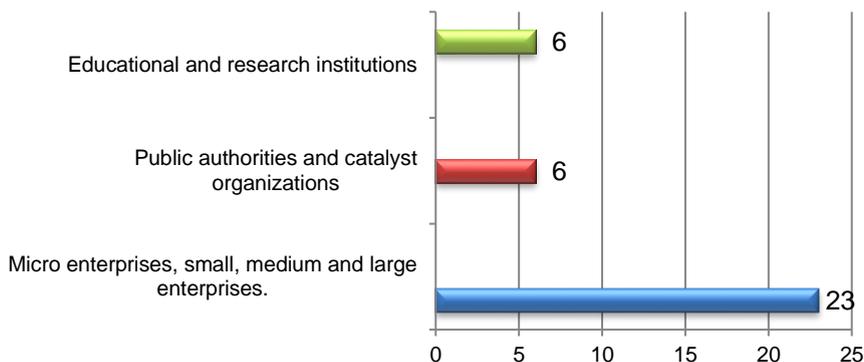
We determined the quantitative and qualitative aspects of the research with the questionnaire applied to the clusters in Romania and we used national and international studies on the clusters for the relevance of the results. The determination of specialization, concentration of economic activities and influence of economic clusters on the entrepreneurship was carried out by calculating the quotient of localization and Gini coefficient.

Descriptive and explanatory case study completed by document analysis, observation and interview, was used for a full investigation of the clusters in the South-West Oltenia region and of the context in which they operates. The research hypotheses were tested after processing and interpretation of data collected.

*Hypothesis 1 - The stage of the life cycle of the clusters and the public policy for clusters supporting influence on the size, structure and funding sources of clusters.*

In the questionnaire we have formulated questions about the number, type of members and funding sources of the clusters in Romania. The analysis of

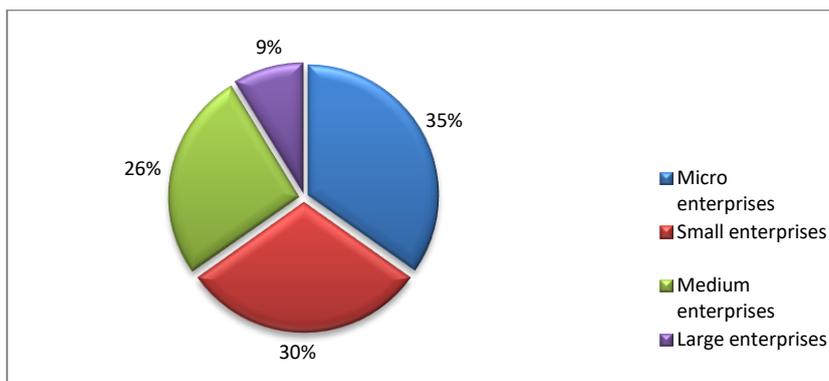
respondents' answers on the size and structure of the clusters shows that the average number of the members of a cluster in Romania is 35, of which 23 for micro, small, medium and large enterprises, representing 65.72 % of the total membership; six public authorities and catalyst organizations, representing 17.14% of the total membership; six institutions of education and research, representing 17.14 % of the members. Financial institutions are not components of the clusters in Romania (Figure 1).



**Figure 1. Cluster size and structure in Romania**

Source: Own processing on the questionnaire

As shown in Figure 2, within the enterprises of the cluster, microenterprises have the highest weight (on average, eight per cluster), followed by small enterprises (seven), medium enterprises (six) and a small number of large companies (two).



**Figure 2. The structure of the enterprises in the cluster**

Source: Processing based on the questionnaire

The study conducted in 2013 under “Smart policies for South-East European Clusters” project is relevant to validate the hypothesis. It shows that the average number of the members of a cluster in Romania is 37, well below the average of the countries located in South East Europe, which are 72 members.

The situation in Romania is understandable, since the clusters are at the stage of generating, maximum growth stage and, unlike the clusters in developed countries that are in stages of development, maturity or rejuvenation (Table 1). Developed clusters in the following countries: Greece, Hungary, Italy, Austria, have an average number of members per cluster located between 41 and 298 members. It notes the lack of financial institutions in the composition of the cluster, only some of the countries analyzed in the study have financial institutions in their structure: Bulgaria, Italy and Austria.

**Table 1**

**Average number of the members of the cluster, according to the type of organization in countries from the SEE space, under the instrument for benchmarking of European Secretariat for Cluster Analysis-ESCA**

Type of organization	Bulgaria	Albania**	Slovakia	Croatia	Slovenia	Romania	Greece	Hungary	Serbia	Italy	Austria	Media țărilor
Large enterprises	1	0	1	1	11	<b>2</b>	1	0	1	7	35	4
Medium enterprises	2	0	4	1	4	<b>6</b>	3	0	10	19	35	7
Small enterprises	3	0	4	4	9	<b>7</b>	7	12	13	74	111	22
Micro-enterprises	5	12	4	10	6	<b>8</b>	24	19	16	123	79	30
Universities, technical colleges	1	2	1	1	2	<b>2</b>	1	0	2	2	14	2
R & D institutes	0	0	0	0	1	<b>3</b>	1	0	1	1	12	1
Universities and training providers	0	1	1	0	0	<b>2</b>	0	0	1	1	8	1
Financial institutions	1	0	0	0	0	<b>0</b>	0	0	0	1	1	0
Public authorities and catalysts	2	1	2	5	2	<b>7</b>	2	10	6	9	3	5
Average number of employees *	15		17	22	35	<b>37</b>	39	41	50	237	298	<b>72</b>

\* Average number of employees in the companies of the clusters

\*\* Some data are not available for Albania

Source: University of Primorska – Slovenia, „Smart Policies for South-East European Clusters” - POLISEE (2013), *Global Impact Assessment Report: analysis of cluster policies.*

The correlation between the size, cluster structure, on the one hand and stage of the life cycle of the clusters, on the other hand, is checked by theory and studies in clustering field. The studies show that during the development of the clusters, decreased the percentage of large and medium companies, R & D institutes, universities, public authorities, catalysts in the cluster structure and increased the percentage of micro and small enterprises.

When asked about the stage of clusters' evolution in Romania, the majority of the respondents (62 %) agreed that the organizations of the clusters they represent are in the stage of generating and growth. The remaining respondents considered the clusters are in the generating stage (12 %) and growth stage (26 %).

Representatives' responses of the clusters on their dynamics shows that the structure of the clusters is similar during the evolution of the cluster (includes four leaves of the clover), only the absolute number of the members has increased over time, following the accession of new members who seek to benefit from the advantages of the association. The analysis of respondents' opinions shows that during the evolution of the cluster, the size is changed by increasing the number of the members.

Funding clusters is one of the most important issues that may influences the existence, the development of a cluster and therefore it is of great interest to policy makers. Finding cluster is public and private. The link between funding sources, stage in the life cycle and public policy that support clusters was analyzed based on the answers to questions regarding the sources of clusters financing and the development of projects financed by grants. The representatives of clusters considered the structure of funding sources is: 75 % of public funds and 25 % of private sources, and that the majority of clusters (80 %) carry european projects.

The clusters in Romania, under the stages of generating and development have benefited from grants for integration firms in supply chains and clusters by Sectorial Operational Programme „Increasing of Economic Competitiveness” 2007-2013 or research-development-innovation activities through the Framework Programme FP7. Even with the lack of a specific policy exclusively designed to the clusters, the availability of the funds for functioning of the clusters has made that the public funding to exceed private sources of financing. The clusters need public funds in generating phase and during the evolution acquire the capacity of self-financing the economic and technological competitiveness, so the public funding is diminishing.

Specialized studies on clusters funding show that in Europe there are two opposing trends: some regions prefer intensive funding from state budget for clusters, while other clusters are determined by their owners and public authorities to have a high rate of self-financing from the financial contribution of the members, organizing of workshops, training courses, participation in the projects, services provided on a fee basis. If the members of the clusters pay big contributions or support the co-financing of the projects they want to influence the strategy and to govern the cluster.

Regarding financial support of the clusters, the ideal solution for public administration is self-financing of the clusters (100 %) after five-seven years of cluster life. This thing is not possible because the cluster with a seven year old is unable to support the promotion, economic and technological competitiveness in the region and in Europe (the project - Cluster and Network Cooperation for Business Success in Central Europe, 2013).

The examples of good practice in the world in funding clusters lead to similar results, respectively (the project - Cluster and Network Cooperation for Business Success in Central Europe, 2013):

- The clusters are financed up to 35 % - 65 % of public funds, depending on the stage of life-cycle, and the characteristics of technological sector that influence the time to achieve the results;
- About 10 % to 35 % of the clusters are funded by projects through regional, national and european programs;
- Up to 20 % of resources are obtained from rendered services;
- Up to 15 % of resources are provided by contributions of the members.

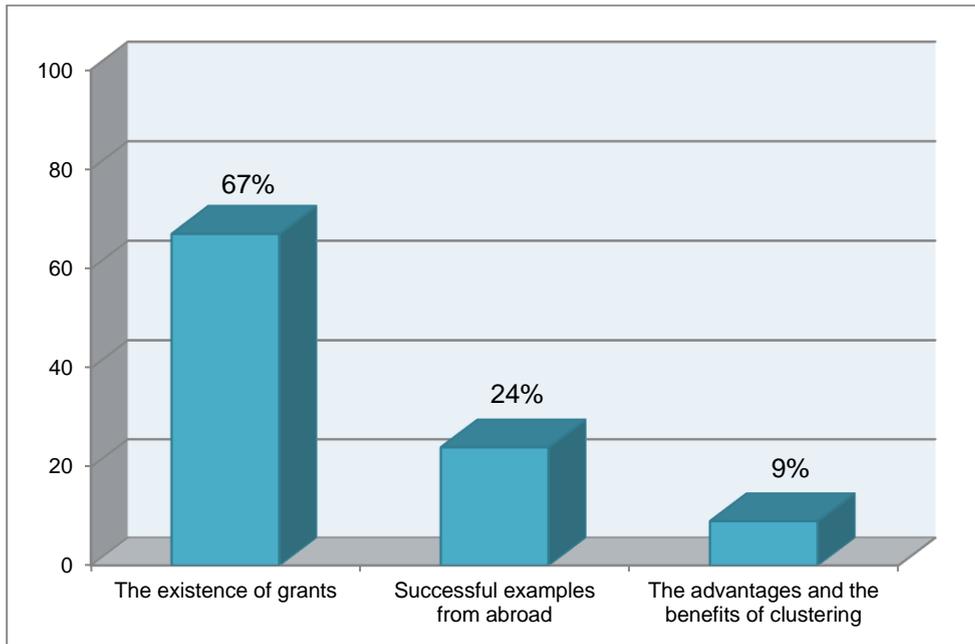
On the international level, some developed clusters (ECO WORLD Styria in Austria in renewable energy and environmental engineering field, AC Styria in Austria in the automotive industry) tend to convince representative companies in the industry in which they operates, particularly in terms of used technology to join to the cluster. The desired effect is integrating for strategic planning, more than the financial contribution.

The study in the project - „Smart Policies for South-East European Clusters” shows that the public funding in the SEE space (funding of cluster management organisations, E.U. projects, national projects, initiated by the management structure of the cluster) was reduced (47 %), compared with private funding (fees membership, service fees, sponsorships) that represents 53 %. In U.E. states with public policy specifically designed to the clusters, the percentages of public and private funding are different. Hungary and Austria have more than 75 % public funding and in Italy 50 % of funds are public and 50 % are private funds. In the countries surveyed, except for three of them, public funding is higher than private funding. In Romania, the situation resulting from the research is explained by the fact that financing programs for clusters and competitiveness poles were active from 2013 through S.O.P. „Increasing of Economic Competitiveness” 2007-2013 and the grants were awarded during 2014. The study is done before accessing these financing programs when funding sources were formed mainly from private sources.

The interpretation of data obtained through the questionnaire and interviews shows that the first hypothesis is validated: „The stage of the life cycle of the clusters and the public policy for clusters supporting influence on the size, structure and funding sources of clusters”.

*Hypothesis 2 – The availability of the grants, largely determine the formation of the clusters in Romania.*

The motivation for clusters' formation in Romanians is analyzed in according with the answers to the questionnaire. The majority of respondents (67 %) reported that the availability of grants for clusters and research, development and innovation activities have influenced the creation of the clusters; 24 % of respondents considered that the successful examples from abroad have contributed to their occurrence and only 9 % of respondents considered that the benefits and advantages of the clusters led to the association (Figure 3).



**Figure 3. The motivation for the formation of the clusters in Romania**

*Source: Processing based on the questionnaire*

The analysis of questionnaire' answers shows that in Romania the advantages of the association in clusters are little known. One reason is the lack or insufficiency of cluster promotion, as unanimously considered the respondents.

In testing the hypothesis relating to the arguments for clusters' formation in Romania contributes two other questions in the questionnaire. These are related to sources of clusters financing in Romania and the implementing of the projects funded by grants. The majority of respondents (80 %) considered that funding sources of the clusters are formed from 75 % of European funds and 25 % from private sources and that the clusters accessing and implementing grants.

The question concerning the form of clusters' organization is relevant for hypothesis testing. To this question, 90 % of respondents answered that the clusters are N.G.Os and the 10 % of respondents answered that the clusters have partnership agreements without legal personality. Obtaining legal personality was a prerequisite for the clusters in order to obtaining funding from S.O.P. „Increasing of Economic Competitiveness” 2007-2013, and the most clusters accessed grant programs.

Thus, the hypothesis 2 „The availability of the grants largely determine the formation of the clusters in Romania” is confirmed, because the majority of respondents (67 %) reported that the existence of the grants led to the creation of the clusters.

The research findings highlight the clusters have restricted possibilities of obtaining financial resources for their activities, including co-financing of the projects. This situation is due the form of organization of the clusters in N.G.Os., which does not allow clusters to obtain loans from financial institutions because they can not guarantee. Therefore, funding sources are mainly formed from grants

and a small percentage from private sources (own contributions, sponsorships). This obstacle could be removed by the inclusion of financial institutions in clusters, but now, in Romania the cluster structure does not include the pillar number five, the financial institutions.

*Hypothesis 3 – The cooperation between members, exchanging knowledge and entrepreneurship represent the most important factors influencing the appearance and the development of clusters.*

Influencing factors of the clusters considered in the research are: cooperation, competition, innovation, strategy, knowledge sharing and entrepreneurship. In this case we used semantic differential scale on 5 levels and the subjects chose the degree of factors' influence: very low, low, moderate, high and very high. Using descriptive statistics we determined the average influence of each factor in SPSS 20 (Table 2).

**Table 2**  
**The average influence main factors with impact on the appearance, operation and development of clusters in Romania**

The factors influencing clusters	Cooperation	Competition	Innovation	Strategy	Knowledge sharing	Entrepreneurship
The average coefficient	3,96	2,58	2,75	3,24	3,52	3,45

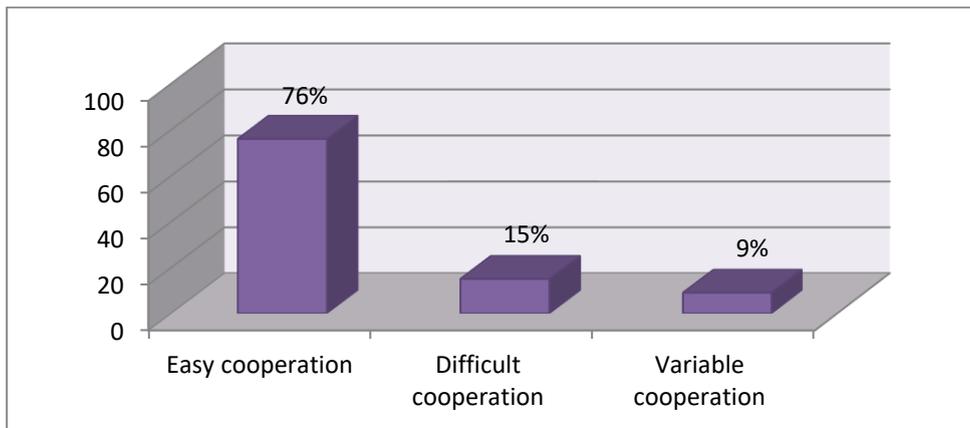
*Source: Processing based on the questionnaire*

We attributed conventional values for each degree of factors' influence in the coding system of SPSS as: very small -1, small -2, moderate-3, high-4 and very high -5.

According to Table 2, the factors with the greatest influence on the clusters are: cooperation, knowledge sharing and entrepreneurship. There is a direct relationship between factors: cluster appearance is determined by the entrepreneurship; the cluster is a partnership between companies and organizations that should cooperate to achieve common goals; sharing knowledge is essential in the cooperation; the cluster stimulates the creativity.

The respondents attach low importance to innovation in the cluster in comparison with other influencing factors and the average influence of innovation factor is 2.75. The research shows a poor knowledge of the concept of innovative cluster in Romania and the role of innovation of product, process, organizational or marketing method to increase the competitiveness on the market.

The picture of the factors that influence the clusters is enhanced by the responses of clusters representatives on the intensity of the cooperation and exchange of information between cluster members: 76 % of respondents considered that the cooperation and exchange of information are easy performed, 15% of them considered that it is difficult to perform, and 9 % of the respondents reported that the intensity of the cooperation is variable (figure 4).



**Figure 4. The intensity of the cooperation and exchange of information between cluster members**

Source: Processing based on questionnaire

In hypothesis testing on the factors with influence on the clusters contributes verification question on the goals of the cluster consisting of: creating networks of cooperation between the companies of the cluster, knowledge transfer, innovation support in cluster companies. For the analysis of the responses we used Likert scale, with a coding system from 1 to 5, where 1 represents total disagreement and 5 total agreement. The average for the assertion that the purpose of the cluster is to create networks of cooperation between the companies of the cluster is 4.05, a value that agrees to 87 % of respondents. The average for the assertion that the aim of the cluster is the knowledge transfer is 3.95 and the average for the statement that the aim of the cluster is supporting innovation in the companies of the cluster is 3.5. The interpretation of the responses shows the relevance of the 3 factors for partnership development.

We can affirm that hypothesis 3 „The cooperation between members, exchanging knowledge and entrepreneurship represent the most important factors influencing the appearance and the development of the clusters”, is checked, because the respondents agree that the essential role of the three factors for the creation, performance and economic competitiveness of the clusters.

*Hypothesis 4 Cluster type economic agglomerations have a positive impact on the entrepreneurial activities in the developing regions.*

According to Porter (1990, 1998) and Krugman (1991) economic clusters sustain the entrepreneurship as encourage the establishment of new companies. Sternberg (2004) and Delgado (2010) support the hypothesis that the clusters have a positive impact on the entrepreneurship.

The phenomenon of entrepreneurship in the region depends on: the characteristics of the region, barriers to entry, infrastructure; the density of people with inovative and entrepreneurial skills (Glaeser et al., 2010); knowledge spillover with positive effect on regional economic growth (Audretsch & Keilbach, 2008).

To highlight the influence of the clusters on the entrepreneurial activities we analyzed the relation between specialization, concentration of economic activities

in the developing regions of Romania that indicates potential clusters on the one hand, and entrepreneurial environment, on the other hand.

An important aspect in the testing of the hypothesis is assessing of the majority of respondents to the questionnaire regarding the relevance of the entrepreneurship for the cluster (average influence of entrepreneurship on the cluster of 3.45 on the Likert scale, with a coding system from 1 to 5).

The entrepreneurial activities carried out in developing regions of Romania were highlighted using information from the National Trade Register Office statistics, on new established companies in the period July 2014 - June 2015.

Regarding the representation of the clusters, because there is no unified methodology and variables unanimously accepted by specialists in this regard, we used statistical methods by which we determined industrial and spatial concentrations, using the coefficients of localization and concentration.

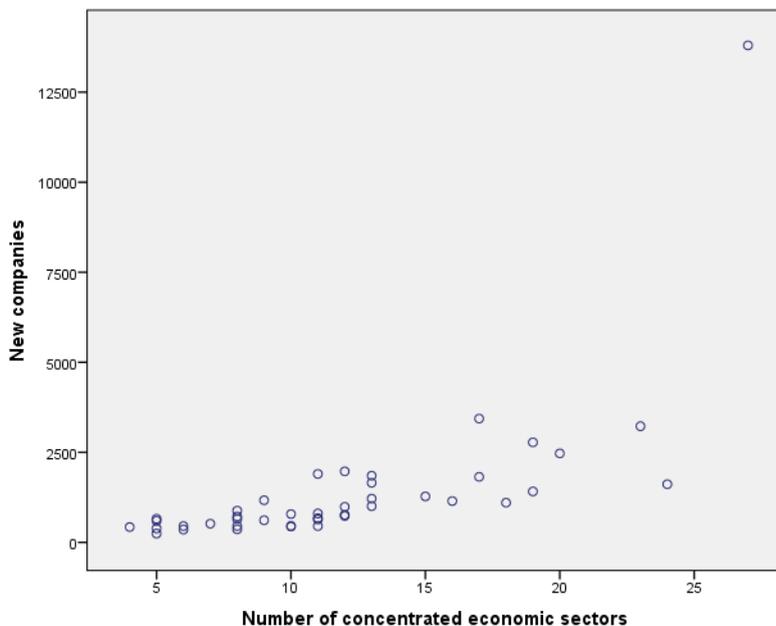
A prerequisite for the formation of the clusters in developing regions is the non-uniform distribution of an industrial sector in space or a certain spatial concentration of firms (Sternberg, Litzenberger, 2004).

To determine the degree of specialization and concentration of the activities indicating potential clusters, we used data on companies operating in the counties of Romania in 2014. We emphasized the specialization of development region in a particular industry, by using the quotient of localization (Hoover, 1936), comparing the relative importance of an industry in the region in terms of employment, with the relative importance of that industry at national level. Thus, we determined the number of industries in which a county is specialized.

We used data on new established companies in the last 12 months, during July 2014 - June 2015, using data from the National Trade Register Office of Romania, to highlight the entrepreneurial activities in Romania. With this data, we built thematic map to show the spatial distribution of the companies, using Excel Choropleth Map of Romania.

Each county is classified according to the number of start-ups in the period July 2014 - June 2015. We determined the number of industrial sectors in which economic activity is specialized for each county, by calculating the quotient of localization and we realized the spatial distribution of economic concentrations in Romanian counties, according to figure

The correlation between the number of new established companies in each county of Romania, in the last 12 months and the number of industries in which that county is specialized is highlighted in the scatter-plot chart, indicating a positive correlation between the number of concentrated industries and the number of new companies established in each county (figure 5).



**Figure 5. The scatter-plot chart for the relation between concentrated industrial sectors and new companies (processing in SPSS 20)**

To determine the nature and intensity of the relation between the number of concentrated economic activities identified in each county and the number of new companies established in the past 12 months, we calculated the Pearson correlation coefficient according to Table 3.

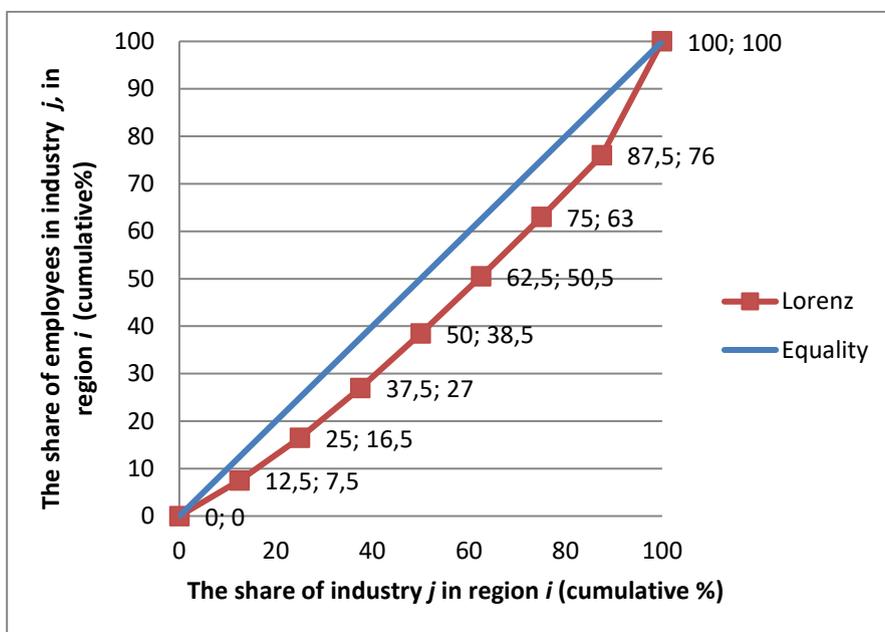
**Table 3**  
**Calculation of the Pearson correlation coefficient (SPSS processing)**  
**Correlations**

		New_companies	No_of_ conc_econ_sect
New_companies	Pearson Correlation	1	,658**
	Sig. (2-tailed)		,000
	N	42	42
No_of_ conc_econ_sect	Pearson Correlation	,658**	1
	Sig. (2-tailed)	,000	
	N	42	42

\*\* Correlation is significant at the 0.01 level (2-tailed).

The value of Pearson correlation coefficient is 0.658, significant in statistical terms, the value of Sig is 0, indicating a direct and positive correlation between the number of industries in which a county is specialized and the number of new companies in a year, in each county of Romania.

Using the Gini coefficient (Gini, 1939) we determined the spatial concentration of an industry compared to other industries. To calculate the Gini coefficient for an industrial activity we used: cumulative share of the employees in industry from the development region, the cumulative share of the employees in the same industry at national level and the number of the regions of Romania (eight). Cumulative weights of the employees are represented using the Lorenz curve, indicating the empirical distribution. The Gini-Lorenz curve is built in a square with side equals one, for an industrial sector and the area of concentration is the area between concentration curve and the diagonal of the square. The value of Gini coefficient is the area between straight line with angular coefficient of 450 and the Lorenz curve.



**Figure 6. The Lorenz curve on the concentration of industry „Construction of buildings” (NACE code 41) at national level, data processed, National Institute of Statistics, 2015 (Tempo-Online)**

In Figure 6 is represented for illustration the Lorenz curve for the activity „Construction of buildings”, NACE code 41. The Gini coefficient is calculated to highlight the concentration of the industry, based on cumulative weights of the number of employees by graphical representation. The Gini-Lorenz curve deviation from the diagonal indicates a strong concentration of the industry.

In this research we determined the Gini coefficient for economic activities (NACE Rev. 2 classification) and we identified the most concentrated sectors of the economy. Economic activities in Romania with high concentration of Gini coefficient have values higher than 0.21, respectively: metallurgy; agriculture, hunting and related services; manufacture of other transport equipment; clothing;

manufacture of chemicals and chemical products; extraction of coal and lignite; wood processing, wood products and cork except furniture; fisheries and aquaculture.

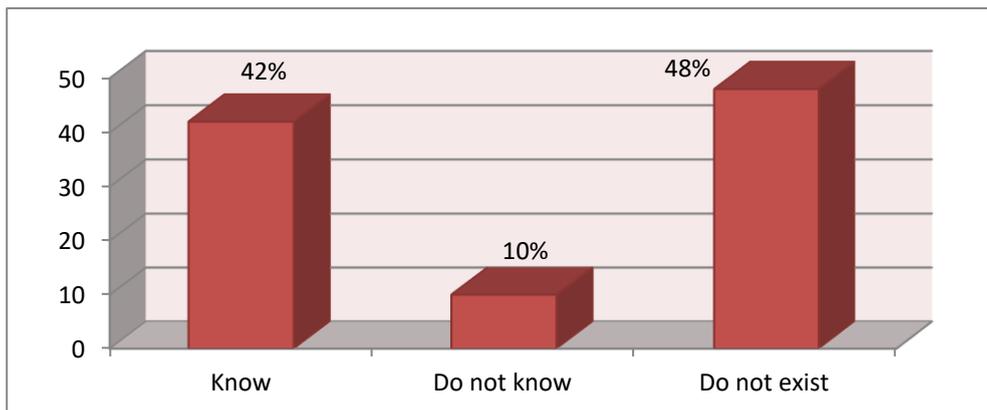
Testing the nature and intensity of the relation between the concentration of economic activity in each industrial sector, as expressed by the Gini index and the number of new established companies in the same industry was performed using Pearson correlation coefficient. The value of the correlation coefficient between Gini index and number of new companies in the last 12 months is 0.578, and the threshold of significance is 0.001, which indicates a significant value of correlation coefficient and a direct and positive correlation between the two sets data.

Therefore, the hypothesis 4 - „Cluster type economic agglomerations have a positive impact on the entrepreneurship in the developing regions” is validated using Pearson correlation coefficient, showing a direct and positive correlation between:

- The number of industrial sectors in which a county is specialized and the number of new companies in each county;
- The concentration of economic activity in the industrial sector and the number of new established companies in the same industry.

*Hypothesis 5 - Insufficient promotion of the clusters and competitiveness pole in Romania, led to the ignorance of the regulations in the romanian legislation on the cluster, and the difference between cluster and competitiveness pole.*

In determining the actual degree of knowledge about cluster regulation in romanian law, we formulated a question in the questionnaire. To this question, 42 % of respondents answered they know about a cluster definition in the romanian legislation, 10% of them do not know the existence of such regulation , and 48 % of respondents believe there is no regulation in Romania about cluster (Figure 4).



**Figure 7. Current degree of knowledge of the cluster concept in the romanian legislation**

*Source: Processing based on questionnaire*

Investigated representatives of clusters or competitiveness poles including regional development agencies know the difference between the terms cluster and competitiveness pole. The remaining respondents did not know the difference between two concepts or wrongly define pole of competitiveness (72%). To test the

hypothesis, we formulated the question about the intensity of cluster promotion in Romania. The unanimous answer of the respondents is that the concept is not adequately promoted.

The difference between cluster and competitiveness pole is only known by the associations initiated of regional development agencies, which access Sectorial Operational Programme „Increasing of Economic Competitiveness” 2007-2013. Applicant guidelines relating to this funding program define the concepts of cluster and competitiveness pole. The lack of promotion of these terms in Romania, unanimously recognized by the respondents, lead to insufficient knowledge of the concepts and of the differences between terms.

Regarding the authorities or institutions to carry out cluster promotion, respondents reported that they should be: the regional development agencies, local and national authorities supporting the field in which cluster operates, the chambers of commerce or universities.

The interpretation of data highlights that hypothesis 5 - Insufficient promotion of the clusters and competitiveness pole in Romania, led to the ignorance of the regulations in the romanian legislation on the cluster, and the difference between cluster and competitiveness pole” is confirmed as 58% of respondents do not know the romanian legislation that regulate the cluster, and the difference between a cluster and a pole of competitiveness is known only by the associations which have inside regional development agencies.

The dissemination of innovativ cluster concept in Romania and examples of good international practice, in seminars and thematic conferences organized at local, regional, national levels or by making specific tools (guide, portal, consulting services), stimulate the interest of economic operators for the creation and development of clusters. It is important to promote the benefits of the cluster in Romania due to the economic advantages of the association. The popularity of this concept will increase as it becomes clear that these groups are engines of competitiveness and innovation.

#### **4. Conclusions**

The research highlights the relation between the size, structure, funding sources of clusters, on the one hand, and the stage in the life cycle of the clusters and supporting public policy, on the other hand. The investigation carried out showed that in Romania, the clusters have a small number of members, compared with the associations of developed european states, which can be explained by the fact that the majority of the clusters in Romania are in the stage of generation and only some of the clusters are in the development phase. Regarding funding sources of clusters, the research has proven that the structure of funding sources is: 75 % of public funds and 25 % of private sources, and that the majority of clusters develop european projects.

The romanian clusters are at the beginning of the evolution and they need of public resources to function, following the ongoing to obtain self-financing capacity from own funds or raised funds and the public intervention to diminish. The research has shown that setting up motivation of the clusters refers to the availability of grants. The existence of European funds for clusters or research, development and innovation activities has influenced the creation of the clusters.

Other factors such as: examples of good practice from abroad or the advantages of the clusters have contributed to a lesser extent the emergence of the clusters. Empirical study on the characteristics of the clusters in Romania shows that the most important factors influencing the appearance and development of the clusters are: cooperation between members, sharing knowledge and the entrepreneurship.

The study has led us to identify and confirm a direct correlation between clusters and entrepreneurial environment. Economic clusters support the entrepreneurship because encourages the establishment of new companies. Positive impact of the clusters on the business environment in developing regions of Romania was confirmed by the analysis of two correlations. The first correlation is proven between the number of new companies established in each county during a year and the number of industrial sectors in which the county is specialized. The second validated correlation is between the number of new companies and the concentration of economic activity in an industrial sector.

Insufficient promotion of the clusters or competitiveness pole in Romania is the main factor determining the ignorance of regulations in the romanian legislation on the cluster and the difference between cluster and competitiveness pole. The research highlights that only representatives of the clusters which include regional development agencies know the regulation of the concept in romanian legislation and the difference between the two concepts. It is necessary to promote the cluster by the regional development agencies or public authorities supporting the field in which cluster operates. Empirical research results show the need of policy and strategy for clusters, for providing technical and financial support through programme for funding of activities and cluster management.

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