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## CHARACTERISTICS OF ENTREPRENEURIAL PROFILE IN SOME EMERGENT TERRITORIAL STRUCTURES IN ROMANIA

*The development of the connections between cities and their surrounding spaces led to the creation of highly complex emergent structures, which require particular attention from specialists and decision-makers. This study emphasizes the importance of regional development hubs in space organization with superior economic dynamics, due to the influence exerted by the polarizing city on the economic assets in the neighboring territorial systems. Another goal of the current study is to identify the factors that contribute to organizing space in areas of urban influence, as a result of the establishment of complex linkages between the development hub and the surrounding space. Special attention is paid to the role of the entrepreneurial sector in space organizing, as the areas analyzed are characterized by a steep dynamic of the entrepreneurial sector.*

*Keywords:* emergent structures; polycentric development; entrepreneurial sector; territorial dynamics; territorial management.

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## ХАРАКТЕРИСТИКА ПІДПРИЄМНИЦЬКОГО ПРОФІЛЮ ДЕЯКИХ НОВИХ ТЕРИТОРІАЛЬНИХ СТРУКТУР РУМУНІЇ

*У статті показано, що розвиток відносин між містами та прилеглими до них районами призвів до формування нових структур великої складності, що вимагає особливої уваги з боку експертів та осіб, які приймають рішення. Тому, у зв'язку з поляризаційними впливами міста на економічні компоненти сусідніх територіальних систем, підкреслено важливість регіональних центрів розвитку в структурі простору з високою економічною динамікою. Виявлено фактори, які сприяють структуруванню простору в районах міських впливів, особливо у зв'язку з комплексними відносинами між полюсами розвитку і його околицями. Особливу увагу відведено ролі бізнес-сектора в структурі простору, оскільки досліджені райони характеризуються високою динамікою підприємницького сектора.*

*Ключові слова:* нові структури, поліцентричний розвиток, підприємницький сектор (бізнес-сектор); територіальна динаміка; територіальне управління.

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## ХАРАКТЕРИСТИКА ПРЕДПРИНИМАТЕЛЬСКОГО ПРОФИЛЯ НЕКОТОРЫХ НОВЫХ ТЕРРИТОРИАЛЬНЫХ СТРУКТУР РУМУНИИ

*В статье показано, что взаимодействие между городами и прилегающими к ним районами привело к формированию сложных развивающихся структур, требующих особого внимания со стороны специалистов и лиц, принимающих решения. Поэтому, в связи с поляризационным влиянием города на экономические компоненты соседствующих территориальных систем, подчеркнута значимость региональных центров развития в организации пространства с высокими темпами экономического роста. Определены факторы, способствующие структурированию пространства в зонах влияния городов, особенно в связи с комплексными отношениями между полюсами развития и*

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*прилегаючими територіями. Особое внимание уделено роли делового сектора в структуре пространства, так как исследуемые районы характеризуются высокой динамикой предпринимательского сектора.*

*Ключевые слова: новые структуры, полицентрическое развитие, предпринимательский сектор, территориальная динамика, территориальное управление.*

**1. Introduction.** The complex development of the areas around big cities is determined by the increasing number of the connections between overcrowded big cities and the surrounding area, which offers much competitive strength in favor of the development of major economic ventures requiring large spaces. With the increase in those spaces' complexity, the need has arisen to identify management systems that would optimize the complex processes inside those territorial systems, considered emergent.

The steep dynamic of economic processes inside the urban-rural interface has determined a multiplication of the territorial analysts' concerns with detailed analyses of the dynamics of the entrepreneurial sector in that space, as well as with identifying the factors that contribute to shaping a certain entrepreneurial profile in areas of urban influence (Ianos, 2004; Brenner, 2003, 2004; Grilo and Thurik, 2008). Academic studies mention with increasing frequency the territorial dimension of the development of the entrepreneurial sector, considered the engine of economic development of territorial systems (Krueger and Brazeal, 1994; Koellinger et al., 2007; Segal et al., 2005; Carree and Thurik, 2003; Audretsch and Keilbach, 2004; Luthje and Franke, 2003; Reynolds, 1997; Rotefoss and Kolvereid, 2005).

The importance of studying the entrepreneurial sector is obvious in the geographers' studies concerning the manner urban settlements contribute to the organization of the surrounding space, because of the gradual intensification of the cooperation ties between the development hubs and the functionally-subordinated townships, as the polarizing hub's economy develops (Ianos, 2004).

The entrepreneurial sector contributes to the development of the polarization capacity of territorial systems by creating the conditions for the multiplication of economic enterprises inside the urban-rural interface, which offers improved competitive strengths to entrepreneurs. Function of this characteristic of the development hubs, the surrounding space acquires a bigger or smaller territorial complexity, depending on the opportunities for linkage with other settlements inside a polycentric network.

Implementing territorial management models in areas of urban influence can lead to the development of the entrepreneurial sector, by generating certain competitive strengths as a result of the involvement of metropolitan authorities in the development of communication routes and other infrastructure elements (Miao et al., 2010; Burinskiene, 2009; Burinskiene and Rudzkiene, 2009; Zavadskas et al., 2007; Zavadskas et al., 2008; Loo, 2006).

Areas of urban influence benefit from numerous advantages favoring the development of the entrepreneurial sector, the socioeconomic climate being the most important among them, the influence of the center in terms of innovation and good practices is very high in comparison to isolated systems (Falck, 2007). These competitive strengths are bigger in the rural area around big cities than inside polarizing centers.

The relocation of economic enterprises towards the outskirts of towns determined the creation of certain economic clusters around development hubs, which

create a genuine polycentric network inside the area of urban influence, grounded in several drivers of economic development. One notices a significant increase in the number of companies at the level of these development hubs, as well as along the main access routes into the polarizing center, which become structuring axes, with an increasing concentration of economic enterprises. The structuring axes created by the concentration of enterprises stand out in the areas of urban influence due to much bigger territorial complexity than in the surrounding spaces.

**2. Material And Methods.** The functional profile analysis of the entrepreneurial sector within emergent territorial systems originated in the obvious differences between systems, against the background where polarizing hubs have similar economic and social characteristics. This evidence generated the hypothesis of the existence of causes outside a polarizing center, such as position compared to Romania's major development corridors.

In order to identify the way the overall entrepreneurial sector is organized in each emergent structure, studies were conducted at the level of the South-Western development region, one of the 8 development regions in Romania. The study encompassed 4 regional development hubs: Drobeta Turnu Severin, Targu Jiu, Slatina and Ramnicu Valcea, cities that registered a spectacular evolution, helped by their function of county seats. The emergent space around these 4 regional development hubs knew an important evolution of enterprises, with numerous economic enterprises of national, regional and local importance being relocated to the area of influence. The steadily increasing economic complexity of these areas around cities made the scientific community consider them as emergent territorial systems, the result of the complex linkages between the polarizing center and the surrounding space.

The starting point was the polycentric development strategy created by the Interdisciplinary Center for Advanced Research into territorial dynamics, where a polycentric network was designed, encompassing the development hubs and the main avenues of interaction between them. The development corridors and the structuring axes that emerge in the wake of the interaction between the development cores were also designed.

The development hubs were ordered into a hierarchy, in terms of the polarization capacity, calculated using 5 criteria: size and demographic attractiveness, economic force and competitiveness, capacity of polarization by way of higher-tertiary sector services, the number of lower-rank towns in the area of influence, territorial representativeness and the outlooks of supporting the consolidation of the regional system of settlements. Aggregation of these indicators resulted in an index of polarization capacity.

Field research and a thorough research into statistic data helped to identify the main directions of linkages, as well as the ties at the level of local networks, at the level of each development hub (Fig.1), an important action in determining the regional context of the processes inside areas of urban influence.

After determining the regional polycentric network, the areas of urban influence were identified, using the following criteria: the convergence of transport systems, economic development, demographic characteristics and the socio-cultural criterion.

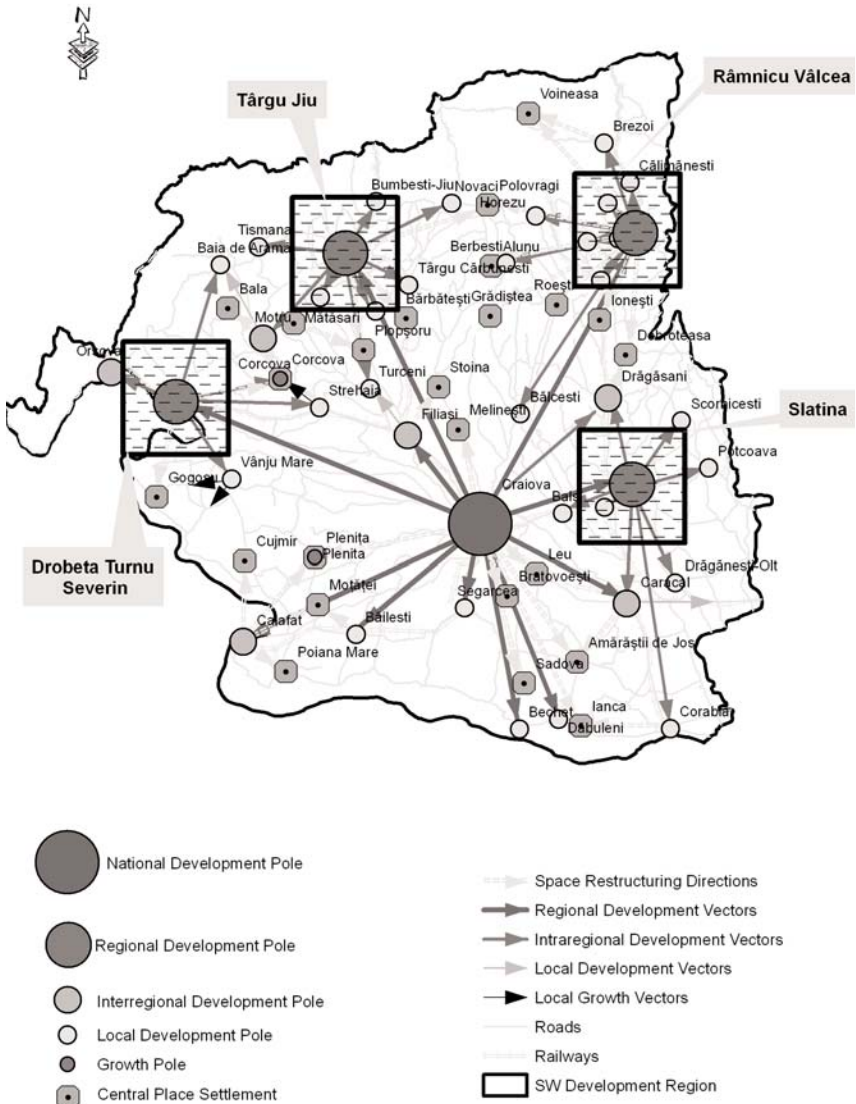


Figure1. South-Western polycentric network

A functional plan was drawn of the CENE (Classification of enterprises in national economy) code, at the level of each emergent structure. For unbiased analyses, companies with no employees were disregarded. The main indicators used were: distribution of the number of employees per CENE code, the evolution of the number of employees per each CENE code, the evolution of profit per each CENE code. The indepth analyses were conducted using the databases supplied by Borg Design.

**3. Results.** The indepth analyses conducted at the level of the 4 regional hubs highlight important differences at the level of all the indicators calculated. Inside the area of influence of the city of Drobeta Turnu Severin, one notices low functional complexity, closely linked to the economic decline of the polarizing hub. In 2010, the Drobeta Turnu Severin emergent area registered a total 33 fields of trade, including 4 fields (retail in unspecialized stores, construction work and forestry) with more than 50 employees each, and only 1 field with more than 150 employees (commodity transport by road) (Fig. 2, Table 1). The economic characteristics of the Drobeta Turnu Severin emergent system, as well as the evolution of the main economic indicators, point to the important role of infrastructure in the economic development of a particular space. The peripheral position of the polarizing hub within the national network of settlements, as well as the undersized road infrastructure have led to an economic decline, and implicitly a weaker functional organization of the surrounding space. Implementation of infrastructure projects during 2011 created the premises for the development of the entrepreneurial sector inside the urban-rural interface, where the construction of a ring road was followed by several investment projects along that road, consisting of economic enterprises requiring large spaces, meant to supply the polarizing center.

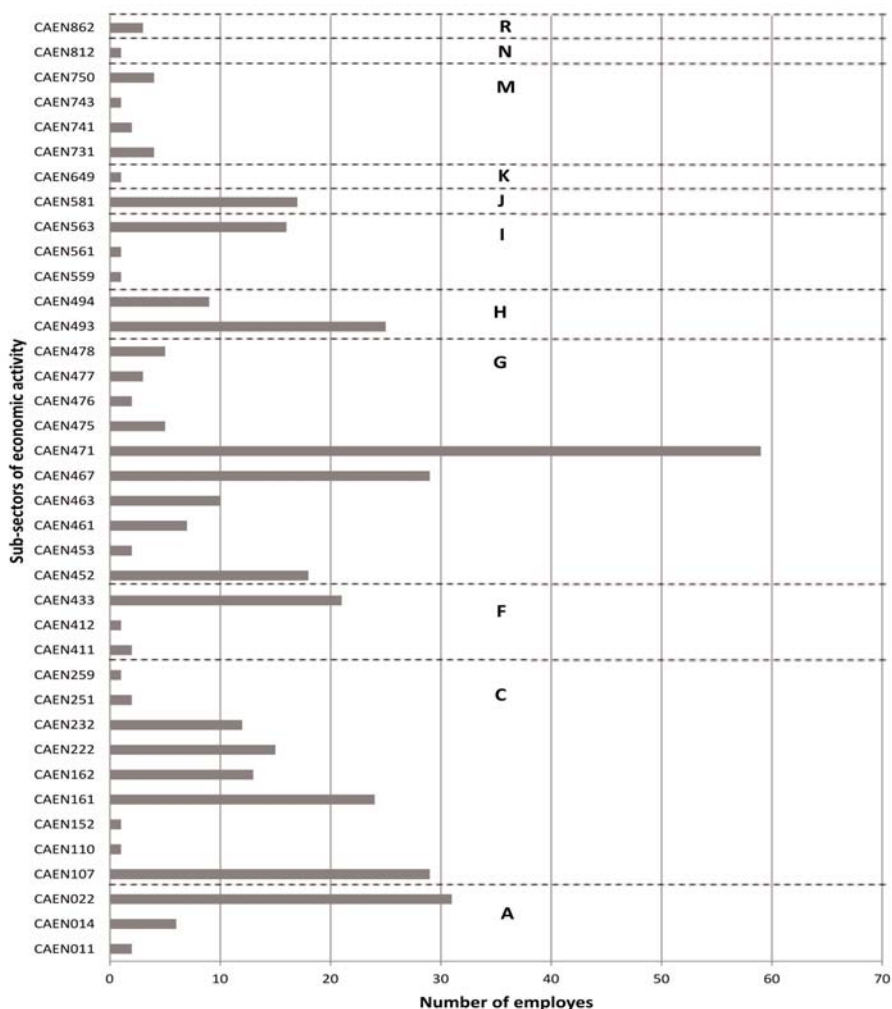
**Table 1. Characteristics of the entrepreneurial sector in Drobeta Turnu Severin emergent territorial system (2010)**

Township	Number of companies	Number of employees	Turnover (Euro)	Total profit (Euro)
Simian	112	588	22,866,425	586,179
Balvanesti	3	1	36,837	996
Breznita Ocol	8	7	188,913	2,355
Cazanesti	3	2	52,462	5,512
Hinova	11	108	1,445,074	101,637
Husnicioara	2	1	20,067	232
Ilovat	6	4	34,349	2,090
Izvoru Barzii	6	37	421,962	1,831
Malovat	8	9	169,524	12,115
Prunisor	8	3	2,936,617	44,594
Sisesti	4	7	318,977	19,241
Total	171	767	28,491,207	776,782

Source: Borg Design.

In the area of influence of the city of Targu Jiu, the process of functional organization is in an incipient phase, but one can notice an important dynamics of economic ventures, because the number of economic enterprises rose by 36% during 2007-2010. The number of employees exceeds 50 only in the field of retail in unspecialized stores. The fields of trade that registered a significant dynamics were constructions, timber processing, bakery, motor vehicle repair, specialized retail, transport and publishing (Figure 3, Table 2).

The outlooks of the development of this emergent structure are linked to the development of road infrastructure that would link the polarizing city to the Pan-European Corridor IV and the development of road infrastructure towards the tourist attractions in Northern Oltenia.



A. Agriculture, forestry and fishery; C. Processing industry; F. Constructions; G. Wholesale and retail trade, autovehicles and motorcycles repairing; H. Transport and storage; I. Hotels and restaurants; J. Information and media; K. Financial brokerage and insurances; M. Professional, scientific and technical activities; N. Activities of administrative services and activities of support services; R. Health and social security.

Figure 3. Emerging entrepreneurial profile of the territorial system Targu Jiu

The emergent territorial system comprising the city of Ramnicu Valcea is the most complex, with 70 types of fields of trade and a total number of employees exceeding 1,787 by 2010. In terms of CENE codes, 12 fields of trade register more than 50 employees, and one field (livestock breeding) more than 450 employees (Fig.4, Table 3). The most spectacular evolution was registered in the fields of transport, trade, livestock breeding, bakery production, plasticware production, material recycling. The functional complexity of the territory is the result of its favorable location on the one of the main development corridors in Romania, Sibiu-Pitesti.

**Table 2. Characteristics of the entrepreneurial sector in Targu Jiu emergent territorial system (2010)**

Township	Number of companies	Number of employees	Turnover (Euro)	Total profit (Euro)
Balesti	36	77	3,094,178	151,563
Dragutesti	21	40	2,232,547	28,124
Turcinești	21	51	1,115,717	56,577
Arcani	19	21	1,090,123	41,306
Calnic	12	16	496,899	64,724
Danesti	8	5	66,737	4
Lelesti	21	28	422,135	16,505
Pestisani	28	135	3,299,584	85,153
Stanesti	11	11	383,959	11,759
Telesti	11	5	116,935	16,181
Total	188	389	12,318,814	471,896

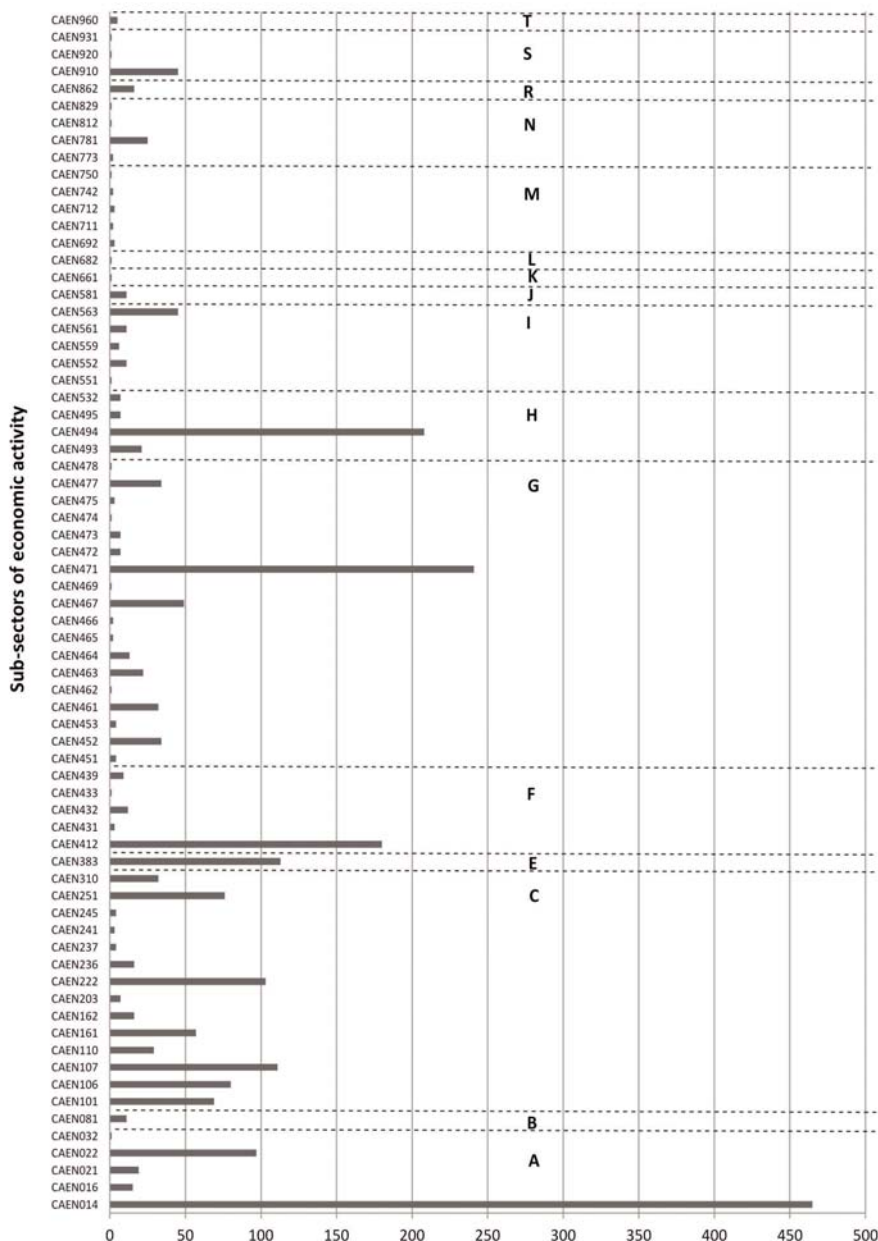
Source: Borg Design.

**Table 3. Characteristics of the entrepreneurial sector in Ramnicu Valcea emergent territorial system (2010)**

Township	Number of companies	Number of employees	Turnover (Euro)	Total profit (Euro)
Barbatesti	14	79	1,418,903	66,658
Berislavesti	11	34	1,366,364	79,471
Budesti	27	88	5,410,516	205,598
Bujoreni	30	392	44,963,291	806,305
Bunesti	11	29	522,269	12,603
Daesti	18	112	1,751,912	358,755
Danicei	2	7	10,765	0
Francesti	11	16	8,870,366	4,596
Galicea	8	23	695,774	50,119
Golesti	6	55	1,685,919	14,912
Ionesti	4	12	106,886	25,592
Malaia	22	84	1,686,020	88,442
Mihaesti	8	27	1,034,441	34,924
Milcoiu	3	3	71,732	2,365
Mucreasca	5	11	121,780	8,538
Nicolae Balcescu	8	24	1,306,022	17,065
Olanu	7	19	295,143	29,617
Pausesti	3	4	86,581	130
Pausesti-Maglasi	22	51	1,299,226	71,781
Pietrari	20	124	3,234,627	21,808
Runcu	4	5	105,145	245
Salatrucel	10	9	158,231	543
Stoenesti	5	47	1,428,654	26,071
Stoilesti	1	4	58,209	1,064
Sirineasa	13	21	1,468,206	12,247
Vladesti	55	321	12,209,086	655,246
Voineasa	47	186	3,537,866	148,399
Total	375	1787	94,903,934	2,743,094

Source: Borg Design.

The development of Pan-European Corridor IV offers a favorable territorial context to the development of this emergent structure, as the evolution of economic indicators is closely linked with the infrastructure projects already implemented in this area.



A. Agriculture, forestry and fishery; B. Extracting industry; C. Processing industry; E. Water distribution, sanitation, waste management, decontamination activities; F. Constructions; G. Wholesale and retail trade, autovehicles and motorcycles repairing; H. Transport and storage; I. Hotels and restaurants; J. Information and media; K. Financial brokerage and insurances; L. Real estate transactions; M. Professional, scientific and technical activities; N. Activities of administrative services and activities of support services; R. Health and social security; S. Entertainment, cultural and recreational activities; T. Other activities and services;

Figure 4. Emerging entrepreneurial profile of the territorial system Ramnicu Valcea



The area of influence of the city of Slatina has stood out because of the economic force of a heavily industrialized city during the communist era, which in the wake of the post-1989 reorganization managed to retain its aluminum production facilities. Spectacular evolutions were also registered in the following fields: hardware production, construction and retail in specialized and unspecialized stores. The highest number of employees is found in the hardware production (more than 160) and retail in specialized stores (more than 120) (Figure 5, Table 4).

*Table 4. Characteristics of the entrepreneurial sector in Slatina emergent territorial system (2010)*

Township	Number of companies	Number of employees	Turnover (Euro)	Total profit (Euro)
Ganeasa	47	77	3,761,060	213,345
Slatioara	62	316	28,029,903	958,751
Milcov	6	26	391,768	170,336
Brancoveni	12	13	188,515	38,613
Coteana	17	20	508,230	26,882
Brebeni	50	84	6,324,689	49,661
Valea Mare	17	48	3,580,649	49,187
Curtisoara	15	56	1,913,445	17,482
Teslui	11	127	8,893,998	23,983
Priseaca	10	1	24,441	5,164
Plesoiu	19	24	1,574,821	31,908
Total	189	266	14,780,781	1,022,727

*Source:* Borg Design.

The analysis of the entrepreneurial sector in emergent territorial structures shows important differences determined by the position of each system, compared to Romania's main development corridors. In addition to this macrofactor, there is the interest of local communities in the development of an infrastructure that would supply the new situation, economy-wise.

**4. Discussion.** The development of the entrepreneurial sector in areas of urban influence is determined by the means of conveying the information essential to development, based on geographical proximity, the determining factor for the propagation of innovation and good practices across the territory. There is in addition an important prerequisite, the level of education, as the population around big cities benefits from high-quality education services supplied by the polarizing hub. Numerous works that deal with the development of the entrepreneurial sector in a particular territory emphasize the importance of the level of education in the emergence and development of this sector of the economy (Glaeser, 2007).

The importance of studying the economic processes inside the areas of urban influence is supported by the need to identify the territorial management systems that are able to secure the optimal functioning in the territory for the processes that emerge as the result of the natural relations between the city and the surrounding space. The need for territorial development strategies emerges in numerous studies, which insist on identifying the need for acquiring a direction of natural evolutions in order to obtain the optimal functionalities across the territory (Bourdeau-Lepage and Huriot, 2003; Kjaer, 2004; Abler, 1970). Functional reorganization in the areas of urban influence is accompanied by pressure on the components of the environment,

therefore environment management systems are necessary, matching the intensity of the "aggression" (Uygan and Cetin, 2012; Ianos et al., 2009; Peptenatu et al., 2010; Braghina et al., 2010; Peptenatu et al., 2011; Braghina et al., 2011; Gumrukcuoglu, 2011; Ilies et al., 2012, Peptenatu et al., 2012).

The spectacular evolution of the entrepreneurial sector inside emergent territorial systems is determined by the position of the polarizing centers inside the national and regional polycentric network. The outlooks of the implementation of major infrastructure projects contributed to several emergent territorial structures standing out from the rest, as they registered a spectacular increase in the number of companies, in turnover and in profit.

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### References:

- Abler, R. (1970). What Makes Cities Important, Bell Telephone Magazine.
- Audretsch, D.B. & Keilbach, M. (2004). Entrepreneurship capital and economic performance, Regional Studies, 38 (8), 949-959.
- Bourdeau-Lepage, L., Huriot, J.-M. (2003). Metropolises and Global Coordination. A Historical perspective, AFSE Congress 2003, Paris.
- Braghina, C., Peptenatu, D., Constantinescu, St., Pintilii, R.D., Draghici, C. (2010). The pressure exerted on the natural environment in the open pit exploitation areas in Oltenia. Carpathian Journal of Earth and Environmental Sciences, 5(1): 33 - 40.
- Braghina, C., Peptenatu, D., Draghici, C., Pintilii, R.D., Schvab, A. (2011). Territorial management within the systems affected by mining. Case study the South-Western Development Region in Romania. Iran. J. Environ. Health. Sci. Eng., 8 (4): 342-352.
- Brenner, N. (2003). Metropolitan Institutional Reform and the Rescaling of State Space in Contemporary Western Europe, European Urban and Regional Studies, Vol. 10, No. 4, 297-324 (2003) DOI: 10.1177/09697764030104002;
- Brenner, N. (2004). Urban governance and the production of new state spaces in Western Europe, 1960-2000, Review of International Political Economy, 11, 447-488
- Burinskiene, M. (2009). New methodology for sustainable development towards sustainable transportation system, Technological and Economic Development of Economy 15(1): 5-9. doi:10.3846/1392-8619.2009.15.5-9
- Burinskiene, M., Rudzkiene, V. (2009). Future insights, scenarios and expert method application in sustainable territorial planning, Technological and Economic Development of Economy, 15(1): 10-25. doi:10.3846/1392-8619.2009.15.10-25
- Carree, M.A. & Thurik, A.R. (2003). The impact of entrepreneurship on economic growth, in: D.B. Audretsch & ZJ Acs (Eds), Handbook of Entrepreneurship Research. Boston/Dordrecht: Kluwer Academic Publishers: 437-471.
- Evans, D.S. & Leighton, L.S. (1989). Some empirical aspects of entrepreneurship. American Economic Review, 79 (3), 519-535.
- Falck, O. (2007). Survival chances of start-ups, do regional conditions matters? Applied Economics 39 (16), 2039-2048.
- Fischer, E.M., Reuber, A.R. & Dyke, L.S. (1993). A theoretical overview and extension of research on sex, gender and entrepreneurship. Journal of Business Venturing, 8 (2), 151-168.
- Floysand and Sjøholt (2007). Rural Development and Embeddedness: The Importance of Human Relations for Industrial Restructuring in Rural Areas, Sociologia Ruralis, 47, (3), 206-227.
- Grilo, I. & Thurik, A.R. (2008). Determinants of entrepreneurial engagement levels in Europe and the US. Industrial and Corporate Change, 17 (6), 1113-1145.
- Gumrukcuoglu, M. (2011). Urban air pollution monitoring by using geographic information systems: a case study from Sakarya, Turkey, Carpathian Journal of Earth and Environmental Sciences, 6, (2):73 - 84

- Humeau, J. B., Peptenatu, D., Pintilii, R., Draghici, C., Schvab, A. (2010). The Role of Polycentric Network in the Demographic Dynamic of Human Settlements. *Journal of Urban and Regional Analysis*, 2 (1): 25-37.
- Ianos, I., Peptenatu, D., Zamfir, D. (2009). Respect for environment and sustainable development. *Carpathian Journal of Earth and Environmental Sciences*, 4(1): 81-93.
- Ianos, I. (1987), *Orasul si oraganizarea spatiului geografic*, Editura Tehnica, Bucuresti.
- Ianos, I. (2004), *Dinamica Urbana*, Editura Tehnica, Bucuresti.
- Ilies, A., Dehoorne, O., Ilies, D. C. (2012). The cross-border territorial system in Romanian Ukrainian Carpathian area. Elements and Structures generating premises for an integrated crossborder territorial system with tourist function, *Carpathian Journal of Earth and Environmental Sciences*, February 2012, Vol. 7, No. 1, p. 27-38.
- Kjaer, A. M. (2004), *Governance*, Polity Press, Cambridge.
- Koellinger, P., Minniti, M., & Schade, C. (2007). I think I can, I think I can: Overconfidence and entrepreneurial behavior. *Journal of Economic Psychology*, 28 (4), 502-527.
- Krueger, N. & Brazeal, D.V. (1994). Entrepreneurial potential and potential entrepreneurs. *Entrepreneurship Theory and Practice* 18 (3), 91-104.
- Loo, B. P. Y., Chow, S. Y. (2006). Sustainable urban transportation: concepts, policies, and methodologies, *Journal of Urban Planning and Development-ASCE*, 132(2): 76-79. doi:10.1061/(ASCE)0733-9488(2006)132:2 (76)
- Luthje, C. & Franke, N. (2003). The 'making' of an entrepreneur: testing a model of entrepreneurial intent among engineering students at MIT. *R&D Management*, 33 (2), 135-147.
- Miao, X., Yu, B., Xi, B., Tang, Y. H. (2010). Modeling of bilevel games and incentives for sustainable critical infrastructure system, *Technological and Economic Development of Economy*, 16(3): 365-379.
- Peptenatu, D., Pintilii, R.D., Draghici, C. (2011). Environmental risk management of urban growth poles regarding national importance. *Int. J. Environ. Sci. Tech.*, 8(4): 737-746.
- Peptenatu, D., Pintilii, R.D., Draghici, C., Stoian, D. (2010), Environmental pollution in functionally restructured urban areas: case study - the city of Bucharest, Iran. *J. Environ. Health. Sci. Eng.*, 7(1): 87-96.
- Peptenatu, D., Merciu, C., Merciu, G., Draghici, C., Cercloux L.A. (2012), Specific Features Of Environment Risk Management In Emerging Territorial Structures, *Carpathian Journal of Earth and Environmental Sciences*, 7, (2), 135-143.
- Reynolds, P.D. (1997). Who starts new firms? - Preliminary explorations of firms-in-gestation. *Small Business Economics*, 9 (5), 449-462.
- Rotefoss, B., Kolvareid, L. (2005). Aspiring, nascent and fledgling entrepreneurs: an investigation of the business start-up process. *Entrepreneurship & Regional Development*, 17 (2), 109-127.
- Segal, G., Borgia, D. & Schoenfeld, J. (2005). The motivation to become an entrepreneur. *International Journal of Entrepreneurial Behavior & Research*, 11 (1), 42-56.
- Uygan, D. & Cetin, O. (2012). Mapping boron pollution using GIS for boron-affected soils in Western Turkey, *Carpathian Journal of Earth and Environmental Sciences*, February 2012, Vol. 7, No. 1, p. 89-94.
- Zavadskas, E. K., Kaklauskas, A., Kaklauskienė, J. (2007). Modelling and forecasting of a rational and sustainable development of Vilnius: emphasis on pollution, *International Journal of Environment and Pollution* 30(3-4): 485-500. doi:10.1504/IJEP.2007.014824
- Zavadskas, E. K., Turskis, Z., Tamosaitiene, K., Marina, V. (2008). Multicriteria selection of project managers by applying grey criteria, *Technological and Economic Development of Economy*, 14(4): 462-477. doi:10.3846/1392-8619.2008.14.462-477.

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