POST-CRISIS ECONOMIC SPECIALISATION PATTERNS OF ARGES COUNTY IN ROMANIA AND THE EU. MOVING TOWARDS SMART SPECIALIZATION

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Abstract:
Under the new European regional policy framework for 2014 – 2020, smart specialization is a key issue meant to highglight the unique characteristics and assets of each country/ region and to rally regional stakeholders and resources around an excellence-driven vision for their future. To this end, this paper provides a statistical analysis of specialization patterns in Arges county on the basis of GVA and employed population, using traditional absolute and relative measures. At the same time, the paper highlisgts the shifts in the local economy due to the economic crisis (2008 - 2010) and offers a number of possible further actions for smart specialisation.

Keywords: *specialisation indexes, Arges county, shift-share analysis, smart specialisation*

JEL code: R12

Introduction: Arges county's socio-economic profile

Argeş county is located in the central – southern part of Romania and belongs to the Soiuth Muntenia region, as established by the Law no. 315/2004 on regional development in Romania[3]. The county ranks the 10th among Romania's 41 counties plus Bucharest for its surface (NUT3 units in the European classification) and includes three municipalities, four cities, 95 communes and 476 villages (Statistica teritorială, 2013).

On the 1st January 2012, Arges country had 636 643 inhabitants, representing 3% of the national population. When compared to the European level, both Romania and Arges county face a downward trend in the population change, on the short-term (2011-2012), as well as on the long-term (2002-2011). The causes are related, *inter alia,* to the negative rate in the natural change of population and, on the other hand, to a high internal and external migration (Table no. 1.1). According to the results of the last census conducted in 2011, only 46% of the resident population in Arges county lives in urban areas (Table 1.2), so that the county can be classified as an *intermediate region* in the European urban – rural classification (according to the European criteria, Arges county falls *de facto* into the category of *predominantly rural regions*, as the rural population is 50% or more of the total population; however, given the fact that the area includes a city of more than 200000 inhabitants, representing at least 25% of the regional population, the county falls under the *intermediate region* category (Eurostat, 2013: Urban - rural typology).

In what it regards Europe 2020 targets, both Romania and South Muntenia - the region Arges county belongs to — are still far from reaching their agreed targets for education and training. As can be seen from the Table 1.., Romania aims to reduce early leaving from education and training (age group 18 - 24) to 11.3%, but the rate is currently of 17.4% at at the national level and almost two times higher than proposed target in Sounth Muntenia region (21.3%). Similarly, while the proposed target for tertiary education attainment (population aged 30-34) is of 26,7%, the national rate was of 21,8%, while the regional rate was of only 16,6% in 2011.

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[3] According to this Law, regions in Romania have no legal status, but an economic development function, meant to ensure a coherent framemework for the implementation of regional development policies and strategies.

Table no. 1: Socio-demographic indicators

1.1.

INDICATORS: EUROSTAT	EU27	RO	AG
Population on 1st Jan. 2012	503 297 336	20 095 996	636 643*(p)*
Total population change: 2011	1 336 029	-103 063	-2 299
Natural change of population: 2011	407 427	-55 197	-2 151
Net migration (2011)	928 602	-47 866	-148

Eurostat, 2013 – *Demographics*

1.2.

INDICATORS: CENSUS	EU27	RO	AG
Total population change: 2002 – 2011	-	- 1.559.300 (-7,20%)	-40200 (-6,50%)
Urban population: 2011	-	54%	46%

INS (2013) - *Census 2011*

1.3.

EUROPE 2020	EU27	RO	South Muntenia
Early leavers from education and training (pop. aged 18 – 24)	12,8% (10%)	17.4% (11,3%)	21,3%
Tertiary educational attainment (pop. aged 30 -34)	35.8% (40%)	21.8% (26,7%)	16.6%

Eurostat, 2013 – *EUROPE 2020 indicators*

Table no. 2 provides an overview of the main indicators for the European, national and regional income and employment. Thus, the GDP per capita in Arges county is much higher than the GDP/ capita at the national level, but it is still very low when compared to the European average, even when considering purchasing power parity. The figures for unemployment, however, are more optimistic when compared to the European and national level (Table 2.1), but the employment rates still remain below the national and regional targets by 2020 (70%), i.e. 63.8% for Romania and 61.3% for South Muntenia. Finally, the performance for one of the most important indicators of smart growth in Europe 2020 - gross domestic expenditure on research and development – places Romania and South Muntenia region at the bottom of European rankings, with minimum chance of achieving the proposed target by 2020 (Table 2.2.).

Table no. 2 Socio-economic indicators

2.1.

EUROSTAT INDICATORS	EU27	RO	AG
GDP/ capita (2010)/ % of the EU average	24,500 (100%)	5,800 (24%)	6,200 (25%)
GDP/ capita PPS (2010)/ % of the EU average	24,500 (100%)	11,400 (47%)	12,100 (50%)
GDP/ capita (2012, CNP)	-	4400	6594
Unemployment rate (2012)	10,2%	7%	6,10%

Eurostat (2013), CNP (2013), INS (2013)

2.2.

EUROPE 2020	EU27	RO	Sud Muntenia
Employment rate - age group 20-64 (2012)/ target	68,4 (75%)	63,8% (70%)	61,3%
Gross domestic expenditure on R&D (2012)/ target	2,3% (3%)	0,5% (2%)	0,36% (2010)

Eurostat 2013, *Europe 2020*

This paper aims to provide a comparative analysis of outcome and employment patterns in Arges county using traditional statistical measures - sector share analysis, Krugman specialization index, location quotient and shift-share analysis, the ultimate goal

being to identify those areas with potential for specialization in the national and European context. The second part of the paper introduces the research methods and the results of statistical calculations, while the final part draws a number of conclusions and policy implications meant to highlight the new paradigm of "smart specialization" - as described by the current European regional policy for 2014-2020.

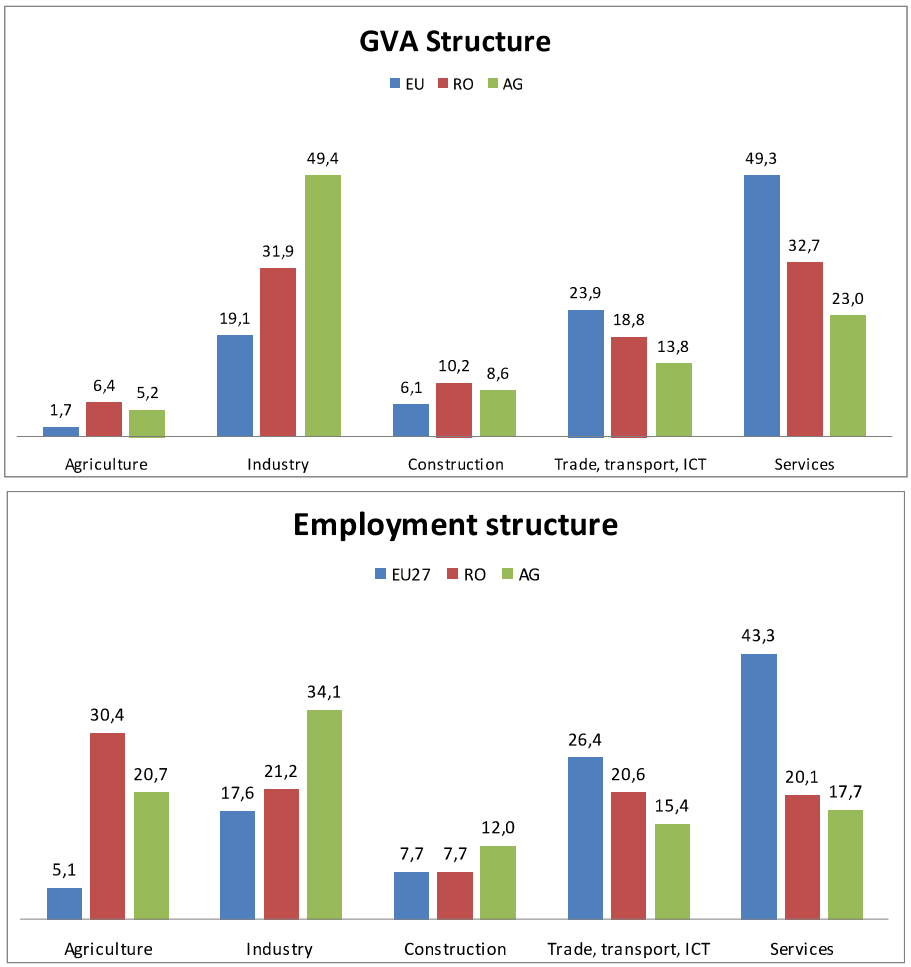
2. Research method and results

The analysis of economic specialization is a recurrent theme particularly in the field of regional economics, the interest being fueled by several theories that underline the major advantages of specialization and concentration of economic activities, such as David Ricardo's theory of comparative advantage and or the new factor endowment theories in international trade (Goschin et al., 2009). This way, the literature in the field has agreed a number of methods for calculating the economic specialization of regions, a special attention being paid to the sector-share analysis, Krugman specialization index, location quotients and shift-share analysis that are also emphasized and used in this paper.

2.1. Sector share analysis

The simplest method to assess regional specialization is the sector share analysis identifying the contribution of each economic sector to the regional output (measured by gross value added = GVA) or/ and employment. This way, *Figure no. 1* presents the shares of agriculture, industry, construction, trade and services in the total GVA and employment in the European, national and local economies.

Figure no. 1. Sector – share analysis



Source: authors' computation

Sectoral differences between the three economies are visible both on the dates for GVA and employment. The European economy is highly specialized in trade and services, sectors that generate about 70% of its total GVA and employment. It should be noted that the European sectoral shares for GVA are almost equal to those for employment, which is not the case Romania, nor for Arges county. The national economy has over 60% of GVA from industry and services, sectors that count for only 40% of total employment. Major imbalance occurs in agriculture, a sector that engages almost a third of the total employment nationwide, but whose share in the GVA is of only 6%. In Arges county, the industry is the dominant sector both in terms of output and employment, a major imbalance being also recorded for agriculture, where the share of employment is about 20%, but the GVA's share is of only 5%.

These sectoral differences can also be quantified by the two other indicators commonly used in the literature: Krugman specialization index and the location quotient.

2.2. Krugman specialization (dissimirarity) index

To measure specialization, **Krugman specialization (dissimilarity) index** takes into account the differences in absolute value between the shares of each sector in two different geographical units and gather these differences. Its values range from 0 (identical territorial/sectoral structures) to 2 (totally different structures) (Baldwin and Wypplosz, 2006).

Table no. 3. Krugman specialization (dissimirarity) index

ECONOMIC SECTOR	AG - EU		AG – RO	
	GVA	EMPL.	GVA	EMPL.
Agriculture, forestry and fishing	3	16	1	9
Industry	30	16	17	13
Construction	3	4	1	4
Trade, transport, accomodation and food, I&C	10	11	4	5
SERVICES	26	26	3	3
Financial, insurance, real estate activities; professional, scientific and technical activities; administrative and support service **(services for enterprises)**	*14*	*9*	*2*	*1*
Public administration, defence, education, human health and social work; arts & entertainment **(services for households)**	*12*	*17*	*1*	*2*
ECONOMIC SPECIALISATION	72%	73%	26%	34%

Source: Authors' computation

The results highlight a much higher specialization of the local economy in relation to the European economy (72-73%) than to the national economy (26-34%), the major differences being those in agriculture, industry and services. Local economy differs significantly from the national one only for the industry sector (*Table no. 3*).

2.3. Location quotient (LQ)

Unlike Krugman index that only shows how different are two economies without indicating in whose favor are the differences, the location quotient reveals those sectors with potential for specialization and industrial concentration. The location quotient (LQ) represents the ratio between the share of the output/ employment in a sector in the total output/ employment at the local level and the share of the output/ employment in that sector in the total output/ employment in the reference economy (i.e. in this paper – the European and national economy) (The Cities Alliance, 2007), as follows:

BOX No. 1

LQ = (Xir/Xr) / (Xin/Xn)

LQ = location quotient; *Xir* = output/ local employment in the sector *i; Xr* = output/ total local employment; *Xin* = output/ employment in the reference economy in sector *i; Xn* = output/ total employment in the reference economy

A location quotient greater than 1 indicates region's specialization in that sector. For a sector with a location quotient equal to 2 in a given region, it is estimated that half of the production is retained for domestic consumption and half is exported; moreover, it is assumed that exports are be zero in any sector where the location quotient is less than 1 (Constantin, 1998).

Table no. 4. Local economy's location quotient in the European and national economy (2010)

ECONOMIC SECTOR	AG –EU		AG – RO	
	GVA	EMPL.	GVA	EMPL.
Agriculture, forestry and fishing	**3,1**	**4,0**	**0,8**	**0,7**
Industry	**2,6**	**1,9**	**1,6**	**1,6**
Construction	**1,4**	**1,6**	**0,8**	**1,6**
Trade, transport, accomodation and food, I&C	**0,6**	**0,6**	**0,7**	**0,8**
SERVICES	**0,4**	**0,4**	**0,7**	**0,8**
Financial, insurance, real estate activities; professional, scientific and technical activities; administrative and support service **(services for enterprises)**	*0,4*	*0,3*	*0,7*	*0,8*
Public administration, defence, education, human health and social work; arts & entertainment **(services for households)**	*0,5*	*0,5*	*0,8*	*0,9*

Source: Authors' computation

As shown in *Table no. 4*, the sectors where the local economy has a high degree of specialization and export potential are agriculture and industry, the latter with a high degree of specialization in relation to the national economy, too. On the other hand, services are the most vulnerable sector of the local economy, so that Arges county must import services to meet the domestic demand.

2.4. Shift-share analysis

As compared to the before-mentioned methods, the shift-share analysis allows the interpretation of variations (shifts) in time, while explaining which factors are the drivers of such variations. Specifically, the analysis explains the change of output / employment in terms of three categories of influence factors (effects): the national effect (national share = NS), represented by the average rate of change in the country, the effect of industry mix (IS) which captures the changes due to sectoral variations and the regional competitiveness effects (regional share = RS) that refers to the regional capacity to ensure favorable conditions for economic performance. When combined, the three components give the overall size of the change (Goschin et al., 2010).

Calculating the shift terms for a sector involves first calculating the growth rates for each sector (*i*) in the local economy (g_{ir}) and the reference economy (g_{in}) and then computing the growth rate for each economy (g_r; g_n).

BOX No. 2. Growth rates by economic sectors

$$g_{ir} = (X^{t+1}_{ir} - X^{t}_{ir)/} X^{t}_{ir};$$

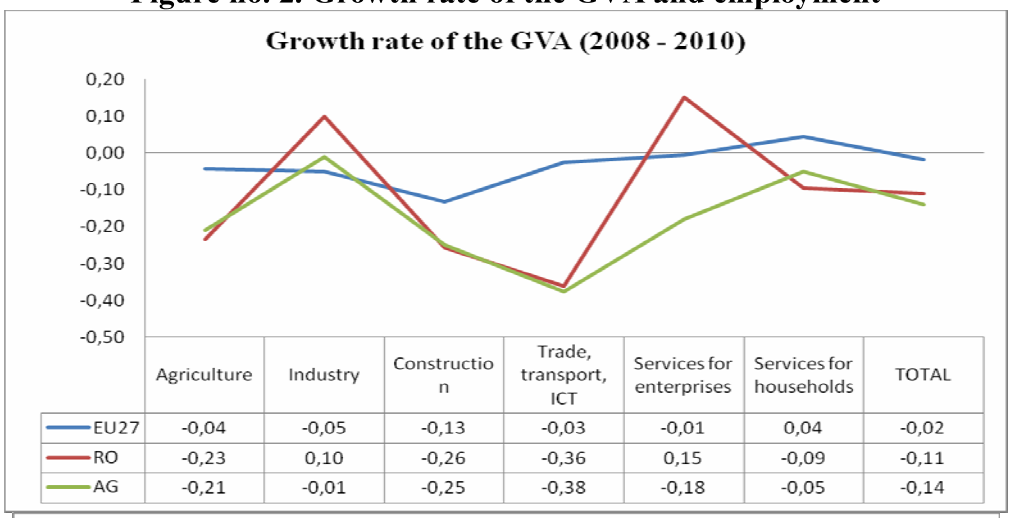
$$g_{in} = (X^{t+1}_{in} - X^{t}_{in)/} X^{t}_{in}$$

X^{t}_{i} = output/ employment in the reference year (*t)*; X^{t+1}_{i} = output/ emplyment in *t+1*

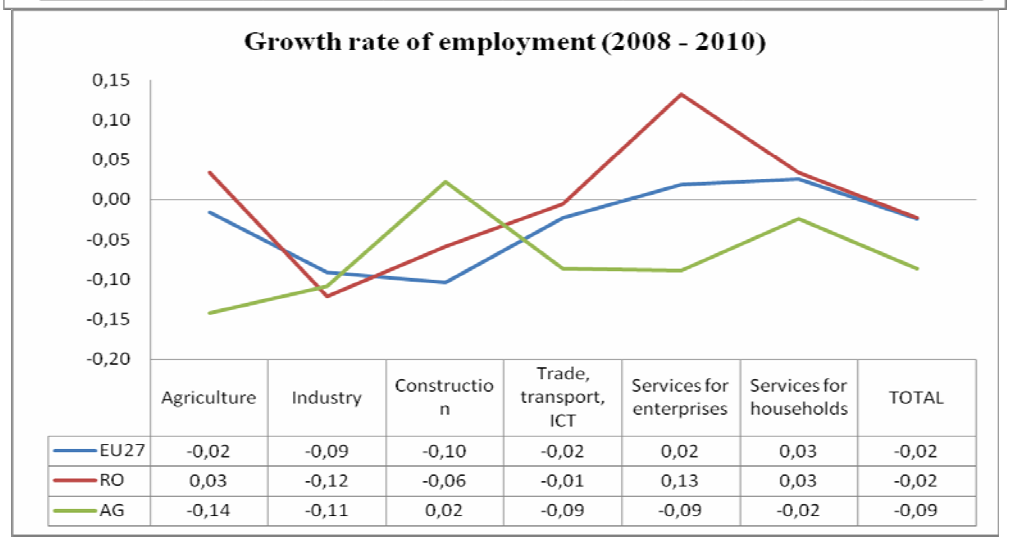
$$g_r = \Sigma\, g_{ir};\quad g_n = \Sigma\, g_{ir};$$

Figure no. 2 shows the growth rates of GVA and employment for 2008-2010, a period that marks the beginning and the peak of the economic crisis. Of the three economies under analysis, the European economy had the lowest rate of decline of -0.02% both in output and in employment, the most affected sectors being construction and industry. On the other hand, both the local and national economy had significant losses in terms of GVA (RO: -11%: AG: -0.14), the most affected sectors being the trade, construction and agriculture. In terms of employment, the biggest losses at national level have been recorded in the industry, while the local economy experienced large declines in agriculture, too.

Figure no. 2. Growth rate of the GVA and employment



	Agriculture	Industry	Construction	Trade, transport, ICT	Services for enterprises	Services for households	TOTAL
EU27	-0,04	-0,05	-0,13	-0,03	-0,01	0,04	-0,02
RO	-0,23	0,10	-0,26	-0,36	0,15	-0,09	-0,11
AG	-0,21	-0,01	-0,25	-0,38	-0,18	-0,05	-0,14



	Agriculture	Industry	Construction	Trade, transport, ICT	Services for enterprises	Services for households	TOTAL
EU27	-0,02	-0,09	-0,10	-0,02	0,02	0,03	-0,02
RO	0,03	-0,12	-0,06	-0,01	0,13	0,03	-0,02
AG	-0,14	-0,11	0,02	-0,09	-0,09	-0,02	-0,09

Source: Authors' computation

Once the growth rates have been determined, the three types of effects are calculated as follows:

BOX No. 3 Types of effects

NS = $X^t ir * g_n$ (NS = national share); **IS** = $X^t ir * (g_{in} - g_n)$ (IS = industry mix);
RS = $X^t ir * (g_{ir} - g_{in})$ (RS = regional share)

Table no. 5 presents the results of the shift-share analysis of the local economy compared to the European one. The results can be interpreted as follows: between 2008 and 2010, the local economy has recorded a total loss of output of 567.2 million euro (mainly in construction and trade) and a decrease in employment of 25000 people, of

which 11000 in industry and over 9000 in agriculture. By types of effects, losses can be mainly explained by local effects, namely by the losses in competitiveness at the county level. The effects of the European crisis are reflected in National Share (NS) column, which shows that the European influences have produced a loss of 81 million € and a decrease in employment of about 6000 people. Finally, the positive values recorded for the Industry Share (IS) show that the local industrial mix was a relatively optimal one, since it brought gains in the GVA and minor losses in employment .

Table no. 5. Shift – share analysis: AG – EU (2008-2010)

SECTOR	GVA				EMPLOYMENT			
	NS	IS	RS	**SS**	NS	IS	RS	**SS**
Agriculture	-4,6	-5,5	-38,1	**-48,2**	-1,3	0,3	-8,1	**-9,1**
Industry	-35,0	-50,7	67,8	**-17,9**	-2,0	-7,2	-1,7	**-11,0**
Construction	-8,1	-44,8	-47,3	**-100,1**	-0,6	-2,6	3,9	**0,7**
Trade, transport, ICT	-15,5	-4,3	-271,1	**-290,9**	-0,9	-0,1	-2,9	**-3,9**
Services for enterprises	-10,0	7,0	-86,6	**-89,6**	-0,2	0,4	-1,2	**-1,0**
Services for households	-8,3	26,6	-38,8	**-20,5**	-0,8	1,7	-1,8	**-0,9**
TOTAL	-81,5	9,3	-495,0	**-567,2**	-5,8	-1,0	-18,2	**-25,0**

Conclusions

The results of these analyses can be synthesized as follows:

Table no. 6 Local opportunities for specialization

	AGRICULTURE	**INDUSTRY**	**TRADE & SERVICES**
+	The highest location quotient – potential for specialization in the EU.	- The most competitive sector in the local economy – potential for specialization in the EU and Romania.	-
-	High imbalances between GVA and employment shares ; high seasonality (good vs. bad agricultural year).	- High vulnerability to economic crisis (about half of the losses in local employment during 2008-2010).	- sectors where the local economy does not satisfy the domestic demand.

These results have a number of implications for decision-making, especially when a key-question arises: "Which of the three sectors to be supported: *agriculture* - which has the greatest potential for differentiation, *the industry* - which is the most competitive sector of the local economy or *the services* sector - to reduce the dependence on imports?" In agreement with the European framework for 2014 - 2020, the recommendation is to focus all efforts on **smart specialization** that addresses the difficult problem of prioritizing investments in few areas offering strong competitive advantages.

Smart specialization is closely related to the local potential for research, development and innovation at and to the regional capabilities to create links and network between universities, research centers and the business environment, able to identify barriers to innovation and delimit areas of specialization: for example, while leading regions can invest in the development of advanced technologies and innovation in services, lagging areas can focus on applying innovative technologies in existing sectors (EC COM (2010) 553 final).

The arguments presented in this paper are not sufficient to advocate for specialization in a sector or another, especially since there are some limitations related to the availability of data until 2010 and only for the sector, not the division level. In addition, innovation-related

data in the local economy can only be identified through micro-studies at sectoral level - that are currently missing. Nevertheless, the paper brings in some key-points that any strategy for specialization - and especially for smart specialization - should consider:

1. Arges is a predominantly rural county and is part of a region with very low performances for Europe 2020 indicators for smart growth (gross expenditure on research and development, employment and education). No local specialization strategy can be expected to produce positive effects without a prior improvement on these dimensions.
2. Arges is a "poor" county when compared to the European economy, but a "rich" county when compared to the national figures, a county with a high potential for specialization on the European market, but not on the Romanain one. Therefore, the specialization strategy must define a priori the target market, because - for example, the decision to specialize in agriculture will be advantageous especially in relation to the European market and not to the national one.
3. Finally, given the fact that "smart specialization" refers to those areas with potential for research - development - innovation for which there are no available local data, any strategic approach should consider bringing together businesses, decision-makers and academics to "discover" and prioritize the areas with potential for innovation, knowledge transfer and economic progress.

References

1. Baldwin R., Wypplosz, C. (2006), *Economia integrării europene*, Ed. Economică, Bucureşti, 2006, p. 288
2. Constantin D.L. (1998). Economie regională. Ed. Oscar Print, Bucureşti, p. 127
3. *** Comisia Națională de Prognoză (CNP, 2013). *Prognoza în profil territorial – varianta de primăvară 2013*. Accesed at: http://www.cnp.ro/user/repository/prognoza_teritoriala_primavara_%202013.pdf
4. ***EC COM(2010) 553 final, *Regional Policy contributing to smart growth in Europe 2020*, http://ec.europa.eu/regional_policy/sources/docoffic/official/communic/smart_growth/comm2010_553_en.pdf
5. ***Eurostat *Statistics* (2013). Accesed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home
6. *** Eurostat *Urban – rural typology* (2013). Accesed at: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Urban-rural_typology).
7. Goschin Z., Constantin D.L.,Roman M., Ileanu B. (2009), *Specialization and concentration patterns in Romanian economy*, Journal of Applied Quantitative Methods, Vol. 4 (1), Spring 2009
8. Goschin Z., Constantin D., Mitruț C., Danciu A. (2010), Impactul regional al crizei economice din perspectiva ocupării forței de muncă. Studii şi cercetări de calcul economic şi cibernetică economică, Nr. 3-4/ 2010, pp. 6-7
9. *** Institutul Național de Statistică (INS, 2013) *Tempo on-line* . Accesed at: https://statistici.insse.ro/shop/?lang=ro
10. *** Institutul Național de Statistică (2013). *Recensământul populației şi al locuințelor. Rezultate definitive*. Accesed at: http://www.recensamantromania.ro/wp-content/uploads/2013/07/REZULTATE-DEFINITIVE-RPL_2011.pdf
11. *** Institutul Național de Statistică (2013). *Repere economice şi sociale regionale. Statistica teritorială*, Publicații de sinteză: 14-Jun-2013
12. The Cities Alliance (2007), *Understanding your local economy. A resource guide for cities*. Washington DC, US, p. 87