

## **THE ANALYSIS OF ECONOMIC AND SOCIAL INEQUALITIES AT REGIONAL LEVEL**

*Nicoleta Maria GOGALTAN* <sup>1\*</sup>

### **ABSTRACT**

*The human capital and the labor force market represent key elements of any regional development strategy.*

*This article proposes to analyze the economic and social inequalities at regional level. In this respect, it has been used a set of inequality indicators, estimated based on date series, as well as the statistical methods for measuring the regional concentration.*

**KEYWORDS:** *Inequality, regional, indicators, concentration, Gini, E-views*

### **1. INTRODUCTION**

The causes of regional inequalities are diverse and they are imposed by geographic reasons as well as by economic and social changes and transformations. In the new Member States, the economic and social heritage was the main cause, being considered a real handicap highlighted by technological underdevelopment, social deprivation, high unemployment, inadequate infrastructure.

After the year 2004, one of the priorities of the regional policy was a higher standard of living in the new Member States with the help of resources transfer from the rich regions to the poor ones. This transfer is realised on the basis of the solidarity principle and in the benefit of the citizens and of the disadvantaged regions.

Large economic and social inequalities between regions and Member States have existed since the beginning of the European integration process, becoming worse with each expansion. Romania's regional development strategy has to fall within the orientations and tendencies promoted by the European Union. Its successful application depends not only on ensuring the necessary financial support, but also on the manner in which this responds to "behavioural challenges": participation, communication, mentalities, attitudes.

A strategy approach oriented at the citizens' needs (people-centred approach) can lead to the enlargement of the knowledge base, understanding and commitment of the groups trained in regional development, in improving the relations with promising local initiatives. In the phase of strategy implementation all the actors involved can be

---

<sup>1\*</sup> corresponding author, Assistant Professor PhD, Faculty of Computer Science for Business Management, Romanian - American University, Bucharest, mariaburac@yahoo.com

identified: central and local administration, business sector, non-governmental organisations and, last but not least, the local communities, the citizens.

The local administration represents a key element in a democratic political system, which provides a series of services essential for the economic and social wellbeing of the citizens. This represents the closest level to the citizens and plays an important part in representing the concerns and opinions defined at town level. The local administration must support the structures and the economic and social environment in an active and participative manner.

The regional development process is regarded as a necessary step for the creation of an adequate framework for a significant and especially sustainable improvement of the standard of living, the diversification of the economic activities, the stimulation of private investment, the reduction of unemployment etc.

In order to identify the level of the present economic and social inequalities registered between the eight development regions in Romania, we will realise a series of specific analysis concerning different aspects of the evolution of this process in a regional context.

This paper aims to present the results of the measurement of the economic and social inequalities existing between the development regions in Romania in different timeframes.

There is a large number of statistical methods for the measurement of the territorial concentration of the economic variables. Among these we chose one method very well known

## **2. THE ANALYSIS OF DEVELOPMENT DIFFERENCES AT REGIONAL LEVEL WITH THE HELP OF THE GINI/STRUCK COEFFICIENTS**

In order to identify the level of the regional, economic and social inequalities will be used the method of the Gini/Struck concentration coefficients, which present the main tendency of an economic phenomenon shown with the help of a statistical indicator. The classic formula of the Gini coefficient is the following (where  $g_i$  represents the share of the region  $i^1$ ):

$$C_G = \sqrt{\sum_{i=1} g_i^2} \quad \text{and where} \quad \frac{1}{n} \leq C_G \leq 1$$

The maximum level of the coefficient is 1; the minimum level of the coefficient is not zero, but  $\sqrt{1/n}$ . In the Gini-Struck variant, the concentration coefficient is positioned

$$C_{G-s} = \sqrt{\frac{n \sum_{i=1} g_i^2 - 1}{n - 1}};$$

between 0 and 1 and results like this:

---

<sup>1</sup> Pecican E, Indicatori privind convergenta reală și aplicațiile acestora, [ftp://www.ipe.ro/RePEc/ror/ror\\_pdf/seince091004.pdf](http://www.ipe.ro/RePEc/ror/ror_pdf/seince091004.pdf)

The Gini/Struck coefficient presents a concentration in growth as it approaches the level of the superior limit, which is 1. The period of analysis of the inequalities is 2008 and 2011, and the interpretation of the values obtained is the following: the value of the Gini coefficient which is smaller than 0,3 implies the existence of a low regional concentration; values between 0,3-0,5 imply an average concentration and over 0,5 an increased concentration.

**Results obtained**

*Concentration of the total regional gross domestic product*

The concentration of the economic performances at regional level shown with the help of total GDP is a low one (until the year 2000), after which is observed an increase of their concentration until the year 2008, when the effects of the crisis begin to manifest.

Starting with the year 2009 is found a decrease of the concentration of the total regional GDP, this tendency being a constant one (chart 1).

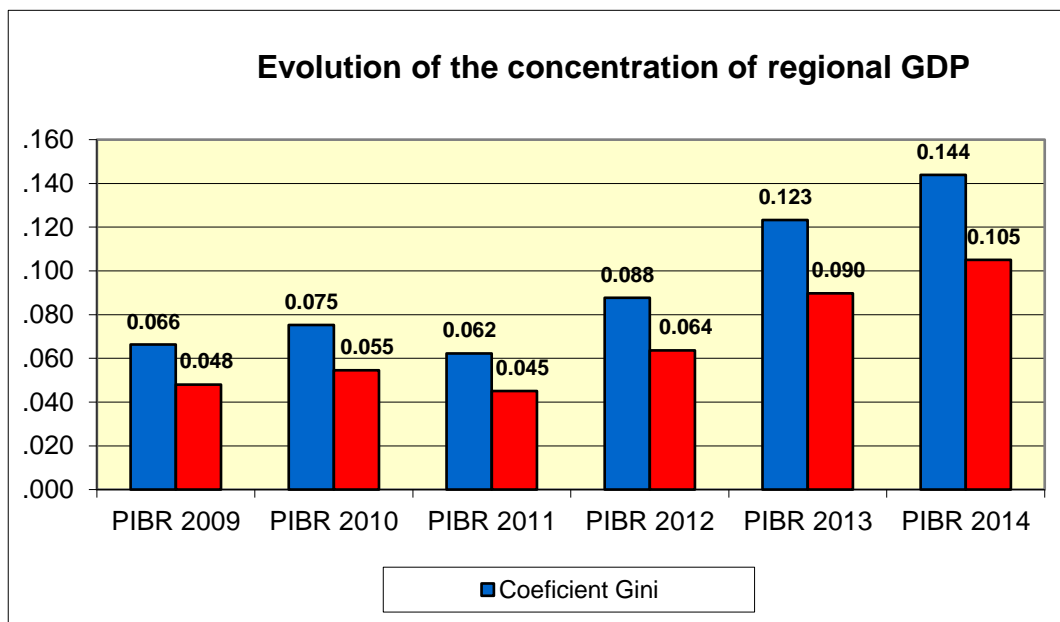


Chart 1. Evolution of the Gini/Struck coefficients – regional GDP indicator – period 1995-2010  
 Source: Own processing – data from the Statistical Yearbook of Romania, 2008-2014

*Demographic concentration*

Concerning the regional population, we can't speak of an important concentration, but ather of a constant evolution tendency (0,106) and even a decrease of the concentration in rural areas (Chart 2).

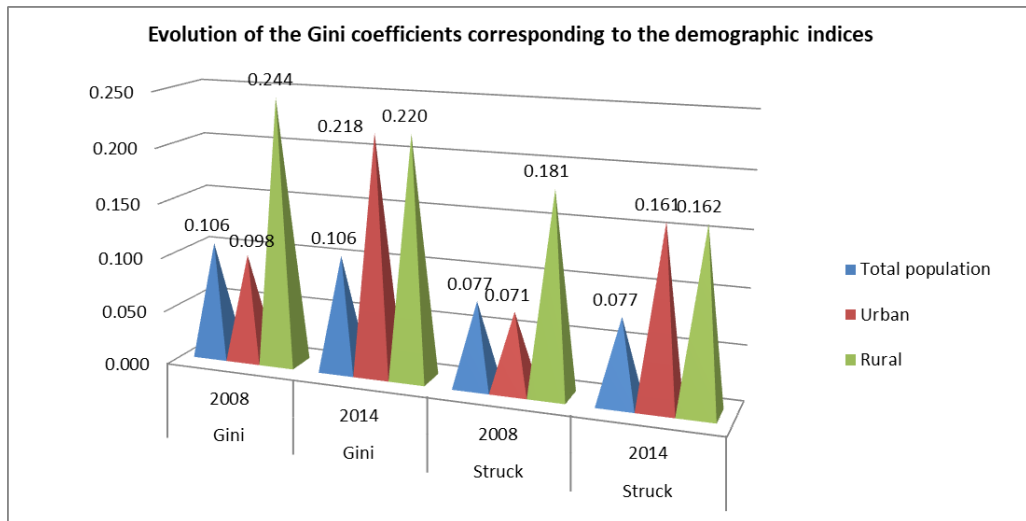


Chart 2. Concentration of the population in urban/rural environment  
 Source: Own processing of data from the Statistical Yearbook of Romania, 2008-2014

*Concentration of the companies*

A relevant aspect for the development of a region is the entrepreneurship sector. Thus, have been calculated the Gini coefficient corresponding to the total number of active companies, which have shown that in the year 2011 was reported an average concentration for these of 0,198. There is also an average concentration at regional level, but decreasing, of the SMEs with a number of 10-49 employees (0,391) and with 50-249 employees (0,201) (chart 3).

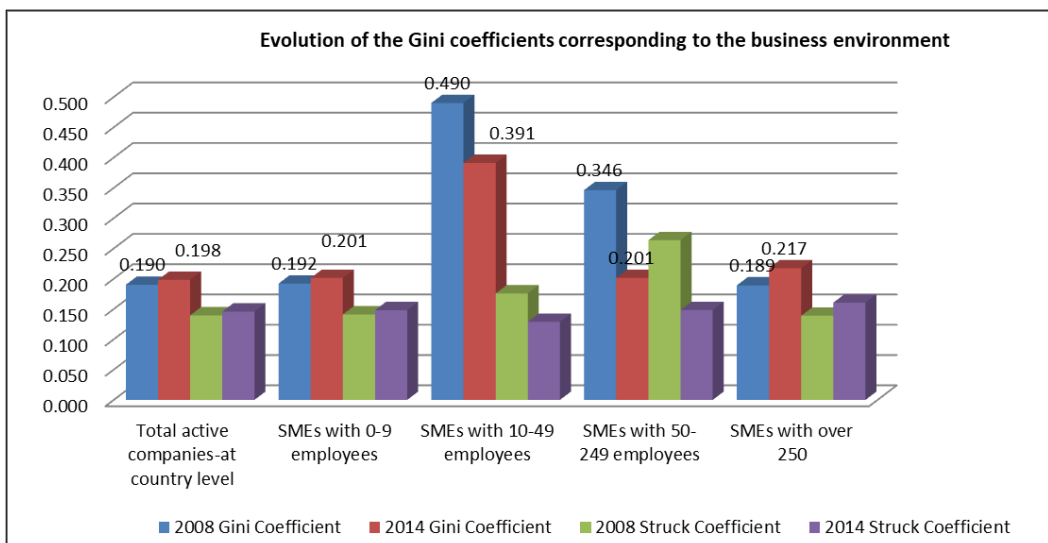


Chart 3. Concentration of the companies at regional level, 2008-2014  
 Source: Processing of data from the Statistical Yearbook of Romania, 2008-2014

Concerning the performances of the active companies is observed an increase of the concentration of the regional economic performances, especially of the turnover and especially in the field of commercial services (0,452) (chart 4).

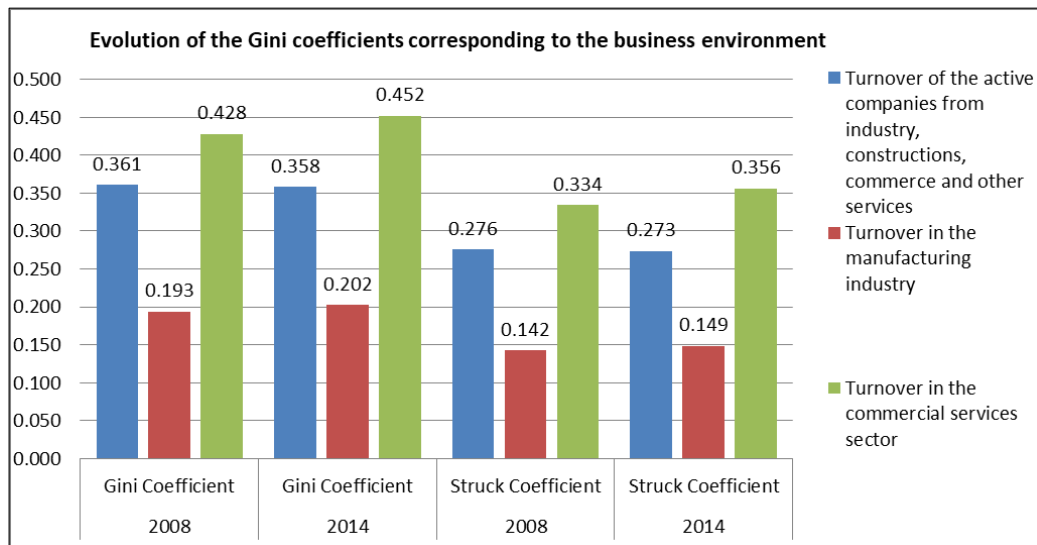


Chart 4. Evolution of the Gini coefficients corresponding to the business environment, 2008-2014  
 Source: Processing of data from the Statistical Yearbook of Romania, 2008-2014

*Concentration of the labour force*

For this analysis was used the index total occupied population, which presents a tendency of reduced concentration, the value of the coefficient reaching 0,11 in the period 2008-2014. By economic sectors are found close values – at the index population occupied in industry and constructions and at the one in services. For agriculture it can be observed an increase of the values of the Gini coefficient, with increasing tendencies (chart 5).

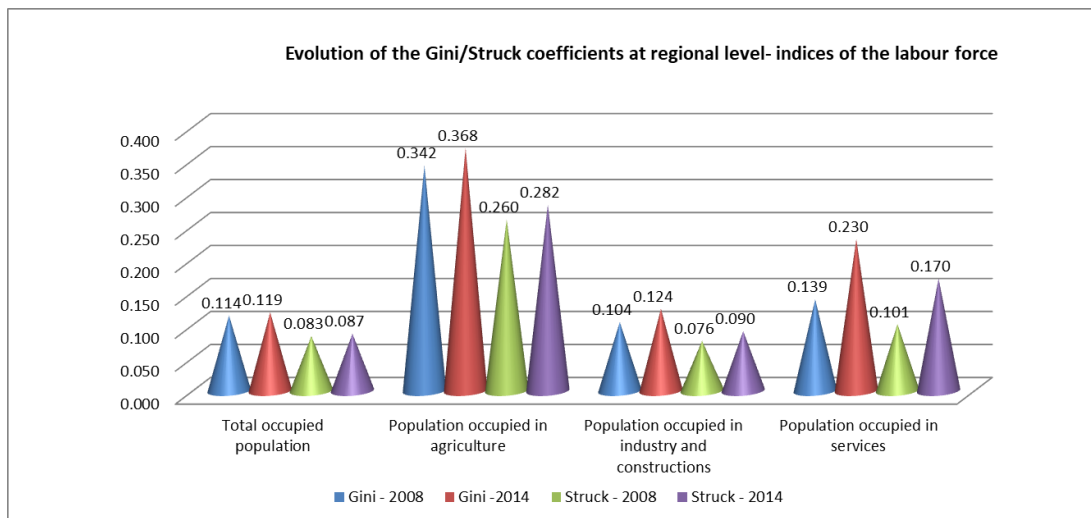


Chart 5. Evolution of the coefficients of the labour force – in the period 2008-2014  
 Source: Processing of data from the Statistical Yearbook of Romania, 2008-2014

*In conclusion, we can't speak about very large regional inequalities, most of the values registered by the Gini coefficient being situated in the interval until 0,3. For the two years taken into consideration we can't speak of a real impact of the funds destined for economic and social cohesion (especially structural funds). In the year 2008 were not accessed at all European funds through POR, and in the year 2014 the absorption rate was around the value of 9%, but the effects obtained have been lagging.*

The human capital and the labour force market are key elements of any regional development strategy, their importance being recognized by the classical economic theory and in recent economic models.

A spatial model which explains the interdependencies between (1) increase of the labour force occupation, (2) migration behaviour, (3) income of the households and (4) public local services al regional level in a model of balanced growth has the following specifications:

$$M Y H_t^* = f[(E M P_t), (O T M_t), (I N M_t), (G E X_t), (M Y H_{t-1})]$$

$$G E X_t^* = f[(E M P_t), (O T M_t), (I N M_t), (M Y H_t), (G E X_{t-1})]$$

where  $EM P_t^*$ ,  $IN M_t^*$ ,  $OT M_t^*$ ,  $MY H_t^*$  și  $GEX_t^*$  are vectors of dimension  $NT \times 1$  from the balance levels of the national immigration, of the occupation of the labour force in the non-agricultural private field, of the national emigration, of the average net monthly salary and respectively of the public local expenditure per capita; t indicates time.

The dependent variables are the growth rates of the labour force occupation, of global immigration and emigration, of the average net monthly salary and of the direct public local expenditure per capita.

- **EMPR:** the growth rate of the labour force occupation is measured by the logarithmic difference between the levels of occupation of the labour force in the non-agricultural private field;
- **INMR:** the growth rate of the global immigration is measured by the logarithmic difference between the levels of global immigration in a certain region;
- **OTMR:** the growth rate of the emigration is measured by the logarithmic difference between the levels of emigration in a certain region.
- **MYHR:** the logarithmic difference between the levels of the average net monthly salary in a certain region is used to measure its growth rate;
- **GEXR:** the local administrations spend money for public local services such as education, recreational activities, police and infrastructure. The growth rate of the direct public local expenditure per capita is measured by the logarithmic difference between the levels of public local expenditure per capita.

**Independent variables**

The independent variables include the demographic factor, the human capital, the labour market, the property market, the industry structure, the facilities and the policies. According to expert studies (theoretical or practical), if not indicated otherwise, in the analysis are used the initial values of the independent variables. This formulation reduces the problem of endogeneity. All the independent variables are in a logarithmic form, with the exception of those which can take negative values or the value 0.

Table 1. Equation of the public local expenditure

Dependent Variable: D(GEXR?)  
 Method: Pooled EGLS (Cross-section SUR)  
 Sample (adjusted): 1997 2008  
 Included observations: 12 after adjustments  
 Cross-sections included: 9  
 Total pool (balanced) observations: 108  
 Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EMPR?)	7.008395	1.761086	3.979587	0.0001
D(INMR?)	0.204442	0.042099	4.856217	0.0000
D(MYHR?)	-19.34940	3.123451	-6.194877	0.0000
D(OTMR?)	-0.183372	0.042726	-4.291838	0.0000
INMR_RO	0.057184	0.020583	2.778219	0.0065
MYHR_RO	2.380529	0.465706	5.111658	0.0000
OTMR_RO	-0.058414	0.020416	-2.861244	0.0051
EMPR_RO	0.316290	0.161204	1.962051	0.0525

Weighted Statistics			
R-squared	0.545431	Mean dependent var	0.331437
Adjusted R-squared	0.513611	S.D. dependent var	1.217630
S.E. of regression	0.857341	Sum squared resid	73.50341
Durbin-Watson stat	2.072904		
Unweighted Statistics			
R-squared	0.061706	Mean dependent var	772.4935
Sum squared resid	3.19E+09	Durbin-Watson stat	2.600489

- The determination coefficient  $R^2$  is significant, namely 54% (0.545431), fact which indicates the effect of the variation of the model factors on the variation of the endogenous variable (GEXR),
- In the equation GEXR the coefficients are significant; the emigration is negatively correlated with the growth rate of the public local expenditure. It is also negatively correlated with the average net monthly salary (MYHR),
- A negative coefficient of MYHR in the equation GEXR indicates the fact that the regions with a high growth rate of the average net monthly salaries correspond with a situation of decrease of the growth of local expenditure. This leads to the fact that payments on wellbeing have the largest share of the regional expenditure.

The results of the GEXR equation are mostly consistent from the point of view of the theoretical expectations. The results indicate that a high growth rate of the local expenditure per capita is positively associated with a high growth rate of the gross emigration. The migrants have an important impact on the demand of supply for local goods and services, as well as on the income which results from supplying those goods and services. The emigration also reduces the possibility of the economies of scale to supply public services. A high emigration can create an excess of capacity and high maintenance costs of the infrastructure stock (such as schools, local police, firemen etc.).

Table 2. Equation of the average net monthly salaries

Dependent Variable: D(MYHR?)  
 Method: Pooled EGLS (Cross-section SUR)  
 Sample (adjusted): 1997 2008  
 Included observations: 12 after adjustments  
 Cross-sections included: 9  
 Total pool (balanced) observations: 108  
 Linear estimation after one-step weighting matrix



Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EMPR?)	0.030625	0.009873	3.101813	0.0025
D(INMR?)	-0.000125	0.000239	-0.520899	0.6036
D(OTMR?)	-0.000111	0.000241	-0.460968	0.6458
D(GEXR?)	-0.000763	4.33E-05	-17.64173	0.0000
GEXR_RO	0.004160	0.000178	23.43819	0.0000
EMPR_RO	0.007495	0.004122	1.818013	0.0721
INMR_RO	0.000838	0.000411	2.037308	0.0443
OTMR_RO	-0.000827	0.000403	-2.048922	0.0431
<b>Weighted Statistics</b>				
R-squared	0.951615	Mean dependent var	1.711581	
Adjusted R-squared	0.948228	S.D. dependent var	7.403788	
S.E. of regression	0.996040	Sum squared resid	99.20949	
Durbin-Watson stat	1.911437			
<b>Unweighted Statistics</b>				
R-squared	0.791655	Mean dependent var	103.0556	
Sum squared resid	94175.08	Durbin-Watson stat	0.945164	

- It is observed that the influences of INMR and OTMR on the endogenous variable are not significant, which means that the employers do not take into account the immigration and the emigration. This fact has led to their exclusion from the MYHR equation, and the new statistic has modified as such:

Table 3. Equation of the average net monthly salaries (modified)

Dependent Variable: D(MYHR?)

Method: Pooled EGLS (Cross-section SUR)

Sample (adjusted): 1997 2008

Included observations: 12 after adjustments

Cross-sections included: 9

Total pool (balanced) observations: 108

Linear estimation after one-step weighting matrix

Cross-section SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EMPR?)	0.019703	0.004455	4.423129	0.0000
D(GEXR?)	-0.000836	4.56E-05	-18.34284	0.0000

GEXR_RO	0.004362	0.000156	27.88783	0.0000
EMPR_RO	0.012934	0.003222	4.014419	0.0001
INMR_RO	0.000883	0.000391	2.255266	0.0263
OTMR_RO	-0.000978	0.000389	-2.515439	0.0134

---

Weighted Statistics

---

R-squared	0.937809	Mean dependent var	1.384182
Adjusted R-squared	0.934760	S.D. dependent var	5.891892
S.E. of regression	0.963489	Sum squared resid	94.68779
Durbin-Watson stat	1.990543		

---

Unweighted Statistics

---

R-squared	0.783333	Mean dependent var	103.0556
Sum squared resid	97936.83	Durbin-Watson stat	0.904209

- The determination coefficient  $R^2$  is significant, namely 93% (0.937809), fact which indicates the effect of the variation of the model factors on the variation of the endogenous variable (MYHR),
- In the MYHR equation the coefficients are significant, EMPR being positively correlated with MYHR.

The results obtained from the MMYR equation (average net monthly salaries) are much more consistent from the point of view of the theoretical expectations. This shows that the regions with an important growth of the occupation have a notable experience of the growth rate of the average net monthly salaries.

The negative coefficient of GEXR in the MMYR equation indicates the fact that direct local expenditure per capita at regional level are concentrated especially in expenditure such as payment of unemployment, wellbeing of the people etc.

The results indicate the fact that a high growth rate of the local expenditure per capita in a certain region is negatively correlated with the growth rates of the immigration in that region. A possible explanation for these results would be that the immigration may lead to a growth of the population and a high density, as well as to the realisation of an economy of scale in supplying public services.

### 3. CONCLUSIONS

Following the analysis performed, the coefficients of the endogenous variables are statistically significant at a level of confidence of 95%. This indicates the fact that there is a strong interdependence between the growth rate of the occupation, the growth rate of the salaries and the growth rate of public local expenditure. The direction of causality indicated by the coefficients is also consistent from the point of view of the expectations.

The results show the existence of a conditional convergence from the point of view of the endogenous variables for each of the equations. This indicates statistically significant

coefficients regarding the last dependent variables. The implications are related to the growth rate of the occupation, to the net immigration/emigration, to the net monthly salaries and to local expenditure, compared to regions with high initial levels.

The empirical results suggest that there is a significant feedback between the growth rates of the net monthly salaries and of the local expenditure at regional level in Romania.

The results of the analysis show that there is a positive interdependence between the growth rates mentioned above.

Considering that Romania is dominated by small communities territorially dispersed which own small local and regional markets, the results obtained are significant. This implies the fact that local governments should act to promote the growth of the occupation, which in turn can determine the reduction of poverty.

## **BIBLIOGRAPHY**

- [1] Ailenei, D.; Grosu, T. (2010), *Economia sectorului public (curs în format digital – www.biblioteca-digitală.ase.ro)*;
- [2] Ailenei D., Mosora D., (2011), *Economics of Sustainable Development. Competitiveness and Economic Growth*, *Theoretical and Applied Economics* No. 2/ 2011 (555), [http://www.ectap.ro/economics-of-sustainable-development-competitiveness-and-economic-growth-dorel-ailenei\\_liviu-cosmin-mosora/a552/](http://www.ectap.ro/economics-of-sustainable-development-competitiveness-and-economic-growth-dorel-ailenei_liviu-cosmin-mosora/a552/);
- [3] Ailenei D., (2011), *Regional patterns of global economic crisis shock propagation into Romanian economy*, <http://www.rrsa.ro/rjrs/V613.AILENEI.PDF>;
- [4] Albu, L.L., *The convergence process in the EU estimated by Gini coefficients*, [http://www.ipe.ro/rjef/rjef4\\_12/rjef4\\_2012p5-16.pdf](http://www.ipe.ro/rjef/rjef4_12/rjef4_2012p5-16.pdf);
- [5] Albu, L. L. (2008), "Trends in Structural Changes and Convergence in EU", *Journal for Economic Forecasting*, Vol. 5, No. 1, 91-101;
- [6] Antonescu D., (2013), *The Regional Development Policy of Romania in the Post-Accession Period*, <http://www.workingpapers.ro/2013/wpince131209.pdf>;
- [7] Armstrong, Harvey; Taylor, Jim (2000), *Regional Economics*
- [8] Clark D., *Regional growth - Export demand models, agglomeration and cumulative growth*, <https://www.economicsnetwork.ac.uk/sites/default/files/Dave%20Clark/1003b.pdf>;
- [9] Hsiao C., 1990, *Analysis of Panel Data*, Cambridge University Press;
- [10] Jula D. – *Economie Regională*, Ed Estfalia, București, 2002;
- [11] Jula D., Jula N., *The Romanian regions competitiveness*, 40Th. Congress of the European Regional Science Association, 29 AUGUST-1 SEPTEMBER 2000, Barcelona, <http://www-sre.wu-wien.ac.at/ersa/ersaconfs/ersa00/pdf-ersa/pdf/266.pdf>;

- [12] Jula, D., Jula N. M., 2013. "Economic Growth and Structural Changes in Regional Employment," Journal for Economic Forecasting, Institute for Economic Forecasting, Institute for Economic Forecasting, vol. 0(2), pages 52-69, June;
- [13] Jula, D., Jula, N., 2009. "Productivity and the Regional Employment in Services. Econometric Estimations for Romania," Journal for Economic Forecasting, Institute for Economic Forecasting, Institute for Economic Forecasting, vol. 6(3), pages 129-137, September;
- [14] Pecican E, Indicatori privind convergenta reală și aplicațiile acestora, [ftp://www.ipe.ro/RePEc/ror/ror\\_pdf/seince091004.pdf](ftp://www.ipe.ro/RePEc/ror/ror_pdf/seince091004.pdf)