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## DISPARITIES IN REGIONAL ECONOMIC DEVELOPMENT IN ROMANIA

Maria Daniela OȚIL\*, Andra MICULESCU\*\*, Laura Mariana CISMAȘ\*\*\*

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### Abstract

*The issue of economic disparities within the European Union economies is not new, it is actually a topical issue. Unfortunately, the EU enlargement has determined an even stronger deepening of the regional disparities, because in the absence of adequate regional development policies, the financial instruments have proved to be ineffective. Recent studies show that the economic crisis has increased regional disparities in the European Union countries, influencing the most important regions, especially the economically less advanced ones, the significant regional differences being identified at the NUTS 3 level. Based on these issues, the present paper tries to answer the following questions: 1. How extended are the regional disparities in Romania and how did they evolve over the period 1998-2012? 2. How did the economic crisis influence disparities? Which territorial units were more affected? In order to measure regional inequalities the Hoover index was used as well as the coefficient of variation, and the indicator for assessing the level of development as well as for highlighting regional disparities was GDP per capita. The analysis and interpretation of the results provide an overview of the situation at the regional level in Romania*

**Keywords:** regional disparities, regions of development, Romania, Hoover index, coefficient of variation

**JEL classification:** R11, R12

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### 1. INTRODUCTION

In the field of regional policies, for any economy, the main challenge represents the mitigation of economic-social discrepancies between various territories (regions), however, the reality shows that this is neither a simple nor a short term issue.

For Romania, which has large shortcoming compared to the economically developed countries, the intense mobilization of internal and external factors of economic growth in order to reduce and remove the shortcomings compared to other countries, is an objective need, a governing law resulting from the regional and national interests, in the light of finality, welfare

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\* Faculty of Economics and Business Administration, West University of Timișoara, Timișoara, Romania; e-mail: [maria.otil@e-uvt.ro](mailto:maria.otil@e-uvt.ro);

\*\* Faculty of Economics and Business Administration, West University of Timișoara, Timișoara, Romania; e-mail: [andra.miculescu@e-uvt.ro](mailto:andra.miculescu@e-uvt.ro);

\*\*\* Faculty of Economics and Business Administration, West University of Timișoara, Timișoara, Romania; e-mail: [laura.cismas@e-uvt.ro](mailto:laura.cismas@e-uvt.ro);

increasing. The inefficient industrial development of the country, which did not take into account the market requirements, led to the occurrence of some important and economic discrepancies between the various Romanian regions/areas. Within these regions, there are also significant differences between their counties, generated by the development of some economic activities that did not take into account their traditional human and natural potential.

The main objective of this paper is to make a contribution to the study of the theory of integration by analyzing regional disparities and the convergence process at regional level in Romania. To meet this objective our research focuses on achieving the following specific targets: to explain the theoretical aspects of the study of economic disparities and of the real convergence process; to identify factors influencing disparities and the unequal regional development; to analyze regional disparities and real convergence in Romania.

Considering various recent international economic studies, which indicate that the economic crisis has led towards the increase of the regional disparities in the case of member countries of the European Union, influencing the most important regions, especially the less advanced economically (significant regional differences being identified at the NUTS III level) our research attempts to answer the question: How has the economic crisis affected disparities and which territorial units in Romania were most affected (the most developed ones or the less developed ones)?

To measure inequalities and to highlight their distribution at territorial level the Hoover index was calculated in four variants: among developing regions (including and excluding the Bucharest Ilfov region), among counties; at intraregional level and within the macroregions (between the regions that make up each macroregion). The existence of inequalities at regional level can be reflected by testing the existence of a real convergence process. To identify the main trends of the convergence process in Romania the convergence hypothesis of sigma was tested (the coefficient of variation), to see if the regions have managed to reduce their differences over the review period.

Knowing the level and the dynamics of disparities is quite important in order to define the priorities from the regional development strategies as basis in outlining the policies in the field of economic, social and territorial cohesion and in order to find solutions for their decrease as an economy which must integrate itself in the productive system of the European Union.

## 2. LITERATURE REVIEW

Most of the times, when approaching issues of disparities, the economists have the tendency to refer to the existing differences at the income level, giving answers related to the tendencies and the process of economic growth at regional level.

In the specialty literature, besides the term of regional disparity, other terms are also used such as: regional discrepancy, difference, regional inequality. *Disparity* means the lack of equality, proportion, discrepancy, difference. In the same area of significances, is also the notion of *discrepancy* which means a distancing in time or space, disproportion, inadequacy, as well as the notion of *difference* meaning separation, lack of similarity, discrepancy. Polese defines *the disparities of regional development* as being differences between the regions regarding their ability to provide opportunities to gain income for their inhabitants (Polese, 1999, p. 300). Some authors consider that inequalities transform into disparities when these exceed the amplitude of 30% (Goschin *et al.*, 2007, p. 27).

*The economic differences* are defined as quantitative and qualitative discrepancies between the levels of economic development of the measured countries by comparing some

macroeconomic indicators (Dobrotă, 1999, p. 163). It is worth to mention the fact that all terms are used to show the development differences between various regions. The term of inequality is generally defined in a negative way. *Inequality suggests a deviation from equality* (Cowell, 1995, p. 11).

The theoretical approaches on regional inequalities are dominated by the concurrence of the two schools of thought (Petraikos, 2009, p. 34): the school advocating convergence, previsions the convergence of regional disparities, a school that is based on the neoclassical economic theory and the school that previsions the regional divergence based on the Theory of cumulative causation.

According to the neoclassical theory of economic growth, the decisions of regional policy are directed to the stimulation of the mobility of labor force, liberalization of trade and technological transfer, the increase of the regional production being the result of increasing the mobility of the production factors and of technologies and the regional policy objective (of reducing the regional disparities) may be achieved on the long term following the process of regional convergence also as an effect of the GDP/inhabitant growth.

There are also national economic studies that are based on the traditional theories regarding disparities which explained that, at the base of inequalities between the regions, there are the following causes: the differentiated endowment of the regions with natural resources, production factors, infrastructure and technology (Goschin *et al.*, 2008, 2009; Constantinescu and Constantin, 2010; Boboc *et al.*, 2012; Goschin, 2014, 2015). Other empirical studies show that there are also relevant influence factors that are not present in the traditional analysis, factors which were pointed out by the recent theories regarding localization (Zaman *et al.*, 2013). Following Solow, the advocates of the neoclassical paradigm assert that the disparities tend to diminish together with economic growth although, as R. Solow (1994) and Fingleton (2003) admit, this is not always the case due to the decreasing performance of the capital. In a competitive environment, labor at regional level and the capital mobility as well as the regional trade also favor the convergence of the prices of factors, strengthening the negative relationship between economic growth and regional disparities.

As an answer to the above mentioned neoclassical empirical studies, an opposing literature was developed according to which growth is a cumulative spatial process, a process that can determine the increase of disparities. In this way, we mention the older development theories, urban theories of development, the school of the new economic geography, and theories of endogen growth, in which a common ground occurs: there is the tendency of associating economic growth to agglomeration (Petraikos, 2009)

The agglomeration of activities in a region is a factor of economic growth but does not determine the decrease of regional disparities. The agglomeration of economic activities in a central region is the expression of a balance between the centripetal forces determining the polarization of economic activities in the central region and the centrifugal ones influencing their dispersion towards peripheral regions (Marinaş and Socol, 2009, p. 67).

The current economic theories study the amplitude of discrepancies, of disparities in various historical moments, their dynamics on the long term and the mechanisms that generated and maintained them. These do not consider the differences of economic development between territorial units just as simple temporal discrepancies. In the analyses regarding the current economies, the economists consider the gross domestic product per inhabitant as being the most adequate synthetic indicator of estimating the development level in an economy. In the field of economic history, Paul Bairoch and Angus Maddison have

influenced the most this field by research aimed to measure the economic discrepancies during some long time periods as well as the analysis of their historical evolution (Murgescu, 2010).

The extension of the European Union has determined a stronger deepening of regional disparities since due to the lack of some adequate policies of regional development, the financial instruments proved to be inefficient (Horváth, 2009).

The economic crisis determined the increase of regional disparities in the European Union member states, this influencing the most important regions mostly those with a less economic performance and in the Eastern European countries there is a high rate of unemployment, significant regional differences being identified at the level of NUTS 3 (Holúbek *et al.*, 2014; Rakauskienė and Kozlovskij, 2014).

The studies regarding convergence in the Central and Eastern Europe (ECE) show that this area of the European Union is relatively homogenous, the disparities being more reduced compared to the Western part (Goschin and Constantin, 2010; Szendi, 2013).

Regarding the adhesion of Romania to the European Union, some authors consider that this determined an increase of regional inequalities. Among the explanations given, we mention:

- Low absorption of structural and cohesion funds at regional level, the developed regions (which have an already high degree of expertise in accessing such funds) benefited by their use (Zaman and Georgescu, 2009; Goschin and Constantin, 2010);
- Focus of direct foreign investment in the developed regions (more than 55% in the Bucharest Ilfov region) (Zaman *et al.*, 2013);
- The economic crisis deepened the existing regional issues, its effects were unequally (distributed) felt at regional level depending on the specific social and economic structures, on the degree of regional specialization and on other local factors (Goschin and Constantin, 2010; Ailenei *et al.*, 2012).

### 3. METHODOLOGY OF ANALYSIS

For measuring the territorial inequalities, of underlining their distribution in a territorial profile, the Hoover index was calculated. This was determined according to the formula:

$$H = \frac{1}{2} \sum_{i=1}^n |X_i - F_i|$$

where: H = Hoover index; n= number of territorial units/regions;  $X_i$  – share of GDP of I county/region of the total GDP value (region, macroregion, country) and  $F_i$  – share of total population in the i county/region of the total population.

The Hoover index was calculated on an annual basis for the 1998-2012 period, in four alternatives: between the development regions (with and without the Bucharest Ilfov region); between counties; within the development regions (the disparities were calculated between the component counties of each region); within the development macroregions (the disparities were calculated between the regions comprising each macroregion).

The existence of inequalities at regional level can be reflected by testing the existence of a real convergence process. For identifying the main tendencies of the convergence process in Romania, the hypothesis of sigma convergence was tested. The test of sigma convergence is based on the calculation of discrepancies of indicators (GDP/inhabitant) and it is compared the variation coefficient during T period with T+1.

$$C_{v_T} = \frac{\sigma_T}{\bar{X}_T},$$

where:  $c_{v_T}$  = variation coefficient in the T period

$\sigma_T$  = quadric average deviation of the regional development level in the T period

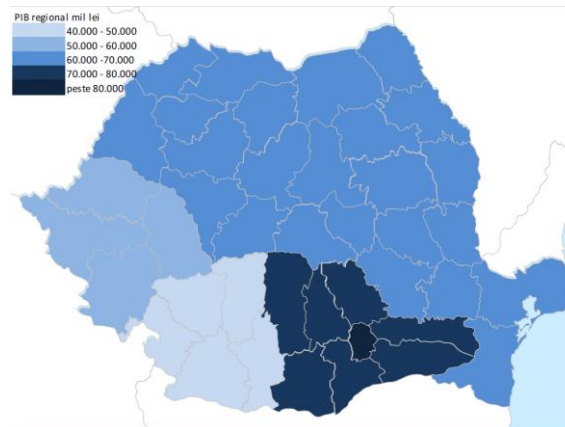
and it is calculated as follows:  $\sigma_T = \sqrt{\frac{1}{n} \sum_{i=1}^n (X_{iT} - \bar{X}_T)^2}$

$\bar{X}_T$  = average level of development in the T period.

There is a sigma type convergence if  $c_{v_T} > c_{v_{T+1}}$ , thus when the phenomenon dispersion is decreasing in a certain time period. The data used in the analysis are taken from INS, Tempo online.

#### 4. ANALYSIS OF DISPARITIES AT REGIONAL LEVEL

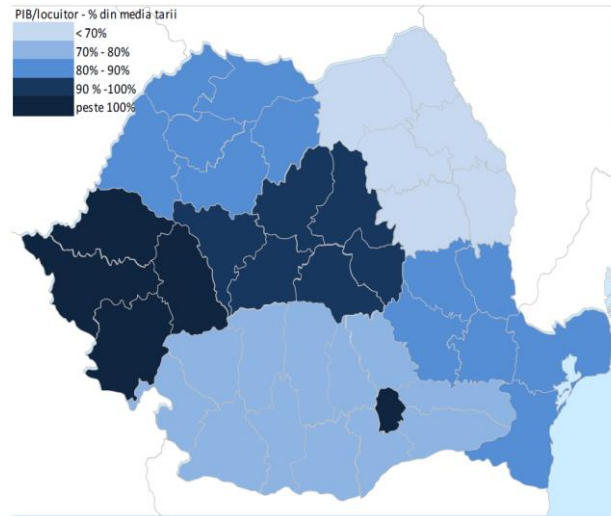
It is obvious that the disparities are present in the 8 existing development regions in Romania (Figure 1). The GDP level corresponding to the development regions ranges between the highest of 161.479,5 mil lei, value recorded in 2012 (Bucharest Ilfov region) and the lowest of 46.597,9 mil lei (the South West Oltenia region) followed by the West region with a GDP of 59143,7 mil lei. The South West Oltenia and West regions have the most reduced participation share in making up the national GDP, at opposite poles we have the South Muntenia and Bucharest Ilfov regions. The explanation of the reduced value of this indicator at the level of the West region consists in the reduced dimensions of the West region compared with the other regions of Romania.



Source: figure based on the data of INSSE (National Institute for Statistics), Tempo online

**Figure no. 1 – Regional GDP, 2012**

Regarding the GDP per inhabitant, the situation is different. Out of the 8 development regions, the West region is ranked 2<sup>nd</sup> being below only to the Bucharest Ilfov region. The GDP / inhabitant of the West region records values higher than the national average indicating a high level of economic development of the region (Figure 2), the Central regions ranking 3<sup>rd</sup>.



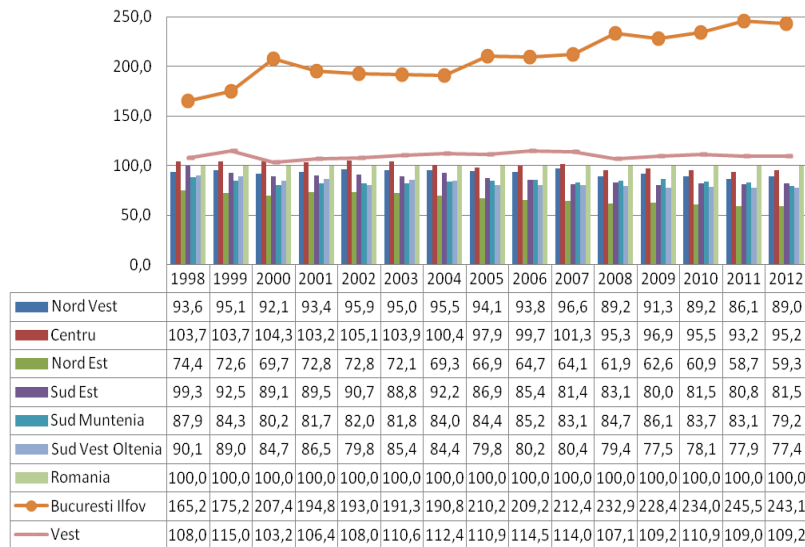
Source: figure based on the data of INSSE, Tempo Online

**Figure no. 2 – GDP/inhabitant, 2012**

The West region, a region ranked 7<sup>th</sup> from the point of view of the contribution to GDP, is ranked 2<sup>nd</sup> regarding GDP/inhabitant same as the central region, indicating a better labor productivity. The North East region has the lowest regional GDP per inhabitant, an aspect indicating the fact that the region has the highest level of poverty. The North East region is within the group of the poorest regions regarding regional development, among which we mention: South Muntenia, South West Oltenia, these two recording values below 80% from the average at national level regarding the presented indicator.

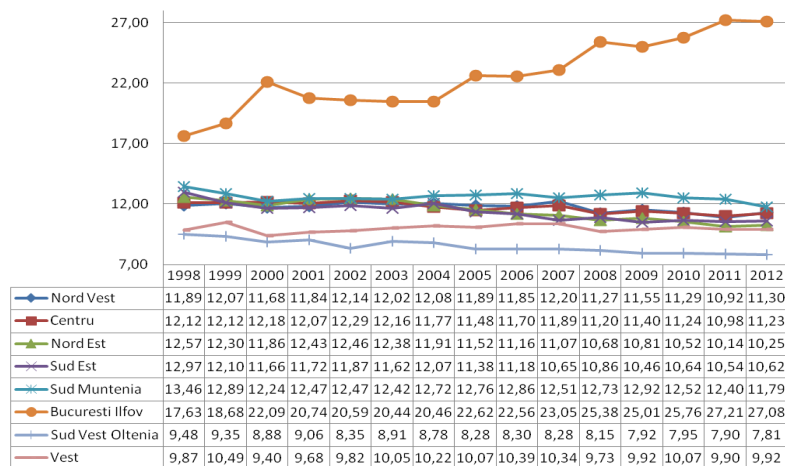
The dynamics of GDP/inhabitant shows that we have a continuation and even an increase of the economic discrepancy between the regions in the analyzed period (Figure 3).

The ratio between the highest values (West region) and lowest values (North East region) of the gross domestic product per inhabitant is increasing (the Bucharest Ilfov region which has a very high GDP/inhabitant is excluded from the comparison). The West region is the only region that during the entire analysis period recorded a higher GDP/inhabitant than the national average with a slight tendency of increase, all other regions still recording a lower GDP/inhabitant than the total GDP of the country. The reduction of discrepancies between the developed areas and those behind is still an issue, a long-term phenomenon as well as the reduction of discrepancies between countries since the developed areas/countries advance in time even though at lower growth rates.



Source: own calculations based on the data of INSSE, Tempo Online

Figure no. 3 – The dynamics of GDP/inhabitant (national average =100)



Source: own calculations based on the data of INSSE, Tempo Online

Figure no. 4 – Share of development regions in the national GDP

From the data analysis regarding the contribution of each region to the national GDP, a series of significant aspects are highlighted (Figure 4):

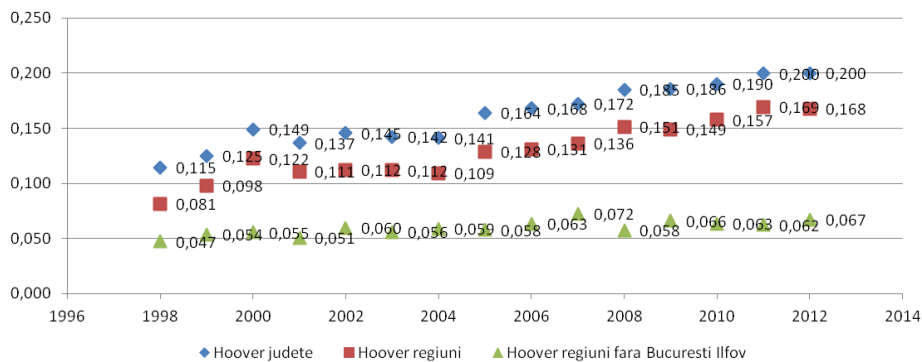
– The South West Oltenia and the West regions have the most reduced participation share to national GDP, at the opposite pole we have the South Muntenia and Bucharest Ilfov regions; the South West Oltenia regions record shares between 7.81% - 9.48% and the West region between 9.82% and 10.34%; in the other regions, the shares are close and range between 10 and 13%.

– The share of participation to the national GDP of the Bucharest Ilfov region is significant and is increasing from 17.63% to 27.08%.

– We may observe the fact that the economic crisis did not determine modifications regarding the ranking of the contributions of regions to the national GDP, the Bucharest Ilfov and West, North West and Central regions increased their contribution to the GDP and the less developed regions of the countries, the North East, South East and South West Oltenia regions recorded small decreases.

#### 4.1. Measuring regional inequality – the Hoover index

The Hoover index was calculated for measuring the territorial inequalities as well as the concentration level of the GDP. The dynamics of the Hoover index of GDP/inhabitant at interregional and cross-county level are presented in Figure 5.



Source: own calculations based on the data of INSSE, Tempo Online

**Figure no. 5 – Disparities regarding the GDP/inhabitant at interregional and cross-county level – the Hoover index**

From Figure 5, we may observe the fact that in all three cases there is a tendency of increase of the Hoover index. At regional level, it records an increase from 0.081 in 1998 to 0.168 in 2012 (107.41%) and at county level it records an increase of 73.91% (from 0.115 in the first analyzed year to 0.200 in 2012). The concentration degree of the GDP per inhabitant between the counties is higher to the interregional one, and this indicates the fact that the cross-county inequalities are higher to the interregional ones thus adding the date on regions determines a compensation of the differences between them. Also, the recalculation of the index at regional level, excluding the Bucharest Ilfov region, determines a significant decrease of the obtained values.

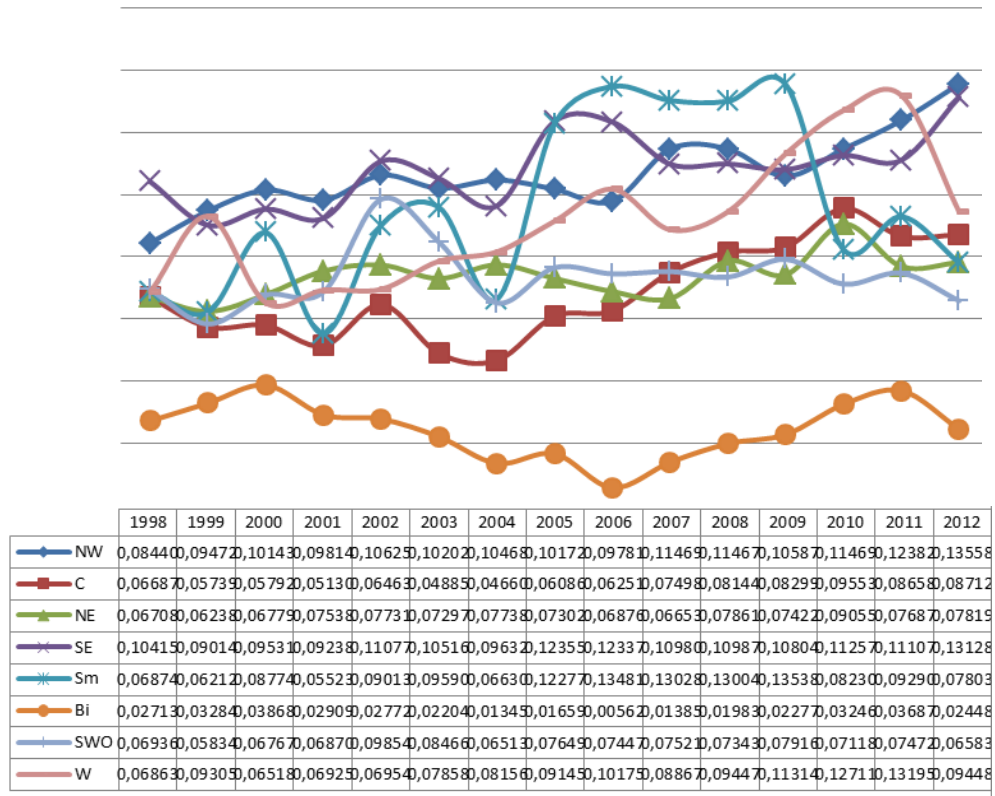
Analyzing the obtained data of the Hoover index at intraregional level (Figure 6), the following can be highlighted:

– There is a slight tendency of index increase in all regions, the highest fluctuations being recorded in the South Muntenia region, a region that during 2005-2009 recorded the highest values of the index;

– The index values are below 0.14 which means, however, a relatively reduced level of disparities at interregional level in our country;



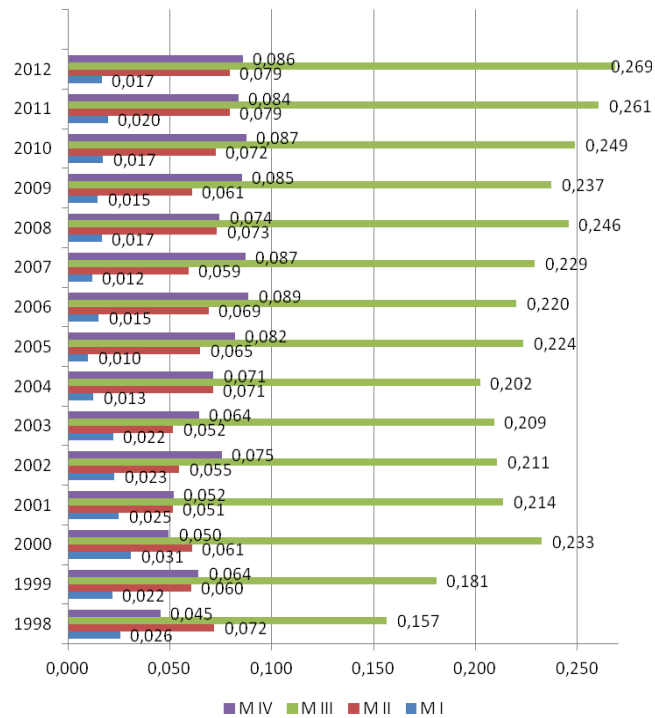
- Expect the Bucharest Ilfov region, the most reduced values of the index are recorded in the North East and South East Oltenia regions (poorly developed regions with a GDP/inhabitant below 80% of the national average) and the highest values are in the relatively developed regions (North West, West and South East);
- The central region recorded one of the highest levels of the index until 2007; after this year the Hoover index recorded a continuous increase;
- The impact of the economic crisis determined an increase of disparities within the more developed regions (West, North West, South East, Central regions).



Source: own calculations based on the data of INSSE, Tempo Online

Figure no. 6 – Disparities regarding GDP/inhabitant at intraregional level – the Hoover index

At macroregional level the situation is as in Figure 7:



Source: own calculations based on the data of INSSE, Tempo Online

**Figure no. 7 – Disparities regarding GDP/inhabitant at macroregional level – the Hoover index**

The 3<sup>rd</sup> macroregion has a high level of the Hoover index compared to the other macroregions due to the fact that it comprises two regions with a very different level of development (the Bucharest Ilfov region, the most developed region of the country that recorded a GDP/inhabitant of over 140% of the national average and the South Muntenia region which belongs to the least developed regions of the country with a GDP/inhabitant below 80% of the national average). This high value of the index in the 3<sup>rd</sup> macroregion shows the fact that the inequalities within this macroregions are much higher than those of the other macroregions, within which we may estimate the fact that the disparities are increasing but, however, are significantly more reduced.

#### 4.2. Measuring regional inequality – the coefficient of variation

In order to see if the regions of our country managed to reduce the differences between them during the analyzed period, the coefficient of variation was calculated (sigma convergence). This type of convergence is assimilated to the catching-up process and shows the distance, the dispersion between the levels of the analyzed economic indicators.

In the [Table 1](#), there are shown the standard deviation, the average and the coefficient of variation of the GDP/inhabitant during 1998-2012 both at regional level as well as macroregional level in Romania.

**Table no. 1 - Standard deviation, average and coefficient of variation of the GDP/inhabitant during 1998-2012**

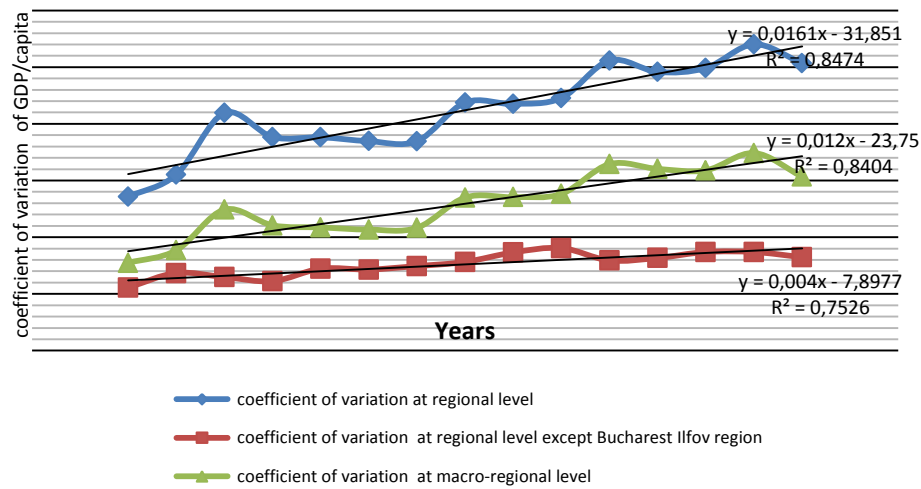
Years	At regional level			At macroregional level			At regional level without Bucharest Ilfov		
	$\sigma_T$	$\bar{X}_T$	$Cv_T$	$\sigma_T$	$\bar{X}_T$	$Cv_T$	$\sigma_T$	$\bar{X}_T$	$Cv_T$
1998	3010.52	12121.13	0.25	3436.26	24242.27	0.14	1225.47	11068.98	0.11
1999	3552.39	12415.90	0.29	4068.02	24831.80	0.16	1512.45	11184.30	0.14
2000	4912.81	12571.87	0.39	5834.14	25143.74	0.23	1383.50	10780.58	0.13
2001	4723.89	13597.15	0.35	5547.38	27194.29	0.20	1431.10	11884.87	0.12
2002	4944.18	14303.11	0.35	5749.84	28606.22	0.20	1692.04	12532.73	0.14
2003	5473.24	16177.87	0.34	6380.18	32355.74	0.20	1905.07	14221.90	0.13
2004	6140.51	18160.95	0.34	7272.45	36321.89	0.20	2230.79	15978.17	0.14
2005	7898.13	19543.71	0.40	9863.66	39087.42	0.25	2441.20	16685.99	0.15
2006	8853.00	21949.43	0.40	11161.53	43898.85	0.25	3065.81	18783.73	0.16
2007	10526.71	25317.70	0.42	13229.51	50635.40	0.26	3692.36	21559.24	0.17
2008	13992.03	29080.95	0.48	18194.59	58161.89	0.31	3615.16	23949.23	0.15
2009	12794.77	27299.12	0.47	16835.79	54598.24	0.31	3628.76	22636.44	0.16
2010	13169.55	26981.69	0.49	17006.30	53963.38	0.32	3712.61	22180.25	0.17
2011	14266.63	27067.05	0.53	18578.35	54134.11	0.34	3668.98	21833.13	0.17
2012	14410.13	27710.52	0.52	18135.24	55421.03	0.33	3851.32	22436.95	0.17

Source: own calculations based on the data of INSSE, Tempo Online

The results obtained in Table 1 show that during the analyzed period both at regional level as well as macroregional level, a sigma convergence does not exist, the coefficient of variation of the GDP per capita recorded significant increases (from 0.25 to 0.47 at regional level and from 0.14 to 0.31 at macroregional level). The results show the non-existence of the regional convergence process, the differences between the regional income tend to increase, which means that certain regions represent strong attraction poles attracting larger quantities of capital and highly qualified labor force against the less developed regions.

The calculations obtained show a much stronger divergence tendency at regional level compared to the macroregional level. Excluding the calculations carried out at regional level regarding the Bucharest Ilfov region, much lower values of the coefficient of variation of the GDP per capita were obtained, which means that the Bucharest Ilfov region has a strong impact on the regional differences, disparities of our country.

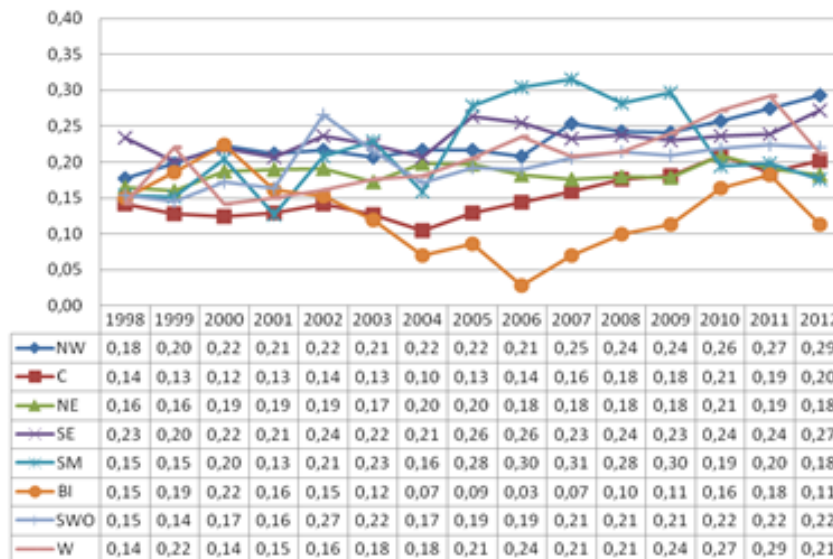
We may observe from Figure 8 the fact that during 1998-2012, the tendency line in all three cases has a positive incline, e.g. the function is increasing, the dispersion increases and a sigma divergence takes place with some period of sigma convergences (2001-2004, 2009, 2012). In these periods (first years of the pre-adhesion period of Romania to the European Union and the first year of the economic crisis) a slight decrease of disparities took place at regional and macroregional level, decreases in the GDP dispersion per capita but, generally, the differences record an ascending trend. A significant increase of the coefficient of variation of the GDP per capita took place in 2008, the first year after Romania's European Union accession (a case which can be explained by the increase of some costs following the attempt of accommodating our country to the EU requirements and rules).



Source: figure based on the data from Table 1

**Figure no. 8 – Sigma convergence (coefficient of variation) at regional and macroregional level of GDP/capital**

Also, we tested the hypothesis of sigma convergence at intraregional level for the period 1998-2012 in order to determine if the regions managed to reduce the differences within. The indicator used was GDP per capita expressed at comparable prices. The results regarding the coefficient of variation of the GDP per capita are presented in Figure 9.



Source: own calculations based on the data of INSSE, Tempo Online

**Figure no. 9 – The coefficient of variation of GDP per capita at intraregional level in Romania**

Analyzing the obtained data, we may estimate the fact that the coefficient of variation of the GDP per capita at intraregional level records an increase in the analyzed period in all regions of our country which means a divergent increase of the economies of component counties. At intraregional level, the sigma convergence hypothesis is not verified, a fact supported by the existence of the increasing trend of the variation coefficient which means that the differences (disparities) tend to increase. The only region in which the coefficient records a decrease in the first part of the period analyzed is the Bucharest Ilfov region, but this aspect is less relevant since this region has only two territorial units. Also, the calculations obtained indicate a much more reduced divergence (low) than the interregional one, the values of the variation coefficient of the GDP per capita being lower.

## 5. CONCLUSIONS

Regarding the GDP per capita, we may find out an increase of disparities at all levels analyzed, an increase also highlighted by the evolution recorded by the Hoover index but reduced in size. Analyzing the territorial concentration of the GDP per capita, we may conclude the fact that the disparities between counties are higher than the interregional ones (a compensation takes places concerning the differences between the regions by adding up the data at regional level) and the exclusion from the analysis of the Bucharest Ilfov region determines a decrease of inequalities which shows the significant influence of Bucharest Municipality on the territorial differences. Also at intraregional level, the differences are increasing but they are more reduced than the interregional ones. In the case of the 3<sup>rd</sup> macroregion which comprises two regions with a very different development level, we may estimate the fact that the inequalities regarding the GDP per capita within this macroregion are higher than the others.

Although in general, the differences between the analyzed territorial units are increasing, in 2009, the first year in which the effects of the economic crisis were felt, a slight decrease is observed regarding interregional differences and an increase of disparities between the component counties of some of the more developed regions (West, North West, South East, Central regions).

The sectorial structure of the regions determined that the impact of the crisis is to be felt differently by these. The development regions in whose counties the primary sector dominates were less affected by the extreme shocks compared to the developed regions but the developed regions managed to adapt to the economic context (to the difficulties emerged on the labor market, increase of unemployment and decrease of demand) and to record increases which determined the deepening of the interregional disparities.

Testing the hypothesis of sigma convergence for the regions and macroregions of Romania was carried out in order to determine if these managed to reduce the differences between them and shows that this type of convergence does not exist, a fact revealed by the existence of an increasing trend of the coefficient of variation of the GDP/capita, the differences between their income are increasing, which means a tendency of divergent increase of the economies in the development regions and macroregions of Romania. This result is due to the very high discrepancies, the differences between the poorly developed regions and the developed ones regarding the presence and the capacity of economic growth factors (physical and human capital, technological progress) to generate higher rhythms of economic growth as well as the capacity of the developed regions to absorb direct foreign investments, to generate and assimilate new technologies. The divergence is much stronger

at regional level compared to the macroregional level and by excluding the Bucharest Ilfov region from the calculations related to regional level, lower values of the coefficient of variation of the GDP per capita were obtained.

In our country, there is obvious the existence of a self-sustained center-periphery type structure of faster growth of regions around the capital due to the investments favoring the developed regions, the higher share of services in these regions, the migration of the labor force (especially the highly qualified one). The agglomeration of the “center” region determines a higher growth rate at national level which emphasizes the differences between the less developed regions (which record lower growth rates) compared to the agglomerations.

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