

ESTIMATING ECONOMIC AND SOCIAL REGIONAL DISPARITIES IN ROMANIA

MARIANA BĂLAN,

UNIV. PROF. PHD., INSTITUTE FOR ECONOMIC FORECASTING- NIER,
ROMANIAN ACADEMY

e-mail: dr.mariana.balan@gmail.com

Abstract

The economic differences between European Union regions in general, and of the member-countries in particular, represent a constant concern both for politics and for economic research. The persistence of regional disparities hampers the capacity of a country to promote economic growth and social cohesion, while regional development might be regarded as a key-factor of economic development and improving living standard.

In Romania, just as in all other regions of the European Union, the process of attenuating regional economic and social disparities was interrupted by the recent financial and economic crisis. Unemployment, poverty and exclusion increased swiftly almost everywhere within the EU.

The paper presents a brief analysis of the level and dynamics of some regional disparities from Romania. In order to estimate the evolution of regional disparities, various methodologies were used such as, for instance, the variation coefficient, the Gini coefficient and the Theil index, etc. The obtained outcomes confirm the negative trends regarding the increase in regional development disparities from Romania and allow for highlighting their determinant factors, especially the flow of foreign direct investments, population ageing and migration.

Keywords: regional disparities, regional development indicators, measures of regional disparity,

Clasificare JEL: C13, C19, R11, R23

1. Introduction

Regionalisation represents one of the main characteristics of the contemporary world that, next to the geographic dimension, adds also the economic, political and security dimensions, as they are all interlinked.

Increasing the role of regions in the development of Europe in general, and in for Romania, in particular, constituted a preeminent phenomenon for the last three decades, considered as an essential element of the European construction in the 21st century.

During the last period of time, as a natural consequence of increasing the importance of regions, increasingly more debates take place around an “Europe of regions” thereby underpinning that the region represents “more than a simple intermediary level between the state level and local authorities” [1] becoming, next to states and localities the their point of the triangle where the process of European integration develops.

At the level of the European Union, and at the one of Romania, the issue of regional disparities is of particular interest mainly from the perspective of the *Territorial Agenda 2020* [2] in the context in which the concept of territorial cohesion becomes operational. In the current conjecture, both at national and European level, the concerns for analysing territorial inequalities based on a far more inclusive, multidimensional vision intensified, as it adds to the traditional analyses regarding economic lags new elements about the disparities related to social inclusion/exclusion, a.s.o.

The regional development policy is a relatively new concept for Romania. As of 1998, the country was structured into 8 regions of development (NUTS2 level), grouping the 41 existing counties and the Bucharest Municipality.

The analysis of statistical data show that Romania entered into the transition process with a relatively low level of regional disparities, as compared with other member-states or candidate countries. However, these disparities increased rapidly and in particular between the Bucharest Municipality and the other regions of the country.

Even though statistical data regarding the socio-economic situation of the regions of development present some time variations (in particular due to local factors), their analysis indicates that economic growth had a significant geographic component, the underdeveloped areas being concentrated in North-East at the border with Moldova and in the South along the Danube. Thus, it might be said that the regional disparity poles are the result of the North-East region with a GDP/capita in 2015 of 5300 euro/inhabitant and the Bucharest-Ilfov region with 20500 euro/inhabitant [3], which is almost four times higher than the one of the North-East region.

According to the Eurostat statistics, all regions from Romania have a low development level in 2016, five out of the eight NUTS 2 Romanian regions being included in the ten least developed regions within the European Union regarding GDP per capita, and the North-East region is one of the five poorest regions of the EU.

As result, regional disparities in Romania represent a real challenge and their understanding is essential in promoting regional development policies that would ensure the harmonious economic development and the improvement of the living standard in the entire country.

The paper has as purpose using a sample of socio-economic indicators selected at the level of the eight regions of development from Romania, and of some statistical methods to quantify regional disparities for providing some empirical perspectives about the current situation of these territorial units from Romania.

2. Specialised literature

In the last decades, the issue of regional disparities and of increasing social cohesion was approached in several specialised studies and works with the purpose of providing decision factors relevant data and information about the trends in the field, elements that influence the level and evolution of these inequalities. A particular interest is shown for using some statistic-mathematical methods and spatial analysis regarding inequalities, the diminishment of territorial differences with respect to the employment level of the population, education and skills level, incomes' size, dimension and structure of the migration phenomenon, infrastructure, the degree of attracting foreign direct investments, etc.

Together with the increase in the importance of the convergence concept, in general, and of the regional one in particular, a series of scientific studies were elaborated both at international level [4]-[13] and at national level [14]-[19].

Studies from other fields such as geography [20]-[22], history [23], sociology [24], [25], political sciences [26] attempted to identify some answers about the emergence, persistence and increase in regional inequalities, as well.

The studies and analyses examining the reach and evolution of regional disparities in countries of Central and Eastern Europe have highlighted that these increased significantly during the last two decades. The increase of inequalities was obvious already from the first stages of transition [27]-[29], but continued during the entire period and, in some cases, even intensified [30]—[33]. The multidimensional analysis of the convergence process in the regions of the Central and Eastern Europe countries highlight that this area of the European Union is relatively homogenous, regional disparities in these countries being smaller than the ones in the regions of Western Europe [34], [35].

Romania entered into the transition process with a relatively low level of regional disparities, as compared with other member-states or candidate countries. The accession of Romania to the European Union contributed to deepening even more the regional disparities. One possible explanation of this phenomenon might be that structural and cohesion funds which should have supported a swifter development of poor regions had a low absorption rate (about 21%) [36], [37]. The fact that foreign direct investments are concentrated in the region Bucharest- Ilfov (59,3% from total FDI in 2015), might be another reason of increasing regional disparities in the post-accession period [34].

3. Brief presentation of some regional lags in Romania

The analysis of the statistical data supplied by the National Institute of Statistics highlights that by the beginning of the nineties Romania had a relatively low level of regional disparities compared with other former communist countries from Eastern Europe. However, these disparities increased rapidly and, save for the region Bucharest-Ilfov which has a particular situation in the economic-social context of the country, it might be noticed that the development took place on the axis West-East, the closeness to western markets being one of the factors influencing economic growth.

The areas on the last positions from the viewpoint of development are concentrated in North-East at the border with Moldova and in South along the Danube, that is regions where agriculture has important weight, and the level of foreign investments is much lower than in the other regions. There are regions where underdevelopment is closely linked to unemployment, internal or external migration, infrastructure and the level of labour force skills, and the incapacity of attracting foreign direct investments.

The trend of increasing development disparities between the eight regions from Romania, especially between the region including the capital (Bucharest-Ilfov) and the other regions, but also between the East and the West of the country may be highlighted by the indicator GDP/capita. In 2016 the least developed region continued to be North-East where the recorded level of the GDP/capita was by 38.37 pp under the national average, and in the region South-West Oltenia by 26,74 pp, while the region Bucharest-Ilfov exceeded by 138,37 pp this average (Figure 1).

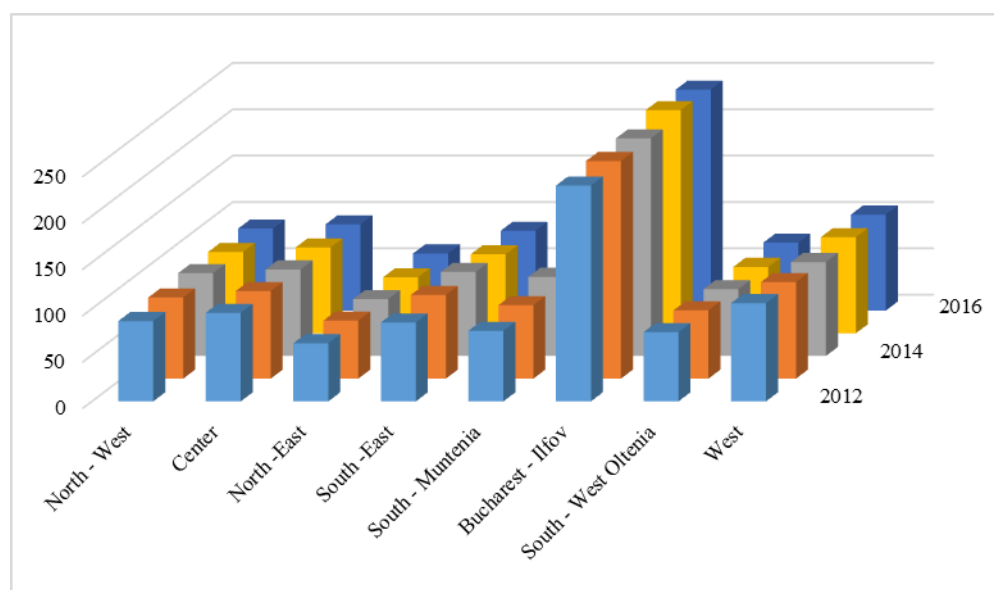


Figure 1 Romanian Regional Gross Domestic Product (PPS per inhabitant) compared with national average (RO=100)

Source: Own calculations based on Eurostat data (online code: [tgs00005])

One of the factors generating these disparities might be labour productivity. Thus from the analysis of the data presented in Table no. 1, it is highlighted that the regions with the lowest productivity are North-East, South-West Oltenia, and North-West for the entire period of analysis (Table no. 1).

Table no.1 Labour productivity at regional level compared with the national average in the period 2008-2016

GDP/employed population (RO=100)									
Region	2008	2009	2010	2011	2012	2013	2014	2015	2016
North - West	83.64	83.80	83.20	79.24	81.95	80.80	81.54	81.29	81.87
Center	93.97	95.70	95.25	92.25	93.43	90.57	89.90	89.71	88.70
North - East	74.34	74.78	74.41	70.92	72.07	72.67	71.78	72.76	74.98
South - East	85.92	88.15	89.69	93.41	92.16	96.14	96.18	91.99	94.12
South - Muntenia	91.77	95.79	90.70	94.82	86.34	89.11	95.54	90.71	92.02
Bucharest - Ilfov	178.13	169.33	171.39	178.38	183.84	181.86	180.07	181.67	169.26
South - West Oltenia	78.30	80.38	81.05	76.68	78.59	77.30	75.05	77.46	80.13
West	100.61	101.81	104.99	101.95	100.19	96.94	92.53	94.06	94.40

Source: Own calculations based on the statistical data of the National Institute of Statistics and Eurostat

In the case of employment (Figure 2), the lags between five of the regions and development and the region including the capital were maintained between +1.77% and -17.85%.

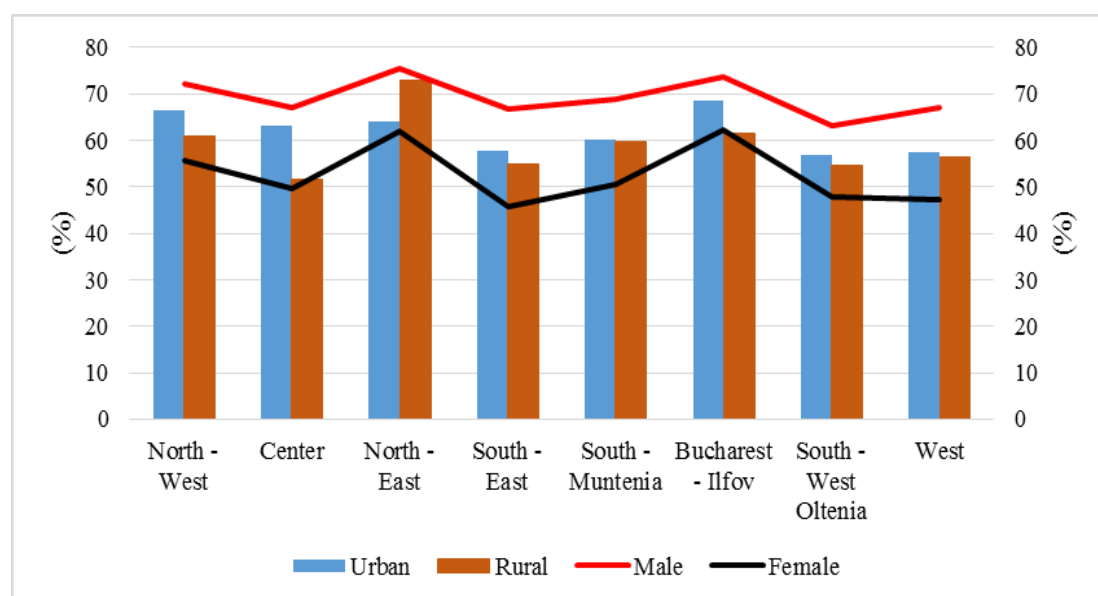


Figure 2 Evolution of the employment rate in the regions of development from Romania, on genders and areas of residence

Data source: TEMPO-online database, National Institute of Statistics, www.insse.ro

The North-East region with higher employment rates than the region Bucharest-Ilfov has a territorial index higher than 100 (Table no. 2).

Table no.2 Employment gaps against the region Bucharest-Ilfov in the years 2008, 2012 and 2016

	Territorial Index (%)			Relative lag/advance (%)		
	2008	2012	2016	2008	2012	2016
	$i_{k/j}^y = \frac{y_k}{y_j} \cdot 100$			$\Delta_{k/j}^y = \frac{y_k - y_j}{y_j} \cdot 100$		
	2008	2012	2016	2008	2012	2016

North - West	98.11	97.65	94.40	-1.89	-2.35	-5.60
Center	93.38	84.01	86.14	-6.62	-15.99	-13.86
North -East	106.78	102.98	101.77	6.78	2.98	1.77
South -East	92.43	87.62	83.33	-7.57	-12.38	-16.67
South - Muntenia	100.47	91.07	88.35	0.47	-8.93	-11.65
South - West Oltenia	99.68	97.65	82.15	-0.32	-2.35	-17.85
West	95.58	91.54	84.37	-4.42	-8.46	-15.63

Source: Author's own calculations based on the TEMPO-online database, National Institute of Statistics, www.insse.ro

The analysis of the evolution of the territorial index in the period 2008-2016 indicates that, in general, the employment rate at the level of the regions decreased in the year 2016 against the region Bucharest-Ilfov (Table 2). Even if the gap between the employment rate at the level of the regions North-East and Bucharest-Ilfov diminished during the crisis and post-crisis period, still this indicator continues to register superior values in the North-East region. With a GDP/capita in PPS of only 36% from the EU average (in the year 2016) the North-East region (the counties Iasi, Suceava, Bacau, Neamt, Botosani and Vaslui) is the fifth poorest region within the EU, but also the region with the highest number of inhabitants and the largest surface.

The recent recession triggered an increase of the unemployment rate in all regions of the country with slight changes in the regional gap of this indicator against the national average (Figure 3). A high level of this indicator was maintained in the Regions South-East, South-Muntenia, South-West Oltenia and Centre (all registering in 2016 values under the national average).

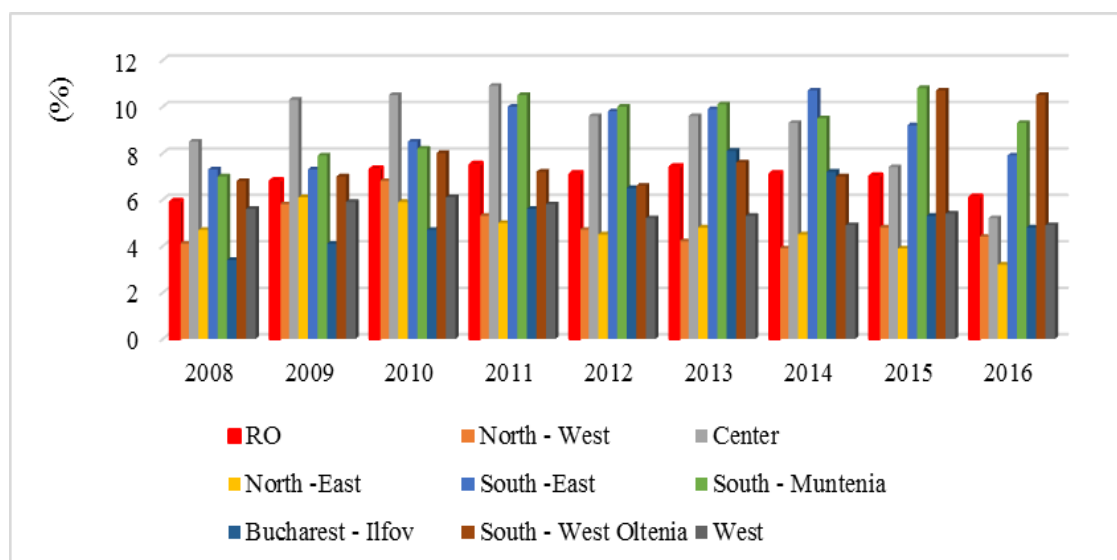


Figure 3 Evolution of the unemployment rate on regions of development

Data source: Tempo-online database, National Institute of Statistics, www.insse.ro

The statistical data regarding the variation of the vacancies in the Romanian regions (for the period 2008-2016) show that the highest level of labour force development is recorded in the region Bucharest-Ilfov where most vacancies can be found (Figure 4). The second place regarding the number of vacancies is held up to the year 2012 by the region North-East with about half of the number of vacancies of the region Bucharest-Ilfov and, after 2013, the region South-West Oltenia. The difference between the region Bucharest-Ilfov and the other regions of development regarding this indicator is significant (Figure 4).

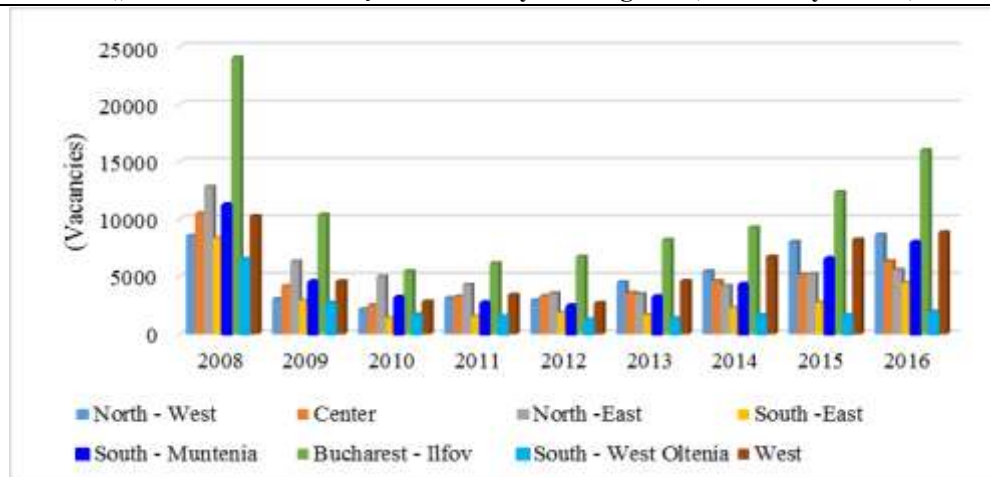


Figure 4 Variation of vacancies in the regions of development

Data source: Tempo-online database, National Institute of Statistics, www.insse.ro

The analysis of the regional differences from the viewpoint of vacancies' rate highlights another hierarchy of these regions, but also the impact of the economic-financial crisis on the regional labour market (Figure 5).

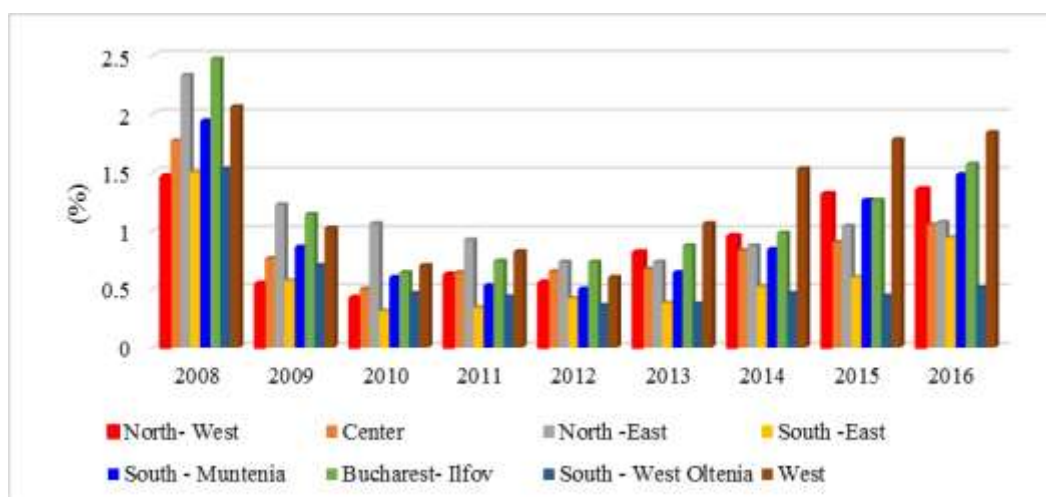


Figure 5 Vacancies' rate by regions of development

Data source: Tempo-online database, National Institute of Statistics, www.insse.ro

Maintained and even deeper disparities between Romania's regions are the outcome of multiple, interdependent factors from among which we mention: infrastructure, education, poverty level, population ageing, labour force migration, number of vacancies, etc.

There are wide regional disparities from the viewpoint of poverty level. The lowest rate of the poverty or social exclusion risk was recorded in the year 2016 in the regions North-West (29.3%) and Centre (29.5%). Higher shares than the national share (38.8%) were recorded in the regions North-East (46%), South-East (44.9%), South-West Oltenia (44.2%) and South-Muntenia (41.2%).

Population ageing represents, as well, a concern raising phenomenon which affects the southern and western regions. Together with the emigration of a high number of citizens, this fact might severely affect future development given the fact that some sectors already feel the shortage of labour force.

4. Theoretical approaches of the analysis of regional disparities with the help of statistical methods

As important macro-indicator in comparing regional disparities was used GDP per capita [38], and the statistical methods used in analysing territorial inequalities were the variation coefficient, the Gini coefficient and the Theil index.

➤ *Coefficient of Variation (CV)*: as shown by Shah and Shankar [39], the variation coefficient as measure of dispersion around the average value is one of the most used methods in the specialised literature for quantifying regional disparities. It is defined with the help of the relationship:

$$v = \frac{\sigma}{\bar{x}} \quad (1)$$

and

$$\sigma = \sqrt{\frac{\sum_{i=1}^n (x_{ij} - \bar{x})^2}{n}} \quad (2)$$

where: CV is the coefficient of variation,

x_{ij} represents the level of variable j in region i ,

N is the number of regions and

\bar{x} is the average x

➤) The *Gini¹ (index) coefficient* represents one of the most widespread indicators of disparities, both in methodological studies, but also in applied researches being considered as a standard measure for analysing inequality. This index is a statistical measure highlighting the concentration level of the value of a statistical data series.

The classical definition of G appears in the notation of the theory of relative mean difference:

$$G = \frac{\sum_{i=1}^n \sum_{j=1}^n |x_i - x_j|}{2n \sum_{i=1}^n x_i} \quad (3)$$

where: x is an observed value,

n is the number of values observed and

\bar{x} is the mean value

If the x values are first placed in ascending order, such that each x has rank i , then some of the comparisons above can be avoided and computation is quicker:

$$G = \frac{\sum_{i=1}^n (2i - n - 1)x_i}{n \sum_{i=1}^n x_i} \quad (4)$$

where: x is an observed value,

n is the number of values observed and

i is the rank of values in ascending order

➤ *The Lorenz Curve* is a graphic method of showing the distribution of population's income in a county/region/country. In its framework, the link is made between the accumulated shares of the population and the ones of the income. The Lorenz-Gini curve is built in a square with

¹ Created and used by the Italian statistician and sociologist Corrado Gini and used first time in the specialised literature as of the year 1912 after the publishing of the paper called “*Variability and mutability*” in Bologna.

the side 1 (100%) and the surface between the concentration curve and the diagonal of this square represents the concentration surface, a function based on which is evaluated the concentration level of the analysed indicator. The concentration is the stronger the more the Lorenz curve deviates from the diagonal. The concentration is minimal (nil) when the global value of the analysed indicator is equally distributed on the considered territorial units.

➤ The development level, expressed synthetically by the level of the GDP per capita in each of the regions of a country is assimilated to the row of independent achievements of a random size y_i . The addictiveness of entropy (one of the properties of its quantitative expression) is also the fact that the basis of the (decimal) logarithms determine the standard unit of the entropy, thus representing the elements on which is based the *Theil index* (1967), defined based on the relationship

$$T = \sum_{i=1}^N y_i \ln \frac{y_i}{s_i} \quad (5)$$

where; y_i is the GDP share of region i and

s_i is the share of the region's population or employment in the total population or total employment in region i

It is considered that as the level obtained for index T decreases, getting closer to zero, the divergence degree (meaning gaps, diversity regarding the development level) is diminished, so that it might be stated that regions converge to closer values regarding the variable y .

Regarding advantages, the Theil index expresses by a synthetic measure a state of the system that can be correlated with the development of a convergence process.

5. Outcomes

Romania's regions of development are eight statistical sizes without legal personality, but which are relevant for analysing the process of convergence/divergence at national level.

The data used for analysis are supplied by Eurostat, the online database of the European Union, by the National Institute of Statistics, and the TEMPO online database.

The indicators used for characterising disparities between the regions from Romania are:

- i) Unemployment rate;
- ii) Employment rate;
- iii) Activity rate;
- iv) Population;
- v) GDP per capita, (euro per inhabitant);
- vi) GDP (at current market prices, by NUTS 2 regions, million euros).

The issue of disparities between regions based on the GINI index regarding GDP distributions has an important role in analysing measures, elaborated policies and instruments made operational for promoting economic and social equity, cohesion, solidarity and inclusion at the level of the entire society at regional, national and international level.

For the period taken into account, the GINI index registers a diminishment in 2009 followed by continuing increase in the subsequent period (Figure 6). The level of inequality in the GDP distribution measured by the GINI index confirms the existence of some relatively small differences between regions.

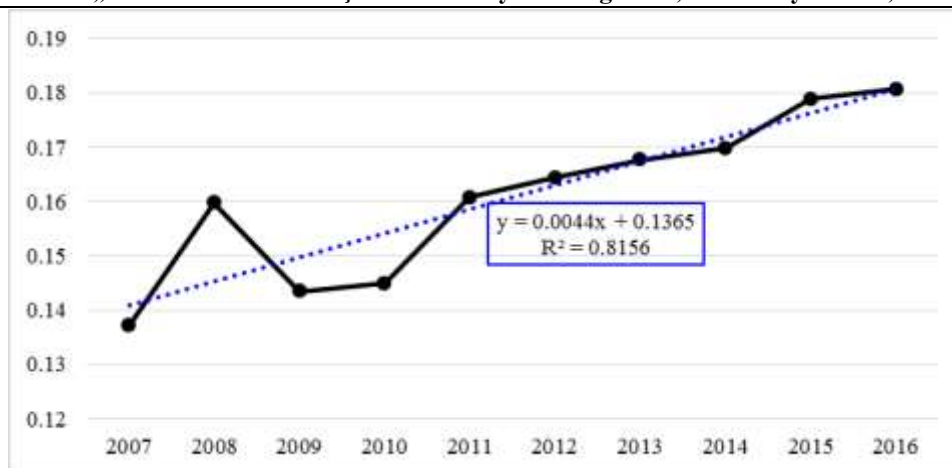


Figure 6 Inequality level (Gini index) of the GDP distribution, by regions, 2007-2016

Data source: Eurostat statistics, (cod online: [nama_10r_2gdp])

The analysis of disparities between the regions from Romania regarding the distribution of incomes was realised based on a graphic representation under the form of the Lorenz Curve. Figure 7 presents, comparatively, the Lorenz concentration curves for the years 2008 and 2016 and indicate a small diminishment of the concentration degree of GDP in Romania.

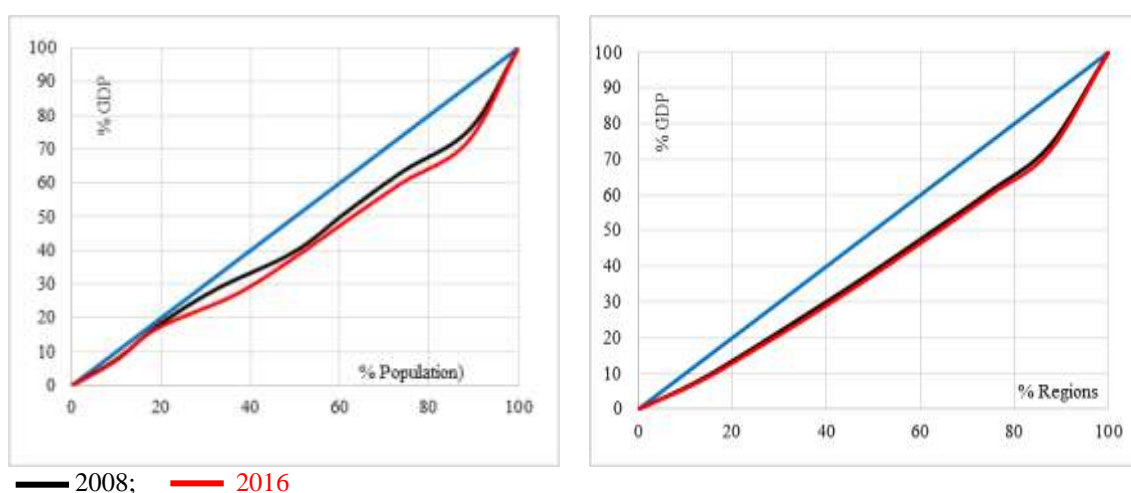


Figure 7 Lorenz Curve – income distribution in Romania’s regions in 2008 and 2016

Data source: Eurostat statistics, (cod online: [nama_10r_2gdp]) and TEMPO online database, National Institute of Statistics, Romania

In order to highlight the differences between the labour force markets in Romania’s regions were used various methods of descriptive statistics, and the obtained results are presented in Table no. 3.

Table no.3 Descriptive statistical analysis of the major labour market indicators

	Unemployment rate (%)			Employment rate (%)			Activity rate (%)		
	2008	2012	2016	2008	2012	2016	2008	2012	2016
Mean*	5.93	7.11	6.28	62.33	60.01	61.06	66.26	64.58	65.09
Standard deviation	1.762	2.351	2.614	2.911	4.165	5.209	2.629	3.369	4.472
Coef. Var.	0.297	0.331	0.417	0.0467	0.0694	0.0853	0.0397	0.0522	0.0687
Median	6.2	6.55	5.05	62.7	60.35	59.15	65.3	65.0	64.15

* simple average of country means

For the considered period of time, the unemployment rate shows the highest differences. The analysis of the data from Table no. 3 indicates that the unemployment rate increased differently between regions (the highest values being registered in the regions Centre, South-East, South-Muntenia and South-West Oltenia). The high value of the coefficient of variation for the unemployment rate indicates a spread of the values for this indicator around the average value, higher than for the other indicators of the labour market.

The analysis of the interdependencies between the indicators of the labour market and the impact of the crisis on them might be both illustrated with the help of correlated graphics. For instance, based on the correlated graphic for the pair of indicators unemployment rate-activity rate (Figure 8) the impact of the crisis on the evolution of the two indicators of the labour market can be highlighted at the level of the regions of development from Romania.

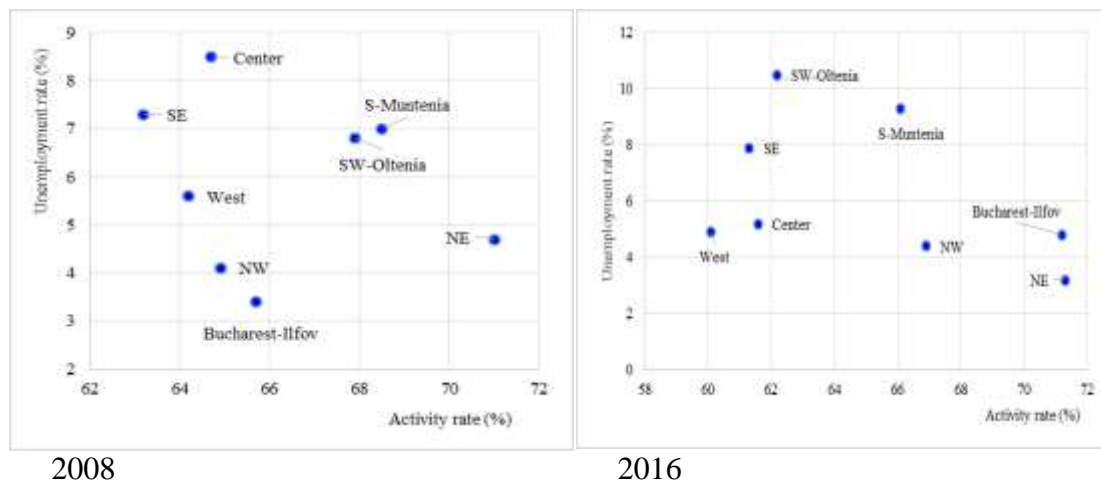


Figure 8 Unemployment rate depending on activity rate of population

Source: author's calculation

Thus, as result of the socio-economic evolution at regions' level as triggered by the recent recession, the answer of the labour market led to significant differentiations regarding its indicators, the interdependencies between them leading to another hierarchy of the regions.

In view of determining the Theil index (5), the data regarding the weight of regional GDP in relation to the national average was taken into account, along with the weight of population and of employed population at the level of each region in total population, respectively the employed population from Romania. The outcomes obtained as result of using the relationship (5) and represented graphically in Figure 9 underpins a trend of increase for the index T in the period 2008-2016 which does not confirm the development of a convergence process between the regions of development from Romania, at least from the point of view of the GDP, of the population and of the employed population.

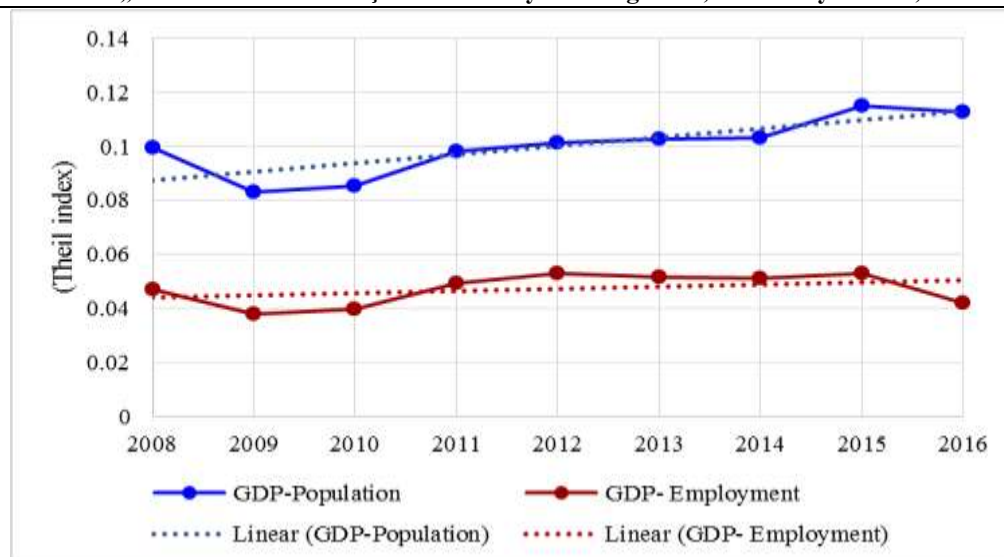


Figure 9 Evolution of Theil index at regional level

Data source: Eurostat statistics, online code: [nama_10r_2gdp]) TEMPO online database, National Institute of Statistics, Romania and author's own calculations

Moreover, the Theil index reveals even more markedly the lag against the regional “equipartition” for the analysed period.

6. Conclusions

To a certain extent, during the last years, the national economies of Europe and, implicitly, the Romanian economy succeeded in recovering the losses and in achieving economic growth rates of the pre-crisis period, however, the number of new created jobs is still not enough for diminishing pressures on the labour force market.

According to the Eurostat statistics, the North-East region is one of the five poorest regions of the European Union. This region continues facing lowest economic performances while dependent on agriculture and low-skilled labour force.

The poor economic performances at the level of Romania's regions of development are triggered by a series of factors, from among which we mention:

- imbalanced economic development between the western and eastern part of the country;
- concentration of underdevelopment in the North-East region and in the southern ones, along the Danube;
- economic disparities at the level of the regions generated significant differences between the indicators of the regional labour market but, especially, of the regional unemployment rates
- structure and size of human resources, migration, population ageing;
- less favourable geographic localisation correlated with poorly developed infrastructure decrease significantly the attractiveness degree of a region for foreign investors;
- higher development level of the Bucharest-Ilfov area as compared with the other regions of development.

Characteristic for all development regions of Romania in the period 2008-2016 is that the activity rate had an oscillating evolution, and that 2014 meant the recovery of this rate in the aftermath of the crisis.

The employment rates show differences both at the level of the country for the eight development regions regarding the regional distribution of the employed population. The regions that had an activity rate above the national average in 2016 were North-East by 71.3%, Bucharest-

Ilfov by 71.2%, North-West by 66.9% and South-Muntenia by 66.1%, while the West achieved only 60.1%

In the case of employment, the gaps between the development regions and the region including the capital were maintained between -17.85% and +1.77%. In the year 2016 the North-East region, with higher employment rates than the region Bucharest-Ilfov had a territorial index higher than 100.

Applying various statistical methods for some macroeconomic indicators and for the ones of the labour market highlighted the same trend of increasing territorial inequalities during the considered period of time.

In the period 2007-2012 the divergence process at the level of development regions of Romania were marked on one hand by the impact of accommodating the Romanian economy to the rigorousness and commitments to EU accession, and on the other hand the effects of the economic and financial crisis.

The regions with a high level of economic and social development had resilience to the external shocks of the crisis, against those with relatively lower levels.

The process of diminishing the gaps between the developed areas and the ones falling behind is a long one, and achieved only by small steps. Even if during the last two years each from the development regions of Romania recorded

7. Bibliography

- [1] *** Regional policy, Increasing the competitiveness of the European regions and towns, stimulating economic growth and job creation, European Union 2014, <https://europa.eu>;
- [2] *** Territorial Agenda of the European Union 2020. Towards an inclusive, smart, and sustainable Europe of diverse regions, 19 May 2011, <http://www.minind.ro>;
- [3] *** Projection of the main economic-social indicators in TERRITORIAL PROFILE up to 2020 – May 2017, National Commission for Forecast, www.cnp.ro;
- [4] **Barro R. J., Sala-i-Martin X.**, Convergence. *Journal of Political Economy* 100(2): 223-251/1992. Published Version doi:10.1086/261816, <https://dash.harvard.edu>;
- [5] **Pritchett L.**, Divergence, Big Time, *Journal of Economic Perspectives*, vol. 11, no. 3, Summer 1997, pp. 3-17;
- [6] **De la Fuente A.**, The empirics of growth and convergence: A selective review. *Journal of Economic Dynamics and Control* Volume 21, Issue 1, January 1997, Pages 23-73, 1997;
- [7] **Durlauf S., Quah D.**, The new empirics of economic growth. In J. Taylor and M. Woodford (eds.), *Handbook of Macroeconomics*, Volume 1. Elsevier Science, Amsterdam, 1999;
- [8] **Magrini S.**, Regional (Di)Convergence, Chapter 62 in *Handbook of Regional and Urban Economics*, 2004, vol. 4, pp 2741-2796, <http://www.sciencedirect.com>;
- [9] **Magrini S.**, The Evolution of Income Disparities among the Regions of the European Union. *Regional Science and Urban Economics*, 29, 257–81, 1999;
- [10] **Fingleton B.** (Ed.). *European Regional Growth*. Berlin etc.: Springer-Verlag, <https://www.econstor.eu>, 2003;
- [11] **Rey S. J., Janikas M. V.**, Regional Convergence, Inequality, and Space, *Journal of Economic Growth*, 5(2), 155-76, (2005);
- [12] **Asheim B.T., Gertler M.**, The Geography of Innovation: Regional Innovation Systems, in J. Fagerberg, D. Mowery, and R.Nelson (eds.), *The Oxford Handbook of Innovation*, Oxford University Press, 291-317, 2005;
- [13] **Audretsch D., Keilbach M.**, Entrepreneurship capital and regional growth, *Annals of Regional Science*, 39, pp.457-469, 2005;
- [14] **Iancu A.**, Real Convergence and Integration, *Romanian Journal of Economic* no. 1, pp.2-40, www.ipe.ro/rjef, 2008;
- [15] **Dăianu D.**, Convergența economică. Cerințe și posibilități, in Aurel Iancu

- (coordinator), „Dezvoltarea economică a României. Competitivitatea și integrarea în Uniunea Europeană”, Editura Academiei Române, București, 2003;
- [16] **Ailenei D., Cristescu A. and Vișan C.**, Regional patterns of global economic crisis shocks propagation into Romanian economy, *Romanian Journal of Regional Science*, Vol. 61, pp. 41-52, 2012;
- [17] **Goschin Z.**, Regional determinants of average wage in Romania, *Procedia Economics and Finance*, pp. 362-369, <http://www.sciencedirect.com>, 2014;
- [18] **Constantinescu M., Constantin D.L.**, Dinamica dezechilibrelor regionale în procesul de integrare europeană: modelare, strategii, politici, Editura A.S.E., București, 2010;
- [19] **Boboc**
- [20] **Gaile G.L.**, Measures of spatial inequality. In: Gaile GL, Willmott CJ (eds.) *Spatial statistics and models*. D Reidel, pp 223-233, 1984;
- [21] **Armstrong H. W.**, Convergence among Regions in the European Union, 1950 – 1990. *Papers in Regional Science*, Vol. 74, pp. 143-152, 1995;
- [22] **Ianos I., Saghin I., Pascariu G.**, Regions and the Territorial Cohesion, *Acta Universitatis Danubius, OEconomica*, 9, 4, 415-429, 2013;
- [23] **O’Connor A.**, Understanding inequality in the late twentieth-century metropolis: new perspectives on the enduring racial divide. In: O’Connor A, Tilly C, Bobo LD, editors. *Urban Inequality: Evidence from Four Cities*. Russell Sage Foundation; New York: 2001. pp. 1–33, 2001;
- [24] **Sassen S.**, *Cities in a World Economy*. Thousand Oaks, California: Pine Forge/Sage Press, 1994;
- [25] **Sandu D.**, Modernising Romanian Society through Temporary Work Abroad. In R. Black, G. Engbersen, M. Okólski și C. Pantiru (eds.), *A Continent Moving West? EU enlargement and labour migration from Central and Eastern Europe*, Amsterdam: Amsterdam University Press, 271-288, 2010;
- [26] **Gruber L., and Gaines B. J.**, Globalization and Political Conflict: The Long-term Prognosis. Paper prepared for delivery at the Annual Meeting of the American Political Science Association, San Francisco, August 30-September 2, 2001;
- [27] **Petrakos G., Kallioras D., Anagnostou A.**, Regional convergence and growth in Europe: understanding patterns and determinants. *European Urban and Regional Studies* 18(4): 375–391, 2011;
- [28] **Brzeski A., Colombatto E.**, Can Eastern Europe catch up?, *Post-Communist Economics*, 11(1), pp.5-25, 1999;
- [29] **Römisch R.**, Regional Disparities within Accession Countries, in Tumpel-Gugerell, G. and Mooslechner, P. (eds.): *Economic Convergence and Divergence in Europe: Growth and Regional Development in an Enlarged Europe*, Cheltenham: Edward Elgar, 183-208, 2003;
- [30] **Petrakos G., Saratsis Y.**, Regional inequalities in Greece. *Papers in Regional Science* 79(1): 57–74, 2000;
- [31] **Petrakos G.**, Regional inequalities in Europe: reflections on evidence, theory and policy. *Town Planning Review* 79(5): 7–13, 2008;
- [32] **Ezcurra R., Rapún M.**, Regional disparities and national development revisited: The case of Western Europe. *European Urban and Regional Studies* 13(4): 355–369, 2006;
- [33] **Kallioras D., Petrakos G.**, Growth, integration and structural change in the regions of the EU new member-states. *Annals of Regional Science* 45(3): 667–68, 2010;
- [34] **Goschin Z., Zaman Gh.**, O tipologie a creșterii economice regionale în România, *Romanian Journal of Economics*, Tome 38, vol. 47 no.1, pp. 134-153, 2014 <http://ideas.repec.org/a/ine/journal/>;
- [35] **Szendi** 2013
- [36] **Zaman Gh., Georgescu G.**, Structural Fund Absorption: A New Challenge For Romania?, *Romanian Journal of Economic Forecasting*, vol. 6, no 1, 136-154, 2009;
- [37] **Goschin Z.**, Territorial Inequalities and Economic Growth in Romania. A Multi-factor

Approach, Procedia Economics and Finance 22, 690 – 698, 2017, <https://www.sciencedirect.com/>

[38] Spieza V., Measuring regional economies. OECD Statistics Brief, 6, 2003, <https://www.oecd.org>

[39] Shankar R., Shah A., Bridging the Economic Divide within Countries: A Scorecard on the Performance of Regional Policies in Reducing Regional Income Disparities. World Development. Vol 31, 2003, Issue 8. p. 1421-1441. [http://dx.doi.org/10.1016/S0305-750X\(03\)00098-6](http://dx.doi.org/10.1016/S0305-750X(03)00098-6);

[40] *** Eurostat statistics, www.eu.europa.eu

[41] *** TEMPO-online database, National Institute of Statistics, www.insse.ro