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3 November 2012

Online at <https://mpra.ub.uni-muenchen.de/56896/>
MPRA Paper No. 56896, posted 28 Jun 2014 06:06 UTC

Emerging Markets Queries in Finance and Business

Identifying regional disparities in Romania: a convergence process perspective in relation to European Union's territorial structures

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Abstract

This article aims to use the appropriate models based on dispersion method, variance, to identify the dynamics and amplitude differences in the level of regional development in European Union and Romania, expressed by the GDP, per capita and total. In the present paper, we limit the approach area to two important aspects: identifying the main convergence trends at regional level within EU-27 with the help of GDP/capita, and the analysis of the trends registered at the level of regional disparities in Romania.

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Selection and peer review under responsibility of Emerging Markets Queries in Finance and Business local organization.

Keywords: regional disparities; regional convergence; concentration; agglomeration; dispersion;

1. Introduction

In general, disparities between regions and inside them occur as result of some concentration, agglomeration, trends triggered by external phenomena, globalization, integration, or by internal ones, clustering, emergence of growth/development poles, involvement of local institutions in various aspects of economic life, etc. As a rule, regional disparities take the shape of differences between the level of incomes per capita and determine, at a given moment, a chain reaction of companies, authorities, inhabitants, etc., that attempt to counteract their escalation.

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2. Analysis of regional disparities in the European Union

Within the European Union, the principle of cohesion and reform of Structural Funds 1989 represent core elements supporting permanently the balanced development at regional level. This fact is proved also by the constant increase of allocations from structural funds for economic and social cohesion, practically, after 1980, they were doubled in real terms. The actual allocations corresponding to cohesion represent 347 billion Euros current prices from which the sums allotted for promoting convergence have about 81.5% from total. Moreover, the existence of a compromise between efficiency and equity leads to the idea of a possible maximization of general growth, in parallel with reaching the convergence of outcomes and productivity at regional level.

In the following, the outcomes of the analysis for the convergence process are presented at the level of the EU regions, with the help of the first method – dispersion and the Lorenz-Gini concentration curve.

2.1. Analysis framework

The analysis framework of the study is formed from the NUTS 2 regions, a statistical system regulated within the European Union by the Statistical Directorate Eurostat. NUTS Nomenclature Units for Territorial Statistics. The NUTS 2 system is used in elaborating and evaluating the cohesion and regional development policy, after the eighties. The importance of the NUTS 2 level become indeed relevant after the reform of Structural Funds, this level becoming the backbone of designing and implementing specific actions aimed to areas with development issues. Within the cohesion policy, the regions NUTS 2 are eligible for accessing Structural Funds by objective 1- Convergence, regarded as the closest level to which community action might be undertaken and to which the principle of subsidiarity is efficiently and effectively applicable.

2.2. Analysis and interpretation

The analysis of the regional discrepancies within EU was realised with the help of the dispersion method, variance, applied for the 271 NUTS 2 regions with respect to GDP value PPP, compared with the community level for the period 1999-2008, completed with the graphic representation of the final outcomes, histogram and the Lorenz-Gini curve.

The majority of member-states have, at regional level, a decreasing trend for the GDP dispersion value, the exception being represented by the group of new member states which presented certain increases of the indicator's value. There is a general trend of decreasing dispersion value, from 32,4% to 27,5%, which might be interpreted by a growth trend of regional convergence.

In regions of the new member states, a clear divergent trend is recorded, resulting from the increased value of GDP dispersion PPP: in Hungary from 30,8% to 38,3%, in Bulgaria – from 21,9% to 37,1;

In the period 1999-2008 a diminishment by 5% of the regional GDP dispersion value can be seen, which confirms the convergence trend within the EU where this process is strongly supported both from Structural/Cohesion Funds, but also from own financial resources of each of the member states .

A similar convergence process, but at a smaller scale, is shown also in the analysis of employed population dispersion, the value of which registers a relatively decreasing trend, of about 1% both for EU-27 and for EU-15. In some member-states, it can be said that a process of increasing disparities takes place with respect to employed population, against the EU average: Austria, Belgium, Portugal, Italy, and Romania. Following the processing GDP/capita at the level of the NUTS 2 regions, and of presenting them under the graphic form, following aspects resulted:

- In the year 1997, about 54.3% of the regions, 145 regions had a GDP/capita over the community average; the number of regions under the average was of about 45.7% from total, 122 regions. With respect to

community assistance, eligibility according to GDP/capita, non-supported regions represented about 75% from total, 202 regions. The average value of GDP/capita 1997 was of 15.265 Euro/capita, 64,9% from total regions, while the maximum value of GDP/capita was of 49.300 Euro/capita.

- The most developed regions, highest GDP/capita – in the year 1997, were: London, 49.300 Euro/capita, and Brussels, 41.100 Euro/capita. At the opposite end, the regions with the lowest GDP/capita of about 3200 Euro/capita were found in Bulgaria, Severozapaden, and Romania, North East with 3600 Euro/capita, South-Muntenia with 4300 Euro/capita, North West with 4400 Euro/capita., South-West with 4400 Euro/capita.
- The number of regions reporting the average value of GDP/capita was of 176. The difference between the highest value and the lowest value recorded by GDP/capita in 1997 was of 15.4 times.
- In 2008 a diminishment can be seen in the number of regions above average, from 153 to 136, and an increase in the number of regions below the EU-27 average, from 114 regions to 131. In 2009 this tendency is continued in similar way. The important trend of the period is the increase in the number of financially unsupported regions by about 5.44%, from 202 regions in 1997 to 213 regions in the year 2008.
- The maximum value of GDP/capita increased by 74%, from 49.300 Euro/capita to 85.800 Euro/capita – in the period 1999-2008. In 2009, the maxim value decrease to 75.900 Euro/capita, in parallel with decrease of minim value. The variance of GDP/capita is 26.17/

Two special moments should be mentioned, which marked changes of the GDP/capita values in EU-27 for the reporting period 1997-2009: the first moment is the one of the period after 2004, when ten New Member States accessed the EU and which triggered the increase in the number of regions below 75% from average, from 69 to 74 regions, and the second, the one following Romania's and Bulgaria's accession when the number of regions placed under the community average increased again, from 126 to 135 regions.

A constant trend during this period is the one of increasing GDP/capita, both the average value, and the maximum and minimum ones, which means that, as a whole, the regional development level increased. Thus, the average value of the indicator increased by 1.49 times, the maximum ones by 1.53 times, and the minimum one increased 0.91 times. Also, the number of regions with a GDP/capita value close to the community average increased as well. The relationship between minimum GDP/capita and the maximum one, variance or maxim/minim, increase from 15.41, 1997, to 47.8, 2001, and decrease after that to 26.17, 2009.

The relative convergence trend at regional level within EU-27 is supported also by the values of the Lorenz-Gini concentration curve. Thus, a closing in trend is found for the Lorenz-Gini curve, year 2009, against the first bisector of the square's area, which presupposes a slight convergence trend at regional level, the more the concentration curve deviates more from the square's diagonal, the larger the concentration surface, that is higher disparities, and the concentration stronger. The value of the Gini coefficient indicates a slight concentration trend of economic performances expressed with the help of the regional GDP, a decrease from 43.17% to 40.3% - for 2009.

Also, the number of financially unsupported regions increased as well, over 75% from the GDP/capita average, from 187, 2000, to 199, 2009, even though the expansion comprised also less developed regions of the new member states. Another trend worth mentioning is the one of a diminishing number of regions with incomes above the community average, from 145 to 136, decrease by 11% and increasing number of regions with income below average 126 to 135.

In conclusion, it can be found that at the level of NUTS 2 regions within the EU-27, for the last ten years, there is a convergence trend, even though "speeds" differ between the two categories of member states old and new.

3. Analysis of regional disparities in Romania

In Romania, the analysis of economic disparities was done based on eight development regions. Development regions are considered as the cornerstone element of the territorial cohesion policy on which

action is taken by specific measures, objectives are defined, and measures are established along with the instruments for their fulfillment, and development methods and models are applied, while proposing scenarios, etc.

3.1. Analysis and interpretation

Following the analysis of the dispersion values GDP/capita the identification of regional disparities from the perspective of economic performances was realized by applying the dispersion, variance, method on GDP/capita PPP in the period 1997-2008. As it is known, the region Bucharest-Ilfov B-I is placed among the most developed regions at EU level as compared with others and, in particular, with the North-East and South regions, thus two situations being accounted for: "with and without B-I region". at regional level, the following aspects resulted. First, in the "with the B-I region" situation, the evolution of regional GDP/capita increased from 4.875 Euro/capita, 1997, to about 12.300 Euro/capita, 2008. The ratio between the maximum value and the minimum one increased from 2:1, 1997, to 4 : 1, 2008. Also, the value of the variation coefficient increased from 21,3% to 54,1%, which might be interpreted as a regional convergence decreasing trend in Romania. Also, in the "without the B-I region" situation is found a relatively low trend of variation between regions – of only 2% from 42.5% to 44,3%. At the same time, the average value of regional GDP/capita presents an increasing trend from a minimum of 3.087,5 Euro/capita, 1997, to 8.702,5 Euro/capita, 2008. The other terms of the variance the minimum/maximum value, variability and amplitude have recorded increasing trends, as well: the minimum value increased by 6.5%, 3600 Euro/capita to 7.200 Euro/capita, and the maximum value increased by 13.39% from 7100 Euro/capita to 21.100 Euro/capita. The average yearly growth rate of the maximum value is superior to the one corresponding to the minimum value, emphasizing the divergences at the level of regional performances.

With respect to domestic GDP, there were the following trends: 2000-2008. First, the contribution of the Bucharest-Ilfov region to domestic GDP formation increased from 22% to 25.3%. The other regions have comparable contributions to total GDP realisation, comprised between a minimum of 8,15% the South-West region and a maximum of 12,7% South-Muntenia. Also, some regions increased their contribution to domestic GDP formation: South-Muntenia, West and Bucharest-Ilfov, while the rest of the regions recorded decreases in the share of the above-mentioned indicator's value.

The increase trend of GDP/capita, 2008 as compared with 2000, has varied from one region to another, recording a maximum in the Bucharest-Ilfov region, by 3.98 times, in the region West, by 2.39 times, and North-West, by 2.36 times. The smallest increase was registered in the regions South-East by 1.98 times, and North-East, by 2 times.

The trend of more marked regional discrepancies is confirmed also by applying the analysis technique with the help of the Lorenz-Gini curve concentration: in the graph can be seen the shift of the curve corresponding to the year 2008 against the first bisector and against the corresponding curve of the year 2000, fact which confirms the outcomes presented above.

Thus, a significant regional GDP concentration can be found, with an increasing trend: the value of the Gini coefficient increased from 3.85% in the year 2000 to 38.83% in the year 2008 an increase by 3%. Concomitantly with the increasing trend of dispersion at regional level for economic performances expressed with the aid of GDP/capita, also a relative convergence trend can be seen for this indicator with the EU-27 average, triggered by the superior growth rate of the value recorded up to the year 2008.

With respect to regional GDP contribution to the community GDP, EU-27, an increase is found regarding the importance of this indicator, given by the increase of its share from 8.43%, 1999, to approximately 25.9%, 2008, a growth of about three times. This situation did not influence the second last place taken by Romania within the EU-27 regarding the value of GDP/capita a little above Bulgaria.

As result of analysing GDP/capita evolution a slight convergence trend can be seen with the average level of the European Union. In conclusion, the economic performances at Romania's level present two major trends: a first trend of relative convergence with the European Union performances, a second trend is given by more marked disparities between the eight regions NUTS-2, as result of increased economic concentration in areas regarded as attractive by population or investors, areas that can ensure a better living standard and activities with higher profitability.

Another important aspect analysed within any regional research is the demographic one. To this end, the indicator "number of inhabitants" was selected, as it is also a weighing criterion for other economic performance indicators, GDP, GVA, SMEs, etc.. Several times, the existence of a numerous population in a region can be an advantage, provided that it has the competences and skills necessary to an advanced society.

In the period 2000-2009, the variation of the population at the level of the eight development regions registered a decreasing trend -0.49%, which means that regional discrepancies have a slight decreasing trend. In 2009, the region West recorded a minimum population of 1.912 million inhabitants, while the maximum population of 3.714 million inhabitants was registered in the North-East region.

The variation coefficient 2009 was of 21.8%, on decrease by 0.18% compared with its value in the year 2000 of about 26.1%. Both values of the population at regional level minimum and maximum are on decrease as compared with the year 2000, the variation of the indicator being relatively low for the analysed period.

In parallel with the decrease in the numbers of population also the density diminished, both at national and at regional level. At regional level, the density of population presents very wide differences between the region Bucharest-Ilfov on one hand, and the other regions, on the other hand; the region B-I has a population density 2010 of about 1242,9 inhabitants/sqkm., while the other regions have significantly lower values: West – 59,8 inhabitants/sqkm, Center - 74 inhabitants/sqkm., South West – 76,7 inhabitants/sqkm the ratio between maximum and minimum being of 20 to 1. Leaving aside the Bucharest-Ilfov region, the other regions are placed under the EU-27 average (116 inhabitants/sqkm), and the differences are visible. Thus, in the period 2000-2010, the population's density reduced from 94,1 inhabitants/sqkm to 89,9 inhabitants/sqkm. The most important decreases with respect to density values were recorded in the regions South-West- Oltenia -6,33%, West -5,81%, South-Muntenia -5,67%, Center -4,45% and North-West -4,44%. The smallest diminishment was reported for the region Bucharest-Ilfov of -0,51%.

With respect to classifying a region within the NUTS-2 category, the limits are given by the numbers of population: between 800.000 and 3 million inhabitants. These limits are not complied with and compliance failure occurred already on their set up in the year 1998 by all development regions from Romania which have values over the maximum one established by the EU. The regions with a population of over three million inhabitants are North-East 3.7 mill. inhabitants, and South-Muntenia 3.2 million inhabitants. Otherwise, the two regions and in particular the North-East region are on the last positions within the EU-27 in relation to GDP/capita, and performances but are placed in Top 20 regions NUTS 2 from the viewpoint of population's size. From this perspective, we may reaffirm the necessity for the following programming periods to have a territorial reorganization on better functional bases, by increasing the number of regions which might lead to diminishing the numbers of population supported and to a better management of the development process as a whole.

Another important field taken into account on analysing regional disparities is the one of the labour force market. For this analysis the indicator "employed population" has been selected. The annual average rate of employed population growth was negative -2.44% with a higher negative value as compared to total population. With respect to the variation of the analyzed indicator, the trend was of shrinking value in the majority of development regions, which presupposes a certain territorial convergence on this market. Also, the value of the variation coefficient registered for the analyzed period a diminishing trend – from 26.1% 2000 to 24.3% 2010.

The diminishing trend of the variation value for employed population indicates that there is an internal phenomenon of labor force migration from one region to another, but also within the same region, a process leading to diminishing regional disparities. This fact is supported also by the comparable shares of the regions with respect to employed population, these varying on a relatively narrow scale: from a minimum of 9.7% in the West region, to a maximum of 14.5% in the region Bucharest-Ilfov. The other regions have similar shares: the North-West region 13.75% from total, the region South-Muntenia 13.79%, the North-East region 14.37%.

From analyzing and interpreting some specific indicators to the research-innovation field, information can be obtained about the development level of a region, the competitive advantages that the region disposes about as compared with other regions and on the way in which action might be undertaken to support this field, regarded as an essential factor for the development of the current knowledge society.

For analyzing regional disparities in the RD field were selected and analyzed two indicators: employees in the research-development activity number of persons and the number of innovative enterprises.

In the period 2000-2009, the average annual rate of employees in RD was of about 1.46%, the variation coefficient pursuing the same increasing trend: from 107.9% in the year 2000 to 109.9% in the year 2009. The value of the coefficient is a relatively high one, as compared with the other coefficients analyzed until now.

The ratio between the maximum number of researchers in the region Bucharest-Ilfov – 19577 researchers and the minimum number in the South-East region – 1865 employees is of 10 to 1.

The regional innovation degree characterized by the number of innovative enterprises is also in favour of the Bucharest-Ilfov region, which has a share of 23.91% from total, the last place being held by the region South-West Oltenia with only 4.83% from total. The presented e shares have underwent some changes in time: thus, in the period 2006-2008, as compared with 2000-2002, the number of innovative enterprises has increased in some regions for instance, in Bucharest-Ilfov – from 21.23% to 23.91% , in the South-East region from 9.91% to 14.11%, while in other regions, this share underwent a decreasing process in the region Center – from 19.22% to 13.18%, in the West region – from 7.32% to 6.17%. It can be seen that the majority have state-owned. With respect to the regional innovation degree , a project drafted by a group of researcher has presented the following conclusions: Bucharest-Ilfov region has an innovation degree 2010 of 72.96% on increase as compared with the year 2008, by about 2.85%; North-East region has an innovation degree of 37,19%, on decrease as compared with the year 2008; the region with the lowest innovation degree is the West region, 25,11%, on decrease against the year 2008. The difference between the maximum and minimum value of the innovation degree is of 2.9 to 1.

For analysing regional disparities of the health sector, we have selected the indicator number of physicians at regional level. An increase is seen for the value of the variation coefficient from 26.5% in 2000 to 36% in 2009, which presupposes a diminishment of the regional convergence degree. The annual growth rate of the physicians' number is of 1.07%, the variation amplitude reaching up to the value of 109.51% year 2009. The minimum number of physicians 4515 is found in the South region, and the maximum in the region Bucharest-Ilfov. From analysing the variability of the indicator 2000-2009, an inflexion point is found for 2005, the value of the coefficient reaching 40.6%. After this moment, the variation coefficient decreases, reaching in 2009 about 36%.

By relating the indicator to 1000 inhabitants, an increase is found in the number of physicians for the majority of regions. The regions with the highest increases are: West 8,7%, Bucharest-Ilfov 5,71%, South Muntenia 4,6% and North West 3,36%, the rest registering decreases in the number of physicians to 1000 inhabitants: North East -3,11%, South-West -1,16% and South- East -0,92%.

In conclusion, there is an increase of the regional discrepancies in the field of health, the most affected regions being those with a low development level. This might be the negative effect of the physicians' migration phenomenon to more attractive areas from the viewpoint of obtained incomes.

In general, the infrastructure is a factor that characterizes the regional accessibility degree and is considered when the attractiveness of an area is analysed. The analysis of the disparities in the field have realized with the

help of the indicator “density of public roads to 100 km²” for the period 2000-2010. Thus, the region with the most important network of public roads is Bucharest-Ilfov 48.9 km to 100 km² followed, but at great distance, by the region South-West 37,1 km to 100 km² and the region South-Muntenia 36.8 km to 100 km². At the opposite end, the region with the weakest infrastructure of public roads is South-East 30,1 km to 100 km². The yearly average growth rate of the indicator density of public roads to 100 km² is of 0.51% for the analysed period. The variation coefficient was of 16,2% 2009, on increase against the year 2000, when it recorded the value of 14,6% an increase of about 1,13%.

A transport infrastructure represents the necessary, but not sufficient, condition for regional development and competitiveness, an important factor that might trigger the localization of economic activities. Infrastructure investments are essential for diminishing distances between regions and, in particular, between peripheral and central regions. The transport infrastructure plays an important role in diminishing regional disparities, facilitating trade and labour force mobility. The improvement of infrastructure diminishes transportation time and costs for goods, increases productivity and heightens regional advantages.

4. Conclusions

The present paper analyzed the evolution of the regional convergence process within the European Union and in Romania with the help of the dispersion method and of specific indicators.

The conclusions drawn based on the performed analyses are:

For the European Union – at NUTS 2 regions’ level:

During the analyzed period, a slight convergence trend can be found at regional level supported by the diminishment of the differences between the minimum and maximum values of GDP/capita. This trend was accompanied by the increase in the number of regions within the 75% category from the GDP/capita average and of decrease in the number of regions with recorded incomes over the community average;

There were two special moments as result of the determined regional analyses: 1 the accession of the ten New Member States year 2004 and 2 the accession of Romania and Bulgaria. The two moments have been a “short-circuit” with respect to the convergence process and led to an increase in the number of regions below the community average.

For Romania – at the level of NUTS 2 regions:

- an increase trend can be seen with respect to regional economic disparities, the value of the analysed indicators varying from one field to another; there are, also, more marked disparities between the region Bucharest-Ilfov on one hand, and the other regions, on the other hand;
- small up to average disparities were identified for the demographic indicators, for infrastructure, health and regarding regional unemployment;
- high regional disparities are found for labor force indicators in certain fields research-development, health, but also with respect to the general level of performance GDP/capita.

In conclusion, at EU-27 level a regional convergence process is shown, while for Romania are found increased economic disparities at the level of the eight development regions. If the phenomenon of more marked regional disparities within member-states shall continue, it is a certainty that the generated effects shall negatively impact also on the convergence process at the level of the European Union as a whole.

Acknowledgements

This paper is supported by the Sectorial Operational Programme Human Resources Development SOP HRD, financed from the European Social Fund and by the Romanian Government under the contract number SOP HRD/89/1.5/S/62988.

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