

# Regional Discrepancies in the European Union

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***Abstract.** The accession of the 12 Member States with GDP figures below the EU average, lead to increased differences between EU regions. The article analyses the discrepancies between NUTS2 and NUTS3 regions in EU-27, from the point of view of GDP/inhabitant and the dispersion of regional GDP/inhabitant.*

*In case of NUTS3 regions, the majority of Member States registered increases in dispersion in the period 2000-2005. Romanian counties were characterized by an accentuated gap between regions.*

*Concerning NUTS2 regions, there are only eight Member States that show decreases in dispersion in 2000-2005, these being also the most populated. Nevertheless, at global level, the EU registered a decrease in regional discrepancies.*

**Keywords:** regional policy; NUTS regions; regional discrepancies; dispersion of regional GDP per inhabitant; differences between EU regions.

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**JEL Codes:** R11.

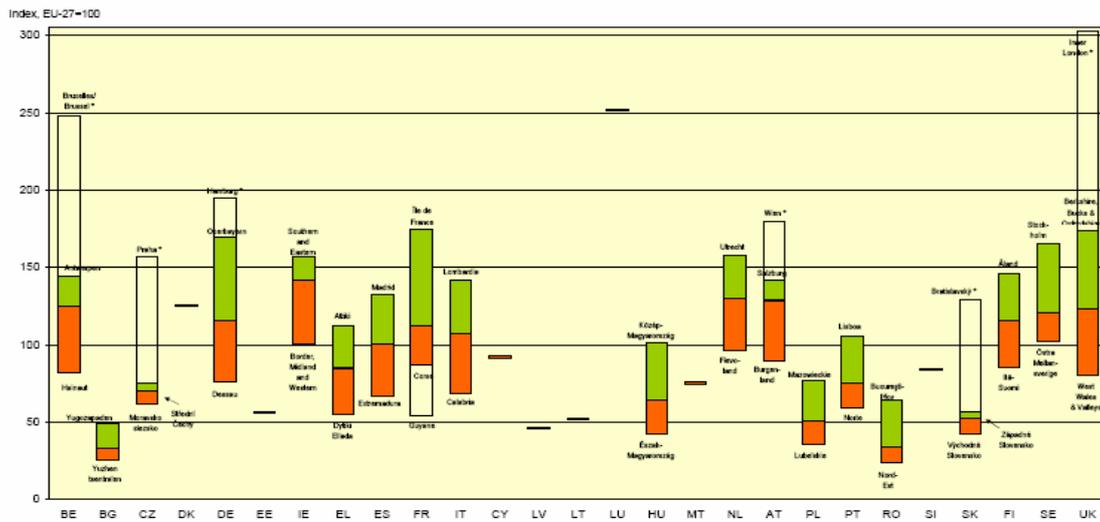
**REL Codes:** 16H, 16J.

Although the EU is one of the richest areas in the world, there are considerable differences between its regions from the point of view of development and opportunities. The accession of the 12 new member states, whose GDP/inhabitant is below the EU average, lead to an increase in the discrepancies between regions. Through its regional policy, the EU aims to transfer resources from the prosperous areas to the less prosperous ones. The purpose is to modernize less developed regions in order to give them the chance to catch up with the more developed ones.

The discrepancies between the regions can have various causes, such as persistent disadvantages like geographic location, recent socio-economic changes, or a combination of these factors. Often, the impact of these disadvantages is felt in poor quality education systems, social exclusion, high unemployment rates and improper infrastructure. For some Member States, the discrepancies are partly due to their former centralized economies. Globalization, climatic changes, the aging population, external immigration or the need for sustainable sources of energy are just as many challenges for the European space, which go beyond national, institutional or political borders. Europe should find common solutions to these

problems, in partnership with representatives at national, regional and local level. They have direct impact on regional and local communities and necessitate the collaboration of all public and private partners in finding practical and integrated solutions.

As mentioned earlier, there are great differences in prosperity levels in the EU, between Member States, but also within their borders. Today, 43% of economic income and 75% of investments in research and innovation are concentrated on only 14% of the European territory, the so-called pentagon between London, Hamburg, Munich, Milano and Paris. From the point of view of GDP per inhabitant (the standard measure of the degree of prosperity) the most prosperous regions are situated in urban centers – London, Brussels, Hamburg, Luxembourg, the most prosperous country in the EU, is seven times richer than Romania and Bulgaria, the poorest Member States and the last to join the EU. Such differences can also be noted between the regions in China and India, in both countries the region with the highest GDP/inhabitant being seven times above the level of the least developed one. On the other hand, in the US, this difference amounts to only 2.5, and in Japan to 2.



Source: European Commission – Eurostat.

Figure 1. GDP/inhabitant (PPP) regional extremes in the 27 EU Member States in 2004<sup>(1)</sup>

At regional level, the difference is even bigger: the richest region is the Inner London region, with 290% of the average EU GDP/inhabitant, while the poorest region is North-East Romania, with 23% of average EU GDP/inhabitant. Although GDP is not a perfect reflection of the standard of living because it is a relative factor in the cost of life, it does provide clues about the existing differences.

These differences are very well portrayed in Figure 1, which depicts the disparities between EU regions in 2004, with the North-East Romanian region registering the lowest GDP/inhabitant, followed by Severozapaden in Bulgaria. Even the poorest regions in Belgium, Great Britain, Italy, Netherlands, Finland, Spain, Austria, Ireland list a higher GDP/inhabitant than the richest Romanian region, Bucharest-Ilfov and the most prosperous Bulgarian region, Yugozapaden.

Indeed, these countries are old EU Member States with levels of GDP/inhabitant well above the two newest Member States, Romania and Bulgaria. Considering the new member states for a comparison between them and Romania, Figure 1 emphasizes that Poland and Bulgaria register a development level similar to that of Romania, the latter having regions with a GDP/inhabitant even greater than Bulgaria. There are regions even in Hungary with a development level similar to that of some Romanian regions. Figure 1 confirms the fact that economic and social discrepancies in Europe are substantial.

The discrepancies are not registered only between regions of different countries, but also between regions of the same country. From a statistical viewpoint, EU regions are classified into NUTS regions on three levels.

**INFO: What are NUTS regions?**

NUTS represents the Nomenclature of Territorial Units for Statistics and is a classification system used by the European Union to collect statistical data at regional level. All regions in the EU are classified on three NUTS levels. A region is included in one of the categories below if it fulfills the following population criteria:

Level	Minimum	Maximum
NUTS 1	3 milion	7 milion
NUTS 2	800,000	3 milion
NUTS 3	150,000	800,000

Each NUTS 1 region can be divided into several NUTS 2 regions, which in their turn can be split into NUTS 3 regions. The following types of regions exist:

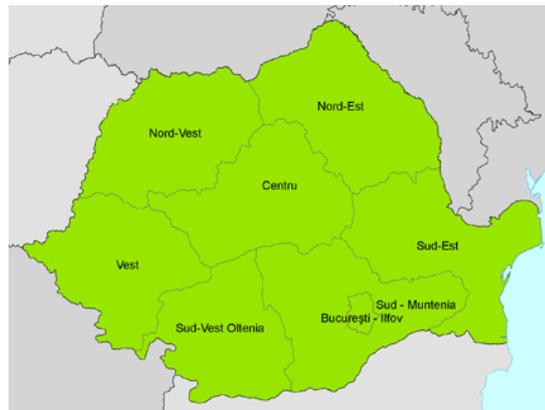
- *normative regions*, which are the expression of political will; their limits are fixed according to the tasks allocated to the territorial communities, according to the sizes of population necessary to carry out these tasks efficiently and economically, and according to historical, cultural and other factors;

- *analytical (or functional) regions* are defined according to analytical requirements; they group together zones using geographical criteria or using socio-economic criteria;

- *regions of general character*, specific to certain fields of activity (mining regions, farming regions, labour-market regions, etc.).

For practical reasons the NUTS nomenclature is based on an institutional division (normative and analytical regions) due to the availability of information and easiness to implement regional policy.

At present there are 268 regions at NUTS 2 level in EU-27. The second level is used for defining eligible regions to be financed from structural funds. For Romania, these are: North-West, Center, North-East, South-Muntenia, Bucharest-Ilfov, South-West Oltenia, and West. The Romanian regions corresponding to the NUTS 3 level are the counties.



**Source:** European Commission – Directorate General for Regional Policy

**Figure 2.** NUTS 2 regions of EU regional policy

**NUTS 3 Regions: Dispersion of regional GDP per inhabitant (PPP)<sup>(2)</sup>**

Table 1 presents the dispersion of regional GDP/inhabitant in the period 1995-2005. It can be noted that the greatest dispersion is registered in Latvia, which means this is the country with the greatest discrepancies between NUTS 3 regions. Trend analysis for the last 10 years suggests an increase in the dispersion from 31.7% in 1995 to 51.2% in 2005. Estonia ranks second with a dispersion of 41.2% in 2005, followed by Hungary with 40%. Also, it is noted that the majority of Member States oscillate in the dispersion range 15-30% for NUTS 3 regions.

## INFO: What is the dispersion of regional GDP per inhabitant (PPP)?

For a certain country, the dispersion of regional DGP/inhabitant is the sum of absolute differences between regional GDP/inhabitant and national GDP/inhabitant, proportional to the population of each region. GDP is expressed in purchasing power parity.

$$D = 100 \frac{1}{Y} + \sum_{k=1}^n |(y_k - Y)|(p_k/P)$$

$y_k$  = GDP/ inhabitant in region k;

$Y$  = GDP/inhabitant national average;

$p_k$  = population of regions k;

$P$  = country's population;

$k$  = the number of regions in the country.

The value of the dispersion of regional GDP/inhabitant is zero if the values of the

regional GDP/inhabitant are similar in all the regions of the country and it will be positive when there will be differences in regional GDP/inhabitant.

The data in Table 2 suggests that the discrepancies between regions increased instead of decreasing, in the majority of Member States, with the exception of four. An analysis of the trend in the period 1995-2005 suggests that there is a tendency for the dispersion to increase in almost all EU Member States. Table 2 shows that the only countries that succeed to improve the differences in GDP/inhabitant between NUTS 3 regions are Spain, Italy, Austria and Belgium. From the old Member States, Sweden and Ireland are the countries that register the greatest increase in discrepancies between regions, namely a rise of 49% and 42%, respectively.

Table 1

Dispersion of regional GDP/inhabitant, NUTS 3 regions (%)

Country/Period	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Belgium	28.1	27.9	27.8	28	28.1	27.6	27.6	27.5	26.9	27.3	27.5
Bulgaria		24.4	21.1	23.3	26.4	27.1	28.9	30.3	29.2	29.4	32.5
Czech Republic	15.4	15.3	16.8	19.2	20.4	21.3	22.9	23.3	23.5	22.5	23.3
Germany	27.4	27.3	27.6	28	28.1	28.1	28.4	28.1	28.4	28.2	28.3
Estonia		31.6	35	37.1	36.1	38.7	39.3	40.2	41.5	44	41.2
Ireland	18.2	18.5	21.5	23.9	22.1	22.5	23.3	25.8	26.5	25.5	25.9
Greece						22.9	24	25.4	26.1	27	29.1
Spain	19	19.5	19.8	20.2	20.6	20.5	20.2	19.6	19	18.5	18
France	22.1	22.5	22.9	22.6	23.3	23.9	23.8	23.5	23.6	22.7	22.7
Italy	24.7	24.8	24.4	24.4	24.2	25	25.3	24.8	24.7	24.9	24.2
Cyprus	0	0	0	0	0	0	0	0	0	0	0
Latvia		31.7	36.2	41.3	46.1	46.8	45.2	51.9	49	52.9	51.3
Lithuania	11.1	11.3	13.8	15.4	17.3	19	20	23	22.8	22.2	23.5
Luxembourg	0	0	0	0	0	0	0	0	0	0	0
Hungary	31.4	33.4	35.2	36.2	37.6		36.8	38.8	37.3	37.2	40
Malta						3.4	3	3.3	3.9	4	4.1
Netherlands	15.5	15.9	16.1	16.2	16.3	16.7	15.6	16.2	16.4	16.7	17.2
Austria	26.7	26.8	26.5	26.2	26.1	26	26.1	25.9	25.9	25.4	25.1
Portugal	26.6	26.2	26.8	27	26.2	27.4	27	26.9	27.3	27.6	28.1
Romania	12.8	13.8	15.6	22.7	24.6	28.7	29.1	30.8	28.1	27.4	31.9
Slovenia	19	19.1	18.6	18.7	20	19.9	20.6	20.9	22.5	22.2	22.4
Slovakia	28.3	27.2	28	27.6	27.3	27.8	27.2	28.1	28.7	29.2	33.8
Finland	16.3	17.3	17.6	19.8	21.6	21.8	22.1	20.8	19.2	19	19.8
Sweden	10.4	11.9	13.8	14.7	15.3	15.1	14.4	14.6	14.2	14.8	15.5
Great Britain	19.4	19.6	23	24.1	25.5	26.6	26.8	27.2	27.2	26.9	26.5

Source: European Commission – Eurostat.

Ireland has had an impressive evolution from the moment of its accession to the EU in 1973, when it was the poorest EU Member State, succeeding to become nowadays the country with the highest GDP/inhabitant after Luxembourg<sup>(3)</sup>, and evolving from an agricultural economy to a technologically advanced economy. Nevertheless, the discrepancies between NUTS 3 regions increased, rather than decreased. The explanation resides probably in the capabilities to absorb EU

funds and ability to direct the money towards projects with a high value added. All regions were eligible for EU funding, but some had better abilities to implement projects financed from structural funds. Therefore, the regions developed together, the more advanced didn't wait for the lagging ones to catch up with them. Moreover, the more technologically advanced regions developed faster than the agricultural regions, creating bigger differences between NUTS 3 regions.

Table 2

**Percentage increase in dispersion in the period 1995-2005**

Country	% increase from 1995 to 2005	Country	% increase from 1995 to 2005
<b>Old EU Member States</b>		<b>Last accession wave (2004 and 2007)</b>	
Germany	3.28	Bulgaria	33.20
Belgium	-2.14	Czech Republic	51.30
Ireland	42.31	Romania	149.22
Greece	27.07	Cyprus	0.00
Spain	-7.69	Latvia	61.83
France	0.89	Lithuania	111.71
Italy	-2.42	Hungary	27.39
Portugal	5.64	Malta	20.59
Luxembourg	0.00	Slovenia	17.89
Netherlands	10.97	Slovakia	19.43
Austria	-5.99	Estonia	30.38
Finland	21.47		
Sweden	49.04		
Great Britain	36.60		

**Source:** European Commission – Eurostat.

Romania is the country with the greatest rise in dispersion in the period 1995-2005, with an increase of approximately 150%, which lead to a deepening of the gap between counties (NUTS 3 regions considered in the calculation of dispersion). The second ranking, with an increase of about 110%, is Lithuania, followed at a big distance by

Latvia, with an increase in dispersion of 62%.

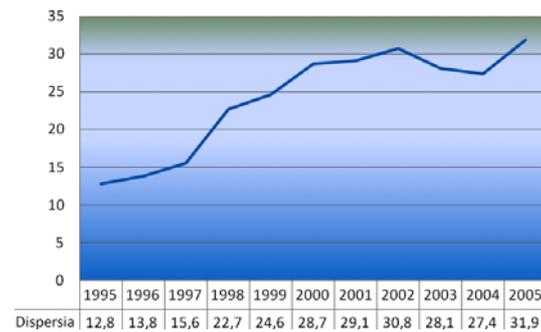
It can be noted that, between 1995 and 2005, the dispersion for Romania registers an increasing trend which doubled in only four years and became 2.5 times bigger in 2005 compared to 1995. The only period of improvement was registered between

2003 and 2004, followed by another increase in 2005 that went beyond the 2002 level, as it is portrayed in Figure 3.

The beginning of the period under analysis was characterized, in the economic sphere, by decline and instability, as well as by an obsolete industrial base that needed big investments. In the second part of the 90's, a lot of plants were closed down or registered substantial losses, being privatized afterwards. Nevertheless, the privatization process didn't solve the problems because in many cases the foreseen investments were never made. Foreign investments didn't flood the country, especially due to economic and political instability that kept investors away, especially those that were risk averse.

Although Romania holds a strategic position at the intersection of commercial roads between Europe and Asia/Middle East, the lack of transport infrastructure had a negative impact on a harmonious regional development. Some counties were preferred by investors due to their geographic position (for example, the counties in the west of Romania as they were closer to the western market, where the products made in Romania were exported), cheap workforce, proximity to raw materials, etc. The lack of transport and administrative infrastructure capable to sustain the market economy, lead to a heterogeneous development of the various Romanian counties. Thus, this situation is also the result of a combination of traditionally historical factors and recent

tendencies for development, including unforeseeable factors related to the geographic dimension of the privatization process. More precisely, the counties were affected in various ways by the privatization and the restructuring/dissolution of unprofitable sectors of the economy or of companies owned by the state.



Source: European Commission – Eurostat.

Figure 3. Dispersion of regional GDP/ inhabitant for Romania (%)

To have a complete picture, it should be pointed out that the counties had, from the beginning, a different start, meaning that each had a different level of development, and the least developed ones didn't manage to catch up or to keep up with the development pace of other regions, mostly due to the lack of know-how, infrastructure, administrative capacity and ability to attract investments. Table 3 shows that the GDP of some counties increased faster than that of others, the smallest rise amounting to 189% in Olt county and the most significant one amounting to 316% in Timis county. Only four counties registered an increase in GDP below 200% in the period 2000-2005: Olt,



## **NUTS 2 Regions: dispersion of regional GDP/inhabitant**

Taking into account that NUTS 2 regions are considered in the allocation of EU funds, an analysis is deemed more important than in the case of NUTS 3 regions (counties in the case of Romania).

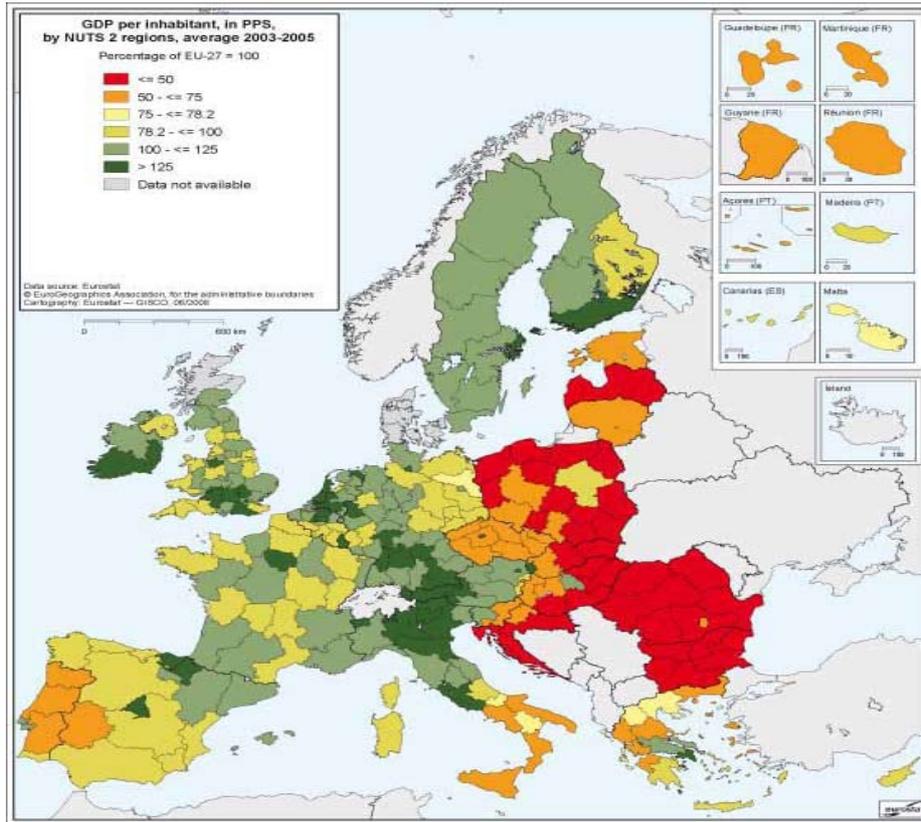
Even in the case of NUTS 2 regions there are substantial discrepancies within national boundaries, as it can be observed in Figure 4 for Italy, Spain and Germany.

In 2005 the highest value of GDP/inhabitant was two times bigger than the values registered in 12 of the 22 Member States with more than one NUTS 2 region (for example, Luxembourg has only one region). This group includes seven new Member States and seven of the 14 old Member States with more than one NUTS 2 region. The most significant regional differences are in the United Kingdom, where there is a factor of 3.9, followed by Slovakia and France, with a factor of 3.4 between the two extreme values. The lowest values are in Ireland and Slovenia, with a corresponding factor of 1.5 for each. Moderate regional disparities in GDP/inhabitant<sup>(4)</sup> are found only in the EU-15 Member States and in Bulgaria, Croatia and Slovenia. In all the new Member States and in a number of the EU-15 Member States, a substantial share of economic activity is concentrated around the capital regions. As a result, in 18 of the 22 countries with more

than one NUTS 2 region, the capital regions are also the regions with the highest GDP/inhabitant. Figure 2 shows the leading position of the regions of Brussels, Prague, Sofia, Athens, Madrid, Paris, Lisbon, Budapest, Bratislava, London, Warsaw, and Bucharest.

Figure 2 presents the distribution of the average GDP/inhabitant (PPP)<sup>(5)</sup> in the period 2003-2005 in 6 groups and by NUTS 2 regions. The three-year average is important because it is used in the allocation of EU structural funds to each region. Figure 4 shows a concentration of the less developed regions (with a GDP/inhabitant below 75% of EU-27 average in the period 2003-2005) in Italy, Portugal, Greece, Germany and the new Member States.

In Spain, just Extremadura registers values below the 75% threshold, and in France only the four overseas departments (Guadeloupe, French Guyana, Martinique, Reunion) are in a similar situation. All regions in Eastern Germany passed the 75% threshold when the EU grew in 2007 to 27 members, which means that GDP/inhabitant in the new EU-27 is some 4% lower than it was in EU-25. Overall, 70 NUTS 2 regions register values of the average GDP/inhabitant in the period 2003-2005 below 75% of the EU-27 average. These regions are inhabited by 25.4% of the population of the enlarged Union.



Source: European Commission – Eurostat.

Figure 4. GDP/inhabitant in purchasing power parities for NUTS 2 regions (average values for the period 2003-2005)

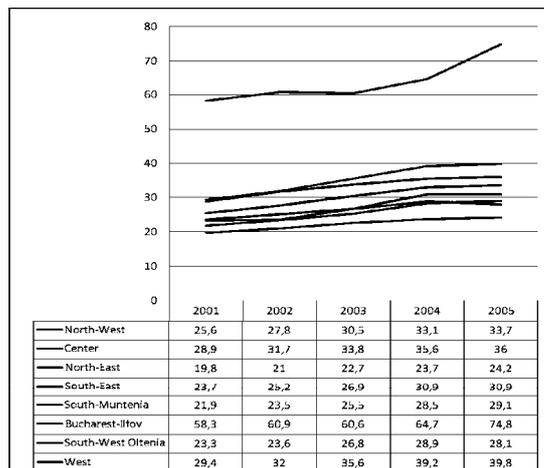
Figure 4 also shows very prosperous regions, with an average GDP/inhabitant higher than 125% of the EU average. These 47 regions are inhabited by 23% of the EU-27 population. Contrary to what one might think, these regions are not located in the heart of Europe, but include regions around the capitals mentioned above (especially London, Brussels, Dublin, Paris, Madrid, Prague, Bratislava), as well as in peripheral regions such as Attiki in Greece, South and Eastern Ireland, Etela-Suomi in Finland.

Regions characterized by an average development, which amount to 34 and are inhabited by 12.6% of the EU-27 population, registered in the period 2003-2005 an average GDP/inhabitant of less than 50% of the EU-27 average. Most of the Romanian

and Bulgarian territory (with the exception of Bucharest-Ilfov) falls into this category. Other seven regions fall into this category only due to the last wave of accessions in 2007 when Romania and Bulgaria joined the EU, which caused a 4% decrease in the GDP average and resulted in three Greek regions, two Italian, one German and one Maltese to be reclassified.

As Figure 5 and the corresponding table show, Bucharest-Ilfov is well above the rest of the Romanian regions in terms of prosperity. As mentioned previously, it is characterized by a higher level of development given the fact that it spreads around the capital. In 2001, the regions varied in development levels, with the exception of South-East and South-West Oltenia, which in

2001 listed a similar percentage for the GDP/inhabitant compared to the EU average (23% of the EU-27 average). While in 2001 the level of all regions (with the exception of Bucharest-Ilfov) oscillated in the range 20-30% of EU-27 average, in 2005 this figure increased by 5-10 percentage points. The West and North-West regions witnessed a more rapid increase than the others, among which is worth mentioning South-Muntenia and South-West Oltenia as having an accelerated growth. These are followed by Bucharest-Ilfov, which surprisingly was not the region with the most rapid growth.



Source: European Commission – Eurostat.

Figure 5. GDP/inhabitant relative to EU27 average (%)

Table 4 portrays the values for GDP per capita in the eight NUTS 2 Romanian regions, as well as the increase registered in the period 2001-2005. Contrary to the data supporting Figure 5, the data in Table 4 are not expressed in terms of the EU-27 average. Nevertheless, it can be noted that the ranking of the regions doesn't change, the most significant increase being witnessed by the West and North-West regions, followed by South-Muntenia and South-West Oltenia. Bucharest-Ilfov ranks only fifth. In 2005, the difference between the most prosperous and the poorest region is quite significant – the GDP/inhabitant for Bucharest-Ilfov is three times higher than that for North-East, the least developed region in Romania and, in fact, in the enlarged European Union. Moreover, the GDP per capita for the region around the capital is almost double that of the second ranking region in terms of development. In 2001 the situation was more or less similar, the GDP/inhabitant of the most developed region being approximately three times higher than the figure for the least developed one. From 2001 to 2005 the regions maintained their ranking positions with a single exception – South Muntenia and South-West Oltenia swapped positions, although they are not far apart on the scale.

Table 4

GDP/inhabitant (PPP) by Romanian NUTS 2 regions)<sup>(6)</sup>

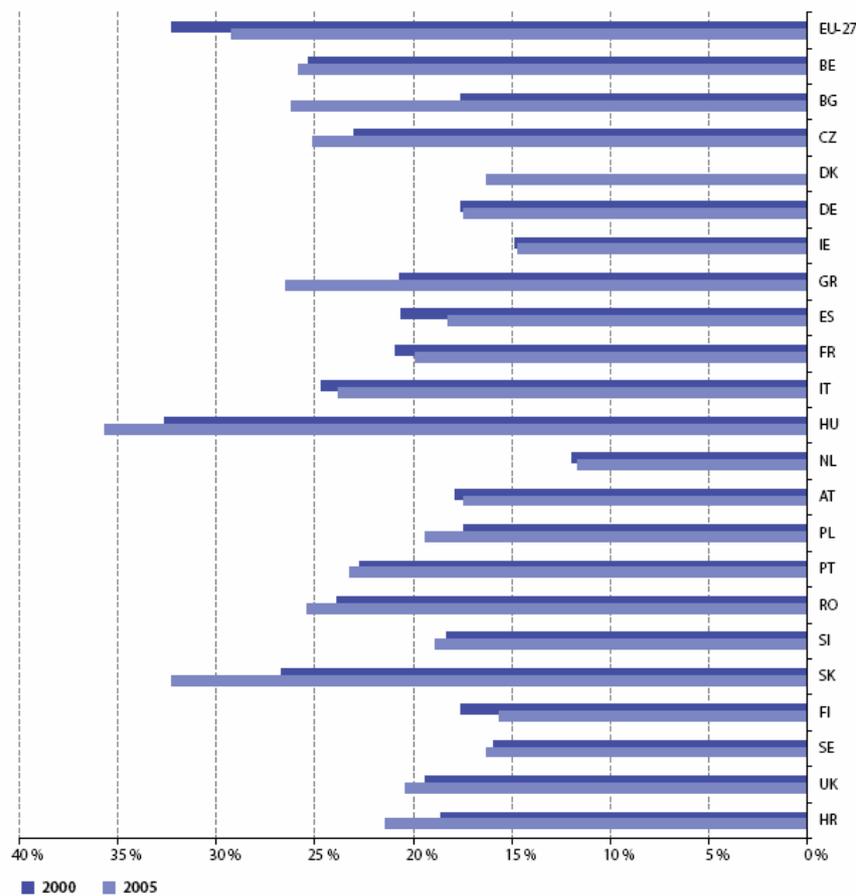
Region	Year					% increase 2001/2005
	2001	2002	2003	2004	2005	
North-West	5051	5666.1	6305.2	7153.7	7542	49.32
Center	5706.3	6478.7	6982.2	7694.2	8066.3	41.36
North-East	3904.4	4291.6	4700.2	5113.3	5429.6	39.06
South-East	4678.3	5144.4	5551.3	6668.4	6920.6	47.93
South-Muntenia	4320.1	4802.1	5273.5	6163.2	6526.5	51.07
Bucharest-Ilfov	11498.6	12432.8	12537.3	13980.0	16760.1	45.76
South-West Oltenia	4597.3	4816.2	5530.2	6235.4	6293.3	36.89
West	5804.2	6524.7	7356.5	8466.9	8916.7	53.62

Source: European Commission – Eurostat.

A comparison of the data for the period 2000-2005 shows significant differences in the development of the old Member States compared to the new-entrants, regional differences for the majority of EU-15 countries seeing a downward trend. Nevertheless, only the extremes of regional values cannot provide a complete picture, taking into account that they are all treated the same regardless of their population figures.

Thus, the linear dispersion indicator will be analysed as, for each region, it weights the difference in GDP/inhabitant compared with the national average on the basis of the population of the region in question.

Thus, the extreme values of regions with a small population (i.e., Aland in Finland) will receive a smaller weight, while the more populated ones (i.e., Ile-de-France) will be assigned a higher weight.



Source: European Commission – Eurostat.

Figure 6. Regional dispersion GDP/inhabitant<sup>(7)</sup> in the period 2000–2005

Figure 6 depicts the dispersion for all Member States with more than one NUTS 2 region. The highest regional dispersion is registered by Slovakia and Hungary, with values higher than 30%. These values are three times higher than the

Netherlands, which registers the greatest homogeneity with values of just 11%. The majority of the Member States can be found in the 20-30% range, with the exception of Poland and Slovakia whose values are below 20%.

In the case of NUTS 2 regions, the dispersion increased for Romania from 2001 to 2005, a conclusion similar to the one reached for NUTS 3 regions. Nevertheless, the increase in dispersion is not as significant for Romania as it is for other countries such as Greece, Bulgaria, Slovakia, Hungary, the first one being an old member state, and the last two having joined the EU in 2004. Of the new Member States, only Slovenia and Portugal show a smaller increase, while of the old Member States whose dispersion figures have amplified, only those for Belgium are lower than those for Romania. Nevertheless, at EU-27 level a fall in dispersion below the 30% threshold can be noted. Among the states that show an amelioration of this indicator can be listed: Germany, Ireland, Netherlands, Austria with very small reductions and Spain, France, Italy, Finland with a more significant decrease. Although the graph may leave the false impression that the overall diminution in dispersion is smaller than the overall increase, leading to an absolute rise, it must be pointed out that this indicator is weighted against the population figures for each country, which in the end leads to an overall decrease in dispersion at EU-27 level.

## Conclusion

Although the EU is one of the richest areas in the world, there are considerable differences between its regions from the point of view of development and opportunities. The accession of the 12 Member States, with GDP figures below the

EU average, lead to increased discrepancies between EU regions. The most prosperous country in the EU, Luxembourg, records a GDP/inhabitant seven times bigger than that of Romania and Bulgaria. At regional level, the difference is more accentuated: the most prosperous region is Inner London with 290% of average EU GDP/inhabitant, while the poorest region is North-East Romania with 23% of the average EU GDP/inhabitant, while the poorest region is North-East Romania with 23% of average EU GDP/inhabitant.

In case of NUTS 3 regions, the majority of Member States registered increases in dispersion in the period 2000-2005, only four countries registering decreases: Spain, Italy, Austria, Belgium. Romania is the country with the greatest rise in dispersion in the period 1995-2005, with an increase of approximately 150%, which lead to a deepening of the gap between counties (NUTS 3 regions considered in the calculation of dispersion).

Concerning NUTS 2 regions, there are only 8 Member States that saw decreases in dispersion in 2000-2005: Germany, France, Spain, Italy, Austria, Ireland, Netherlands, Finland, the first ones being the most populated. Nevertheless, considering that the dispersion is weighted against the population, at global level, the EU registered a decrease in regional discrepancies.

EU regional policy aims at transferring resources from prosperous areas to the poorer ones by modernizing the latter ones in order to offer them the possibility to catch up with the developed ones.

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## Notes

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- (1) Purchasing Power Parity.
- (2) Purchasing Power Parity.
- (3) In 2007 Luxembourg registered a GDP/inhabitant in purchasing power parity of 266.5, while Ireland registered 150.4 and Romania 44.3, according to Eurostat.
- (4) Factors of less than 2 between the highest value and the lowest.
- (5) Purchasing Power Parity.
- (6) Purchasing Power Parity.
- (7) Expressed in purchasing power parity (PPP) for NUTS 2 regions.

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