Gross domestic product

Introduction

Gross domestic product (GDP) is a key measure of a nation's economic development and growth. This chapter considers economic growth across the regions of the European Union Member States and candidate countries Croatia and the former Yugoslav Republic of Macedonia. It finds that the differences between Member States are quite large, but decreasing.

Economic activity is expressed in national currency, converted by purchasing power parities (PPPs), which take account of different price levels between Member States, allowing for a more accurate comparison. Thanks to PPPs, GDP is converted into an artificial common currency, called purchasing power standards (PPS). This makes it possible to compare purchasing power in countries that use different national currencies.

Finally, the chapter considers the level of economic dynamism in the regions of Member States and candidate countries, and finds that new Member States are continuing to catch up at a relatively strong rate.

Main statistical findings

Regional GDP per inhabitant in 2008

Map 7.1 shows per-inhabitant GDP (as a percentage of the EU-27 average of 25 100 PPS) for the European Union, Croatia, the former Yugoslav Republic of Macedonia and Turkey, which has, after a lengthy interruption, again provided data (for the reference years 2004–06) in line with the European system of accounts (ESA95) Data Transmission Programme.

The regions with the highest per-inhabitant GDP are in southern Germany, the south of the UK, northern Italy and Belgium, Luxembourg, the Netherlands, Austria, Ireland and Scandinavia. The regions around certain capitals, Madrid, Paris, Praha and Bratislava, also fall into this category. The weaker regions are concentrated in the southern, south-western and south-eastern periphery of the Union, in eastern Germany and the new Member States, Croatia, the former Yugoslav Republic of Macedonia and Turkey.

Detailed analysis of the data in this chapter does not cover Turkey, since the data available consists of a time series that only goes up to 2006, i.e. two reference years less than for other countries.

Within the EU, per-inhabitant GDP ranges from 28 % of the EU-27 average (6 500 PPS) in Severozapaden in Bulgaria to 343 % (85 800 PPS) in the capital region of Inner London in the UK.

The factor between the two ends of the distribution is therefore 13.2:1. Luxembourg at 280 % (70 000 PPS) and Brussels at 216 % (54 100 PPS) are in positions two and three, followed by Groningen (Netherlands) at 198 % (49 700 PPS), Hamburg at 188 % (47 100 PPS) and Praha at 173 % (43 200 PPS) in positions four, five and six. Praha (Czech Republic) thus remains the region with the highest per-inhabitant GDP in the new Member States; Bratislavský kraj (Slovakia) follows with 167 % (41 800 PPS) in ninth position among the 275 statistical areas (known as NUTS 2 regions of the countries examined here — 271 regions in the EU plus three regions in Croatia, and the former Yugoslav Republic of Macedonia). However, Praha and Bratislavský kraj must be regarded as exceptions as regards regions in the new Member States that joined in 2004. The next most prosperous regions in the new Member States are a long way behind: Bucureşti - Ilfov in Romania at 113 % (28 300 PPS) in position 74, Zahodna Slovenija (Slovenia) at 109 % (27 300 PPS) in position 87, Közép-Magyarország (Hungary) at 107 % (26 800 PPS) in position 96 and Cyprus at 97 % (24 400 PPS) in position 129.

With the exception of four other regions (Mazowieckie in Poland, Sjeverozapadna Hrvatska in Croatia, Malta and Vzhodna Slovenija in Slovenia), all the other regions of the new Member States, Croatia and the former Yugoslav Republic of Macedonia have a per-inhabitant GDP in PPS of less than 75 % of the EU-27 average.

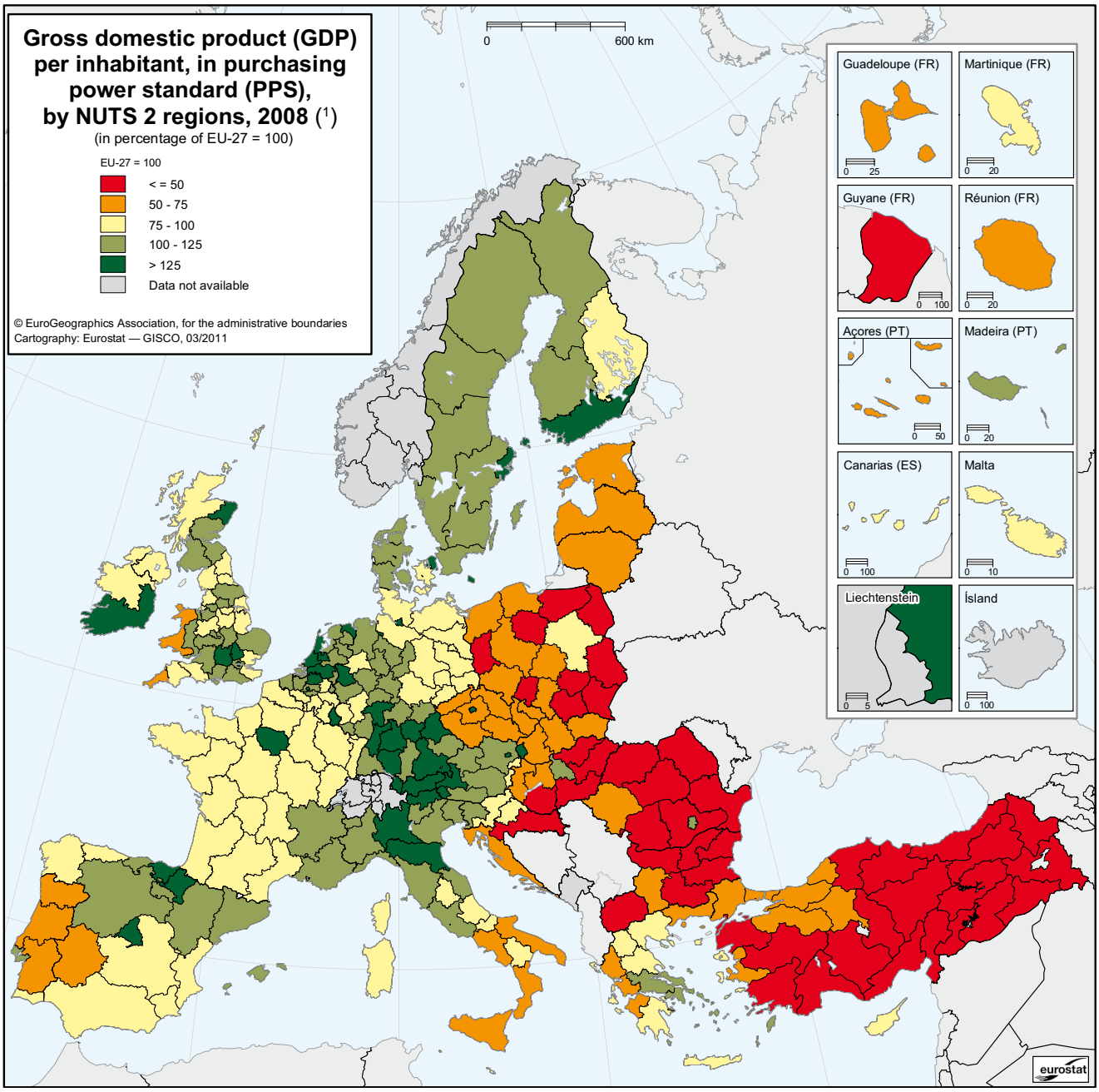
As a result, in 2008, GDP in 67 regions was less than 75 % of the EU-27 average. Some 24.4 % of the population of the EU, Croatia and the former Yugoslav Republic of Macedonia lives in these 67 regions. Only a quarter of these regions are in EU-15 countries, while three quarters are in new Member States, Croatia and the former Yugoslav Republic of Macedonia.

At the upper end of the spectrum, 40 regions have per-inhabitant GDP of more than 125 % of the EU-27 average; these regions are home to 19.4 % of the population. Regions with a per-inhabitant GDP of between 75 % and 125 % of the EU-27 average are home to 56 %, and thus a clear majority of the population of the 29 countries under consideration (EU-27, Croatia and the former Yugoslav Republic of Macedonia). Some 9.3 % of the population live in the 27 regions whose per-inhabitant GDP is less than 50 % of the EU-27 average. With the exception of the French overseas department of Guyane, all these regions are located in the new Member States, Croatia or the former Yugoslav Republic of Macedonia.

Major regional differences even within countries themselves

There are also substantial regional differences within countries themselves, as Figure 7.1 shows. In 2008, the highest per-inhabitant GDP was more than twice the lowest in 13

Map 7.1: Gross domestic product (GDP) per inhabitant, in purchasing power standard (PPS), by NUTS 2 regions, 2008 (1)
(in percentage of EU-27 = 100)



(1) Turkey, 2006.

Source: Eurostat (online data code: nama_r_e2gdp).

of the 23 countries examined here with several NUTS 2 regions. This group includes seven of the nine new Member States/candidate countries, but only six of the 14 EU-15 Member States.

The largest regional differences are in Turkey, where there is a factor of 4.9 between the highest and lowest values, and in the United Kingdom and Romania, with factors of 4.8 and 3.9 respectively. The lowest values are in Slovenia, Ireland and Sweden, with factors of 1.4, 1.6 and 1.6. Moderate regional disparities in per-inhabitant GDP (i.e. factors of less than 2 between the highest and lowest values) are found only in EU-15 Member States, plus Slovenia and Croatia.

In all the new Member States, Croatia and a number of EU-15 Member States, a substantial proportion of economic activity is concentrated in regions that include the capital. Consequently, in 18 of the 23 countries included here in which there are several NUTS 2 regions, these regions are also those with the highest per-inhabitant GDP. For example, Map 7.1 clearly shows the prominent position of the regions of Brussels (Belgium), Sofia (Bulgaria), Praha (Czech Republic), Athina (Greece), Madrid (Spain), Paris (France) and Lisboa (Portugal) as well as Budapest (Hungary), Bratislava (Slovakia), London (United Kingdom), Warszawa (Poland) and Bucureşti (Romania).

A comparison of the extreme values between 2000 and 2008, however, shows that trends in the EU-15 have been quite different from those in new Member States. While the gap between the regional extreme values in the new Member States and Croatia is growing in most cases, it is shrinking in one out of every two EU-15 countries.

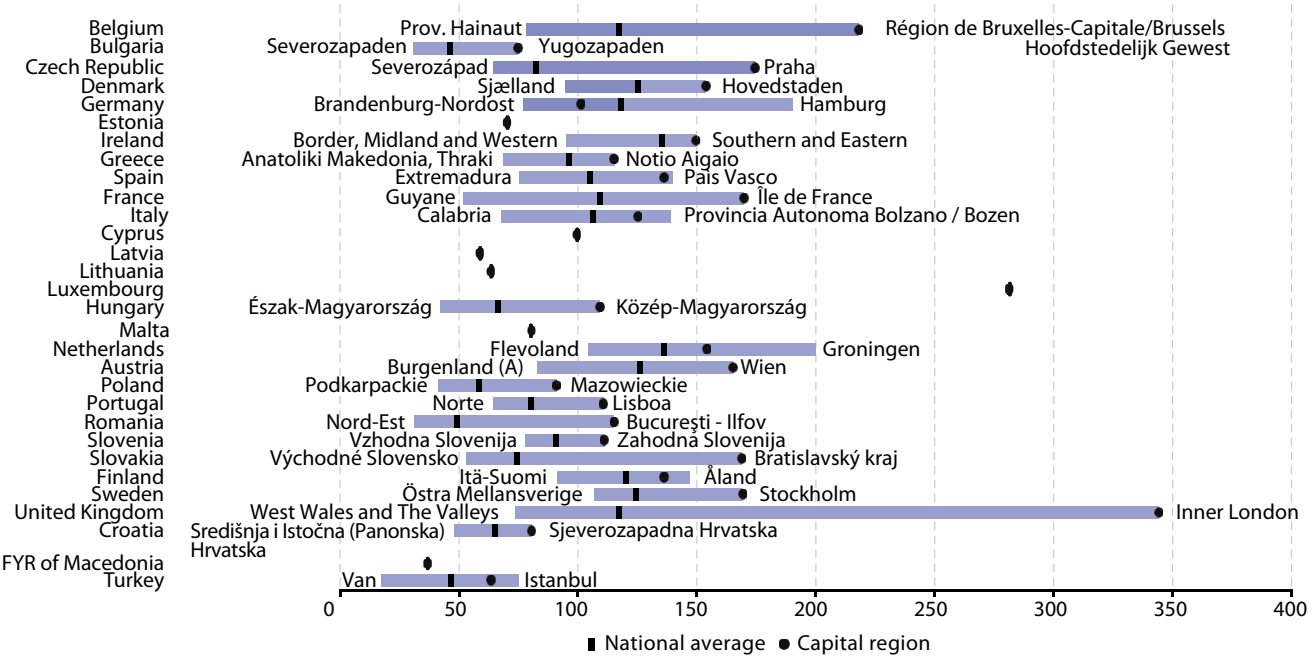
Dynamic catch-up process in the new Member States

Map 7.2 shows the extent to which per-inhabitant GDP changed between 2000 and 2008, compared with the EU-27 average (expressed in percentage points of the EU-27 average). Economically dynamic regions, whose per-inhabitant GDP increased by more than 3 percentage points compared with the EU average, are shown in green. By contrast, less dynamic regions (those with a fall of more than 3 percentage points in per-inhabitant GDP compared with the EU-27 average) are shown in orange and red. The range is from + 58 percentage points for Bratislavský kraj (Slovakia) to – 40 percentage points for Brussels in Belgium.

The map shows that economic dynamism is well above average in the south-western, eastern and northern peripheral areas of the EU, not just in EU-15 countries but particularly in new Member States, Croatia and some regions of Turkey.

Among the EU-15 Member States, strong growth is particularly evident in Spain, parts of the Netherlands and Greece, as well as the north of Finland and Sweden. On the other hand, weak growth that started several years ago is persisting in several EU-15 countries. Italy and France have

Figure 7.1: Gross domestic product (GDP) per inhabitant, in purchasing power standard (PPS), highest and lowest NUTS 2 region within each country, 2008 ([1])
(in % of the EU-27 average, EU-27 = 100)



([1]) Turkey, 2006.

Source: Eurostat (online data code: nama_r_e2gdp).

been particularly badly hit. Not a single region achieved the EU-27 average growth rate during the eight-year period 2000–08. Performance has also been weak in a number of regions of Germany, Portugal, Sweden and the UK. Ireland is a special case. Due to the economic and financial crisis, both NUTS 2 regions fell back to the levels of 2001, i.e. by 15 percentage points, during the year 2008.

Of the new Member States, apart from the very dynamic capital regions, the Baltic States, Romania, Slovakia, the Czech Republic and most regions of Poland have seen growth markedly above the average. Croatia and the former Yugoslav Republic of Macedonia also reveal above-average economic growth for the eight-year period 2000–08.

Closer analysis of the most dynamic regions shows that 41 EU-27 regions have outperformed the EU average by more than 10 percentage points; of these, 24 are in new Member States.

The 10 fastest-growing regions are spread over nine EU Member States. Among these 10, there are five capital regions in new Member States. The three regions in EU-15 countries in this top-10 group (Luxembourg, Groningen in the Netherlands and Inner London) can all be considered special cases.

The non-capital region with the strongest growth in the new Member States was Vest (Romania), where per-inhabitant GDP (in PPS) increased by 23.8 percentage points compared to the EU-27 average between 2000 and 2008.

At the lower end of the distribution curve, there is a clear concentration: of the 34 regions in which per-inhabitant GDP fell by more than 10 percentage points below the EU-27 average, 13 are in Italy, six in France, five in the UK and four in Germany.

Closer examination of the new Member States yields the pleasing result that, between 2000 and 2008, only one region (Malta with– 5.8 percentage points) fell back, compared with the EU-27 average.

The catch-up process in new Member States was of the order of 1.7 percentage points per year between 2000 and 2008, compared to the EU average. Per-inhabitant GDP (in PPS) in these 12 Member States thus rose from 45 % of the EU-27 average in 2000 to almost 59 % in 2008. In 2008, performance was particularly strong, with 2.7 percentage points. This can be explained partly by the fact that the economic and financial crisis struck first in the EU-15 Member States, some of which, like Ireland, Italy and Denmark, were already in recession in 2008. On the other hand, among new Member States, only Estonia and Latvia already had negative volume growth rates in 2008, and the full effects of the crisis became apparent only in 2009. The initial data available on certain Member States for 2009 and 2010 would suggest that the recession affected rural regions and areas lagging behind in terms of economic development less severely than regions with a high per-inhabitant GDP, or with a high level of dependence on exports or tourism.

Different trends within countries themselves

A more detailed analysis of trends within countries between 2000 and 2008 shows that the economic development of regions within a country can be almost as diverse as between regions in different countries.

The largest differences were seen in the Netherlands, Romania, Slovakia and the United Kingdom, where there were performance differences of more than 40 percentage points relative to the EU average for the per-inhabitant GDP of the fastest- and slowest-growing regions. The countries with the smallest differences between regions were Ireland, Slovenia, Denmark and Finland, with regional performance differences of between 2 and 9 percentage points.

In both new Member States and EU-15 countries, significantly diverging regional trends were the result mainly of dynamic growth in capital regions. However, as the values for Slovenia (6 percentage points) and Poland (14 percentage points) show, the data available do not confirm the assumption that major regional growth disparities are a typical feature of new Member States.

The data also show that the regions with the lowest levels of per-inhabitant GDP made significant progress. Between 2000 and 2008, Nord-Est and Sud - Muntenia (both in Romania) caught up by 11 and 18 percentage points and Yuzhen tsentralen (Bulgaria) by 9 percentage points compared to the EU-27 average.

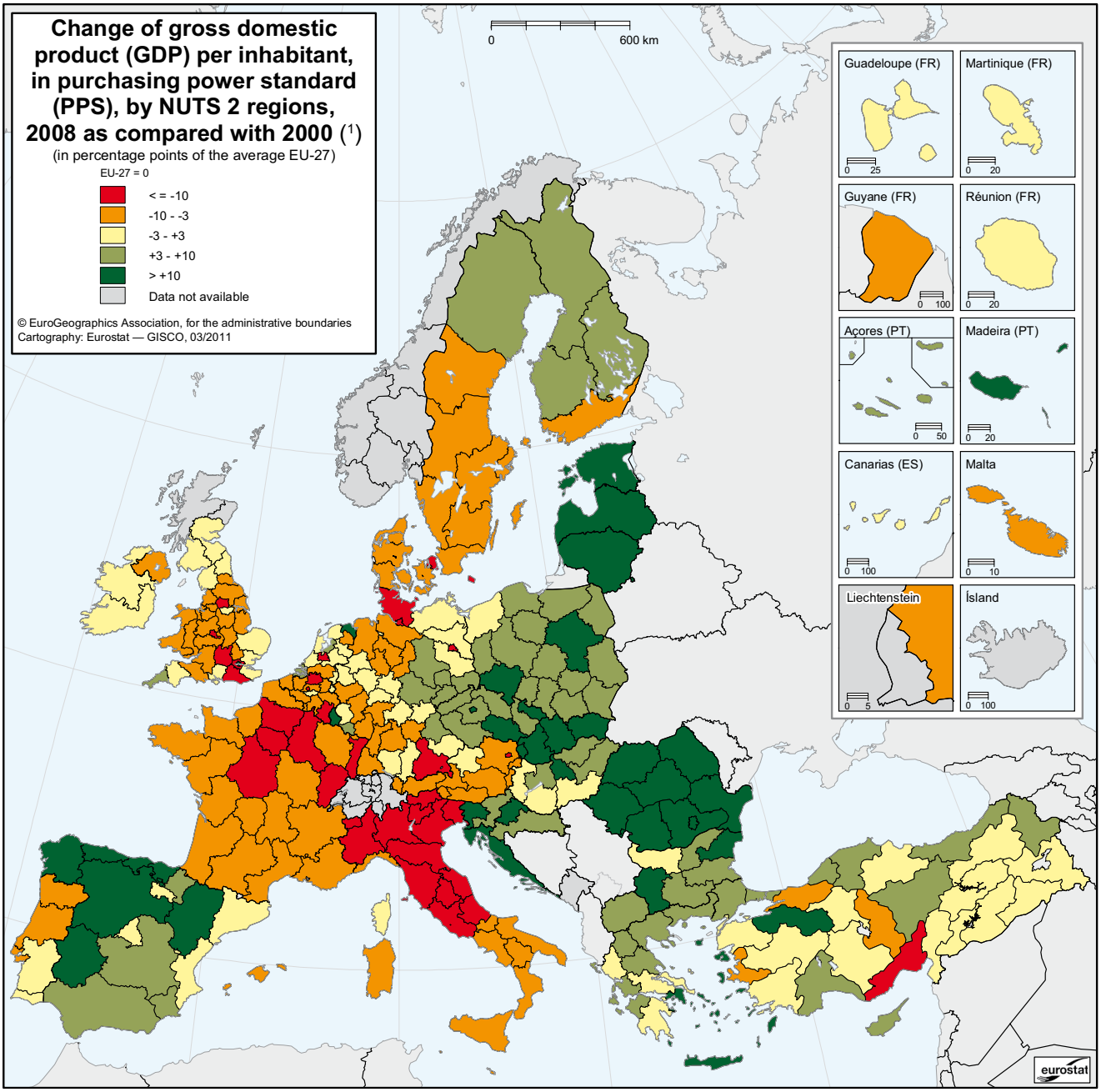
Convergence makes progress

This section addresses the question of whether convergence among the regions of the EU-27 has made progress over the eight-year period 2000–08. Regional convergence of per-inhabitant GDP (in PPS) can be assessed in various ways on the basis of data supplied to Eurostat by national statistical institutes.

The simplest approach is to measure the gap between the highest and lowest values. By this method, the gap closed from a factor of 17.2 in 2000 to 13.2 in 2008. The main reason for this clear convergence was faster economic growth in Bulgaria and Romania. However, as this approach looks only at the extreme values, it is clear that the majority of shifts between regions are not taken into account.

A much more accurate evaluation of regional convergence is afforded by the dispersion of regional GDP calculated by Eurostat for the EU-27 and Croatia since 2007 (for details of the method see below, 'Data sources and availability', 'Dispersion of regional per-inhabitant GDP'). This takes account of divergences from the national average in all NUTS 2 regions for each country in turn, weighted by the regional population. Figure 7.2 compares the values of dispersion at regional level NUTS 2 for 2000 and 2008; the order of countries follows the values ranked in 2008. In the

Map 7.2: Change of gross domestic product (GDP) per inhabitant, in purchasing power standard (PPS), by NUTS 2 regions, 2008 as compared with 2000 (1)
(in percentage points of the average EU-27)



(1) Denmark, Eurostat estimate; Turkey, 2006 as compared with 2000; Croatia, 2008 as compared with 2001.

Source: Eurostat (online data code: nama_r_e2gdp).

first instance, a downward trend is apparent, i.e. a decrease in regional dispersion for the EU-27 as a whole. An examination of the trend in individual countries reveals clear differences between certain groups of Member States. First, most of the EU-15 countries have lower dispersion than the new Member States. In addition, values in the EU-15 countries are generally decreasing, whereas they are increasing considerably in some of the new Member States. It is thus evident that the economic catching-up process in new Member States has so far gone hand-in-hand with increasing regional disparities.

The approach most often used at present involves classifying the regions according to their per-inhabitant GDP (in PPS) in relation to the average of the EU-27. This enables calculation of the proportion of the population living in more or less prosperous regions, and how this proportion has changed over time.

Table 7.1 shows clear progress in economic convergence between regions over the eight-year period 2000–08 for the EU-27, Croatia and the former Yugoslav Republic of Macedonia: the proportion of the population living in regions where per-inhabitant GDP is less than 75 % of the EU-27 average fell from 28.1 % to 24.4 %. At the same time, the proportion of the population living in regions where this value is greater than 125 % fell from 24.3 % to 19.4 %. These shifts at the top and bottom ends of the distribution meant that the proportion of the population in the midrange (per inhabitant GDP of 75–125 %) increased sharply from 47.6 % to 56.2 %. This corresponds to an increase of around 51 million inhabitants.

A comparison between the data for 2000 and 2008 reveals that eight regions managed to pass the 75 % threshold in the course of this period. These were two regions in Greece, as well as one region each in Spain, France, Poland, Romania, Slovenia and Croatia. These regions are home to 19.6 million people, or around 3.9 % of the population of the 29 countries examined here. At the same time, however, GDP in one Italian and one UK region, covering a total of 6 million inhabitants, i.e. approx. 1.2 % of the EU population, again fell below the 75 % threshold. Taking both developments into account, as a result of economic development between the years 2000 and 2008, the population living in regions with a GDP of more than 75 % of the EU-27 average grew by 13.6 million people.

A more detailed analysis shows that, in addition, many regions with a GDP of less than 50 % of the EU-27 average have made quite substantial progress. Between 2000 and 2008, the population living in these regions fell by almost a third, from 14.8 % to 9.3 % of the 29 countries examined here, i.e. by over 25 million. At the same time, only one region (the French overseas department of Guyane) fell back below the 50 % threshold.

Moreover, an examination of the 10 weakest regions as at 2000, where 4.8 % of the population lived at that time, shows that this group made strong progress. Per-inhabitant GDP in these regions rose, from 22.6 % to 36.4 % of the EU-27 average between 2000 and 2008. This shows the strong catch-up process under way in Bulgaria and Romania.

Data sources and availability

What is regional gross domestic product?

The economic development of a region is, as a rule, expressed in terms of its gross domestic product (GDP). This indicator is also frequently used as a basis for comparisons between regions.

But what exactly does it mean, and how can comparability be established between regions of different sizes and with different currencies?

A meaningful comparison can be made only by comparing the regional GDP with the population of the region in question. This is where the distinction between place of work and place of residence becomes significant. GDP measures the economic output achieved within national or regional boundaries, regardless of whether this was attributable to resident or non-resident employed persons. The use of GDP per inhabitant is, therefore, only straightforward if all employed persons involved in generating GDP are also residents of the region in question.

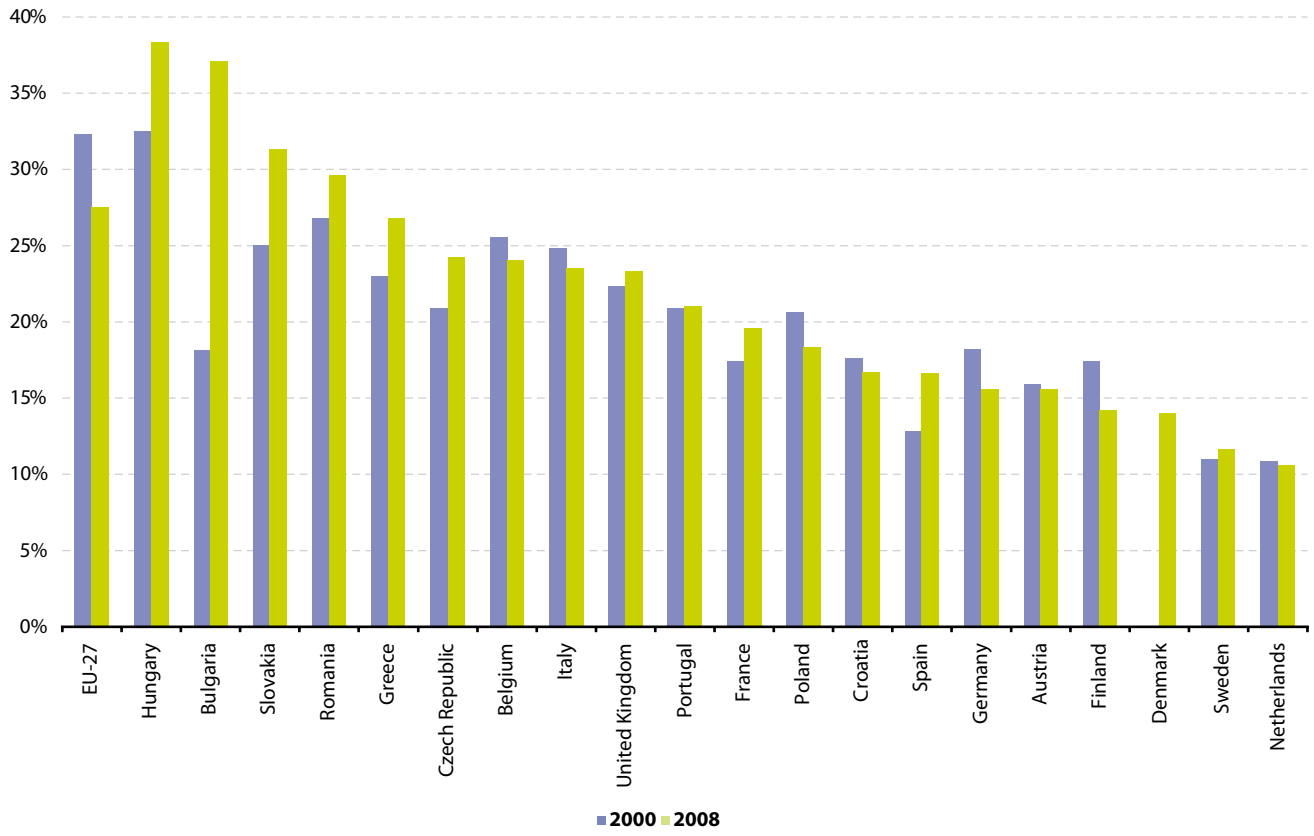
In areas with a high proportion of commuters, regional GDP per inhabitant can be extremely high, particularly in economic centres such as London (United Kingdom) or Wien (Austria), Hamburg (Germany), Praha (Czech Republic) or Luxembourg, and relatively low in the surrounding regions, even if households' primary income in these regions is very high. Regional GDP per inhabitant should, therefore, not be equated with regional primary income.

Regional GDP is calculated in the currency of the country in question. To make GDP comparable between countries, it is converted into euro, using the official average exchange rate for the given calendar year. However, exchange rates do not reflect all the differences in price levels between countries. To compensate for this, GDP is converted using conversion factors, known as purchasing power parities (PPPs), to an artificial common currency, called purchasing power standard (PPS). This makes it possible to compare the purchasing power of different national currencies.

Purchasing power parities and international volume comparisons

International differences in GDP values, even after conversion via exchange rates to a common currency, cannot be attributed solely to differing volumes of goods and services. The 'level of prices' component is also a major contributing factor. Exchange rates reflect many factors

Figure 7.2: Dispersion of regional GDP per inhabitant, in PPS, NUTS level 2, 2000 and 2008 (1)
(%)



(1) Regional dispersion is not applicable for Estonia, Ireland, Cyprus, Latvia, Lithuania, Luxembourg, Malta and Slovenia; Croatia, 2001 and 2008.

Source: Eurostat (online data code: nama_r_e0digdp).

Table 7.1: Proportions of resident population of EU-27, Croatia and former Yugoslav Republic of Macedonia in economically stronger and weaker regions

Percentage of population of EU-27, Croatia and FYR of Macedonia resident in regions with a GDP per inhabitant of	2000	2008
> 125 % of EU-27 = 100	24.3	19.4
> 110 % to 125 % of EU-27 = 100	15.5	16.0
> 90 % to 110 % of EU-27 = 100	21.5	24.7
> 75 % to 90 % of EU-27 = 100	10.5	15.5
less than 75 % of EU-27 = 100	28.1	24.4
of which: less than 50 % of EU-27 = 100	14.8	9.3

Source: Eurostat (nama_r_e2gdp).

relating to supply and demand in the currency markets, such as international trade, inflation forecasts and interest rate differentials. Conversions via exchange rates are, therefore, of only limited use for international comparisons. To obtain a more accurate comparison, it is essential to use special conversion rates which remove the effect of price-level differences between countries. Purchasing power parities are currency conversion rates of this kind, converting economic data expressed in national currencies into an artificial common currency, called purchasing power standard (PPS). PPPs are, therefore, used to convert the GDP and other economic aggregates (e.g. consumption expenditure on certain product groups) of various countries into comparable volumes of expenditure, expressed in PPS.

With the introduction of the euro, prices can now, for the first time, be compared directly between countries in the euro area. However, the euro has different purchasing power in different countries within the euro area, depending on the national price level. PPPs must, therefore, also continue to be used to calculate pure volume aggregates in PPS for Member States within the euro area.

In their simplest form, PPPs are a set of price ratios, which show the relationship between the prices in national currency of the same good or service in different countries (e.g. a loaf of bread costs EUR 1.87 in France, EUR 1.68 in Germany, GBP 1.45 in the UK, etc.). A basket of comparable goods and services is used for price surveys. These are selected so as to represent the whole range of goods and services, taking account of different consumption structures in different countries. The simple price ratios at product level are aggregated to PPPs for product groups, then for overall consumption and, finally, for GDP. To have a reference value for the calculation of the PPPs, a country is usually chosen and used as the reference country, and set to 1. For the European Union, the selection of a single country as a base seemed inappropriate. Therefore, the PPS is the artificial common reference currency unit used in the EU to express the volume of economic aggregates for the purpose of spatial comparisons in real terms.

Unfortunately, for reasons of cost, it will not be possible in the foreseeable future to calculate regional currency conversion rates. If such regional PPPs were available, the GDP in PPS for numerous peripheral or rural regions of the EU would probably be higher than that calculated using the national PPPs.

Calculating in PPS instead of euros can lead to differences in the ranking of regions. For example, in 2008, the Swedish region of Östra Mellansverige was recorded as having a per-inhabitant GDP of EUR 30 800, ranking above the Italian region of Marche, with EUR 26 700. However, in PPS, Marche, at PPS 26 500 per inhabitant, is ahead of Östra Mellansverige, at PPS 26 200.

In terms of distribution, the use of PPS rather than the euro has a levelling effect, as regions with a very high per-inhabitant GDP also generally have relatively high price levels. This reduces the range of per-inhabitant GDP in the NUTS 2 regions in the EU from around EUR 85 300 to around PPS 79 300.

Per-inhabitant GDP in PPS is the key variable for determining the eligibility of NUTS 2 regions under the European Union's structural policy.

Dispersion of regional per-inhabitant GDP

Since 2007, Eurostat has calculated a new, derived indicator which records the differences between regional per-inhabitant GDP and the national average, and makes them comparable between countries. This dispersion indicator is calculated at NUTS 2 and at NUTS 3 levels. The figures used by Eurostat are based on GDP in purchasing power standards (PPS).

For a given country, the dispersion 'D' of the regional GDP of the level 2 regions is defined as the sum of the absolute differences between regional and national GDP per inhabitant, weighted on the basis of the regional share of population and expressed in percent of the national GDP per inhabitant:

$$D = 100 \frac{1}{Y} \sum_{i=1}^{n} \mid (y_i - Y) \mid (p_i / P)$$

In the above equation:

- y_i is the regional per-inhabitant GDP of region *i*;
- Y is the national average per-inhabitant GDP;
- p_i is the population of region *i*;
- P is the population of the country;
- *n* is the number of regions of the country.

The value of the dispersion of GDP per inhabitant is zero if the values of regional GDP per inhabitant are identical in all regions of the country or economic area (such as the EU or the euro area), and it will show, all other things being equal, an increase if the differences in per-inhabitant GDP between the regions grow. A value of 30 % therefore means that the GDP of all regions of a given country, weighted on the basis of the regional population, differs from the national value by an average of 30 %.

Context

GDP is an important indicator of economic activity and growth in a region. It is used to make comparisons between Member States of the EU and is crucial in determining a wide range of policies, such as the extent to which a Member State should contribute to the EU budget.

Three-year averages of GDP, for example, are particularly important, because they are used to decide which regions are eligible to receive support from the European Union's Structural Funds.