ECON NOTE

The impact of the recession in 2008-2009 on EU regional convergence

Friday, 14 December 2012   Atanas Kolev

1.   Executive summary

The purpose of this note is to study regional economic convergence in EU regions during the deep recession in 2008 and 2009 making use of the latest available data on regional GDP per capita that cover this period.

- **Regional economic convergence slowed down substantially in 2008-2009 after nearly a decade of rapid convergence.** The solid performance of many regions in NMS in the decade to 2007 came on the back of significant productivity gains thanks to large private capital inflows as well as substantial resources from EU structural funds. With the beginning of the financial crisis in August 2007 private capital flows to NMS dried up, economic activity subsided and cross-border trade collapsed. These developments have had a noticeable negative impact on regional convergence.

- **Convergence did not stop completely at the outset of the crisis, but it was driven by different and transitory forces.** Most notably, by a convolution of a staggered entry and exit from the recession of poorer and richer countries, as well as by substantial currency depreciations in the UK and Sweden.

- **EIB lending to convergence regions rose significantly during the recession in 2008-2009**, helping to leverage more European structural funds. This inflow of capital substituted the withdrawing private capital to some degree and likely provided a buffer against the severe economic shock.

- **EIB lending to convergence regions rose in expanding regions and stayed flat in those that were in recession, despite the sharp fall in aggregate investment in 2009 in most EU countries.** In 2008, the bulk of the lending increase went to regions in countries that were still expanding, like Bulgaria, Romania and Poland. The recession came in Bulgaria and Romania in 2009 and with it EIB lending moved on to convergence regions that began their economic recovery in the second half of 2009. That said, EIB lending levels kept steady in the poorest regions even when they entered into recession in 2009.

- For regional convergence to resume its pre-recession pace, it is of utmost importance for **convergence regions to re-invent the economic model that brought about the higher productivity growth rates before 2007.**

- **In addition to EIB lending and structural funds (SF) from the EU, there is a significant role for technical assistance (TA),** including by the EIB, to strengthen upstream project preparation. This can boost the effectiveness and efficiency of SF in especially poorer regions with limited administrative and project selection/management capacity.

2. There is a clear pattern of regional inequality in the EU

Today's regional inequality in the EU is characterised by the relatively poor regions in the New Member States (NMS) and Southern Europe, on one side, and the rich regions in Central and Northern Europe, on the other. Figure 1 plots a map of regional GDP per capita in purchasing power standards (PPS) relative to the EU average (EU=100) in 2009. [1, 2] Different colours on the map represent different ranges of GDP per capita, varying from light yellow for the group of regions with lowest GDP per capita (27-75 per cent of the EU average) to dark green for the group of regions with the highest GDP per capita (115 – 332 per cent of EU average).

Most regions in NMS fall in the group with GDP per capita of up to 75 per cent of EU average, together with some Greek, Italian and Portuguese regions. The second group (76-90 per cent of the EU average) consists mostly of regions in Southern Europe and East Germany. These two groups are the primary focus of EU regional policy. [3]

Figure 1.   Regional GDP per capita (PPS, EU=100), 2009.
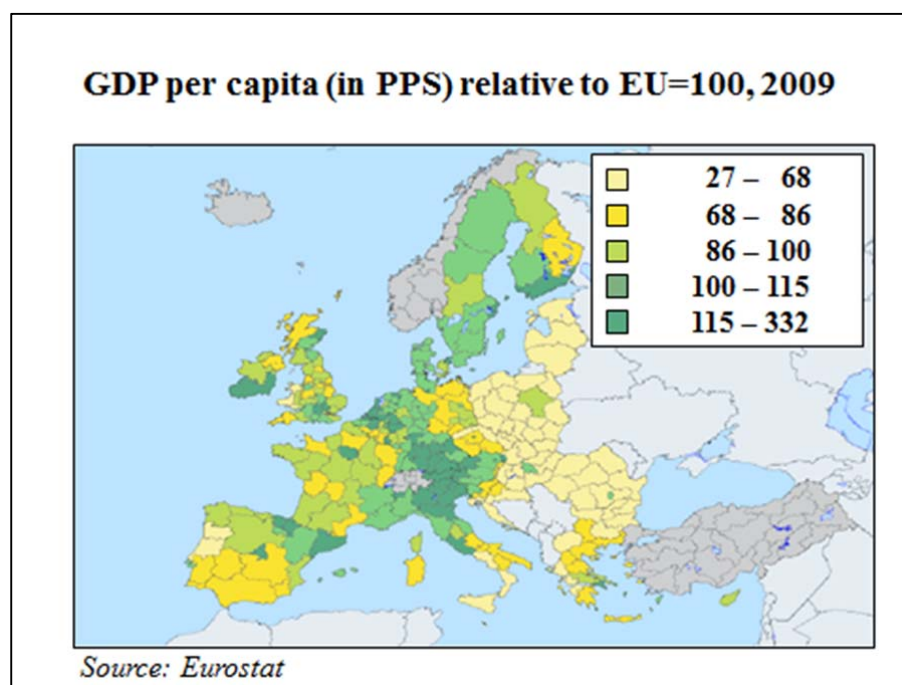
The third group (91-100 per cent) consists mostly of regions in France, Italy, Spain, and the UK. The fourth (110-115 per cent) and fifth (115-332 per cent) group of regions are concentrated in central and Northern Europe.

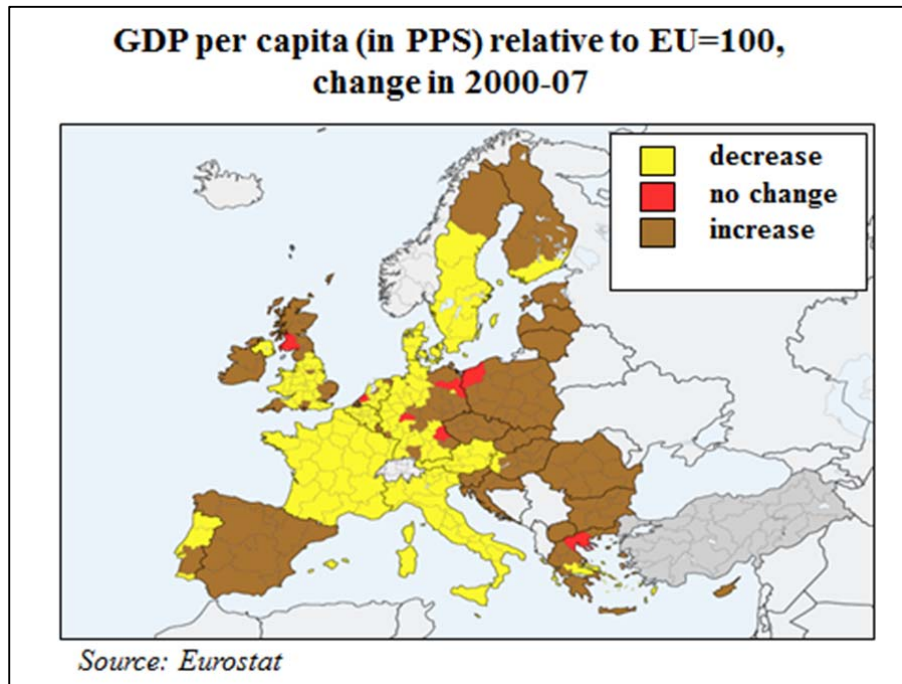**3. EU regional economies came closer between 2000 and 2007**

Present regional inequality notwithstanding, regional convergence advanced substantially between 2000 and 2007. Figure 2 plots the change in regional GDP per capita in this period. GDP per capita increased faster than the EU average in regions shaded in brown, whereas it increased slower than the EU average in regions shaded in yellow. "Red" regions grew at a rate equal to the average EU growth rate.

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[1]   Admittedly GDP per capita is an imperfect measure of welfare. A major drawback is that GDP does not account for a number of factors that influence quality of life and, more generally, welfare due to market imperfections, for instance. There have been numerous attempts to define a better measure of welfare, like the Better Life Index of the OECD, but none of them has proven reliable and with wide cross-section and time-series coverage. For this reason, this note is based on the analysis of GDP per capita.

[2]   Purchasing Power Standards is a unit of account calculated by Eurostat and is meant to correct for differences in prices for a given product in different places. PPS allows a better comparison of income and economic activity in different regions.

[3]   Convergence regions are defined by the European Commission as those having GDP per capita below 75 per cent of the EU average. Regions in EU-15 with GDP per capita below 75 per cent of _EU-15 average_ (the so-called phasing-out group) are also eligible for funding under the convergence objective.

Figure 2.   **Regional GDP per capita (PPS, EU=100), change 2000-2007.**

GDP per capita (in PPS) relative to EU=100, change in 2000-07

decrease
no change
increase

Source: Eurostat

According to this map, the majority of regions that grew faster than the EU average are located in NMS, East Germany, Greece, Spain and Portugal and most of them had GDP per capita below the EU average in 2007. At the same time, GDP per capita in rich regions in central and northern Europe grew at rates below EU average. These two parallel developments moved both very poor and very rich regions closer to the average and therefore enhanced regional cohesion.

4.   Regional convergence slowed down substantially during the recession

The solid performance of many regions in NMS in the period 2000-2007 came on the back of significant productivity gains thanks to large capital inflows and the ensuing integration of local business in the production and trade networks of companies in Western Europe. Substantial resources from EU structural funds also helped by supporting projects that improve infrastructure, administrative capacity, local-business competitiveness and cohesion more generally.

The financial crisis that began in August 2007 and the subsequent severe recession in 2008 and early 2009 had a significant negative impact on capital flows to NMS. Economic activity subsided and cross-border trade collapsed in the end of 2008 and beginning of 2009.

Following these developments, _cross-country_ convergence in the EU came to a stop. Unemployment in poorer regions increased more than that in richer regions, especially for low-skilled labour, and hinted that regional convergence in the EU followed the cross-country pattern.

With this in mind, let us examine the data on regional GDP per capita (in PPS, EU=100) for the period 2007-2009.[4]
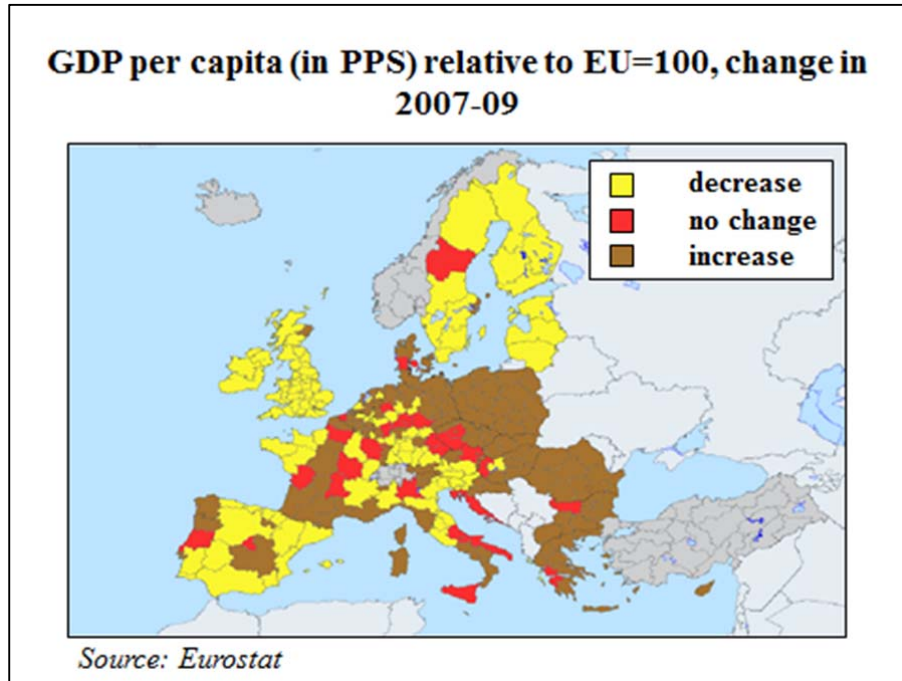
Figure 3 plots the change in regional GDP per capita (PPS) between 2007 and 2009. Regional GDP per capita fell relative to the EU average in regions coloured in yellow, increased in regions coloured in brown and did not change in red-coloured regions.

A brief inspection of the map gives the impression that regional convergence did not lose momentum during the financial crisis and the ensuing recession in 2008 and 2009. Indeed, more regions gained (135) relative to the EU average than those that lost (109). Moreover, regions with GDP per capita (PPS) below the EU average were a majority (82) among those that gained.[5]

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[4]   2009 is the latest data on regional GDP per capita provided by Eurostat.
[5]   In 27 regions, GDP per capita did not change relative to EU average between 2007 and 2009.

Figure 3.   **Regional GDP per capita (PPS, EU=100), change 2007-2009.**

GDP per capita (in PPS) relative to EU=100, change in 2007-09

Legend: yellow = decrease, red = no change, brown = increase

Source: Eurostat

A closer look at the data, however, reveals that convergence was minimal. The annual decrease of the dispersion of GDP per capita across regions, which is a widely-used measure of convergence, was 16 times slower in 2008 and 2009 than the annual average decrease in the period 2000-2007. Other measures of regional inequality also slowed down substantially (see Box 1 for details).

5.   The reduction of regional inequality was of different nature from that of 2000-2007

Based on the comparison with the period 2000-2007, it seems that regional convergence of GDP per capita ground to a halt. More importantly the convergence patterns changed, as well as the underlying reasons for this convergence.

Figure 4 plots the distribution of regional GDP per capita in 2007 and 2009. The far left red bar, for instance, indicates that the number of regions with GDP per capita between 30 and 50 per cent of the EU average was 4 in 2007, whereas the fifth blue bar, from left to right, indicates that the number of regions with GDP per capita between 110 and 130 per cent of the EU average was 70 in 2009.

Two major developments are evident from Figure 4. First, the number of very poor regions, with GDP per capita below 50 per cent of the EU average, fell between 2007 and 2009 and the same happened with the number of very rich regions in the interval between 110 and 130.[6] Second, the number of regions in the interval containing the mean, between 90 and 110, increased from 63 to 69. These developments show that indeed the distribution shrank both from the left and from the right to the centre, meaning more regions moved closer to the mean and therefore enhanced cohesion.

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[6]   The number of regions below 50 per cent of the EU average declined from 28 in 2007 to 22 in 2009, while the number of regions with GDP per capita between 110 and 130 came down from 49 to 40.

Figure 4.   **Distribution of GDP per capita (PPS, EU=100) in 2007 and 2009.**

Source: Eurostat; ECON staff calculations.
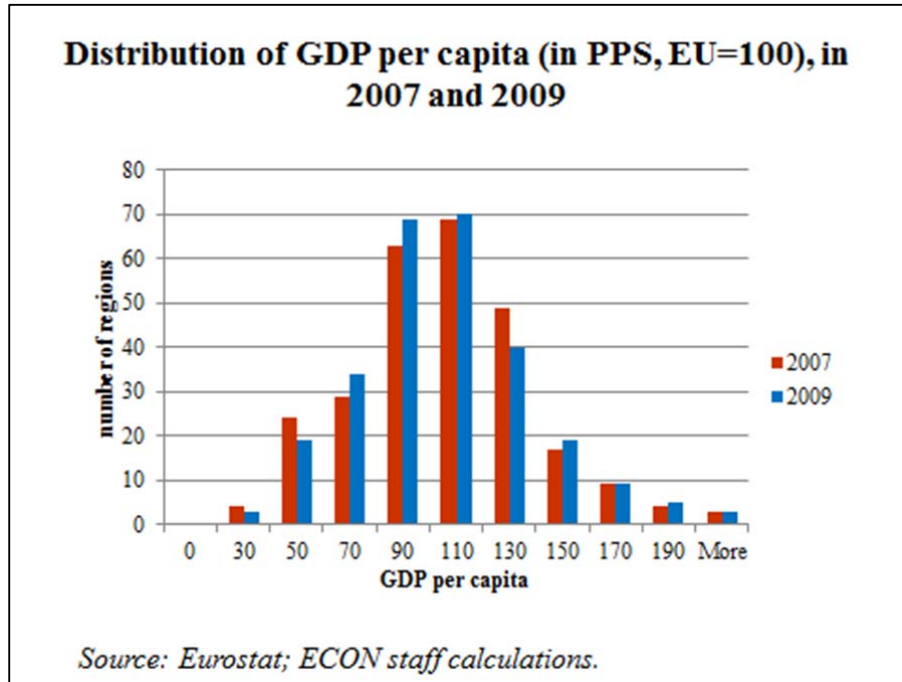
The likely reasons for these changes could be found in relative growth performance of EU economies. Figure 5 plots the two-year growth differential of GDP per capita in EU countries with the average EU growth rate in the period 2007-2009. Red bars plot the annual growth differential in 2008 (relative to 2007), while the blue bars plot the annual growth differential in 2009 (relative to 2008).

Poland, Bulgaria, and Romania all outperformed the EU average by more than 5 percentage points over the two years. These countries are home to 17 of the 22 regions with GDP per capita (PPS) below 50 per cent. Further, a quarter of all regions with GDP per capita between 51 and 75 per cent also reside in these three countries. Hence a major part of the convergence in the bottom of the distribution came from the fact that these countries outperformed the EU average in 2008 and 2009. While Poland kept on with its strong performance, though, Romania and Bulgaria simply entered the recession later than the rest of the EU and continued in recession after the rest of the EU began to recover. Therefore it is not clear how durable this apparent convergence will turn out to be.

Figure 5. Real GDP per capita growth differential with the EU average, 2008-2009.

Growth of real GDP per capita relative to EU, 2008 – 2009

Source: Eurostat ; ECON staff calculations.
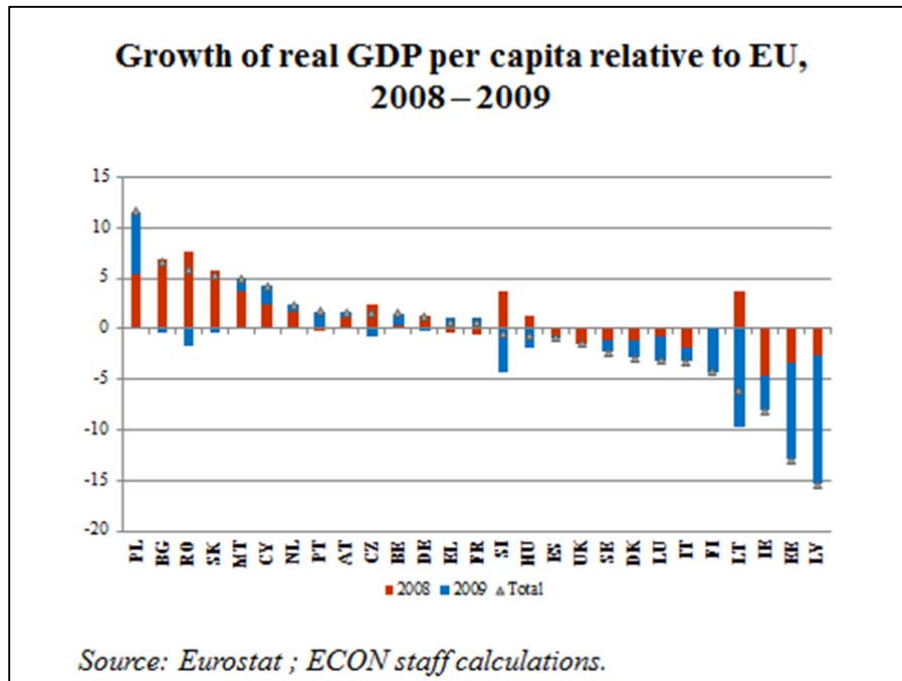
While the recession started later in several relatively poor EU countries, it started earlier in several countries with a lot of very rich regions. Thus, rich regions in Ireland, Italy, Spain, Sweden and the UK moved closer to the mean.

Swedish and British regions slid down particularly deep relative to the EU average. This was due not only to a deeper recession but also to substantial depreciations of the British pound and the Swedish krona. Currency depreciation is important in this comparison, because PPS measures the amount of units of national currency that one would need in that country in order to maintain the purchasing power of one euro in the EU. Thus when local currency depreciates that automatically lowers GDP measured in PPS.

Summing up, the observed regional convergence in the EU during the recession was not due to faster-than-average productivity growth in NMS, but rather to a combination of staggered entry and exit from the recession and significant currency depreciation in some countries outside the euro area.

6. **EIB lending supporting convergence during the recession**

Not all capital flows to NMS stopped during the financial crisis and the ensuing recession. Notably, financing coming from EU structural funds continued to flow and, in some countries, even increased in the period 2008-2010. Despite the difficulties to quantify effects of EU financing, it is very likely that it provided a buffer against the large recessionary shock.

In this period, EIB lending increased substantially, too, thereby further leveraging EU funds available to convergence regions. Figure 6 plots total signatures in the EU during the period 2007-2009, as well as the breakdown between individual loans and intermediated multi-beneficiary loans (or credit lines).

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Figure 6.   **EIB total lending (signatures) in the EU and breakdown into individual loans and credit lines, EUR bn.**

EIB total lending (signatures) in the EU, EUR bn

Source: ECON staff calculations.
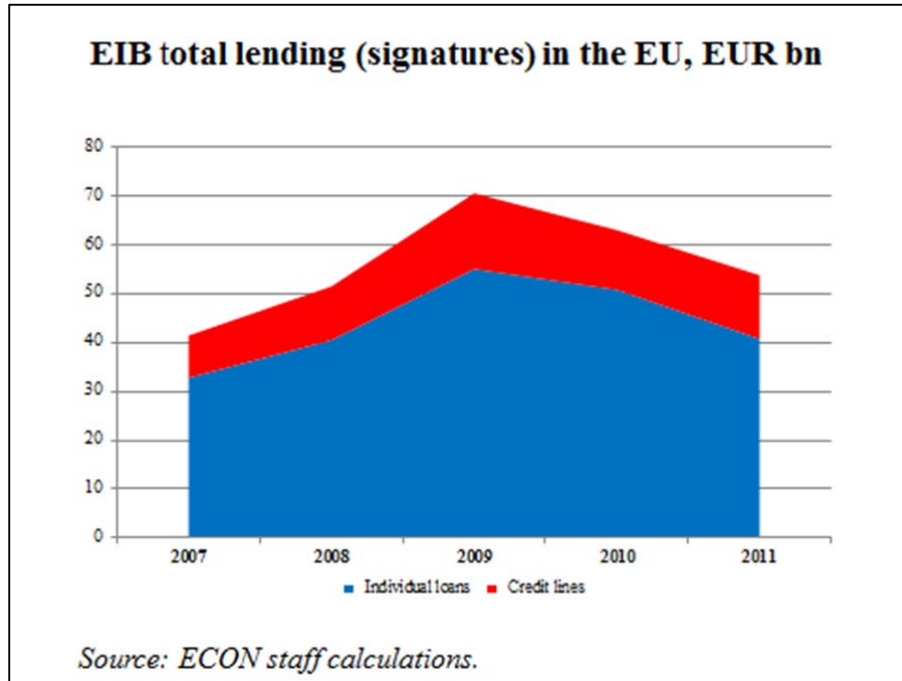
Both signatures of individual loans and credit lines rose in 2008 and especially in 2009, as the EIB ramped up its support for the European economy. By the end of 2009, most EU members began economic recovery and credit conditions began to normalise. Consequently, signatures went on a downward path in 2010 and 2011. In 2012 signatures are likely to fall even further, while those for 2013 are expected to pick up again, following shareholders' expectations related to the capital increase. Lending to convergence regions is expected to increase both in nominal and in relative terms in 2012 and 2013, relative to 2011. [7]

Lending to convergence regions in the EU followed closely the increase in total lending. Table 1 presents information about individual loans to convergence regions and about the breakdown of these loans into different groups of regions based on their GDP per capita. The share of individual loans to convergence regions in total lending in the EU is in the first row of the table. The share of loans to regions with GDP per capita (PPS) in 2007 below 50 per cent of EU average are in the second row of Table 1, the share of those regions with GDP per capita between 50 and 75 per cent is in the third row, and the share of regions with GDP per capita between 76 and 90 per cent of the EU average is in the last row.

In 2007, the last year before the recession, the EIB signed about 13.8 billion euro in individual loans that meet the convergence objective of the Bank, i.e. about 33 per cent of total lending in the EU. Of these, about 2.6 billion (6 per cent of total lending) went to regions that had GDP per capita (PPS) in 2007 of below 50 per cent; about 5.1 billion (12 per cent of total lending) in regions with GDP per capita between 50 and 75 per cent; about 6.1 billion (15 per cent) in regions with GDP per capita between 75 and 90 per cent of GDP.

In 2008, lending to all three groups increased in absolute terms. Lending to the two lower-income groups increased also relative to total lending in the EU: from 6 to 7 per cent for the group of lowest-income regions and from 12 to 13 per cent for the group of regions with GDP per capita

between 50 and 75 per cent of the EU average (see rows 2 and 3 of Table 1). Lending to the group of regions with GPD per capita between 76 and 90 per cent rose in absolute terms by 20 per cent but that was still lower than the increase of total lending (by 24 per cent) and therefore its share in total lending fell from 15 to 14 per cent (see the last row in Table 1). In absolute terms, lending kept steady in 2009 in the group of poorest regions whereas it increased substantially in the second group and moderately in the third. This, together with the 33 per cent increase in total lending in the EU, resulted in declining shares in total lending for groups 1 and 3 and an increasing share for group 2.

Table 1. **Individual loans (IL) (signatures) to convergence regions and breakdown by income group, in per cent of total signatures.**

|	2007	2008	2009	2010	2011
Convergence Individual Loans	33	34	34	35	28
< 50% EU GDP per capita	6	7	5	5	6
50% – 75% EU GDP per capita	12	13	16	15	10
76% – 90% EU GDP per capita	15	14	13	15	13

Source: ECON calculations based on EIB Annual Reports

Total lending started to decline in 2010, as evident from Figure 6, and so did lending to convergence regions. In 2011 however, convergence lending declined much more than total lending and hence its share dropped from 35 to 28 per cent (see Table 1).

During the recession in 2008 and 2009, investment fell sharply in most EU countries. Levels of EIB lending to convergence regions however, kept steady or increased, as can be inferred from the lending pattern discussed above. More precisely, lending to convergence regions increased first to those that were not yet in recession in 2008 and once they entered into recession in 2009 it kept the level attained in the previous year. The bulk of the lending increase of 2009 went to those regions where recovery began in the second half of that year. For instance, none of the four countries that are home to the regions with GDP per capita below 50 per cent was in recession in 2008, whereas only Poland avoided the deep economic slump in 2009. Meanwhile, most of the countries that contain regions in the second and third group were in deep recession in 2008 and early 2009, but began to recover by May 2009 (cf. last three rows of Table 1).

The volumes of disbursed multi-beneficiary intermediated loans (or credit lines) were substantially smaller than those of individual loans and their annual growth across regions differed somewhat from that of individual loans (see Figure 7). Credit lines nearly doubled in 2008, relative to 2007 and continued to rise in all three regions in 2009, including in the group of poorest regions, where they rose by more than 120 per cent. In 2010, credit lines kept their levels in the two groups with lower GDP per capita and declined in the group of regions with GDP per capita between 76 and 90 per cent of the EU average. 2011 saw recovery of credit lines to the latter and substantial further increase in group 2, while credit lines to the group of regions with lowest GDP per capita declined.

Figure 7. Disbursed multi-beneficiary intermediated loans allocated to a particular NUTS 2 region, millions of euro.

Source: ECON staff calculations.
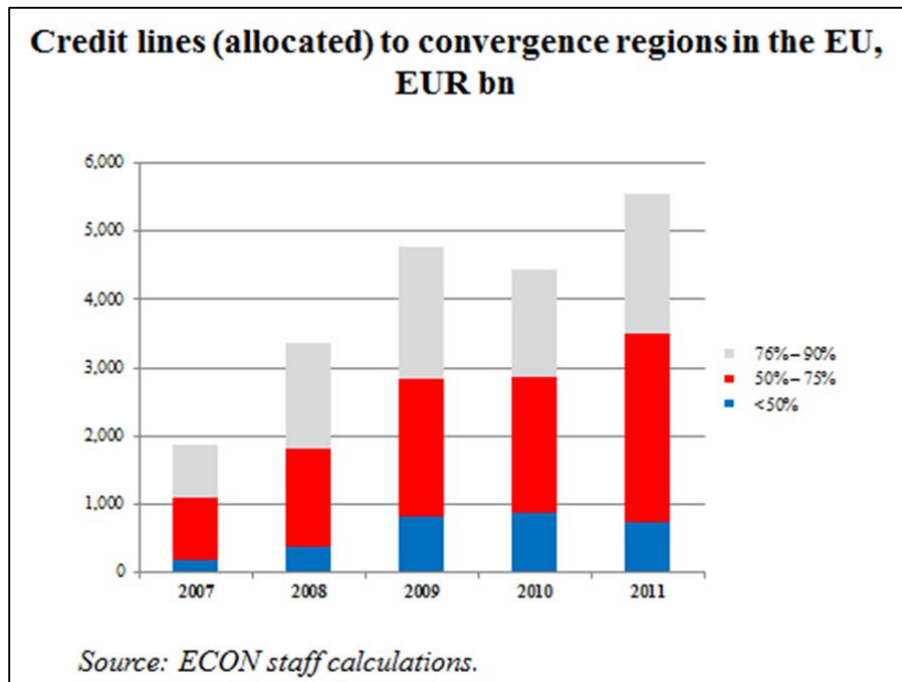
7. It is still early to quantify the full impact of the recession in 2008-2009 on EU regional convergence

Regional convergence did not fully stop during the recession and until the end of 2009, when most of the EU countries entered a recovery phase. Nevertheless, it was not driven by a strong productivity growth differential between NMS and EU-15 as it was in the period 2000-2007, but rather by one-off factors. Taking this into account, together with the weak recovery and the subsequent recession in 2011-2012, one may conclude that we still have not seen the full impact of the recession on convergence – it may very well make a pause or even be partially reversed. Whether this will be the case or not depends on whether the strong productivity growth of NMS economies underlying the earlier convergence pattern will return.

As of today, available data provide mixed signals about the current state of regional convergence. Regional labour markets continue to diverge. Both employment and unemployment rates across European regions have become more disperse in 2011 relative to 2007 and 2009. Persistent unemployment and low employment rates are associated with losses of productivity both by individuals who are not working and for regional economies with such labour-market problems.

Country-level data, on the other hand, produce more positive signals. Figure 8 plots GDP per capita relative to EU average. A green bar indicates that GDP per capita of the corresponding country has increased relative to EU average between 2007 and 2011, while a red bar indicates that the GDP per capita of the corresponding country has declined relative to the EU average. In 2011, seven of the eight countries with the lowest GDP per capita (PPS) in the EU have moved closer to EU average relative to 2007.

This positive development was mostly due to the fact that the EU average was essentially the same in 2007 and 2011, whereas GDP per capita marginally improved in the poorest countries in the EU over the four-year period. Such a development still does not mean that a robust productivity-growth differential has emerged after the crisis. Nor does it mean that improvement in the national average will benefit the regions of these countries proportionally.

Figure 8.   GDP per capita in PPS relative to EU average (per cent) and change over the period between 2007 and 2011 (colours).
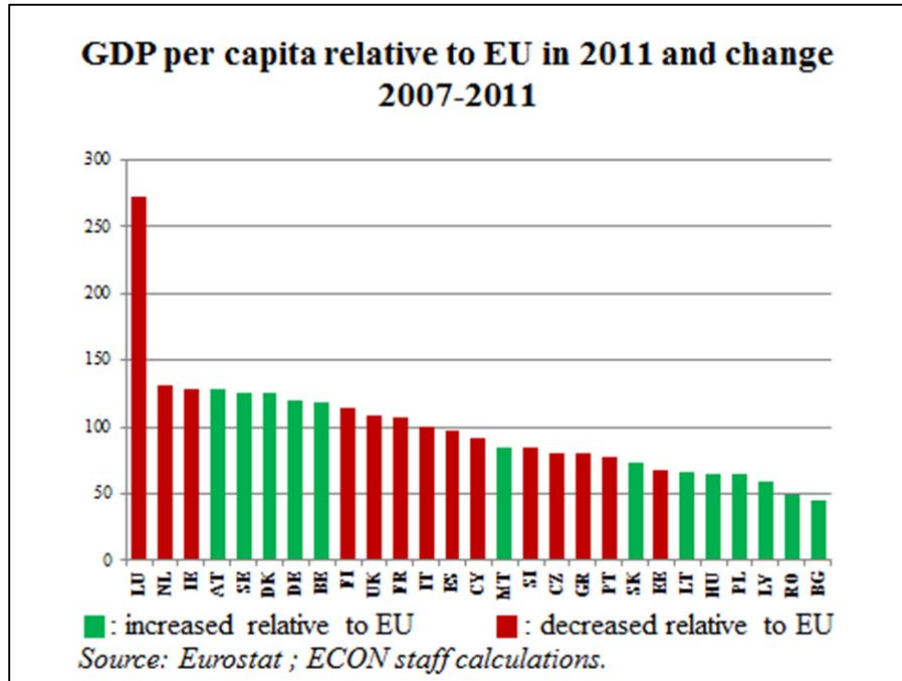
As noted earlier, the strong convergence in the period 2000-2007 benefitted from large inflows of productive investment and integration of businesses in convergence regions into the production network of Western Europe. Nevertheless, there are some caveats that should be taken into account.

First, an increase of available financing is not equally effective in all economic environments due to different institutional quality and absorptive and administrative capacity. Second, the analysis in this note is focused on convergence only, and it cannot be used to draw conclusions about the desirability of additional convergence lending as compared to other types of lending; that assessment would need to be made in a broader context. Finally, as in all types of EIB lending, the quality of the projects to be financed is key.

Stepping up technical assistance (TA), including by the EIB, to strengthen upstream project preparation may alleviate problems, like lower administrative capacity and lower project quality. TA can boost the effectiveness and efficiency of SF in especially poorer regions with limited administrative and project selection/management capacity.

Box 1.   A closer look at regional GDP per capita in the EU in the period 2007-2009.

Table 2 presents key descriptive statistics about the distribution of GDP per capita in EU regions. The first row contains information about the standard deviation of GDP per capita in EU regions. It has declined slightly, 0.3 per cent, between 2007 and 2009, which implies an average annual decrease of 0.15 per cent. For comparison, the average annual decrease of the standard deviation of regional GDP per capita between 2000 and 2007 was about 2.4 per cent.

**Table 2. Descriptive statistics of the distribution of GDP
per capita (PPS, EU=100) in 2007 and 2009.**

	2007	2009
Standard deviation	36.56	36.45
90^{-th}/10^{-th} percentile	13.19	13.15
75^{-th}/25^{-th} percentile	3.70	3.65

Source: Eurostat; ECON staff calculations

Standard deviation is a useful summary statistic, but it has its drawbacks. In particular, it gives little information about the shape of the distribution. For this reason, the last two rows contain information about the ratios of 90^{-th} to 10^{-th} and 75^{-th} to 25^{-th} percentiles.

A percentile is the threshold below which lies a certain proportion of a given population. For instance, in this context, the 90^{-th} percentile is the amount of GDP per inhabitant below which are situated 90 per cent of the EU regions. Similarly the 10th percentile is the threshold below which lie the regions with the lowest 10 per cent of GDP per capita. Taking the ratios of the 90^{-th} to the   10^{-th} and the 75^{-th} to the 25^{-th} percentiles gives additional insights into the distribution of GDP per capita across EU regions.

In other words, these ratios give information about inter-regional inequalities after subtracting the regions at the very top and bottom of the ranking. This is useful, because often there are observations at the two extremes of the distribution that are very different from the rest and influence the broad and encompassing measures, such as the mean and standard deviation. For example, the 90^{-th}/10^{-th} percentile ratio for the EU in 2007 of 13.19 means that the (threshold) level GDP per capita above which were the 10 richest regions was more than 13 times higher than the (threshold) level of GDP per capita below which lay the 10 poorest regions.

The annual average rates of decline for the 90^{-th}/10^{-th} and 75^{-th}/25^{-th} between 2007 and 2009 were 0.15 and 0.7 per cent, respectively. For comparison, the annual average rates of decline for these ratios during the period 2000-2007 were about 0.9 and 1.8 per cent.