

## Chapter 4

# Restoring Convergence between Member States in the EU and EMU <sup>(1)</sup>

### 1. INTRODUCTION

Over the past two decades, significant convergence has occurred between European Member States in terms of employment and social outcomes. However, since the onset of the crisis, much of this progress has been reversed, posing serious new policy challenges for the countries concerned and the EU as a whole<sup>(2)</sup>.

These recent developments suggest a need to refocus many current employment and social policy instruments at national and EU levels, and have intensified the pressures for further structural reform within the EMU. In November 2012, the Commission published the *Blueprint for a Deep and Genuine Economic and Monetary Union*<sup>(3)</sup>, with a view to complementing the already ambitious reforms underway with the creation of a banking union, deepening the fiscal and economic union and strengthening its social dimension. The Blueprint underlined that the creation of an EMU-wide fiscal capacity should be considered as a longer-term step to improve the stabilisation of EMU economies, in particular in the case of asymmetric (temporary) shocks, as well as the need to proceed in parallel with a process

of political integration. The means to set up such a fiscal capacity is the subject of quite some discussions<sup>(4)</sup>, as intended by the Blueprint's subtitle 'Launching a European debate'.

This chapter reviews literature on the identification of relevant key channels and the developing theory that the current EMU-architecture can, in the face of (asymmetric) shocks, drive short-run divergence in socioeconomic performance and, in the long-run, increase the persistence of such adverse developments. In particular there is a growing awareness among policy makers that cross-border effects will increasingly affect domestic stabilisation and upward convergence, as European economies become more integrated, which calls for a markedly stronger coordination of structural reforms (see, for instance, Draghi 2014).

Stylised facts are first presented on socioeconomic convergence in Europe since the mid-1990s, including a comparison with the United States, with a focus not only on employment and productivity trends, but also on unemployment, household incomes, poverty and inequalities. Trends in nominal unit labour costs, human capital formation and indebtedness in the run-up to the crisis are also

reviewed, as they are seen as potential drivers of the divergent socioeconomic performance observed since the onset of the crisis.

Two major concerns are then addressed: firstly, the extent to which cross-border effects arising from labour markets are likely to intensify in the future and how they are likely to impact upward convergence across the EU and, secondly, the potential for a fiscal capacity to not only stabilise economies hit by temporary asymmetric shocks, but also mitigate such cross-border effects. The analysis concludes by looking at the extent to which national and EU labour market and social policies can strengthen upward socioeconomic convergence and labour market resilience, in terms of:

- the routes available at national level to strengthen the contribution of employment and social policies, with a view to better stabilising the economy and reinforcing long-term growth;
- the European level routes that could contribute, such as strengthened labour mobility, targeted or reinforced cohesion funds, common benchmarks, and, in the longer term, the development of an EMU-level fiscal capacity.

<sup>(1)</sup> By Olivier Bontout. With contributions from Guy Lejeune and Eric Meyermans.

<sup>(2)</sup> See European Commission (2012a, 2013a, 2014a).

<sup>(3)</sup> See European Commission (2012b)

<sup>(4)</sup> See for example Allard et al. (2013), Pisani et al. (2013) as well as CEPS (2014) and Dolls et al. (2014) both prepared for the European Parliament and Clayes et al. (2014).

## 2. PRODUCTIVITY AND EMPLOYMENT GROWTH: THE KEY TO LONG-TERM CONVERGENCE IN THE EU

How has convergence between EU Member States in key employment and social dimensions evolved over recent decades, and how does this compare with developments in the United States?

This section initially reviews trends in convergence of key socioeconomic variables, followed by a comparison with developments in the United States. Next, it reviews adverse developments in three key socioeconomic dimensions that can impact significantly on employment and productivity growth: i.e. trends in nominal unit labour costs (ULCs); human capital formation; private and public debt.

### 2.1. Convergence trends in the EU since the mid-1990s

How did the dispersion of labour market and social performance evolve over recent decades in Europe?

This section reviews trends in the dispersion of key employment and social variables, placing emphasis on overall economic development as reflected by: GDP per head or per capita; employment and unemployment (and activity) rates; gross household disposable income per capita; poverty and inequalities.

#### 2.1.1. Key dimensions of convergence

##### *Identifying key dimensions ...*

Five employment and social dimensions were selected for the analysis, reflecting

the scoreboard for key employment and social indicators (see Joint Employment Report 2014). Emphasis is put on overall economic developments (as reflected by GDP per head), employment and unemployment rates, gross household disposable income (GHDl) per capita, poverty rates, and inequalities (S80/S20):

- GDP per head (GDPpc) provides a broad indication of economic development and relates to the various factors that contribute to economic growth or growth models, notably productivity and employment trends (see Box 1).
- Employment and unemployment developments, which are key contributors to economic growth (and indicate remaining unused potential) and a central dimension of the EU2020 strategy.
- Household income per capita (gross household disposable income GHDlpc), is a more direct indicator of the development of the populations' living standards than GDPpc trends.
- The rate of being at-risk-of-poverty-and-exclusion (AROPE), complemented by monetary poverty rates (at the 60% of the median threshold).
- Inequality (measured by the S80/S20 ratio), which indicates the extent to which overall economic and social developments are inclusive and is another key dimension of the EU2020 strategy.

##### *... and measuring convergence*

The analysis covers 28 EU Member States and focuses, as far as possible, on the

1995–2013 period. Convergence can be analysed in two basic ways: in terms of levels (Beta-convergence) and in terms of variability (Sigma-convergence) as described in Box 1. In this chapter convergence is mainly measured in terms of variability, in order to provide an assessment of the trends relating to key variables, while convergence in terms of levels is more relevant to assessing the catching up process (for a review of Beta convergence, see, for instance, trends within EA-12 in ESDE 2013).

Trends in GDPpc and GHDlpc are measured in constant prices since the focus is on convergence of real economic and living conditions<sup>(5)</sup>. The literature on growth initiated by Solow (1956) developed the concept of 'catching up' that is close to beta convergence. It should be noted that this type of 'absolute' convergence is not always easy to verify and a number of additional elements are taken into account, notably the possible endogeneity of total factor productivity (TFP) growth. Other analyses of convergence have been developed such as 'conditional growth' (Mankiw et al., 1992) and more generally the literature identifies a number of dimensions of convergence<sup>(6)</sup>.

Since convergence can result from changes in the dispersion within zones as well as between zones, this chapter considers both overall convergence or divergence development in Europe<sup>(7)</sup> (as reflected by the coefficient of variation), as well as the contribution of trends within and between European zones to these overall developments (see Section 1.2.1 below). For this, a standard between-within decomposition of total variance is used, along with the decomposition of the Theil index (see Box 1 and Annex).

<sup>(5)</sup> Furthermore, while entry into the euro is conditional on fulfilling the Maastricht criteria, the euro is intended to support real convergence, defined in terms of per capita GDP, by fostering economic integration (see European Commission, 2008).

<sup>(6)</sup> See, for instance, Islam (2003).

<sup>(7)</sup> As far as possible in the EU-28 (with the only exception being Section 1.2.1 which focuses on developments in nominal unit labour costs in the euro area).

**Box 1: Economic convergence, growth models and measures of convergence***Economic convergence and growth models*

Economic growth is conventionally attributed to the accumulation of human and physical capital and increased productivity following technological innovation. The most basic growth model, the Solow model (also called the neoclassical growth model) considers that technological innovations are exogenous and assumes that capital and labour have diminishing returns. Notably it implies that, in general, poor countries with less capital per person grow faster (because of diminishing returns to capital), leading to convergence in GDP per head over time.

In the Solow model, GDP depends on production factors (capital and labour) augmented by technology. Total factor productivity (TFP) is, by definition, that part of the increase in output that cannot be explained by changes in the other input factors. This residual is seen as a (proxy) measure of skills, knowledge and technical progress. In empirical analysis, capital and TFP are not easy to separate. This is due to the fact that technical progress is often embodied in new capital goods. One would underestimate the effect of TFP by assuming that growth is the result of capital accumulation. Differences in TFP are seen to be important in explaining differences in income and growth between countries, particularly in the long run when countries can overcome the steady state and grow by inventing new technology.

*Decomposition of growth*

Trends in GDPpc and GHDpc are measured in constant prices, since the focus is on real economic and living conditions convergence<sup>(1)</sup>. Furthermore, the use of GDP in real euros (deflated by the GDP deflator) is preferred to the PPS which are available in nominal values and are thus more appropriate for cross-section comparisons (since No specific price deflator of PPS values is available).

GDP and growth can be decomposed into several contributions. This section uses a standard simple decomposition of GDPpc trends in productivity (apparent employment productivity GDP/L), employment rate of the 15–64 population (share of employment in the active age population) and active age population rate (share of active age population in total population), as reflected below.

$$\text{GDPpc} = \text{GDP} / \text{Population} = (\text{GDP} / \text{L}) * (\text{L} / \text{POP active age}) * (\text{POP active age} / \text{Population})$$

$$\text{GDPpc} = (\text{Apparent productivity}) * (\text{Employment rate}) * (\text{Share of active age population})$$

*Measures of convergence*

Sigma-convergence refers to a reduction of disparities over time between countries, for instance, measured in terms of the standard deviation or coefficient of variation (the ratio of the standard deviation to the average). Beta-convergence refers to a situation where incomes in poorer countries grow faster than those in richer ones, usually measured in terms of change over time. The two concepts of convergence are closely related with Beta-convergence being necessary but not sufficient to achieve Sigma-convergence (see, for instance, Monfort, 2008).

Other indices exist (for instance, the Gini coefficient, the Atkinson index, the Theil index and the Mean Logarithmic Deviation). It is recommended that we 'consider a variety of measures to draw firm conclusions about changes in the extent of disparities' (see, for instance, Montfort, 2008), and the analysis in this chapter focuses on the coefficient of variation as a main measure of sigma-convergence, complemented as regards within zones and between zones dispersion by a standard between-within decomposition of total variance and a decomposition of the Theil index (see Annex 3). An emphasis in the main text is put on the decomposition of total variance which is closer to the measure of the coefficient of variation and, more specifically, on the share of total variance corresponding to the between zones component (as the level of variance per se can be misleading, since it is affected by homothetic changes which do not affect dispersion, the Annex provides additional elements on the level of the between zones contribution to total variance expressed as an index, based on the first year when data are available).

<sup>(1)</sup> Furthermore, while entry into the euro is conditional on fulfilling the Maastricht criteria, the euro is intended to support real convergence, defined in terms of per capita GDP, by fostering economic integration (see European Commission, 2008).

**2.1.2. Convergence in Europe, trends between and within zones**

In order to provide an overview of employment and social convergence trends in Europe (EU-28) overall, it is useful to reflect not only on overall developments, but also on changes in dispersion both within and between zones. For this purpose, five groups of countries are considered, reflecting socioeconomic and geographical proximity criteria:

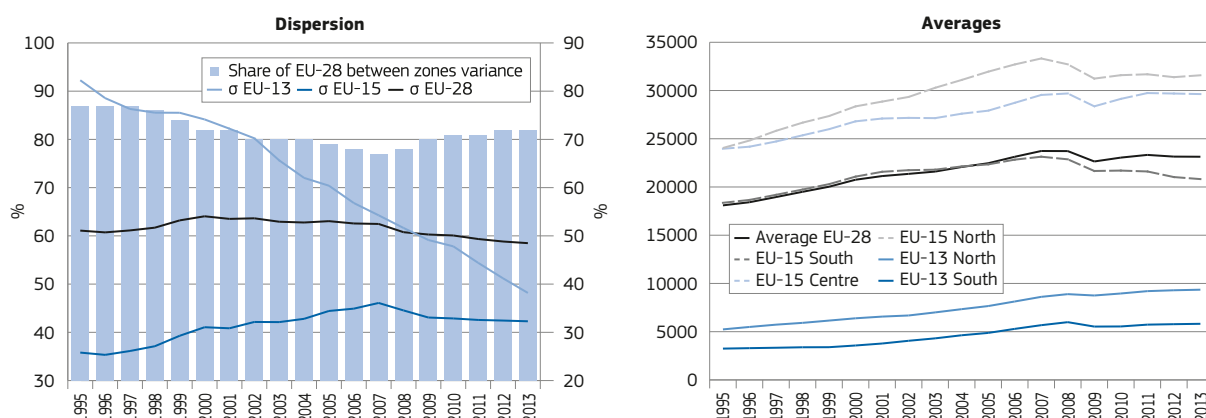
- EU-15 Centre (Belgium, Luxembourg, the Netherlands, Germany, Finland, France, Austria)<sup>(8)</sup>, which represented 36% of EU-28 population in 2013.
- EU-15 North (Denmark, Sweden, United Kingdom)<sup>(9)</sup>, which represented 17% of EU-28 population in 2013.
- EU-15 South and periphery (Greece, Ireland, Portugal, Spain, Italy)<sup>(10)</sup> which represented 26% of EU-28 population in 2013.
- EU-13 Centre and North (Czech Republic, Hungary, Poland, Slovenia and Slovakia), which represented 13% of EU-28 population in 2013.
- EU-13 South and periphery (Bulgaria, Cyprus, Estonia, Latvia, Lithuania, Malta, Croatia, Romania) which represented 8% of EU-28 population in 2013.

<sup>(8)</sup> Or in other terms EA-12 Northern countries, see European Commission (2014a).

<sup>(9)</sup> Which are actually EU non-EA countries.

<sup>(10)</sup> Which are actually EA-12 South and periphery countries, see European Commission (2014a).

Chart 1: Convergence and divergence of GDP per capita in the EU (1995–2013)

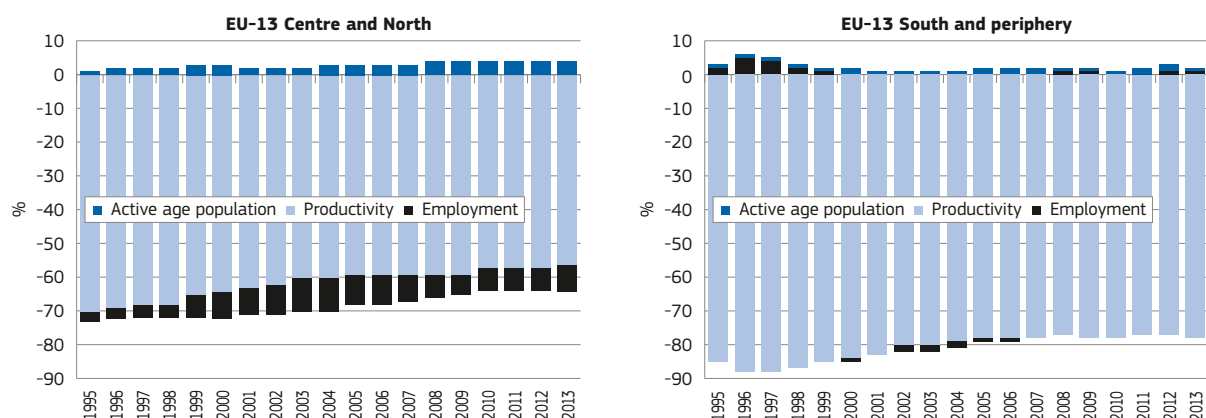


Reading note:  $\sigma$  values refer to the coefficient of variation (based on weighted averages) and are reported on the left scale. The share of between zones variance in total variance is reported on the right axis.

Source: Eurostat, calculations DG EMPL.

Notes: GDP in real terms (in euros); the share of inter groups variance is based on unweighted averages by zone (see annex). Some missing values in the beginning of the period were kept constant for the calculation of dispersion and averages: BG, EE, HR, CY, MT (1995–99), LV (1995–98), EL, LT, SK (1995–97), PL, RO (1995–96), HU, SI (1995).

Chart 2: Decomposition of the GDP per capita gap to EU-28 average for two EU-13 zones (1995–2013)



Source: Eurostat, calculations DG EMPL.

Notes: Calculations based on GDP in real terms, in euros. Some missing values in the beginning of the period were kept constant for the calculation of averages: BG, EE, HR, CY, MT (1995–99), LV (1995–98), LT, SK (1995–97), PL, RO (1995–96), HU, SI (1995).

### Slow GDPpc convergence reflecting adverse developments in EU-15 South and periphery

The dispersion of GDP per head since 1995 in Europe has been fairly stable, with some strong convergence within EU-13 (reflecting the catching-up process) and some slightly divergent trends in EU-15. This overall stability in EU-28 reflected a pre-crisis decline in between-zones dispersion, which came to a halt when the 2008 crisis hit and reversed in relative terms (see Chart 1a).

More specifically, in EU-13 (both Centre and North, as well as South and periphery zones) a catching up since 1995 is observed (Chart 1b). In EU-15, developments of GDPpc have been more heterogeneous, with EU-15 South losing ground

mainly since around 2005 (and to a lesser extent since the early 2000s). EU-15 Centre GDPpc levels remained broadly stable in comparison to EU-28 (and actually gained some ground in recent years) and EU-15 North GDPpc remained broadly stable (also reflecting potential changes in exchange rate against the Euro).

While the gradual catching up process of EU-13 appears consistent with that of previous decades<sup>(11)</sup>, developments since the mid-2000s, particularly in EU-15 Southern and periphery zone, appear atypical.

The GDP per head developments can be split into three different effects (see Box 1), focusing on trends in: productivity

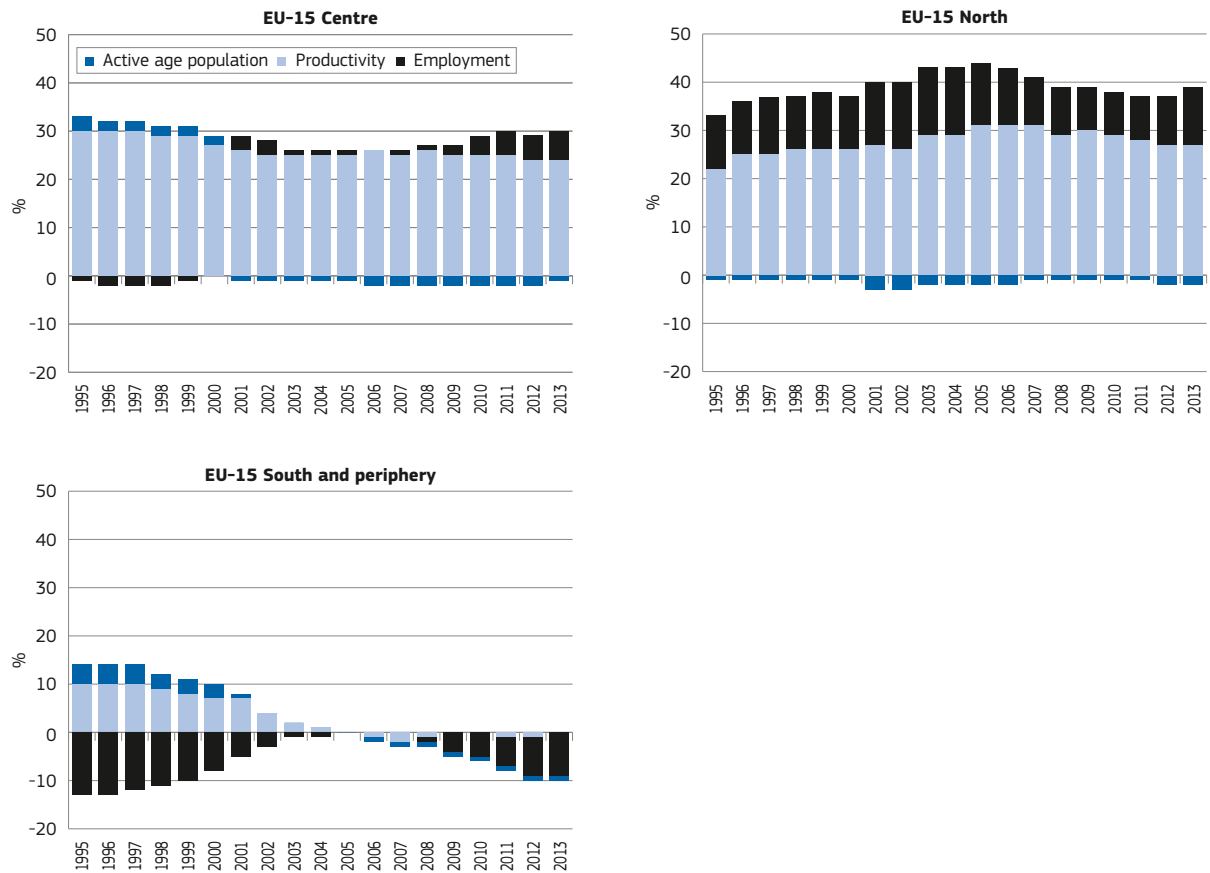
(apparent employment productivity GDP); employment (share in employment of the active age population); and active age population (share of the active age population from the overall population).

### Gradual catching up of GDPpc by the newer Member States, reflecting quicker productivity gains

Since 1995, the gap in GDP per head between EU-13 and EU-28 narrowed, mainly reflecting productivity gains. Over the period, this progressive catching up process actually impacted more on the decline in the gap to the EU-28 average GDPpc than employment rates and active population rates. However, the contribution from the share of the active age population remained positive over the period, and

<sup>(11)</sup> See, for instance, Barro and Sala-i-Martin (1991) or Sala-i-Martin (1996).

Chart 3: Decomposition of the GDP per capita gap to EU-28 average for three EU-15 zones (1995–2013)



Source: Eurostat, calculations DG EMPL.

Notes: Calculations based on GDP in real terms, in euros. Some missing values in the beginning of the period were kept constant for the calculation of averages: EL (1995-97).

even increased in EU-13 Centre and North. This partly compensated for the relatively weaker dynamics of employment rates until the mid-2000s, which have only partially reversed since then<sup>(12)</sup>.

### **Overall stability of GDPpc in the core older Member States compared to the EU average, though with different employment dynamics**

The relative stability in the gap in GDP per head between the EU-15 Centre and the EU North zones nevertheless masks different composition trends over the period. In both zones the relative advantage in terms of productivity levels remained broadly constant since the mid-1990s, though with some fluctuations and, notably, slight erosion in EU-15 Centre.

In EU-15 North, the relative advantage in terms of the contribution of employment rate levels was stable over the period, translating into an advantage of around

10 percentage points of average EU-28 GDP per head. In EU-15 Centre, employment rates used to be close to the EU-28 average but there has been a significant relative improvement over the period, notably since the beginning of the crisis.

Finally, while the contribution of the share of the working age population remained relatively small, it is noticeable that it was negative in these two zones and that the relative deterioration appears to have fallen since the beginning of the crisis in EU-15 Centre and has further developed in EU-15 North, probably reflecting trends in net migration.

### **A growing gap in GDPpc in the peripheral older Member States, compared to the EU average, linked to weakening productivity and employment**

Developments in GDP per head in EU-15 South and periphery were more significant over the period. EU-15 South experienced losses in productivity over the 1995–2004 period (see, for instance, Balta and Mohl, 2014), which were initially compensated

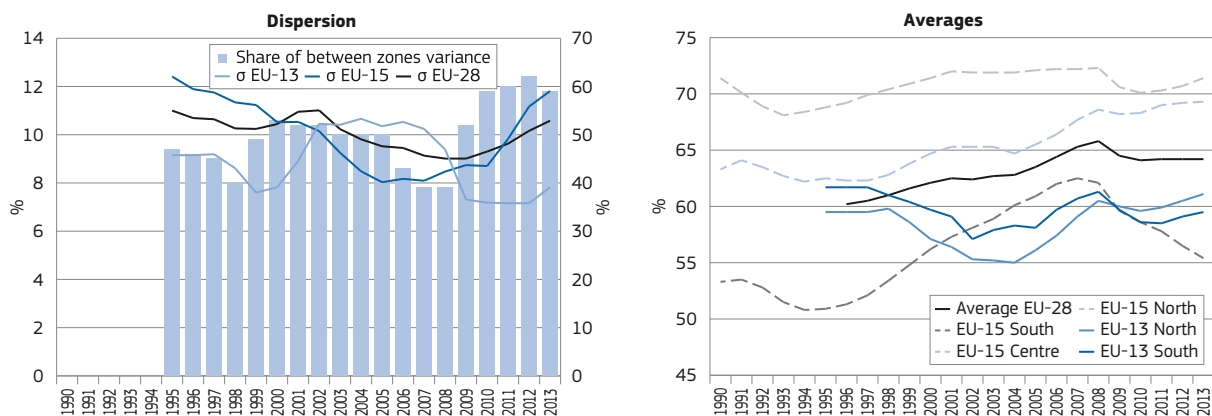
by an above average improvement in employment rates (see also European Commission, 2008). Since the crisis, however, developments in employment rates have been less favourable than in the EU overall and have also been combined with a slight reduction in the working age population. These adverse employment developments reflect a change in the composition of employment across sectors during the boom phase, which reversed with the crisis, notably in the construction sector (see ESDE 2013).

### **A move from convergence to divergence in employment and unemployment in the crisis, mostly driven by between-zones movements**

The decade from the mid-1990s until the onset of the crisis was marked by some EU-wide convergence in terms of both employment and unemployment rates (see Charts 4 and 5). This converging trend was particularly strong within EU-15. Since 2008, however, these converging trends reversed, mainly due to adverse developments within EU-15.

<sup>(12)</sup> See, for instance, European Commission (2009).

Chart 4: Convergence and divergence of Employment rates in the EU (1995–2013)

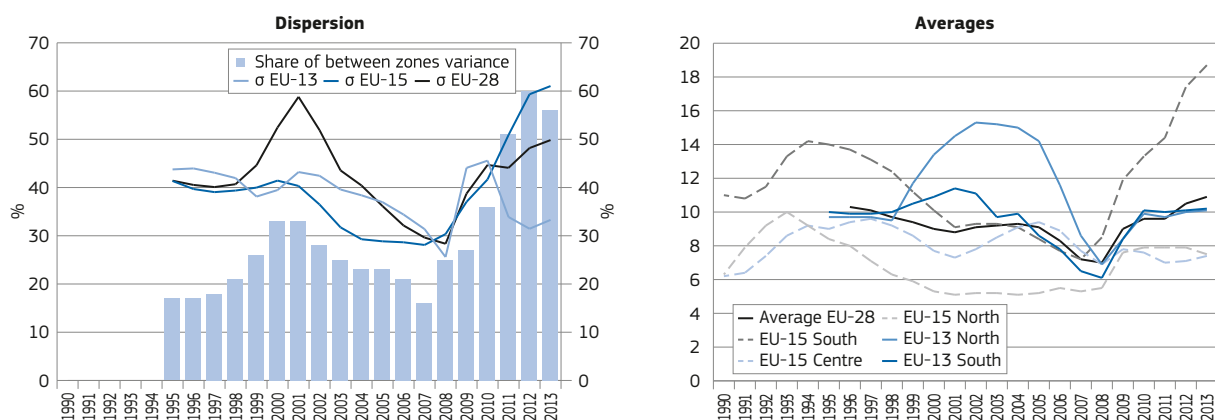


*Reading note:*  $\sigma$  values refer to the coefficient of variation (based on weighted averages) and are reported on the left scale. The share of between zones variance in total is reported on the right axis.

*Source:* Eurostat, employment rate 15–64 age bracket, calculations DG EMPL.

*Notes:*  $\sigma$  refers to the coefficient of variation (based on weighted averages); the share of inter groups variance is based on un-weighted averages by zone (see annex). Some missing values in the beginning of the period were kept constant for the calculation of dispersion and averages: s HR (1995-01), BG, MT (1995-99), CY (1995-98), LT, LV, SK (1995-97), CZ, EE, PL, RO (1995-96), HU, SI (1995), AT, FI, SE (1990-94).

Chart 5: Convergence and divergence of Unemployment rates in the EU (1995–2013)



*Reading note:*  $\sigma$  values refer to the coefficient of variation (based on weighted averages) and are reported on the left scale. The share of between zones variance in total is reported on the right axis.

*Source:* Eurostat, calculations DG EMPL.

*Notes:*  $\sigma$  refers to the coefficient of variation (based on weighted averages); the share of inter groups variance is based on unweighted averages by zone (see annex). Some missing values in the beginning of the period were kept constant for the calculation of dispersion and averages: BG, CY, EE, HR, MT (1995-99), LV (1995-98), LT (1995-97), PL, RO (1995-96), HU, SI (1995), AT (1990-93), DE (1990), EL (1990-97).

Trends in unemployment rate dispersion very closely reflect those of employment rates, with strong convergence before the crisis and strong divergence since, with, notably increased dispersion between zones. It should be noted, however, that both these adverse developments seem to have stabilised to some extent in 2013, and that the sharp changes observed in unemployment rates resulted in a relatively small fall in activity rates.

It is worth noting that the long-term convergence of activity rates continued during the crisis and that activity rates resisted well, even in the most affected regions (Chart 6), implying that there

were No significant withdrawals from the active population during this crisis (see also Chapter 1).

### ***A slight reversal of converging trends in household incomes in the crisis***

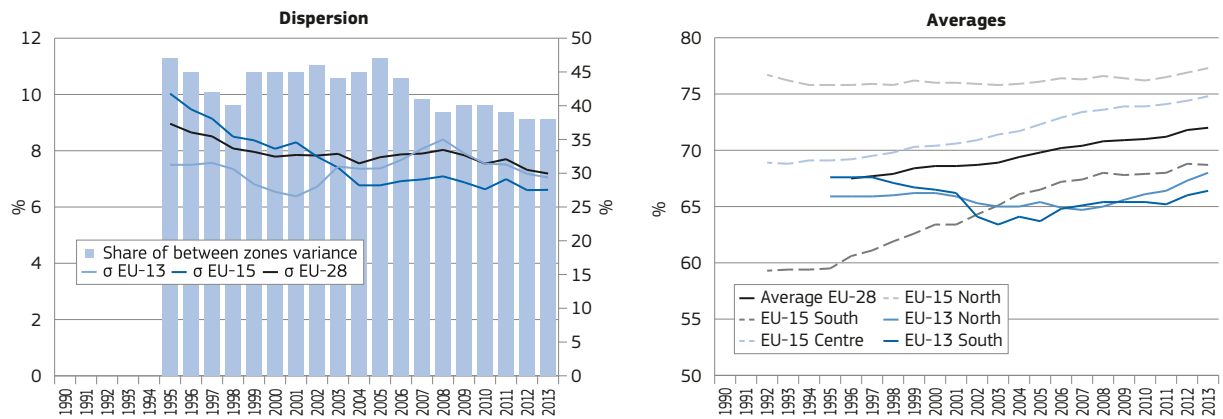
The degree of dispersion of EU household incomes over the last two decades appears to have been broadly stable but with some diverging trends since the crisis, linked to a slight increase in between-zone variance. This relative stability, notably during the first years of the crisis when some European countries were rather more strongly affected by

the crisis, presumably reflects the strong stabilising impact of tax and benefit systems on household incomes (see Chapter 1). However, it can be noted that in 2012 there was a further increase in dispersion, both in EU-13 and EU-15, reflecting a slight additional increase in between-zone dispersion.

### ***A halt in convergence of poverty rates in the crisis***

Over the past decade or more, poverty and exclusion rates have tended to converge in Europe. However, this overall experience includes two different sub-periods. Before the crisis, convergence

Chart 6: Convergence and divergence of activity rates in the EU (1995–2013)



*Reading note:*  $\sigma$  values refer to the coefficient of variation (based on weighted averages) and are reported on the left scale. The share of between zones variance in total variance is reported on the right axis.

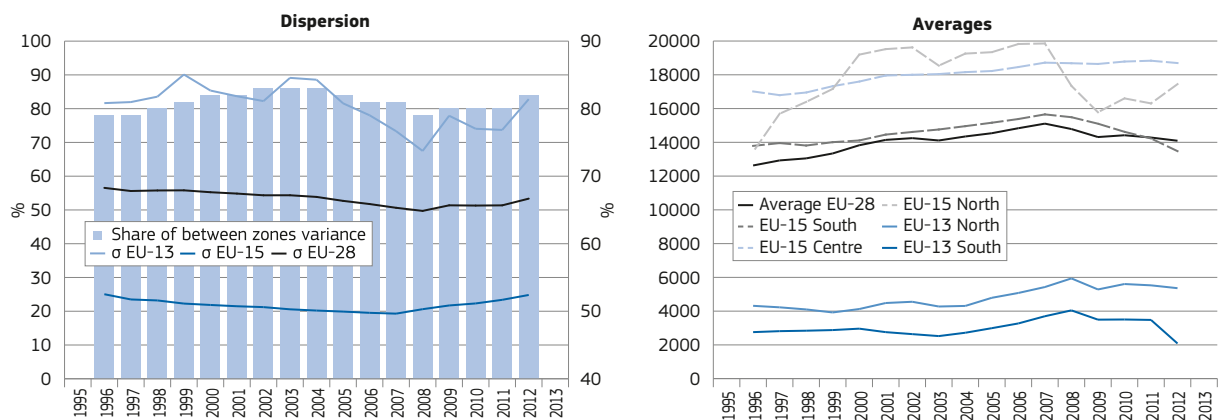
*Source:* Eurostat, employment rate 15–64 age bracket, calculations DG EMPL.

*Notes:*  $\sigma$  refers to the coefficient of variation (based on weighted averages); the share of inter groups variance is based on unweighted averages by zone (see annex). Some missing values in the beginning of the period were kept constant for the calculation of dispersion and averages: HR (1995-01), BG, CY, MT (1995-99), CZ, EE, LV, LT, SK (1995-97), PL, RO (1995-96), HU, SI (1995), IT (1992), AT (1992-93).

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Chart 7: Convergence and divergence of GDI per capita in the EU (1995–2013)



*Reading note:*  $\sigma$  values refer to the coefficient of variation (based on weighted averages) and are reported on the left scale. The share of between zones variance in total variance is reported on the right axis.

*Source:* Eurostat, calculations DG EMPL.

*Notes:*  $\sigma$  refers to the coefficient of variation (based on weighted averages); the share of inter groups variance is based on unweighted averages by zone (see annex). Values in real euros deflated by HICP. Missing data for MT, some missing values in the beginning of the period were kept constant for the calculation of dispersion and averages: LU (1996-2005), BG, HR, IE (1996-01), EL, ES, RO (1996-99).

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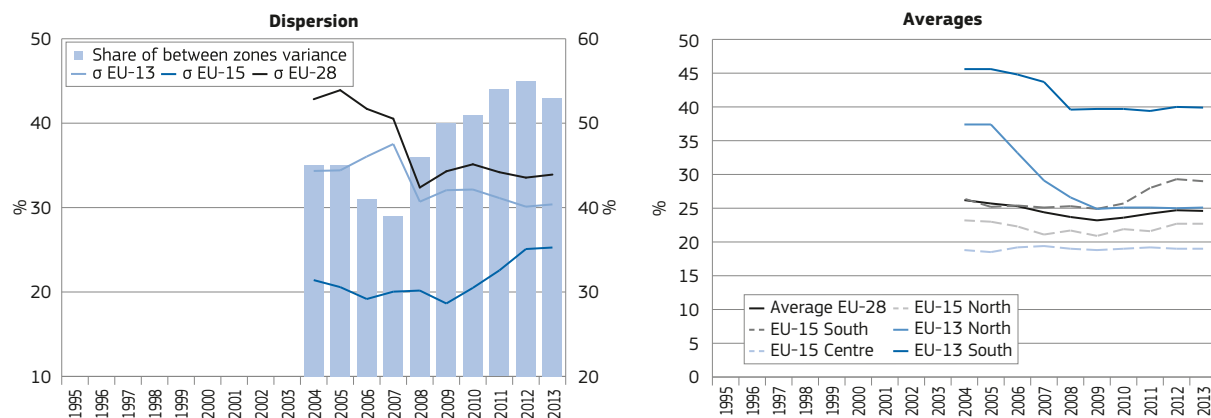
was mainly driven by developments in EU-13, accompanied by some stability in dispersion within EU-15 and some decline in between-zones variance. Since the onset of the crisis in 2008, however, convergence has come to a halt, with convergence within EU-13 paused, some increased divergence within EU-15, as well as a significant

increase in between-zone dispersion in Europe (Chart 8).

Overall developments in monetary poverty have followed a similar pattern, with a stabilisation in the degree of dispersion since the crisis that reflects a reversal of dispersion trends by zones, with some convergence in EU-13 and

some divergence in EU-15. While the convergence before the crisis in EU-15 was associated with some increase in poverty rates in the EU-15 Centre zone (where poverty rates are relatively low), this increase paused during the crisis and was accompanied by a decrease in the EU-15 Northern zone and an increase in the EU-15 Southern zone.

Chart 8: Convergence and divergence of AROPE in the EU (2004–12)



**Reading note:**  $\sigma$  values refer to the coefficient of variation (based on weighted averages) and are reported on the left scale. The share of between zones variance in total is reported on the right axis.

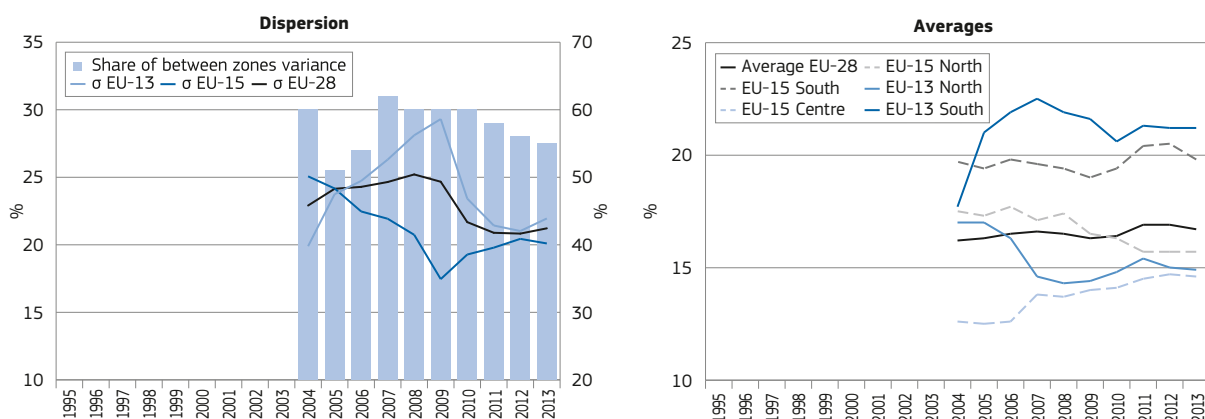
**Source:** Eurostat, calculations DG EMPL.

**Notes:**  $\sigma$  refers to the coefficient of variation (based on weighted averages); the share of inter groups variance is based on un-weighted averages by zone (see annex). Some missing values at the beginning of the period were kept constant for the calculation of dispersion and averages: HR (2004-09), RO (2004-06), BG (2004-05), CZ, DE, CY, LV, LT, HU, MT, NL, PL, SI, SK, UK (2004).

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Chart 9: Convergence and divergence of AROP in the EU (2004–12)



**Reading note:**  $\sigma$  values refer to the coefficient of variation (based on weighted averages) and are reported on the left scale. The share of between zones in total variance is reported on the right axis. The dates correspond to the dates of the SILC waves which refer to households' incomes on the year before.

**Source:** Eurostat, calculations DG EMPL.

**Notes:**  $\sigma$  refers to the coefficient of variation (based on weighted averages); the share of inter groups variance is based on un-weighted averages by zone (see annex). Some missing values at the beginning of the period were kept constant for the calculation of dispersion and averages: RO (2005-06), CZ, DE, CY, LV, LT, HU, MT, NL, PL, SI, SK, UK (2004).

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**Ongoing convergence in inequalities masks increasing dispersion between zones**

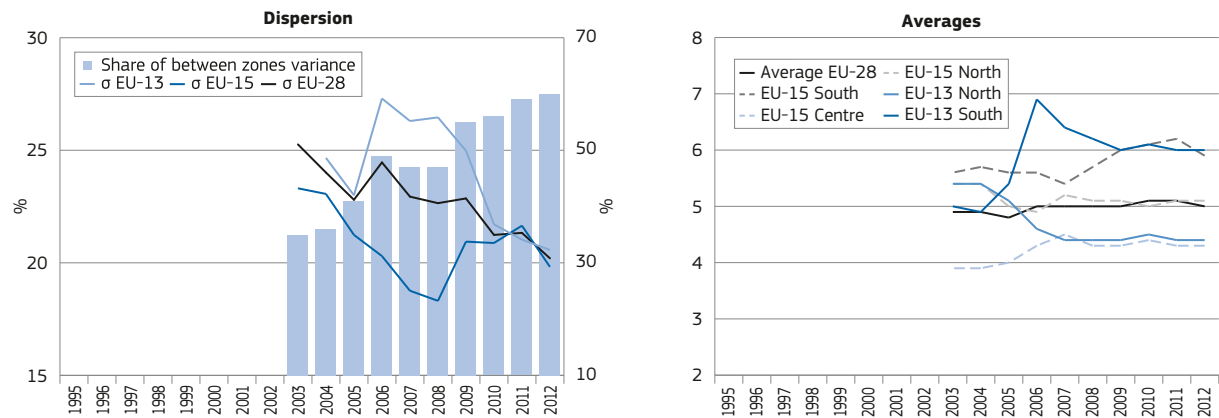
Finally, convergence in inequalities occurred over the last decade (measured as the ratio of average incomes

of fifth and first quintiles S80/S20), but with different timings in their development in EU-13 and EU-15. While the onset of the crisis saw divergence being followed by some convergence within EU-13, the reverse occurred in EU-15, where there was significant

convergence until the crisis which reversed and then stabilised. Overall, these trends were associated with a significant increase in the share of variance between zones, with adverse developments in the EU-15 Southern and peripheral zone.



Chart 10: Convergence and divergence of inequalities (S80/S20) in the EU (2004–12)



*Reading note:*  $\sigma$  values refer to the coefficient of variation (based on weighted averages) and are reported on the left scale. The share of between zones variance in total is reported on the right axis. The dates correspond to the dates of the SILC waves which refer to households' incomes on the year before.

*Source:* Eurostat, calculations DG EMPL.

*Notes:*  $\sigma$  refers to the coefficient of variation (based on weighted averages); the share of inter groups variance is based on un-weighted averages by zone (see annex). Some missing values at the beginning of the period were kept constant for the calculation of dispersion and averages: CZ, DE, CY, LV, LT, HU, MT, NL, PL, SI, SK, UK (2004).

### 2.1.3. EU and United States experienced different trends during the crisis

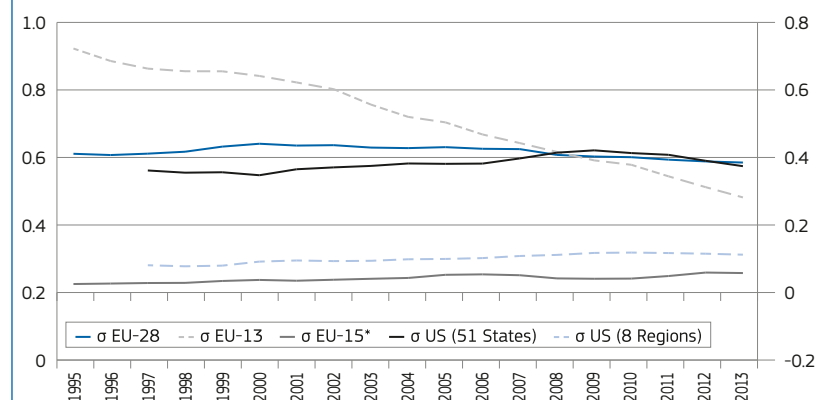
It is useful to compare trends in dispersion rates of GDP per head; unemployment rates; and poverty rates within Europe with those within the United States over recent decades given their similarity in terms of economic development and overall size<sup>(13)</sup>, and the availability of relevant long-term data series.

#### **GDPpc convergence resumes slightly more quickly in the United States than in Europe**

While some convergence of GDP per head continued in the EU as a whole during the crisis, this was the product of different trends (see above). On one side, strong convergence dynamics remained at play in EU-13 while there was stability in dispersion within EU-15. On the other side, the long-term trend of between-zones convergence eventually came to a halt and reversed in relative terms.

The dynamics of GDP per head convergence were slightly different in the United States, with an initially divergent trend, in the early phase of the crisis, which reverted afterwards (from 2010 between States and from 2012 between regions).

Chart 11: Convergence and divergence of GDP per capita in the EU and in the United States (1995–2013)



*Reading note:*  $\sigma$  values refer to the coefficient of variation (based on weighted averages).

The definition of the five EU-28 zones is the same as in the former section.

*Source:* Eurostat and BEA, calculations DG EMPL.

*Note:* Real GDP per capita expressed in euro in Europe and dollar in USA. Dispersion measured as the coefficient of variation, based on the weighted average of each zone EU-15\* does not include LU.

#### **Divergence of unemployment rates in Europe, stability in the United States**

Since 1995, developments were similar in the EU-28 and EU-15, with some convergence followed by significant divergence in unemployment rates since the beginning of the crisis. Within EU-15 (for which longer time series are available)

convergence actually dates back to the 1960s and the reversal since the crisis has brought it back to the early 1970s dispersion levels.

In the United States, where the dispersion of unemployment rates between States is around half that in Europe, there has been some overall stability in dispersion over recent decades, with the most significant

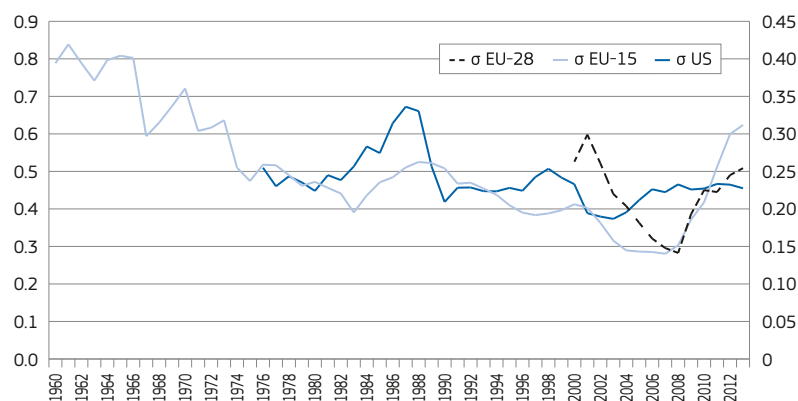
<sup>(13)</sup> In this respect the comparison with other federal countries, such as CH or CAN, may be less relevant.

increase occurring in the second half of the 1980s. Most notably, unemployment rates have not shown a significant increase in dispersion in recent years.

**Stability in dispersion of poverty rates in Europe, signs of further convergence in the United States**

In both the EU and United States the crisis led to an increase in overall levels of poverty. The increase is seen to have been more substantial in the United States, though it should be noted that their definition of poverty differs and is not linked to the median income as in Europe<sup>(14)</sup>. In the United States overall dispersion of poverty levels continued to decline during the crisis. In Europe, the slightly declining trend reflected different dynamics in EU-13 and EU-15.

**Chart 12: Dispersion of unemployment rates in the EU and in the United States (1960–2013)**



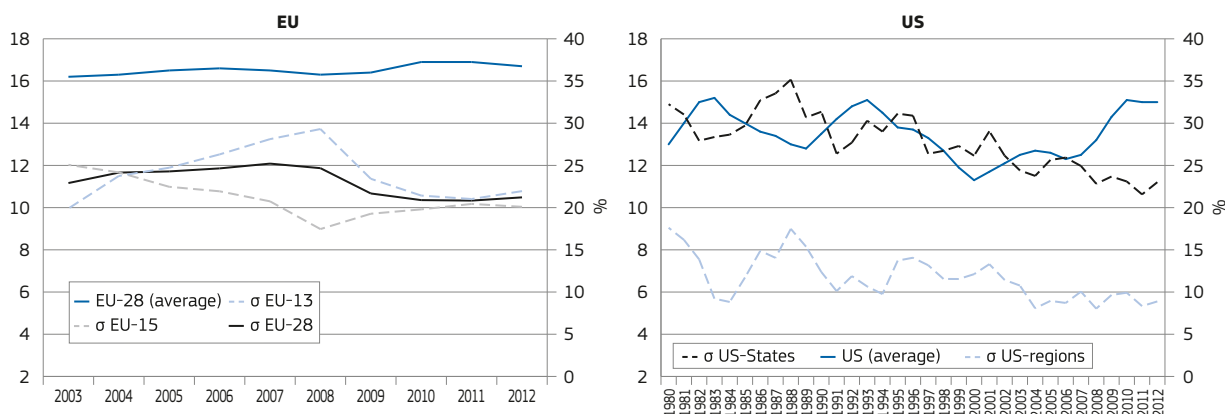
Reading note:  $\sigma$  values refer to the coefficient of variation (based on weighted averages) reported on the left axis for EU and right axis for the United States. The scales are different on both axis.

Source: Eurostat, AMECO and DoL, calculations DG EMPL.

Note: Dispersion measured as the coefficient of variation, based on the weighted average of each zone considered. For Germany, values up to 1989 refer to West Germany.

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**Chart 13: Convergence and divergence of poverty rates in the EU and in the United States**



Reading note:  $\sigma$  values refer to the coefficient of variation (based on weighted averages) reported on the right axis, while average values are reported on the left axis.

Source: Eurostat and Census bureau, calculations DG EMPL.

Note: Poverty relates here to monetary poverty and poverty thresholds are not defined in the same manner in Europe (where it corresponds to 60% of the median equivalised disposable income) and in the USA.

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<sup>(14)</sup> For instance, when the median income declines, which has been the case in some Member States during this crisis (also see Chapter 1), this can translate into declines in at-risk-of-poverty rates as measured based on poverty threshold reflecting 60% of the median income, as long as the income situation of the lower end of the income distribution remains unchanged.

## 2.2. Structural factors impacting on employment and social divergence

An important issue to address is the extent to which nominal unit labour cost growth in the euro area, weak productivity growth, limited human capital formation and increasing indebtedness (of both private and public sectors) has contributed to diverging socioeconomic performance, and how such developments may affect upward convergence in the future.

Since a currency union implies irreversible nominal exchange rates, Member States are no longer able to adjust relative prices and wages via changes in the nominal exchange rate in the face of economic shocks and competitive challenges, and have to make adjustments in terms of prices and nominal unit labour costs (reflecting changes in nominal wages and productivity). However, experience shows that these adjustments are generally slow to take place (see below) with the inevitable risk that this may trigger increases in unemployment.

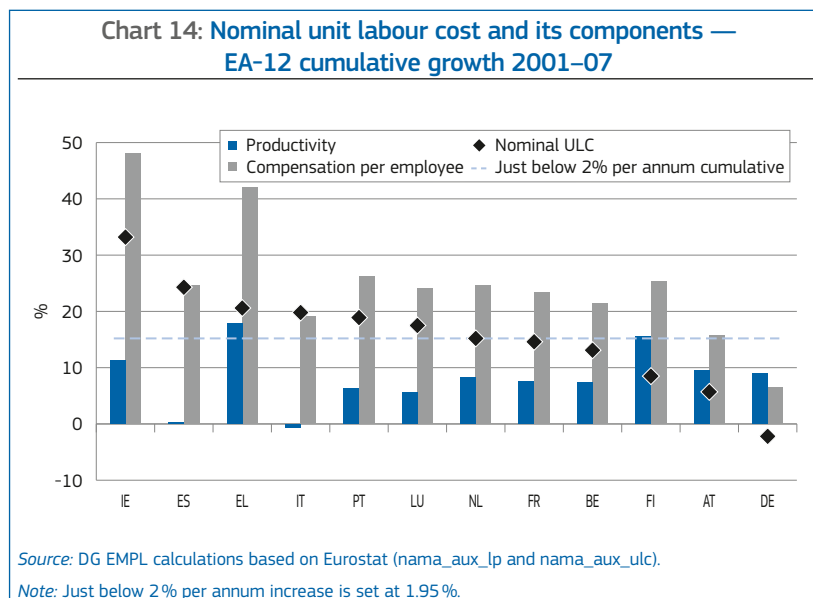
The first subsection reviews trends in dispersion of nominal unit labour cost growth in the euro area, both during the run-up to the crisis and since then.

The second subsection reviews major drivers of potential divergence in human capital formation, in terms of possible impact on productivity growth, notably developments for early school leavers, thereby complementing the analyses provided in the other chapters of this review (see Chapter 2).

The third subsection reviews debt level trends, during the run-up to the crisis, with increases across the EU, notably reflecting in some euro-area Member States strong decreases in nominal interest rates, which may also hinder convergence across Member States.

### 2.2.1. Productivity matters for nominal unit labour cost divergence across the euro area

Developments in nominal unit labour cost, which measures nominal compensation per employee adjusted for productivity, may lead to inflationary (or deflationary) cost-push pressures in an economy. Clearly, in the long-run, strong



divergence in nominal unit labour cost growth across Member States of a currency union (with irreversible nominal exchange rates) is unsustainable.

While changes in nominal compensation are often seen as one way to correct such developments, at least in the short run, the following analysis shows that strengthening labour productivity (in a sustainable way<sup>(15)</sup>) is necessary in order to both restore external balance and promote upward convergence.

### **Divergence in unit labour costs during the run-up to the crisis ...**

In the run-up to the crisis (i.e. the 2001–07 period) there was a strong divergence in nominal unit labour cost (ULC) growth across the euro area (see Chart 14). More particularly, taking growth of just below 2% per year (i.e. the ECB's inflation target, since if real wages grow in line with productivity developments, nominal ULCs will grow at the same rate as nominal prices), several Member States greatly exceeded this benchmark, particularly Ireland, Spain and, to a lesser extent,

<sup>(15)</sup> Labour productivity measures output per unit of labour input. The rule that productivity is calculated as GVA divided by the number of employed persons is an accounting rule which does not constitute a behavioural relationship that indicates a direction of causality, i.e., it still allows that causality runs from (predetermined) productivity and GVA to a (endogenous) number of employed persons, from (predetermined) GVA and number of employed persons to (endogenous) productivity, or from (predetermined) productivity and number of employed persons to (endogenous) GVA. While the latter adjustment is underpinned by structural developments, the two other adjustment schemes may reflect cyclical behaviour in GDP and structural rigidities in labour markets.

Greece, Italy and Portugal<sup>(16)</sup>. In contrast, Germany and to a lesser extent Austria and Finland, undershot this benchmark. These divergent developments led to an unsustainable distortion of competitiveness within the euro area.

However, while divergent development in nominal unit labour costs may impact directly on a country's competitiveness, it is primarily driven by developments in labour productivity and nominal compensation per employee. In Italy and Spain, for example, it was largely driven by relatively weak productivity growth. In contrast, Greece and Ireland (together with Finland) showed the strongest increases in productivity and also recorded much stronger than average increases in nominal compensation per employee. At the same time Germany, and to a lesser extent Austria, showed fairly robust productivity growth in combination with relatively weak growth in nominal compensation per employee.

Correcting such divergent developments across Member States can be approached in different ways, with differing impacts on convergence. Nominal wages can be reduced in the Member States with excessive nominal unit labour cost growth, or increased in the States with relatively weak nominal unit labour cost growth. While this may restore international competitiveness<sup>(17)</sup>, it will not

<sup>(16)</sup> Among the EA-12 Member States that were members of the euro area over the entire period.

<sup>(17)</sup> It can notably be noted that an additional element for consideration lies in the average development in unit labour costs of the euro zone as a whole, as compared with the ones in the main trading partners.

affect the Member State's overall productivity level. Another approach would be to increase productivity in Member States where unit labour cost growth was too strong, which would increase the Member State's overall productivity level — thereby potentially strengthening upward convergence.

**... mainly corrected by adjustments in nominal compensation per employee ...**

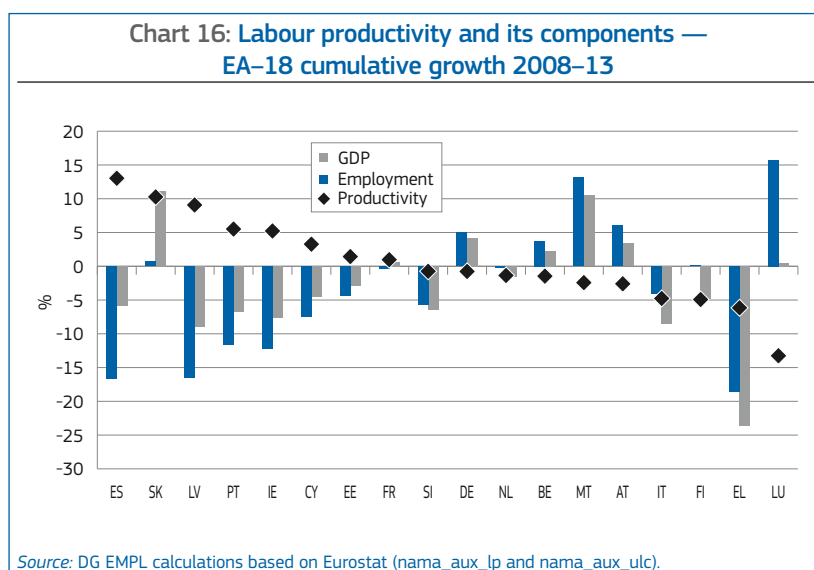
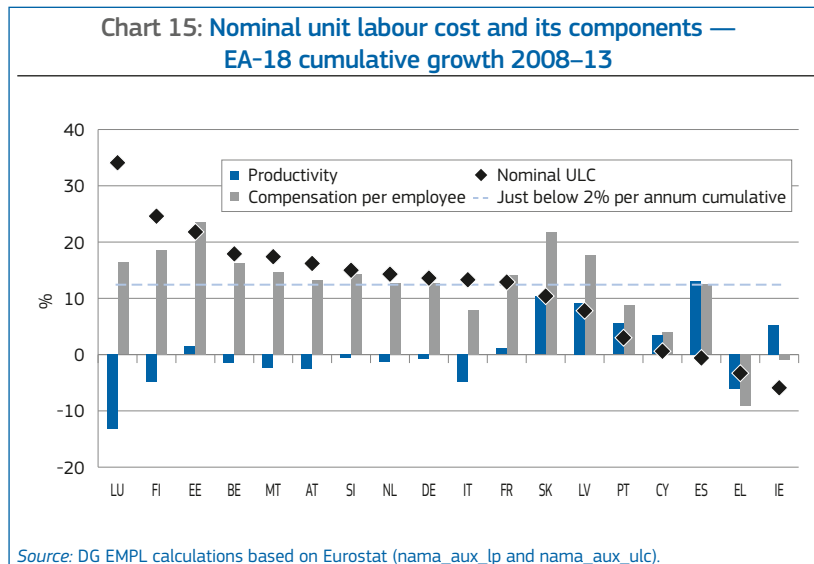
Adjustment over the period 2008–13 has primarily occurred via changes in nominal unit labour costs, with strong downwards adjustment in several euro area Member States (see Chart 15). Ireland and Greece showed negative cumulative growth in nominal unit labour cost for 2008–13, followed by very low growth in Spain and Portugal. At the same time, several core Member States remained close to the just below 2% cumulative growth.

However, the underlying downward adjustment pattern varied significantly across Member States. In Spain strong productivity growth tempered nominal unit labour cost growth, while in Greece it was primarily decreases in nominal compensation per employee that corrected past slippages in nominal unit cost growth.

In this respect, since the onset of the crisis, adjustment has primarily occurred via changes in nominal compensation per employee. This can be due to several reasons, for example the time it takes to improve productivity means that declines in wages and employment could have been necessary to restore 'confidence' under pressing circumstances. Moreover, the financial means to improve productivity growth (such as training and skill formation) are not always readily available during an economic downturn.

**... and shedding labour, but with adverse impacts on upward socioeconomic convergence ...**

Divergence in cumulative nominal unit labour costs were tempered by increased productivity in some Member States. However, in several Member States



(particularly Spain, Latvia, Portugal, Ireland and Cyprus) the gains in productivity were primarily realised by sharper reductions in employment than output (see Chart 16)<sup>(18)</sup>. While such productivity increases may restore convergence in nominal unit labour cost in the short run, they may also have an adverse impact on long-term upward convergence and social cohesion.

**... which can be insufficient to restore competitiveness in a sustainable way**

On the whole, the rebalancing over the 2008–13 period reversed some of the divergence observed in the 2001–07 period (Chart 17). While, on average,

nominal ULCs were very slightly below the 2% benchmark, corresponding to the ECB inflation target, relatively lower development in some Member States reflects stronger increases in nominal ULCs elsewhere.

This pattern of development was achieved through significantly below average developments in some Member States who had previously experienced above average increases (particularly Ireland, Greece, Spain and Portugal, who saw declines or stagnation in nominal ULCs), but generally without above average increases in Member States who had previously experienced lower than average developments (in particular in Austria and Germany).

<sup>(18)</sup> It can also be noted that changes in employment can have affected more specifically lower productivity sectors, resulting in a positive impact on average productivity (see, for instance, European Commission, 2014a, for analysis of the sectoral composition).

While it is beyond the scope of this chapter to investigate in depth the various roots of wage dynamics, developments over the period also reflect shortcomings in the architecture of the euro area (such as developments in real interest rates). Moreover, the underlying loss of competitiveness can be related to wage setting developments<sup>(19)</sup> and to the incomplete pass through from wages to prices (see Section 2.2).

## 2.2.2. Trends in human capital investment

In the years preceding the crisis, some countries experienced weak productivity gains, (notably the Southern or periphery EU-15 as indicated above), with future productivity growth prospects seen to rely strongly on education and skill among the active population. This section thus reviews some key dimensions of trends in education and skill structures of the active age population, as well as trends in the youngest segment of the active population, namely early school leavers and NEETs<sup>(20)</sup>. In particular, it seeks to document whether trends observed before the crisis have been affected in recent years<sup>(21)</sup>.

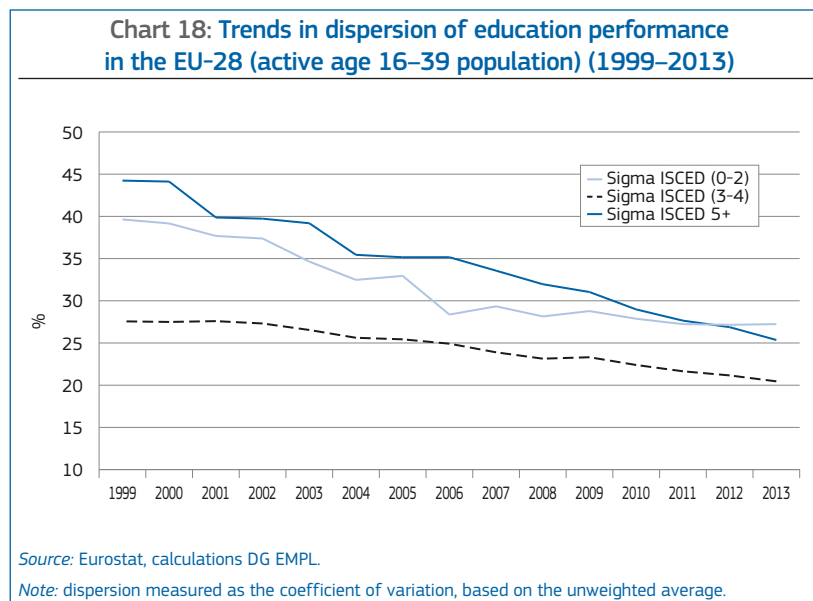
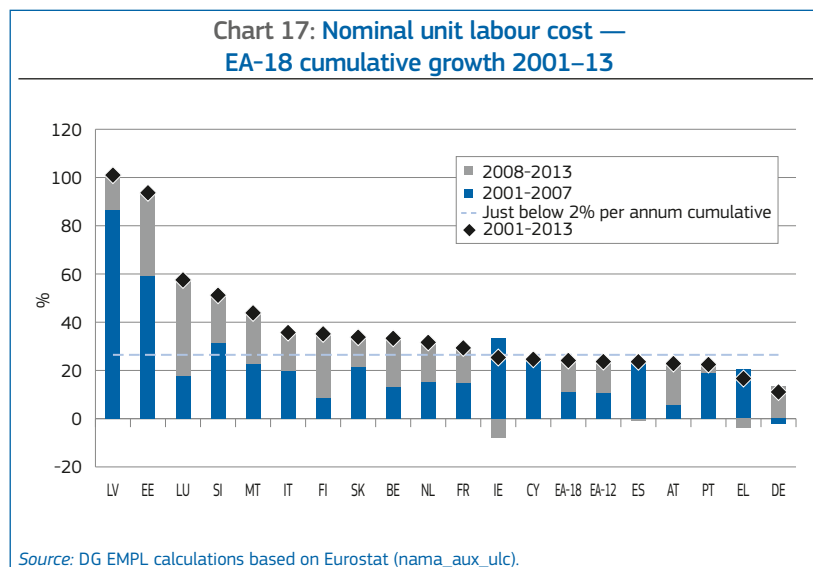
The average level of education of the working age population (as reflected by the ISCED classification) is progressively increasing with convergent trends in educational attainments by 16–39 year olds over the past 15 years. Moreover, these trends were not affected by the crisis, suggesting that there has not been any significant deterioration in the potential for long-term growth. However, the stabilisation in dispersion of the share of the active age population with education levels up to lower secondary education (ISCED 0–2 range) in recent years is worth noting.

Nevertheless, any review of trends in the education of the working age

<sup>(19)</sup> As well as either price or non-price competitiveness factors. For instance, assessing external positions on the basis of real effective exchange rates (based on wages adjusted for productivity) does not reflect all costs, such as capital costs, R&D expenditure and distribution costs.

<sup>(20)</sup> Young people Not in Employment, Education or Training.

<sup>(21)</sup> The analysis in this section complements analyses presented elsewhere in this report. Chapter 2 discusses in more detail the challenges to future human capital formation, while Chapter 3 provides an analysis of the increasing importance of job quality and workplace innovation to strengthen productivity growth.



population needs to be complemented by analysis of the trends in skills, since these are even more relevant to productivity (and education levels can reflect very different skills between countries)<sup>(22)</sup>. In this regard, there is no indication that the dispersion of skill levels in the 16–64 population improves when considering younger age brackets (16–24). Though younger cohorts generally benefit from higher average skills, the differentials between countries are lower for younger generations and are sometimes reinforced (as, for instance, in the case in England and Northern Ireland, see Chart 18).

When considering the youth situation over the period, it is remarkable that there is a clear convergence pattern

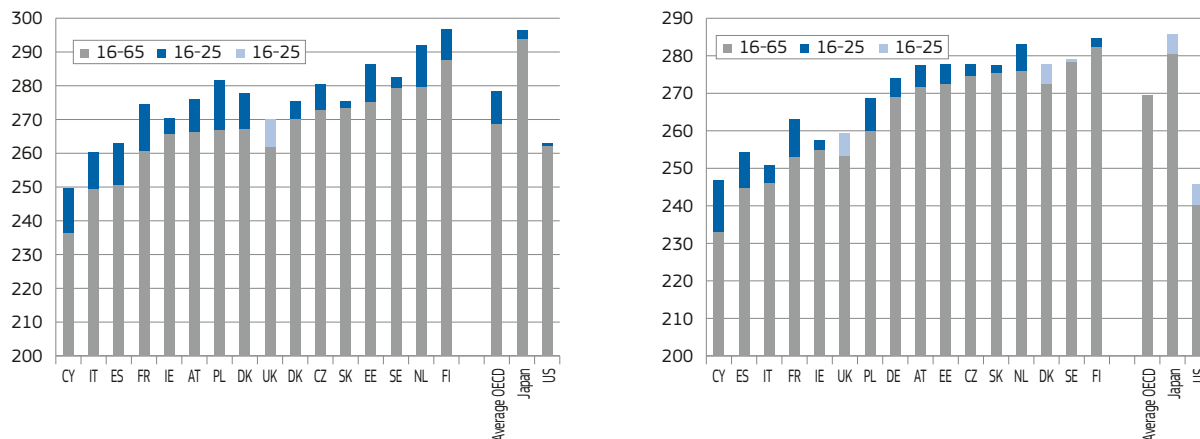
in the share of early school leavers (aged 18–24), with convergence continuing during the crisis — though at a reduced pace, particularly in Southern EU-15 countries. This is a positive sign that most of the gains made before the crisis will be beneficial after the crisis, providing stronger grounds for employment growth. It can be noted that the slowdown of the convergence pattern in recent years could reflect longer periods at school, due to the deterioration of the labour market.

The labour market attachment of younger generations, as reflected by the rate of NEETs, has seen some significant reversal of the convergence trends in recent years. However, this mainly reflects increases in unemployment rather than inactivity<sup>(23)</sup>.

<sup>(22)</sup> See, for instance, OECD (2012).

<sup>(23)</sup> See, for instance, EU Employment and Social situation, Quarterly review, March 2014.

**Chart 19: Scores in literacy (left panel) and numeracy (right panel) for a selection of Member States or regions (2012)**  
Adjusted average scores for populations aged 16–25 and 16–65



Reading note: The bar for 16–25 is in light blue and not in blue when the score for 16–25 is lower than the one for 16–65.

Source: OECD PIAAC, calculations DG EMPL.

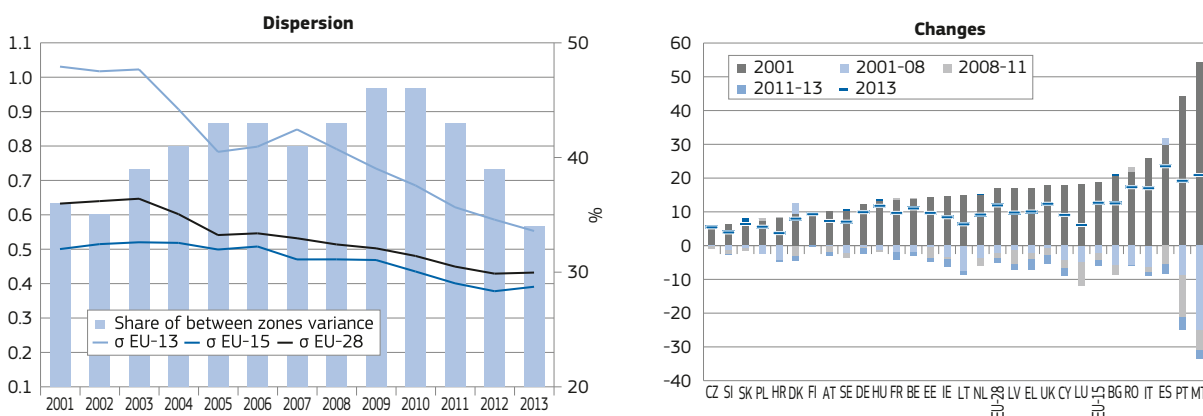
Note: UK refers to England and Northern Ireland.

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**Chart 20: Trends in the rate of early school leavers in Europe (age 18–24 population) (2001–13)**



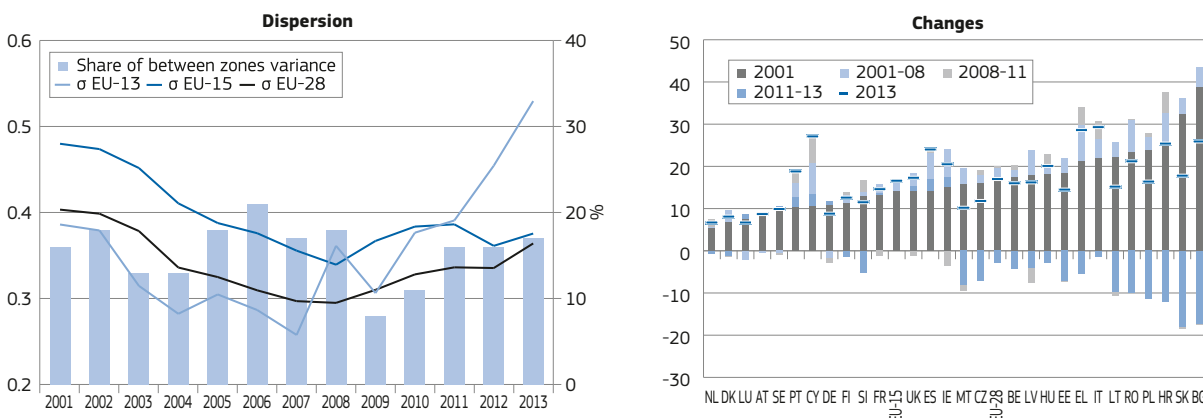
Source: Eurostat, calculations DG EMPL.

Notes:  $\sigma$  refers to the coefficient of variation (based on weighted averages); the share of inter groups variance is based on unweighted averages by zone (see annex). Some missing data at the beginning of the period were kept constant for the calculation of dispersion: CZ, IE, HR, LV, SK (2001) and UK (2003).

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**Chart 21: Trends in the rate of NEETS (18–24) in Europe (2001–13)**



Source: Eurostat, calculations DG EMPL.

Notes: Dispersion measured as the coefficient of variation, based on the unweighted average. Some missing data at the beginning of the period were kept constant for the calculation of dispersion: CZ, IE, HR, LV, SK (2001).

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### 2.2.3. Trends in public and private indebtedness

Trends in public and private indebtedness can also contribute to diverging socioeconomic performance, notably since increases in good economic times can reduce access to credit in bad economic times, while increases in private debt can fuel consumption when debt is increased, but also then reduce consumption when debt is serviced. Furthermore, during an economic downturn, servicing debt may have a strong adverse impact on the purchasing power of households (especially when inflation is lower than expected), notably at the lower end of the income distribution. This may also hinder convergence across Member States, to the extent that it stifles aggregate demand in debtor countries.

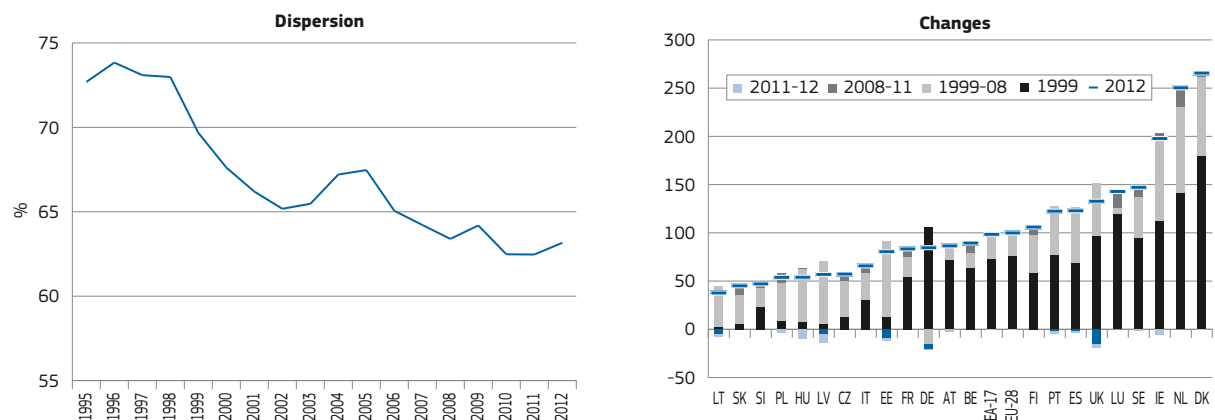
Households' debt to income ratios had been converging overall in Europe since the mid-1990s but this convergence essentially halted during the crisis (see Chart 22) and was accompanied by a significant increase between 1999 and 2008 (over 20 percentage points for the whole EU average). This increase was not only significant in EU-13 Member States (in relative and absolute terms) where initial levels were relatively low, but also in some Member States where rates were already relatively high (such as Ireland, the Netherlands or Denmark). During the crisis household debt to income ratios were on average nearly stable, including in Member States where household incomes were more strongly affected.

While household debt to income ratios converged, non-financial corporate indebtedness

diverged in the decade preceding the crisis, with significant increases in the EU-15 Southern and periphery zone (see Chart 22) and declines mostly in EU-13. These diverging developments reverted somewhat during the crisis, with some significant declines in some EU-15 Southern and periphery Member States (in particular in Spain and Portugal).

Public debt to GDP ratios showed some divergence before the crisis, notably as a result of increases in Southern and peripheral EU-15 Member States (such as Portugal and Greece), but also due to declines in some EU-15 Northern Member States (such as Sweden and Denmark) and EU-13 Member States (such as Bulgaria and Slovakia). Overall, there was some convergence over

Chart 22: Trends in households' gross debt to income ratio (1995–2013)



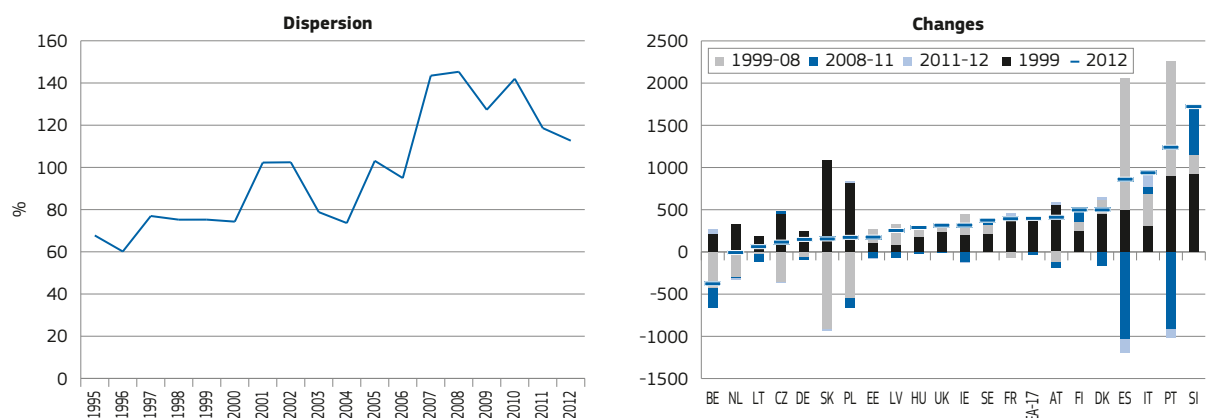
Source: Eurostat, calculations DG EMPL.

Notes: Gross debt-to-income ratio of households as registered by national accounts  $((AF4, liab)/(B6G+D8net))$ . Missing data for BG, EL, CY, HR, MT and RO, some missing data at the beginning of the period were kept constant for the calculation of dispersion : IE (1995-01), ES (1995-99), LU (1995-2005), SI (1995-01).

Reading note: Dispersion measured as the coefficient of variation, based on the EU-28 weighted average.

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Chart 23: Trends in non-financial corporations' net debt to income ratio (1995–2013)



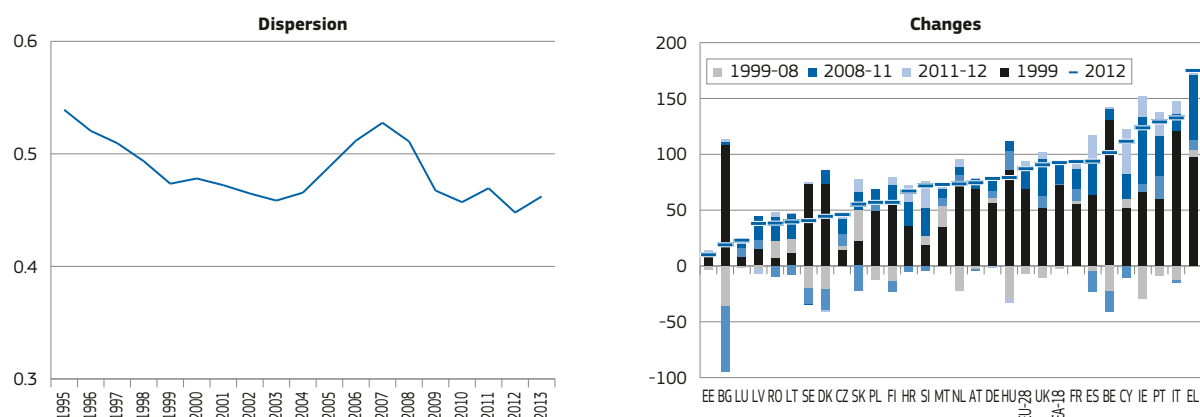
Source: Eurostat, calculations DG EMPL.

Notes: net debt-to-income ratio, after taxes, of non-financial corporations:  $(AF2+AF33+AF4, liab - assets)/(B4N-D5PAY)$ . Missing data for BG, CY, EL, MT and RO, some missing data at the beginning of the period were kept constant for the calculation of dispersion DK (1995-02), EE, SI (1995-01), ES (1995-99), PL (1995-96), LV (1995 and 1997).

Reading note: Dispersion measured as the coefficient of variation, based on the unweighted average.

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Chart 24: Trends in public debt to GDP ratio (1996–2013)



Source: Eurostat, calculations DG EMPL.

Note: Some missing data at the beginning of the period were kept constant for the calculation of dispersion BG (1995-97), HR (1995-01).

Reading note: Dispersion measured as the coefficient of variation, based on the EU-28 weighted average.

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the first years of the crisis and some stabilisation since then, but within the context of a significant average increase in public debt.

### 2.3. Conclusion: promoting upward convergence by balanced adjustment efforts and strengthening human capital formation

While socioeconomic convergence had been ongoing across the EU over the last two decades, it came to a halt with the crisis in terms of GDP per head and reversed strongly for employment and unemployment rates. Activity rates, which held up during the crisis, broadly continued to converge. Convergence slightly reversed in terms of household incomes and came to a halt in terms of poverty. These trends were mainly due to adverse developments in southern and peripheral EU-15 Member States, which translated into an overall increase in the share of dispersion between zones. Conversely, convergence (within EU-13 and with the EU-15) broadly continued for most Member States that joined the EU in 2004 or later.

In comparison, adjustments in the crisis were more balanced in the United States than in Europe, with convergence (between States or regions) in GDP per capita recovering slightly more quickly after the crisis in the United States, unemployment rates not diverging in the United States, (they diverged significantly in the EU) and poverty rates still showing signs of convergence in the

United States (convergence came to a halt in the EU).

These divergent socioeconomic trends after 2008 concentrated mainly within EU-15 and reflect the exceptional scale and impact of the crisis in a context where the adjustment capacity in the euro area was wanting (see Section 2.1). But they also reflect the consequences of the build-up of structural imbalances that had taken place prior to the crisis, notably divergent nominal unit labour cost growth in the euro area, low productivity growth in several Member States, and the rising indebtedness of households, enterprises and the public sector in many Member States. While this correction led to a cyclical recovery in productivity growth in Member States such as Spain, it also led to deflationary tendencies in Member States such as Greece, Cyprus and Portugal. Furthermore, the correction has not been distributed symmetrically across Member States, notably with respect to nominal unit labour cost growth. It was primarily the Member States that had experienced higher than average growth in nominal unit labour costs in the run-up to the crisis that made the strongest downwards adjustments, while adjustment in the Member States that had recorded below average growth was rather moderate.

More positively, the convergence in labour force education levels and in the share of early school leavers was not interrupted by the crisis. However, it seems that human capital formation risks remaining

an important source of divergence across Member States, since strong dispersion in skill levels persists, especially among the young (also see Chapter 2 of this report).

## 3. CONVERGENCE WITHIN THE EU, A SPECIFIC CHALLENGE?

The persistent divergent socioeconomic cyclical developments across the euro area since the onset of the crisis, suggest that the current E(M)U framework, could be strengthened to foster upward convergence in times of cyclical downturn<sup>(24)</sup>.

In particular it is important to consider the extent to which cross-border effects arising from labour market and social adjustments are likely to intensify in the future, how such developments might impact on the goals of upward convergence, and whether a fiscal capacity at the EMU level could mitigate any negative effects.

There is a need to look beyond traditional macro-economic adjustment channels and also consider socioeconomic developments, such as changes in labour market polarisation and hysteresis effects, that risk deepening and extending the duration of any economic downturns.

<sup>(24)</sup> Such ideas go back to the early discussions on optimal currency areas, with Mundell (1961) emphasising the need for price flexibility and labour mobility, and Kenen (1969) the need for fiscal integration for smoothing adjustment to asymmetric shocks.



### 3.1. The specificities of a monetary union

#### *The capacity to adjust to asymmetric shocks in the EMU*

In an economic and monetary union with irreversible nominal exchange rates, the available channels for adjustment to asymmetric shocks at the Member State level include, on one hand, market based channels such as wages, prices, labour mobility (geographic and occupational), and private capital flows, and on the other hand, policy based channels including fiscal policies such as automatic fiscal stabilisers, discretionary taxes and public expenditure. And by construction, they do not include monetary policy instruments (such as open market operations) or the possibility of adjusting nominal exchange rates.

The absence of national monetary policy instruments and nominal exchange rates, combined with downward rigidity in prices and wages, requires additional adjustments through quantities (including raising unemployment and decreasing real income) when a national economy is hit by an adverse asymmetric shock. This is especially the case when access to capital markets is limited, so that the adjustment burden cannot be spread over time.

In addition, such a limited adjustment capacity can generate strong adverse socioeconomic consequences (such as distributional impacts, hysteresis effects, and interactions with product markets, as discussed below), which may generate self-reinforcing adverse labour market developments that increase the duration and intensity of an economic downturn, with the risk of a permanent loss of potential output and employment.

It is worth noting that since the introduction of the euro, there appear to be at least as many asymmetric shocks as before (such as, for instance, measured by the dispersion in growth rates; see, for instance, European Commission (2008), Pisani (2012) and Allard et al. (2013)). While a number of factors affect trends in business cycle synchronisation, increased trade integration can lead to more synchronisation of the business cycle (see, for instance, Frankel and Rose, 1998), while there are other forces that reduce synchronisation, such as increasing economic specialisation linked to

trade integration (see, for instance, Krugman 1993)<sup>(25)</sup>, as well as heterogeneity in the development of real interest rates (see, for instance, ESDE 2013).

In such an environment, the fiscal capacity of the currency union level is an important factor in terms of the system's ability to alleviate the economic and social impact of asymmetric shocks. Under the current architecture of the EMU, however, adjustment relies on decentralised fiscal policies under a rule-based framework and does not provide for an (automatic) fiscal stabilisation capacity<sup>(26)</sup>. Furthermore, while social protection generally played a prominent role in compensating households' income losses in the early phase of the crisis (2008–9), and thus helped stabilise the economy, this capacity was eroded in the second phase of the crisis (particularly in 2012 and 2013). This was due to a number of factors, including high pre-existing levels of sovereign debt and protracted uncertainty about the EMU's future, leading to cuts in public spending and/or tax increases in many Member States<sup>(27)</sup>.

The importance of a common fiscal capacity at the monetary union level had already been recognised in the early stages of European monetary policy cooperation, such as in the Marjolin Report in 1975, the MacDougall Report in 1977 and the Delors report in 1989. Enderlein and Rubio (2014) underlined that the Delors report considered that 'a well-functioning economic pillar was needed to limit the scope for divergences', requiring common regional and structural policies and macroeconomic policy coordination and that 'more effective EC structural and regional policies were seen as indispensable to mitigate the negative effects that economic and monetary integration was expected to have on poorer regions'. In particular, it was feared that agglomeration effects would 'favour a shift in economic activity away from less developed regions,

especially if they were in the periphery of the Community, to the highly developed areas in the centre'. They also note that the Report 'emphasised the need to "equalise production conditions" in the Community by strengthening EC cohesion policies and developing major EC investment programmes in areas such as physical infrastructures, communications, transportation and education' and 'stressed the need to ensure the "efficient use" of EC cohesion funds, the performance of which had to be evaluated and "if necessary be adapted in the light of experience"'. The Commission's *Blueprint for a deep and genuine EMU* (2012), the Four Presidents' report (2012) and the Commission Communication on strengthening the Social Dimension of the EMU (2013) stress that the creation of an EMU-wide fiscal capacity should be considered as a longer-term step to improve the stabilisation of EMU economies, particularly in case of asymmetric shocks.

It should also be underlined that, as stated in the *Blueprint for a deep and genuine EMU* (2012), such developments relate to a medium- and long-term vision of the EMU and are thus complementary to existing measures to improve policy coordination, in particular implementation of the economic governance framework, as well as developments relating to the Banking Union, while they also imply a greater degree of sovereignty transfer and hence should be accompanied by steps towards political integration.

Available estimates of the level of risk sharing (smoothing capacity against the impact of country specific shocks) overall in Europe suggest that it remains low, compared to Canada or the United States (see Allard et al. (2013) and Van Beers et al. (2014)). It appears that the relative weakness of risk sharing in Europe and EMU does not derive from the credit markets, but is mainly due to lower risk sharing in the capital market channels (which remains weak) and fiscal transfer channels (which are comparatively in-existent, see chart). In this respect, the Banking Union should strengthen the capital market and depreciation channels, while the argument that its credibility and efficiency would be strengthened by a fiscal backstop should be noted<sup>(28)</sup>.

<sup>(25)</sup> See Section 2.2 below.

<sup>(26)</sup> The EU budget contributes to stabilising national budgets only in a marginal way, namely through slightly lower national fiscal contributions due to lower imports (tariffs) and economic activity (VAT) and through reduced requirements for co-financing of European Structural and Investment Funds' support (in the case of 'programme countries'). The European Globalisation Adjustment Fund, outside the MFF, provides small-scale financial assistance in case of regional economic shocks.

<sup>(27)</sup> See, for instance, EU Employment and Social situation, Quarterly review, March 2014.

<sup>(28)</sup> See, for instance, IMF (2014), Article IV Consultation with the Euro Area — Staff report.

## Labour mobility

While the last decade has seen a large increase in mobility within the EU, mostly due to the 2004–07 enlargements, there is still scope to increase labour mobility. In 2013, 3.3% of the total population<sup>(29)</sup> (of economically active EU-28 citizens) resided in another EU-28 country, compared with 2.1% in 2005. This increase mainly occurred post-enlargement (2004 and 2007) with more than three quarters of this net increase corresponding to citizens from EU-12<sup>(30)</sup> countries.

During the crisis, mobility flows helped Member States adjust, to some extent, to changing labour market conditions. Intra-EU mobility flows actually declined in the first phase of the crisis (2009–10), but have partly recovered subsequently<sup>(31)</sup>, especially from Southern EU Member States (although the majority of intra-EU movers — around 60% — still originate from Central and Eastern Member States).

There has been a notable increase in inflows in more resilient countries (such as Germany, Austria, Belgium and the Nordic countries)<sup>(32)</sup> and, by contrast, reduced inflows and increased outflows in the countries most affected by the crisis (such as Spain and Ireland<sup>(33)</sup>). However, part of this adjustment reflects changes in migration to and from non-EU countries, rather than intra-EU movements<sup>(34)</sup>. Overall, intra-EU labour mobility remains limited, in comparison to other OECD countries (such as the United States, Canada or Australia)<sup>(35)</sup>. However, while the migration response to labour market shocks prior to the crisis was stronger in the United States, recent evidence suggests that migration in Europe reacted quite strongly to changes in labour market conditions — more so than in the United States, where internal

<sup>(29)</sup> Corresponding to 8 million persons; in addition, there are also around 1.1 million EU inhabitants working outside their country of residence (i.e. 'cross-border' or 'frontier' workers).

<sup>(30)</sup> EU-12: countries that joined the EU in 2004 (EU-10) and 2007 (EU-2).

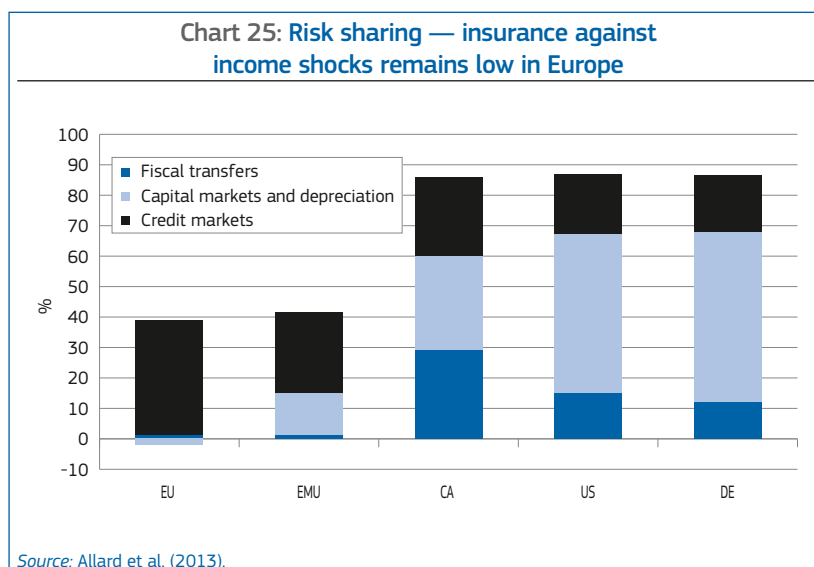
<sup>(31)</sup> European Commission, EU ESSQR June 2014, Supplement 'Recent trends in the geographical mobility of workers'.

<sup>(32)</sup> See European Commission, EU ESSQR June 2014, Supplement 'Recent trends in the geographical mobility of workers'.

<sup>(33)</sup> See Deutsche Bank (2011).

<sup>(34)</sup> European Commission (2014a), pp. 281–6.

<sup>(35)</sup> See European Commission (2014a), pp. 282–3 for a recent review of the literature.



mobility seems to have declined (see, for instance, Jauer et al., 2014).

There is further potential for increased intra-EU labour mobility. Given the disparities in unemployment rates<sup>(36)</sup> and recent increases in mobility intentions in some countries<sup>(37)</sup>, mobility changes remain limited in absolute terms<sup>(38)</sup>. The potential for countries with high unemployment levels to tackle that problem through migration to other countries is limited by the fact that the education profile of the average unemployed person does not match the profile needs of the potential recipient country<sup>(39)</sup>. While there is evidence that current levels of mobility are below the measured mobility intentions<sup>(40)</sup> in terms of movements between euro area countries, any further intra-EU labour mobility is likely to require a reduction in the many remaining barriers to mobility, which

<sup>(36)</sup> See European Commission (2014a), Boxes 2 and 3, pp. 282–6.

<sup>(37)</sup> According to the Gallup Word Poll, the share of EU citizens planning to move permanently in another country increased from 0.5% in 2008–10 to 1.2% in 2011–12, see European Commission, EU ESSQR June 2013, pp. 38–50. Another indicator is the rising number of EU citizens registering in EURES CV online (from 761 000 in June 2012 to 1 035 000 in June 2013 and 1 160 000 in January 2014).

<sup>(38)</sup> See European Commission, EU Employment and Social Situation Quarterly Report, June 2013, pp. 38–50 and European Commission, EU Employment and Social Situation Quarterly Report June 2014, Supplement 'Recent trends in the geographical mobility of workers'.

<sup>(39)</sup> EU-LFS data indicate that most (around 60%) recent movers from the South are highly educated while around 80% of the unemployed in Southern countries have a low or medium level of education, see EU Employment and Social Situation Quarterly Report, June 2013, p. 45.

<sup>(40)</sup> See European Commission, Employment and Social Situation Quarterly Report, June 2013.

notably include differences in administration, taxation, social security systems, transferability of professional qualifications (see Section 3.2).

Moreover, it is important to monitor the broader long-term impact of mobility on both destination and origin countries, and recognise that there are natural limits to intra-EU mobility, as well as potential negative side effects in both destination countries (impact on local services and budgets, risk of displacement effects on low-skilled natives) and origin countries (youth and brain drain, risk for cohesion and sustainability of social security systems in the long-run).

### 3.2. Cross-border externalities arising from employment and social developments linked to economic shocks in a monetary union

In terms of future perspectives, two particular questions can be raised:

- To what extent will cross-border effects arising from employment and social developments intensify in the future, and how will they impact on upward convergence across the EU?
- Do cross-border externalities stemming from developments in national labour markets provide a basis for more EU-level policy coordination?

When an economy is hit by a shock, it has to adjust, but the nature of the shocks and adjustment channels vary greatly (see, for instance, Box 2). In closely integrated national economies,

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such as the EU, the effects of domestic economic shocks and labour market adjustment can often be rapidly transmitted to other Member States, in particular through international trade, labour mobility, knowledge networks and capital flows.

Cross-border effects are determined by the nature of the domestic shock, the domestic adjustment to that shock and the strength of the channels through which shocks are transmitted across borders. All of this can reinforce upward convergence if they involve, for example, the dissemination of good business practices across borders. However, they can increase divergence if they involve, for example, the migration of highly skilled persons who want to escape adverse socioeconomic developments in their home country.

The scale and intensity of these cross-border effects is largely conditioned by the structural characteristics of the economies, such as their trade openness, their integration in cross-border supply chains, their financial integration with the rest of the world, and their access to international knowledge networks and market flexibility (see, for instance, IMF, 2013 and Weyerstrass et al., 2006)<sup>(41)</sup>.

## Box 2: Types of macro-economic shocks

### *Different types of shocks*

A shock on the supply side of the real sector affects, production technologies (e.g. a decrease in productivity growth) or production factors (e.g. increases in the price of raw materials), while a shock on the demand side of the real sector affects, the preferences of consumers (e.g. a shift in propensity to consume), the public sector (e.g. less military spending) or trading partners (e.g. a shift towards overseas imports). In the long run, permanent real shocks induce adjustments in the quantities and relative prices, to restore equilibrium — in the absence of structural reforms. These changes may generate spill-overs to the rest of the world.

A permanent shock is defined as a shock that does not disappear and has a permanent impact, while a temporary shock has no permanent effect on trend developments. Nevertheless, as discussed elsewhere in this section, this distinction does not hold once hysteresis effects in labour markets (and other markets) are taken into account.

A symmetric shock affects all economies in the same way (e.g. the rise in the price of oil affects all oil importers), while an asymmetric shock<sup>(1)</sup> affects a specific Member State (e.g. a boom in the domestic construction sector). Nevertheless, while countries may be hit by a common shock, differences in (labour market) institutions or other country specific characteristics (such as wage setting) may generate asymmetric outcomes (at least in the short- to medium-term).

An exogenous shock (e.g. a geopolitical crisis) is beyond the control of policy makers, while policy-induced shocks (e.g. unexpected bail-outs of banks) stem from discretionary policy decisions. Finally, shocks may be anticipated (e.g. introduction of the euro) or unanticipated (i.e. 'news').

### *Difficulties in identifying the nature of different shocks*

Although knowledge of the nature of a shock that hits an economy is important, it should be recognised that the exact nature of a shock is not always unambiguously observable in real time, and estimations confront several issues.

First, it cannot be excluded that national policy makers may have an incentive to misrepresent the nature of a shock. Consequently, it may be useful to establish an institutional framework that provides an independent assessment of the nature of shocks and macro-economic outlooks.

Furthermore, literature provides several methodologies to estimate (sources of) business fluctuations (including output gaps). Seminal work include Tinbergen (1939) using a linear difference equation, Burns and Mitchell (1946) using leading indicators, Shapiro and Watson (1989) using multivariate dynamic factor models, and Hamilton (1989) using a Markov-based regime shifting models. Nevertheless, experience has shown that real time estimates can be very uncertain, inter alia, due to parameter instability, model uncertainty, and data revisions. See, for instance, Marcellino and Musso (2011), Cheremukhin (2013) and Orphanides and van Norden (2002).

<sup>(1)</sup> Sometimes referred to as 'country-specific shocks'.

<sup>(41)</sup> Empirical assessments of spill-over effects within EMU in the face of budgetary consolidation and structural reforms prior to the crisis can be found in, for example, Weyerstrass et al. (2006) and Beetsma and Giuliodori (2011).

### 3.2.1. Stronger cross-border transmission in the future

A key question concerns the extent to which structural developments in the economy strengthen the channels through which domestic employment and social developments are transmitted across borders, and can this affect upward convergence.

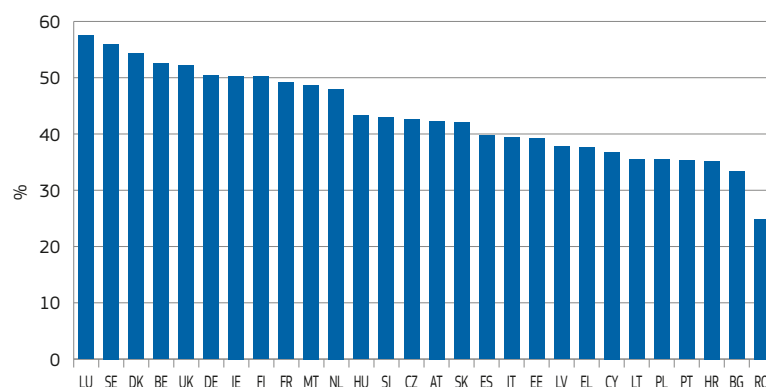
It can be expected that recent or future developments, such as the establishment of a banking union, further strengthening of the European Single Market, and technological developments (including trans-European networks), will together reinforce the channels through which cross-border effects are transmitted within the EU, namely international trade, knowledge networks, migration and capital flows<sup>(42)</sup>.

#### Expanding international trade and supply chains

The continued opening of national markets to international trade and the expansion of value chains across borders should allow countries to further exploit their comparative advantages — with potential to increase upward convergence between countries. Nevertheless, such developments will also make national labour markets more sensitive to labour market conditions in their trading partners and to generate spill-over effects stemming from developments inside and outside the EU, thus calling for changes such as a stronger coordination of working conditions across the EU.

First, when markets are opened further, economic developments in the (main) trading partners impact more strongly domestically. Second, the further expansion of supply chains across borders facilitates the spread of technologies thereby strengthening upward convergence of productivity. Nevertheless, such

Chart 26: Employment share of employment in knowledge intensive services and manufacturing — 2012



Source: DG EMPL calculations based on Eurostat (htec\_emp\_nat2).

Notes: employment in knowledge-intensive services and high- and medium-high-technology manufacturing. UK is 2011 observation.

supply chains also increase countries' exposure to developments in the rest of the world and their sensitivity (both positively and negatively) to EU labour market conditions (see Elekdag and Muir (2013) for aspects relating to Germany, the Czech Republic, Hungary, Poland and the Slovak Republic).

#### Stronger knowledge diffusion across borders

Knowledge is expected to become an increasingly important driver of productivity growth and job creation in the future (see, European Commission, 2014a). Hence, fostering the diffusion of knowledge across borders may become a strong force in support of sustainable upward convergence through catching-up (see, for instance, Guerrieri et al., 2005).

Indeed, there are still major cross-country differences in the share of employment between knowledge intensive services and manufacturing, indicating a strong catch-up potential for the Member States that joined the EU in 2004 or later, as well as Portugal, Greece, Italy and Spain (see Chart 26).

Due care will have to be given to cross-border effects that may have an adverse impact on convergence. First, employees and employers do not always have the skills to use and apply (new) knowledge in an optimal way (see, for instance, Audretsch and Keilbach (2010))<sup>(43)</sup>. Second, depending on the nature of the activity, increasing returns in the accumulation of knowledge may lead to a stronger geographical pooling of highly skilled workers. Such agglomeration effects may however carry negative externalities for the countries/regions from which the high-skilled workers move<sup>(44)</sup>. On balance, there is a risk that such outcomes may weaken convergence across regions and countries.

Nevertheless, not all knowledge-intensive activities are subject to agglomeration effects, and further decreases in trade and transaction costs that strengthen the connectivity of agents with the outside world (such as the expansion of Trans-European networks) may put downward pressure on agglomeration effects (see, for instance, Baldwin et al., 2001). More importantly, efficient and effective use of public funds to boost local innovation capacity has the potential to remedy

<sup>(42)</sup> Although an analytical distinction will be made between four channels, due recognition will be given to possible interactions.

<sup>(43)</sup> In this context it is important to note that the private sector may underinvest in private research and innovation, as well as skill formation, while such outcomes may intensify if labour becomes more mobile.

<sup>(44)</sup> See, for instance, European Commission (2012), Chapter 6, and European Commission (2014) EU Employment and Social Situation Quarterly Review, June 2014, supplement on mobility.

such adverse developments. See, for instance, European Commission (2010).

### **Labour mobility can strengthen upward convergence**

Increased labour mobility means that, in principle, workers can move more easily from areas with a surplus of workers (and lower real wages) to areas with a shortage (and higher real wages). Significant immigration flows put downward pressure on real wages in host countries, while emigration flows put upward pressure on real wages in sending countries<sup>(45)</sup> — thereby strengthening convergence in earnings.

In addition, increased mobility of skilled workers can strengthen the diffusion of knowledge and has strong potential to promote upward convergence in productivity growth. Nevertheless, increased labour mobility runs the risk of agglomeration of knowledge-intensive industries and brain drain that may strengthen divergence (as discussed above). Hence, the coordination of synergies between policies that promote labour mobility and knowledge networks will continue to be an important policy challenge (at the European level) in the future (see also Section 3.2 below).

### **International capital flows: direct foreign and portfolio investment**

Domestic labour market conditions can also trigger cross-border effects via their impact on international capital flows. Foreign direct investment (FDI) from countries at the cutting edge of technology to lagging countries is expected to have a positive impact on employment and growth as well as on human capital formation in the destination country<sup>(46)</sup>. Increased dependency on FDI can however make the host country more vulnerable to sudden reductions in FDI flows, such as labour market shocks, with

consequential risks of a slowdown or halt of the convergence process. Furthermore, there is a risk that the diffusion of technology weakens firms' competitiveness in international markets, so that firms may decide to export rather than invest in production capacity in the other countries — with a potentially adverse impact on convergence (see, for instance, Fosfuri et al. (2001) and Kudo (1993)).

Finally, cross-border portfolio investment can be affected by the development of socioeconomic conditions, in particular by adverse developments in unemployment and income distribution. Firstly, low income earners are generally more affected, since their capacity to service debt may deteriorate more quickly than for other categories of the population. Secondly, as rising income inequality and unemployment affects domestic economic, social and political stability, the 'confidence' of portfolio investors may decrease and a higher risk premium demanded.

### **3.2.2. Cross-border transmission of domestic socio-economic developments in the economic cycle**

This section examines the cross-border effects stemming from domestic labour market adjustment in the face of a temporary shock. More specifically, the analysis in this section will look beyond the traditional macro-economic adjustment channels<sup>(47)</sup>, and identify socio-economic adjustment channels that may also affect the depth and persistence of the downturn. Such socio-economic channels include distributional effects, labour market hysteresis and interactions between labour and product markets (as discussed in the first part of this section). In turn, these socio-economic developments may generate cross-border effects via international trade and capital flows (as discussed in the second part of this section).

### **Domestic socioeconomic developments include...**

When a Member State of a currency union is hit by a temporary asymmetric negative demand shock, its economy will temporarily (but not necessarily only for a short period) deviate from its growth path, before it eventually returns to its original growth path<sup>(48)</sup>, at least in the absence of hysteresis effects, such as the erosion of employability of unemployed workers — as discussed below.

The cross-border effects will primarily be transmitted via the trade channel as the country's real effective exchange rate depreciates and its domestic absorption decreases<sup>(49)</sup>. While cross-border effects are transmitted through changes in average prices, wages and domestic income<sup>(50)</sup>, a full assessment of the adjustment process needs to also take account of the socioeconomic adjustment channels (in particular, distributional and labour market hysteresis effects) as well as other socioeconomic feedbacks.

### **...cyclical distributional effects...**

An adverse temporary asymmetric shock will not only affect total output and income, but can also intensify inequality resulting in important feedbacks to aggregate demand, employment and social cohesion along the following channels.

Firstly, job losses are likely to be disproportionately carried by the low-skilled since the hiring and firing costs of low-skilled workers are lower than those of the highly skilled (notably since the latter carry more valuable firm-specific human capital)<sup>(51)</sup>. Consequently, as the low-paid generally have an above average propensity to consume out of their incomes, aggregate demand will experience an additional downward push<sup>(52)</sup>.

<sup>(48)</sup> It should be noted that a similar argument can be made in the case of a temporary negative supply shock.

<sup>(49)</sup> If focusing only on macro-economic adjustment in labour markets, it would be beyond the scope of this chapter to examine also cyclical cross-border effects that arise from developments that are not directly related to labour market adjustment, such as developments in bond, money and product markets.

<sup>(50)</sup> In a currency union with irreversible nominal exchange and an absence of fiscal capacity.

<sup>(51)</sup> See, for example, Agénor (2001).

<sup>(52)</sup> To the extent that the related average propensity to consume will be higher than the average propensity to consume in the economy.

<sup>(45)</sup> See, for instance, European Commission (2012), Chapter 6, and European Commission (2014) EU Employment and Social Situation Quarterly Review, June 2014, supplement on mobility.

<sup>(46)</sup> See, for instance, [http://ec.europa.eu/research/social-sciences/pdf/labfdi-final-report\\_en.pdf](http://ec.europa.eu/research/social-sciences/pdf/labfdi-final-report_en.pdf)

<sup>(47)</sup> I.e. changes in average prices, wages, income, etc. (in a currency union with irreversible nominal exchange in the absence of a fiscal capacity). See, for example, De Grauwe (2014) for an analysis of traditional macro-economic adjustment channels.

Furthermore, if the downturn persists and entitlement to unemployment benefits expire after a certain period, reductions in unemployment benefit outlays will put additional downward pressure on aggregate demand as well as social cohesion.

Secondly, some additional adverse feedbacks arise from the financial markets, notably as liquidity<sup>(53)</sup> and credit constraints hinder households' borrowing and spending, with a view to smoothing their consumption over time, particularly at the lower end of the income distribution<sup>(54)</sup>.

### **... labour market hysteresis effects ...**

Once a negative demand shock disappears, the economy will start to revert towards equilibrium. However, several adverse labour market feedbacks may prevent a return to pre-shock levels of employment and output<sup>(55)</sup>.

Firstly, persistent spells of unemployment may erode the employability of unemployed persons as well as their earnings potential (for example: due to a loss of skills; decline in the motivation to look for a job; and stigmatisation in the eyes of potential employers). Cockx and Picchio (2013) — using Belgian panel data covering the labour market history of young people over the 1998–2002 period — report that, if job market entry

is delayed by one year, the probability of finding a job in the following two years falls from 60% to 16% for men and from 47% to 13% for women. Arulampalam (2001) — using UK data for the 1991–97 period — reports that unemployment carries a wage penalty of about 6% on re-entry in Britain and that, after three years, they are earning 14% less than if they had not been unemployed. Ball (2009) provides evidence from 20 developed countries that points to a degeneration of skills, a reduction in motivation to search for a job and stigmatisation when unemployment spells persist, while Edin and Gustavsson (2008) report similar results using Swedish data from two waves (1994 and 1998)<sup>(56)</sup>. On the other hand, when the job of the 'main breadwinner' becomes precarious, other members of the family may become more economically active — the 'added worker effect' — partly offsetting the initial hysteresis effects. See, for instance, European Commission (2013).

Secondly, apart from the direct labour market effects on the unemployed persons, such outcomes are also associated with adverse impacts on their health, as well as poorer academic performance and reduced earnings opportunities for their children — all of which have an adverse impact on potential output in the long run (see, for instance, Dao and Loungani (2010) and Bell and Blanchflower (2011)). However, adverse

developments in the labour market can translate into longer periods in education for cohorts who are about to enter the labour market.

Thirdly, the impact of a downturn on retirement decisions is twofold. On the one hand, when economic activity slows down and employers want to fire employees to meet the fall in activity, early retirement may be the preferred exit route. On the other hand, if the crisis has a strong adverse impact on their (financial) wealth, older workers may have a strong incentive to postpone their retirement. See, for instance, OECD (2010).

### **... and distorted product market feedbacks.**

The employment impact of a temporary asymmetric shock depends not only on the nature of the shock but also on the cyclical behaviour of prices and wages. To the extent that prices react to changes in nominal wages with a lag (i.e. pro-cyclical real wages) the domestic purchasing power of wage earners will decrease<sup>(57)</sup>, further deepening the downturn<sup>(58)</sup>. Chart 27 provides some empirical evidence<sup>(59)</sup> on the pass-through of changes in nominal wages (adjusted for productivity, i.e. nominal unit labour cost) to output prices in the euro area (see Box 3 and Annex for more technical details on the specification and estimation).

<sup>(53)</sup> Liquid assets (including cash and checking accounts) are vital to meet uncertain consumption needs. Liquidity constraints amplify business cycle volatility and have nonlinear effects on risk premia. See, for instance, Jaccard (2013).

<sup>(54)</sup> Furthermore, downward pressure on prices will increase both the real incomes but also the real value of debt and real interest rates affecting notably debtors, which can in turn, have a negative feedback on aggregate demand.

<sup>(55)</sup> Also see Blanchard and Summers 1986 for an analysis of the impact of an increase in the structural unemployment on employees' reservation wage and bargaining power, and real wages dynamics. See, for instance, Ball (2014) and Hall (2014) for an analysis of hysteresis effects that look beyond labour markets, including hysteresis in capital accumulation and total factor productivity. Haltmaier (2012) reports regression results covering 40 countries that indicate that the reduction in the capital-labour ratio as a result of lower investment is the main driver of declines in potential output. See also Summers and DeLong (2013).

<sup>(56)</sup> For more details on labour market hysteresis effects see, for example, European Commission (2013, Chapter 3).

<sup>(57)</sup> i.e. in absolute (via the real wage effect) and relative terms (via the labour income share effect which is equal to the real wage effect adjusted for productivity).

<sup>(58)</sup> Again, assuming that the marginal propensity to consume out of wage income is larger than the marginal propensity to consume out of capital income.

<sup>(59)</sup> Based on an econometric analysis using quarterly data for the Member States of the euro area over the 1995q1–2013q2 period.

**Box 3: Estimating the pass-through of changes in the nominal unit labour cost<sup>(1)</sup>**

The starting point of the empirical analysis is the assumption that in the long run output prices are in line with the nominal unit labour cost<sup>(2)</sup>. However, in markets characterised by imperfect competition and imperfect information, the output prices are not automatically fully aligned with nominal unit labour costs due to, inter alia, menu costs<sup>(3)</sup>, administered prices<sup>(4)</sup>, or backward-looking 'rule of thumb' price setting<sup>(5)</sup>. Moreover, the state of the business cycle (i.e. fluctuations in effective demand compared to potential output) may put demand-push inflationary pressures on prices<sup>(6)</sup>. Within such an economy, prices may over- or undershoot their equilibrium values in the short- to medium-run so that output prices will only converge gradually towards the nominal unit labour cost<sup>(7)</sup>.

Specifying these adjustment channels and regressing quarterly changes in output prices on a set of explanatory variables (including changes in the nominal unit labour cost, past price changes and past divergence between output price and nominal unit labour cost)<sup>(8)</sup>, yields estimates that are in line with the hypothesis that output prices adjust with a lag to changes in nominal unit labour costs. Subsequently, the point estimates can be used to project the path along which prices converge to the new equilibrium in response to changes in nominal unit labour cost (keeping all other factors constant) — as shown in Chart 27.

More particularly, Chart 27 shows the impact of an (exogenous shock in the) nominal unit labour cost after two quarters and then one, three, five and ten years — for the euro area Member States for which the data are available (for other Member States the dataset needed for the estimation is not available). It would be beyond the scope of this chapter to take into account feedbacks of changes in output prices and nominal unit labour cost on the rest of the economy, such as nominal interest rates, exchange rates, etc. Moreover, it should also be recognised that to the extent that the effects of cuts and increases in nominal unit labour cost are not symmetric in price adjustment, the simulated results in Chart 27 may overestimate the adjustment speed of prices.

<sup>(1)</sup> More technical details are to be found in Annex 1.

<sup>(2)</sup> More specifically, it is assumed that unit labour cost and price levels are co-integrated.

<sup>(3)</sup> See, for instance, Mankiw (1984).

<sup>(4)</sup> Which are in the short run not necessarily disciplined by market forces.

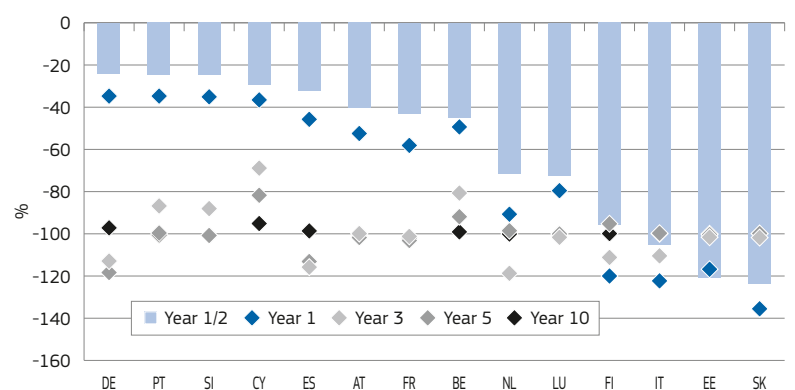
<sup>(5)</sup> See, for instance, Calvo (1983).

<sup>(6)</sup> As well as inflationary pressures on nominal unit labour cost via its impact on nominal wages and productivity — requiring the use of instrumental variables estimation techniques.

<sup>(7)</sup> Note that the analysis in this note is limited to the Member States of the euro area (for which the data are available). This section does not analyse the price level at the level of the euro area as a whole. At that level, the price level is aligned (in the long run) to developments in the supply of money and demand for real money balances.

<sup>(8)</sup> Using harmonised, seasonally and working-time adjusted, quarterly Eurostat data of the Member States for which the data are available, covering the 1995a1–2013q2 period, and applying instrumental variables estimation techniques.

**Chart 27: Adjustment path of output prices after a permanent cut in nominal unit labour cost — total economy**



Source: DG EMPL estimations using Eurostat data.

Notes: nominal unit labour cost is compensation per employee adjusted for productivity. No data available for IE and EL.

#### Box 4: Income distribution and international trade

In classical economic models, such as the Heckscher–Ohlin model, causality runs from international trade to factor income distribution. In assessing the impact of income distribution on international trade, a distinction has to be made between a scale and composition effect<sup>(1)</sup>.

The scale effect is related to differences in marginal propensity to spend income across the income quintiles<sup>(2)</sup>. As income earners in the lower quintiles have a higher marginal propensity to spend income, a re-distribution of income from low- to high-income earners will reduce aggregate demand, including imports. Moreover, when low-income earners face liquidity (or credit) constraints, cuts in their disposable income strengthen the fall in aggregate demand, including imports. The composition effect refers to the allocation of a budget across different goods and services — whereby a distinction has to be made between necessities<sup>(3)</sup> and luxuries<sup>(4)</sup>. A decrease in disposable income will decrease demand for luxuries and increase demand for necessities. Hence, when the home country and trading partners produce different types of goods, the change in income inequality will affect trade patterns.

The quantitative impact of these channels depends largely on the structural characteristics of the economies. It is beyond the scope of this chapter to investigate this in more detail, but Chart 28 provides some indicative evidence of strong differences in trade openness of the Member States of the euro area. As the Chart shows, for example, Greece has the lowest number of jobs (% of total business sector employment in the business sector) sustained by foreign final demand, while Ireland has the highest.

<sup>(1)</sup> Assuming separability of preferences, i.e. in a first stage it is decided how much to spend and how much to save, while in a second stage it is decided how the total spending will be allocated between the available goods and services. See, for instance, Deaton and Muellbauer (1986).

<sup>(2)</sup> See for instance Parker et al. (2013).

<sup>(3)</sup> Such as food and beverages which have a positive income elasticity below 1.

<sup>(4)</sup> Such as exotic travel which has an income elasticity above 1.

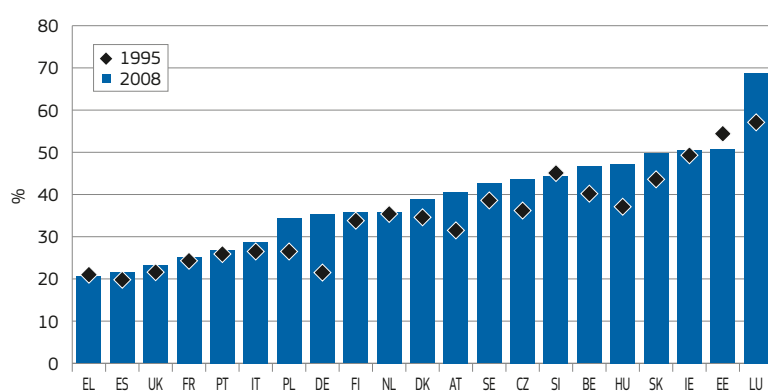
on impact, but returns to equilibrium rather quickly.

#### Transmission of domestic cyclical effects across borders

The socioeconomic adjustments in the face of a temporary asymmetric shock described above (distributional effects, hysteresis and product market feedbacks) will not only affect economic activity in the domestic country, but also the economies of its trading partners through channels such as international trade, capital flows and migration.

Furthermore, as a temporary asymmetric (negative demand) shock may increase income inequality, this will in turn also affect international trade (since demand elasticities vary between types of goods (e.g. luxuries or necessities), as well as between income levels, while countries often specialise in different categories of goods and services; see Box 4). In addition, gains in national price and cost competitiveness also translate into losses in competitiveness of trading partners which can affect a significant share of employment (see Chart 28), inducing a decrease in their exports and an increase in their imports.

Chart 28: Jobs in the business sector sustained by foreign final demand (% of total business sector employment)



Source: OECD.

Apart from these demand side effects, several adverse hysteresis feedbacks on the supply side have to be considered as well, including the possibility of a permanent productivity loss. Indeed, when the rise in income inequality persists after a temporary shock has waned, the domestic country may experience a permanent loss of productivity — which, in turn, has a permanent adverse impact on its trading partners by limiting their opportunities to exploit comparative advantages in world markets.

Furthermore, while international capital flows have the potential to stabilise an economy, these flows can be reduced if, for example, borrowers cannot provide sufficient collateral as a consequence of a shock and rising inequality.

Finally, rising labour flows in the face of an economic downturn can affect domestic wages which tend to start to rebound earlier (while domestic demand can be boosted via remittances from migrant workers), while at the same time, the increased supply of labour in the receiving country tends to put downward pressure on wages. However,

In short, the responsiveness of output prices to changes in nominal unit labour cost (at the level of the economy as a whole) appears to occur very slowly. This is seen to be especially the case in Germany, Portugal and Slovenia, and to a lesser extent in Cyprus and Spain. Such lag between price and nominal wage adjustment implies that real wages (i.e. nominal wage adjusted for prices) and hence the labour income

share will decrease, which may then trigger a further contraction in aggregate demand<sup>(60)</sup>. Nevertheless, the pro-cyclical nature of wages is not observed across all euro area Member States — in Slovakia, Estonia, Italy and Finland, price adjustment overshoots

<sup>(60)</sup> Provided the marginal propensity to consume out of labour incomes is larger than the marginal propensity to spend out of capital income.



hysteresis effects (such as changes in family life and commitments) make it difficult for some temporary workers to return to their home country once the shock has waned. Hence, given that it is usually younger, more dynamic workers who move and become permanent residents<sup>(61)</sup>, in the long run the productivity of the destination country would be expected to increase (relative to the home country), thereby hindering the process of convergence within the currency union.

### 3.2.3. Convergence also requires strengthened socioeconomic stability

Strengthening the capacity to stabilise national economies and implement appropriately designed structural reforms is a necessary requirement to ensure stronger employment and social resilience, and upward socioeconomic convergence, across the EU. In the EMU context, that central stabilisation capacity is currently weak: this serves as an argument for a reinforcement of the euro area fiscal stabilisation capacity. Furthermore, structural reforms could be incentivised by a discretionary fiscal capacity at the euro area level (which could, for instance, take the form of strengthened investment in cohesion funds).

Stabilisation is not only required in order to avoid labour market hysteresis effects, such as skill erosion following persistent unemployment spells (that may reduce long-term growth potential), but also because an economic downturn almost inevitably has social consequences since it tends to have its hardest impact on the most vulnerable groups (such as low skilled workers) with adverse impacts on social cohesion in the long run<sup>(62)</sup>.

The previous analysis has suggested that, in the face of nominal and real rigidities, macro-economic shocks may have a strong adverse impact on employment and social cohesion if adjustment is left solely to market mechanisms, with potentially adverse hysteresis and cross-border effects. Structural employment and social reforms (combined with other types of structural reforms) are key to strengthening countries' capacity

to absorb shocks (especially lasting shocks) and limiting adverse socio-economic outcomes and cross-border effects. Moreover, well-designed insurance mechanisms (such as automatic fiscal stabilisers) have the potential to make a significant contribution in terms of absorbing temporary asymmetric shocks, notably since the capacity may not always be available at the national level (especially when the countries concerned have limited access to financial markets).

In these respects, it can be argued that the effectiveness and sustainability of adjustment mechanisms in E(M)U depends on the nature of the shock. In the case of a temporary demand shock, automatic fiscal stabilisers (including unemployment benefits) can dampen the fluctuations (around predetermined trends) of economic activity (including real GDP). In case of a permanent supply shock, the growth trend itself will be affected rendering automatic fiscal stabilisers unsustainable in the long run. In this case, relative prices have to adjust or structural reforms have to be implemented in order to strengthen employment and labour productivity. However, adjustment to the new equilibrium is unlikely to occur immediately and nominal rigidities will impose an additional adjustment burden, including on the labour market. When this also generates labour market hysteresis effects, additional actions may be needed to smooth the adjustment process (see, DeLong and Summers (2012), Pissarides (2014)).

### 3.3. The contribution of employment and social policies to convergence in the EU

To what extent can reforms in labour market and social institutions at national and European level contribute to a strengthening of upward convergent growth across the EU and better stabilisation of the European economy?

In recent years, there have been strong calls for such reforms and the previous section argued that in a currency union, when adjustment is left to market mechanisms, the adverse socioeconomic impact of temporary asymmetric shocks are likely to be intensified (such as distributional and hysteresis effects) — risking lasting adverse effects on long-term growth.

In that context, reforms at both the national and EU levels could contribute to strengthening growth and convergence (see, for instance, Coeuré (2014) and Sapir and Wolff (2014)). In this respect, this section focuses specifically on employment and social policies and discusses their contribution at the national and the EU level to strengthening long-term growth and better stabilising national economies.

#### 3.3.1. Strengthening the contribution of national systems

At the national level, labour market and social protection reforms can strengthen the resilience of Member States and reduce the risk of shocks causing divergence, by a stronger contribution to growth and to stabilisation in the face of a temporary shock.

#### *Employment-friendly social policies and better prevention of scarring effects*

The design of national systems is essential to support employment and productivity growth. In particular, national employment and social protection systems should provide adequate protection against social risks as well as support to find a job, thus preventing long-lasting impacts of exclusion from the labour market and the long-term costs of shocks. They also support employment growth, notably by providing support to human capital formation, and ensuring the right incentives to work and hire.

Adequate protection against social risks includes protection for not only the active (through unemployment, disability, housing and exclusion benefits) and inactive population (through pensions and family services), but also the whole population through health benefits and services. In line with the Active Inclusion Strategy<sup>(63)</sup>, adequate and minimum income support measures should be considered, when necessary. Beyond their direct socioeconomic impact, if well designed, such services and benefits constitute an investment (see Chapter 1) and contribute to the prevention of scarring effects. Employment and social protection

<sup>(61)</sup> See, for instance, OECD (2014).

<sup>(62)</sup> Although it would have been beyond the scope of this chapter to focus also on price stability, financial stability and fiscal stability, possible interactions with labour markets have been briefly mentioned.

<sup>(63)</sup> Commission Recommendation of 3 October 2008 on the active inclusion of people excluded from the labour market (notified under document number C(2008) 5737), OJ L 307, 18.11.2008, pp. 11–14.

systems also need to adapt to long and short-term changes in labour markets, including more frequent unemployment spells, as well as increased segmentation (see Chapter 1).

Furthermore, employment and social protection systems support the preservation and accumulation of human capital, leading to higher employment and productivity growth. They contribute to a life-cycle approach of building and preserving human capital, with impacts on education systems, childcare services and post-education systems, notably vocational training and active labour market policies (see Chapter 2).

Employment and social protection systems should also provide the right incentives to work and hire. Attention needs to be given to inactivity traps, including linked to pensions, disability or early retirement schemes (see Chapter 1). The financing of employment and social protection systems can also be made more favourable to employment and growth, notably by broadening the financing base from wages towards other financing basis, as well as introducing some social contribution exemptions for certain categories of workers (notably the lower waged, as the employment elasticity to labour costs is higher). While some positive impact on employment can be expected when these measures are

well designed, they can have distributive impacts which need to be monitored (see Chapter 1).

Employment and social protection systems play a key role in stabilising aggregate demand. Unemployment benefits are particularly important and their stabilisation potential can be strengthened provided they can be made more responsive to cyclical developments (see Blanchard et al. 2010 and below, such as for instance unemployment benefit duration). Other aspects need to be considered, including short-time compensation systems and smoothing the price indexation of benefits, such as pensions, which are not directly linked to the active population.

### **Towards more efficient stabilisation at national level through better welfare systems**

In recent years, the contribution to the stabilisation of households' income through social protection expenditure was significant in 2009, but declined from mid-2010, reversed in 2012 and was negligible in 2013. <sup>(64)</sup> Actually, as indexation of social benefits is generally based upon the previous year's inflation, this leads to an increase in real terms of benefits in periods of declining inflation (such as periods of low growth), amplifying the stabilisation impact, with potentially sizeable budgetary impacts.

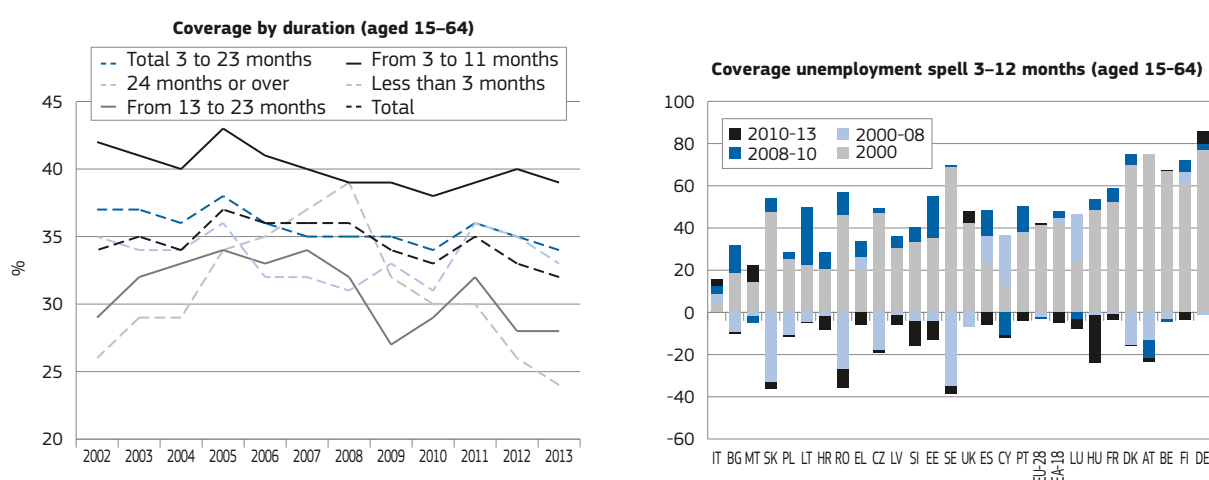
While this is understandable for the indexation of benefits that aim at replacing labour market incomes, it is unclear that it is the most efficient in terms of stabilisation for benefits which are less directly related to the labour market such as (taken up) pensions or to a lesser extent family benefits. For these benefits, indexation rules could be smoothed over the cycle, enabling to strengthen automatic stabilisers more directly linked to labour market developments (see also Chapter 1).

### **Unemployment insurance could be more sensitive to the business cycle ...**

The ability of unemployment insurance schemes to stabilise an economy depends largely on their design, notably in terms of eligibility conditions and duration. The coverage of unemployment spells of less than one year is particularly relevant and there were signs of weakening of coverage for periods of between 3 and 12 months in the crisis (Chart 30a), with declines in a number of Member States since 2010 (see Chart 30b, notably in Greece or Spain). Beyond 12 months, coverage has eroded in 2009 and then stabilised, but went on declining for the very long-term unemployment (more than 24 months).

Making unemployment benefits more sensitive to the business cycle could for

**Chart 29: Trends in unemployment coverage by duration in Europe (2000–13)**



Source: Eurostat, LFS, calculations DG EMPL.

Note: This measure of coverage of unemployment benefits does not reflect coverage by other types of benefits. Missing data for some: BG (2006–13), IE and HR (2004–13), LU (2002–13), MT (2005–13), NL and AT (2012), UK (2009–10). Breaks in series for: EE, PL and FI in 2000, BE, BG, ES, HU, PL and SE in 2001, LV, LT and RO in 2003, BG, FR, HR, LU, PL, RO and SK in 2004, all countries except SE in 2005, DE, ES, FR and HR in 2006, LV, LT, LU, FI and UK in 2007, BE, PL, FI and UK in 2008, EL, CY, LT and HU in 2009, PL in 2010, BE, BG, CZ, DE, PT and SK in 2011, DE in 2012, FR and AT in 2013.

<sup>(64)</sup> See European Commission (2014a) and European Employment and Social situation report, March 2014.

instance take the form of temporarily raising the duration (or coverage) of unemployment benefits<sup>(65)</sup>. Nevertheless, due regard needs to be paid to possible adverse feedbacks such as the impact on workers' behaviour with regard to job-search intensity and the readiness to accept job offers.

### **... and complemented by other instruments, such as short-time work compensation arrangements**

Well-designed short-time working arrangements can alleviate some negative employment and social outcomes during economic downturns. Such schemes, which are often the result of negotiations between employers and trade unions<sup>(66)</sup>, include temporary reductions in working time, while maintaining the existing contractual employer–employee relationship. This allows firms to avoid the costs of recruiting and training new workers<sup>(67)</sup> when demand recovers, and to distribute the adjustment more equitably across workers. However, such schemes are not without risks including possible dead-weight costs and delays in unavoidable restructuring that might prevent more productive firms from expanding (see, for instance, Cahuc 2014). Furthermore, alternatives may exist, such as working time accounts (see, for instance, Burda and Hunt (2011) and Möller (2010)).

### **3.3.2. Strengthening the contribution of EU employment and social policies to long-term growth**

National efforts to support employment and productivity growth could be complemented by EU employment and social policies, with three areas seen as particularly important: support for human capital formation, typically through structural funds; and the introduction of EU common labour market and social benchmarks.

Furthermore, the Blueprint mentioned Convergence and Competitiveness Instruments (or CCI) as steps to be considered in an initial phase of strengthening the EMU, which include contractual arrangements or solidarity mechanisms and financial support for the implementation

of reforms. While discussions concerning such mechanisms are expected to further progress in the near future<sup>(68)</sup>, it can be noted that possible associated provisions as regards labour market institutions and social protection systems could be supportive to long-term growth and convergence, though they are not likely to strengthen short-term economic stabilisation.

### **Fostering investments in human capital through European funds**

Proposals to increase the use of European funds to foster upwards convergence trends are rooted in early debates on the design of the EMU (see section 2.1). It remains however difficult to measure the contribution of structural and cohesion funds on convergence patterns in Europe (see e.g. Marzinotto, 2012)<sup>(69)</sup>.

The new legislative framework of the European Structural and Investment (ESI) Funds adopted in 2013 (including the ESF) puts a greater emphasis on ensuring that funding priorities better reflect the investment needs of human capital development and employment, social and public administration reform — notably through the introduction of a minimum ESF share (23.1% of cohesion policy resources). New provisions also provide for more effective and results-oriented use of the funds, such as making investments conditional on the fulfilment of ex-ante requirements. Furthermore, for the 2014–20 period, the Common Agricultural Policy provides for a policy framework, complementary to other EU policies, aiming at the maintenance of existing jobs, the reduction of seasonality fluctuations in employment and promotion of employment and growth in rural areas<sup>(70)</sup>.

<sup>(68)</sup> The December 2013 Council Conclusions [http://www.consilium.europa.eu/uedocs/cms\\_data/docs/pressdata/en/ec/140245.pdf](http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/140245.pdf) announced further work on the options for a 'solidarity mechanism' or a CCI.

<sup>(69)</sup> While macroeconomic estimates generally provide positive assessments as a result of sizeable productivity improvements, econometric assessments tend to be somewhat inconclusive. Nevertheless, the impact on GDP and employment appears more pronounced for Member States which are the main recipients of support, while the effect of funds continues to build up years after the programmes have ended (see e.g. European Commission, 2014b).

<sup>(70)</sup> Mutually reinforcing support measures, such as investments in local services and infrastructure to improve the quality of life and improve connectivity, training and knowledge transfer actions, research and innovation can effectively contribute to tackling the structural challenges in rural areas with long-term social benefits.

Looking forward, the above analysis suggests that in order to foster long-term growth, in particular in the regions most affected by adverse long-lasting developments, funds could further reinforce the focus on structural challenges, notably human capital formation. In this context several types of measures have been mentioned such as activation and training programmes or strengthening the administration of employment services, as well as training services and social benefits (see, for instance, Schmid 2014).

### **Common benchmarks supportive of inclusive growth**

The literature on EU common benchmarks or standards covers provisions that can contribute to more mobility and adaptability in the labour markets (such as Public Employment Services and active labour market policies or employment protection legislation) as well as to reducing scarring effects and avoiding social dumping (in fields such as wages, unemployment benefits and minimum incomes). Such EU-level common benchmarks or standards are generally seen to be common rules or principles which complement the EU's substantial experience in sharing good practice examples and encourage Member States to take them up.

Common benchmarks or standards have been proposed in the past, such as in a 1992 European Council recommendation<sup>(71)</sup> on common criteria concerning sufficient resources and social assistance in social protection systems<sup>(72)</sup>. More recently, this approach has been taken in the Youth Guarantee, with guidelines given to reach the desired outcomes for young people within four months and a related standard (ensure that No one stays 'NEET' for more than four months).

Looking forward, the above analysis suggests that common benchmarks can increase the effectiveness of national employment and social protection systems in reducing the lasting impacts of economic downturns. Several different types of proposals have been developed. The Youth Guarantee could be extended, as proposed by the incoming Commission President Juncker<sup>(73)</sup>, while others have proposed

<sup>(65)</sup> See, for instance, European Commission (2013a), Chapter 3, and Andersen (2014).

<sup>(66)</sup> See European Commission, Industrial Relations in Europe 2010, Chapter 3.

<sup>(67)</sup> See for instance, Balleer et al. (2014).

<sup>(71)</sup> 92/441/EEC.

<sup>(72)</sup> See, for instance, Frazer and Marlier (2009).

<sup>(73)</sup> See Juncker (2014).

to cover unemployment benefit and minimum income provisions. These could contribute to ensuring the provision of adequate income support during unemployment, backed by effective activation support, for instance through high levels of coverage of benefits (for instance, through minimum duration of unemployment benefits, levels of potential coverage of the employed population<sup>(74)</sup> and of access to active labour market policies). Other proposals have also been made in support of minimum income guarantees based on minimum levels of resources (possibly including incomes and assets), notably for child benefits<sup>(75)</sup>, as well as for pensions, all of which could also strengthen mobility and may also translate into transfers that could partially offset the potentially negative impacts of increased mobility on the sustainability of welfare systems.

A debate has also developed on the merits of common standards for minimum wages, typically expressed as a fraction of the median national wage<sup>(76)</sup>, based on the argument that well calibrated common standards of minimum wages would support the labour market income of the lowest paid workers, without entailing negative effects on unemployment<sup>(77)</sup>. It is argued that common minimum wage standards in the EMU (or EU) would help anchor national wage-setting systems and avoid countries being tempted to compete on low-paid, low-quality, low-productivity jobs, and risk social dumping, while they could also contribute to stronger stabilisation and possibly to some rebalancing of internal demand in countries where it is relatively weak.

These different types of benchmarks or standards, could contribute to 'a gradual and monitored process of structural convergence, ensuring all countries are well equipped to reap the full economic gain from their participation in the EMU' (Von Rompuy, 2014), notably

<sup>(74)</sup> See, for instance, ILO (2014), notably Annexes II and III.

<sup>(75)</sup> See, for instance Atkinson (2013), and Levy et al. (2013).

<sup>(76)</sup> See, for instance, the May 2013 French–German contribution for a stronger Europe of stability and Growth FR and DE and the interview of J.C. Juncker and M. Schultz on May 7<sup>th</sup> 2014 to *El País*, *La Stampa*, *Le Monde*, *Süddeutsche Zeitung* and *The Guardian*.

<sup>(77)</sup> See, for instance, Brischoux et al. (2014).

through promoting more adaptability in the labour markets, reducing scarring effects and avoiding social dumping.

### 3.3.3. Strengthening the contribution of EU employment and social policies to short-term stabilisation

The above analysis underlines that labour mobility remains low in Europe, notably in the euro area (see Section 2.1), and that a euro-area fiscal capacity would have the potential to smooth the adjustment path and mitigate adverse hysteresis effects following an asymmetric temporary shock (see Section 2.2).

The *Blueprint for a Deep and Genuine Economic and Monetary Union*<sup>(78)</sup> underlined that the creation of an EMU-wide fiscal capacity should be considered as a long-term step to improve the stabilisation of EMU economies, in particular in the case of asymmetric (temporary) shocks, as well as the need to proceed in parallel with a process of political integration.

#### Supporting labour mobility

Geographical labour mobility can bring substantial benefits to workers, as well as destination and origin countries, so long as potential negative side effects such as brain drain or the impact on the sustainability of public finances are monitored and addressed. The main driver of mobility between EU Member States is seen to be work opportunities<sup>(79)</sup>, which helps in explaining why mobility between euro area Member States has been limited<sup>(80)</sup>, while in contrast, the current significant differences in unemployment rates may increasingly act as a push factor<sup>(81)</sup><sup>(82)</sup>.

<sup>(78)</sup> See European Commission (2012b) and the mission letter of V. Dombroskis notably mentioning the pursuit of the 'work of the "Four Presidents' report" and the Commission Blueprint for a Deep and Genuine Economic and Monetary Union, integrating the social dimension'.

<sup>(79)</sup> Family reasons and the wish to study abroad also play a role, Eurostat (LFS, 2008 ad-hoc module).

<sup>(80)</sup> European Commission, ESDE 2013, Chapter 5, Box 3, p. 284.

<sup>(81)</sup> European Policy Centre, Making progress towards the completion of the single European labour market, Issue paper No 75, May 2013.

<sup>(82)</sup> While differences in welfare systems or regimes (i.e. restrictions during the transitional arrangements phase) appear to have limited influence on the direction and distribution of flows. See notably OECD (2012b).

Despite long-standing EU-wide policy actions, obstacles such as administrative, language and housing issues can still remain, while some obstacles addressed by EU policies on employment and social protection, such as improving job matching capacity across borders, coordination of social security schemes and mutual recognition of qualifications, can persist.

Looking forward, remaining obstacles to mobility and better mobility for EU citizens could be reduced, notably as regards the remaining barriers beyond language skills and housing regulations<sup>(83)</sup>, such as for instance in the area of social security coordination, but also as regards the improvement in matching cross-border employment policies, for example, improving the recognition of qualifications and implementing and enforcement EU laws in the fight against undeclared work.

#### Unemployment and fiscal capacity

Three forms of fiscal capacity linked to unemployment and providing additional short term stabilisation are most commonly discussed in academic circles (see Box 5)<sup>(84)</sup>:

- transfer systems (leading to budgetary flows in case of specific pre-determined circumstances);
- reinsurance systems (that provide national unemployment systems some reinsurance of their cyclical deficits);
- EMU-wide unemployment benefit systems (that partially pool fiscal risks of short-term unemployment changes).

To help plug the many gaps in the analysis of such supranational schemes (see Box 5), the European Commission has commissioned a study on the feasibility and added value of a European unemployment benefit scheme, following a

<sup>(83)</sup> As regards the simplification of housing regulations, see OECD (2012, 2014b).

<sup>(84)</sup> See, for instance, Bertelsmann Stiftung (2014) and Conference, *Economic shock absorbers for the Eurozone. Deepening the debate on automatic stabilizers* (2014). [http://www.bertelsmann-stiftung.de/cps/rde/xchg/SID-B776DEF6-96A5BBCD/bst\\_engl/hs.xml/nachrichten\\_121747.htm](http://www.bertelsmann-stiftung.de/cps/rde/xchg/SID-B776DEF6-96A5BBCD/bst_engl/hs.xml/nachrichten_121747.htm)

### Box 5: Three types of fiscal capacity strengthening short-term stabilisation

#### *Transfer mechanisms*

A transfer mechanism consists in net transfers to national budgets under specific circumstances, based on a trigger that identifies when a country is entitled to access resources from the supranational fund. Payments can be set at non-frequently ('high') or frequently reached ('low') trigger values. In the first case, the fund can be seen as a 'stormy day' fund, while the second is a 'rainy day' fund.

In such a mechanism, the choice of a trigger mechanism and its implementation is particularly important. The output gap of an economy (i.e. the difference between actual and potential GDP), is theoretically the best approximation of its cyclical position and is therefore often considered as a trigger. However, it is difficult to measure and can only be definitively established a few years later<sup>(1)</sup>. Using an output-gap based trigger can thus lead to inappropriate triggering due to revisions. Available estimates indicate that using real-time estimates would significantly reduce (nearly halve) the stabilising impact, compared to actual estimates available ex-post after revisions<sup>(2)</sup>. Directly observable indicators, such as the unemployment rate, are not prone to significant revisions.

Furthermore, there may be significant delays in implementation, which can result in lower stabilisation impact<sup>(3)</sup>. The stabilisation impact of transfer mechanisms is also most likely to be effective in so far as the corresponding funds have a strong stabilisation impact, such as unemployment benefits (which support a population with a high propensity to consume income).

#### *Reinsurance mechanisms*

In reinsurance mechanisms, Member States pay a contribution into a supranational unemployment reinsurance scheme ('fund'), which pays out to the Member State's unemployment system in cases of shocks. Setting a trigger raises the same type of concerns as with transfer mechanisms.

As the payouts are earmarked for national UBS, a strong stabilisation impact is generally expected. As almost by definition, reinsurance comes with experience rating and as long as contributions and payouts can be balanced over time, there may not be a need to have a claw-back mechanism or to issue debt. However, the estimation of the levels of contributions needed is a serious challenge for 'stormy day' funds, since it is particularly difficult to foresee significant shocks.

Beblavý et al. (2014) present simulations of a reinsurance system for the EU as a whole with payments triggered by deviations in the short-term unemployment rate from its 10-year average. National contributions depend on the scheme's overall holdings and the Member State's balance within the scheme. Simulations over the period 2000–12 show that, on the basis of a small average contribution, the system would have provided a large degree of shock absorption (assuming a fiscal multiplier of 1.5 for unemployment benefits).

#### *European unemployment insurance mechanisms*

European unemployment insurance mechanisms operate permanently and partially pool fiscal risks of short-term unemployment changes, through a mechanism which can also be of a reinsurance type (a 'rainy day' fund working for all types of shocks), potentially requiring only small changes to national systems. Such schemes could also contribute to better labour mobility.

It is generally assumed that such a supranational scheme would remain complementary to national schemes (which could keep extending beyond the common provision according to national preferences) and focus exclusively on short-term unemployment (leaving the task of tackling long-term unemployment to national policies). In practice, however, it is not straightforward to determine a 'common core' of national unemployment benefit systems given the large differences between EU Member States<sup>(4)</sup> and there is a wide range of options from basic conditions generally reached by national systems, to more stringent conditions. This type of mechanism does not rely on a trigger (since its operation reflects changes in the number of unemployed eligible), minimising implementation delays and thus maximising the stabilisation impact. Earmarking for unemployment benefits is generally assumed to translate into a strong stabilisation effect. Implementation risks include moral hazard linked to the possible changes of Member States' activation efforts or a loosening of the supervision of eligibility conditions<sup>(5)</sup>. The introduction of an EMU-level scheme may be accompanied by minimum requirements in national activation efforts, while further mechanisms to minimise moral hazard and avoid lasting transfers include experience rating and claw-back mechanisms<sup>(6)</sup>.

Most available studies assume a borrowing facility and provide estimates of substantial stabilisation for a reasonably sized system (see, for example, Dullien 2013), while simulations of claw-back mechanisms (such as Dullien 2014) suggest that the risk of lasting transfers could be limited to the cost of only a limited loss of stabilisation. Studies based on micro-simulation<sup>(7)</sup> also find a significant level of stabilisation, while it is likely that experience ratings and/or claw-back mechanisms would be needed to avoid some lasting net transfers. More analysis is however needed since there remain uncertainties notably on the number of eligible persons due to relatively scarce EMU-wide disaggregated information on employment histories.

<sup>(1)</sup> See, for example, Kempkes (2012).

<sup>(2)</sup> See, for instance, Enderlein et al. (2013) and Carnot et al. (2014).

<sup>(3)</sup> Such delays can typically arise from the time needed to observe the trigger and the time needed to authorise the trigger mechanism to operate.

<sup>(4)</sup> Though in general, differences between euro-area Member States are smaller (see Esser et al. (2013)).

<sup>(5)</sup> See for instance Vandenbroucke and Luigjes (2014).

<sup>(6)</sup> As well as the variety in the way unemployment benefits are considered for the eligibility and calculation of other benefits. Such mechanisms also deal with the issue of the variety of the taxation treatments of benefits, since these are then reflected in the levels of national contributions.

<sup>(7)</sup> See Dolls et al. (2014) and Jara and Sutherland (2014).

### Box 6: The American unemployment benefit system mixes different features

The unemployment system in the United States combines a first layer of common unemployment benefit system type with very loose harmonisation criteria, a second layer of reinsurance type for big shocks, and a discretionary supplementary scheme. While the common unemployment benefit system is automatically activated by unemployment, this is not the case for the other two programmes.

1) The regular Unemployment Compensation (UC) programme. It is a partnership between the federal government and the States. In general, it provides unemployment benefits to workers who are unemployed 'through No fault of their own', and meet other eligibility requirements of State law. In most States, workers are eligible for a maximum of 26 weeks. Each State administers its own programme within guidelines established by federal law and has, within certain bounds, discretion in terms of eligibility, benefit amounts and benefit duration.

2) The Emergency Unemployment Compensation (EUC) programme, which is an example of Temporal Federal Benefits (TFB). These are paid under conditions set by emergency federal legislation in the case of a recession (see also Vroman 2010).

3) The Extended Benefits (EB) scheme, which was put in place in 1970 and extends the duration of benefits in periods of economic difficulties. This programme is permanent, but benefits can only be paid if a trigger related to the unemployment rate is 'on' in a given State. In these States, only the unemployed who have exhausted their (regular) UC and EUC benefits can receive these EB.

In the regular unemployment compensation, States have an individual State account at the federal unemployment trust fund. States are supposed to levy taxes on (mainly) employers to build up balances in their account during periods of healthy economic growth, and then draw down those balances to provide UB during downturns. States can draw on their accounts so much as to go into deficit. However, States are required to fully repay the loans, with interest, within two years of borrowing the funds. If a state does not repay the full amount, the federal government will recoup its funds by raising the federal payroll tax rate for the State each year until the loan is repaid. This increase is automatically triggered. This mechanism helps avoid permanent transfers for individual States for the regular (UC) benefits.

Pilot Project launched by the European Parliament<sup>(85)</sup>.

Key design issues in such systems include the choice of indicator that can serve to link to national unemployment systems, and the mechanisms to guard against moral hazard or lasting transfers. Such mechanisms to avoid lasting net transfers can be conceived ex-ante ('experience rating') or ex-post ('claw-back') and could be applied separately or jointly. The ex-ante form is called 'experience rating' and consists in using contribution rates to the supranational fund which vary by Member State. The differentiation can be made in function of the recent history in terms of payments made by the supranational fund to the Member State (or another variable). Rates are automatically updated at a regular interval. The ex-post form is called 'claw-back' and the Member State's contribution rate to the supranational fund is adjusted in function of the national balance (of contributions

and pay-outs) with the supranational fund, with a rule for automatic updating over time.

Such systems can be conceived to stabilise both geographically (e.g. across Member States) and over time, thereby allowing for the accumulation of reserves and temporary deficits, which could substantially increase their stabilising impact. Furthermore, a fiscal capacity of either form could be linked to some minimum requirements on labour market or social systems by, for instance, linking it to a commitment to undertake structural reforms and/or other activation policies.

Furthermore, it can be noted that the current United States unemployment system actually mixes these different features (see Box 6), with estimates of the stabilisation provided during a recession ranging between 15% and 30% of the initial drop in GDP (see Chimerine et al. (1999) as well as Vroman (2010))<sup>(86)</sup>.

## 4. CONCLUSION

### *Addressing socioeconomic divergences in Europe requires ...*

The convergence in terms of economic and social performance that had been under way across the EU over the past two decades came to a halt with the crisis, and reversed strongly in the case of employment and unemployment rates. This particularly reflected the adverse impact of the crisis on Southern and peripheral EU-15 Member States, while convergence did continue for most of the Member States that joined the EU in 2004 or later.

These developments reflected both the exceptional size of the crisis but also the underlying structural imbalances that had become apparent in some Member States in the run-up to the crisis (such as weak productivity growth and divergent nominal unit labour cost

<sup>(85)</sup> See Call for Tenders VT/2014/045, <http://ec.europa.eu/social/main.jsp?catId=624&langId=en&callId=414&furtherCalls=yes>

<sup>(86)</sup> See for instance European Commission (2013c).

growth) as well as the absence of a fiscal capacity at EMU level that would help to stabilise national economies in the face of asymmetric temporary shocks.

In that respect it has become clear that the further integration of the national economies that is going to occur in the future is likely to strengthen cross-border economic relationships between EU Member States, which, while improving their overall productivity performance through specialisation and competition, will, for countries in the euro area, limit their capacity to stabilise their national economy and promote sustainable growth in the face of asymmetric shocks.

In this context, the ongoing debate continues regarding the most appropriate ways to complement the ambitious reforms already undertaken with further reforms aiming to create a euro area banking union, deepening the fiscal and economic union, strengthening its social dimension, and creating a genuine political union (see, for instance, European Commission 2012).

In this process it has become increasingly clear that there is a need to look beyond the traditional macro-economic

adjustment channels and consider changes in socioeconomic factors and cross-border effects (both stemming from labour markets) that may influence the depth and persistence of an economic downturn, as well as the adjustment capacity of any given economy. The analysis suggests in particular that in a monetary union, in the face of nominal and real rigidities, macro-economic shocks may have a strong adverse impact on employment and social cohesion if adjustment is left solely to market mechanisms, with potentially adverse hysteresis and cross-border effects.

### **... a strengthening of national reforms and of the socioeconomic dimension of European cooperation**

Actions at both the national and European level can foster stronger upward socioeconomic convergence in the EU.

In particular, reforms in national-level employment and social protection systems can make them more responsive to the economic cycle and thereby contribute to the stabilisation of aggregate demand in the face of a temporary shock, while strengthening convergence and mitigating adverse labour market hysteresis effects. There is also

still much room to improve employment and productivity growth, notably by supporting human capital development and providing the right incentives for employment growth.

At the European level, a range of specific proposals are being discussed in the public domain in order to speed up and strengthen the return to a path of long-term convergence, notably including: strengthening mobility; investing in human capital; and introducing more common benchmarks. In a long-term perspective, a well-designed fiscal capacity at the level of the EMU could be particularly effective, especially when combined with other wide-ranging structural reforms.

The incoming European Commission President Juncker announced his intention to promote initiatives to deepen the EMU, including proposals to encourage further structural reforms, if necessary through additional financial incentives and targeted fiscal capacity at the euro-area level<sup>(87)</sup>. For the longer term, to restore convergence, the Blueprint for a Deep and Genuine Economic and Monetary Union<sup>(88)</sup> considered the creation of an EMU-wide fiscal capacity with an unemployment based system as an option.

<sup>(87)</sup> See Juncker (2014).

<sup>(88)</sup> See European Commission (2012b) and the mission letter of V. Dombroskis notably mentioning the pursuit of the 'work of the "Four Presidents' report" and the Commission Blueprint for a Deep and Genuine Economic and Monetary Union, integrating the social dimension'.

## ANNEX 1: PRICE DYNAMICS IN THE EURO AREA

This Annex examines empirically the pass-through of changes in nominal compensation per employee (adjusted for labour productivity) to output prices in the euro area. First, the transmission mechanisms will be specified, next the data will be discussed followed by a brief presentation of the empirical results.

### Specification

A composite good is produced of which the equilibrium price is determined by the marginal production cost, PMC. However, prices adjust only slowly due to menu costs, administered prices, or backward-looking 'rule of thumb' price setting behaviour. Moreover, calculating the marginal cost and adjusting prices involves a cost that may exceed the potential gain. As a consequence, prices are adjusted for only  $x$  percent of the composite good. In that case the price at moment  $t$  is set as

$$\log(P_t) = (1-x)\log(P_{t-1}) + x \log(P_{Rt}) \quad (\text{A.1})$$

with

$P_t$ : the price at  $t$

$P_{Rt}$ : the new price of the part that undergoes a price change

$x$ : the share of the composite good that undergoes a price change.

with  $0 \leq x \leq 1$  and  $\log(\cdot)$  the natural logarithm operator.

However, not all information is available to calculate the marginal production cost. As a consequence, part of the prices that are revised are set following a 'rule of thumb' rule while the other part is set based on marginal costs, i.e.

$$\log(P_{Rt}) = y \log(P_{MCt}) + (1-y) \log(P_{Bt}) \quad (\text{A.2})$$

with

$P_{Rt}$ : the new price of the part that undergoes a price change

$P_{MCt}$ : the marginal cost

$P_{Bt}$ : the 'rule of thumb' price

$y$ : the share of the revised prices set along marginal cost calculation

with

$$0 \leq y \leq 1$$

The 'rule of thumb' for price changes is driven by an extrapolation of past inflation developments and adjustment to differences between prices and marginal costs in the previous year (that are known at moment  $t$ ), i.e.

$$\log(P_{Bt}/P_{Bt-1}) = z_1 \log(P_{t-1}/P_{t-2}) + z_2 \log(P_{MCt-1} / P_{t-1}) \quad (\text{A.3})$$

Taking finite differences of equations (A.1) and (A.2) yields

$$\log(P_t/P_{t-1}) = (1-x)\log(P_{t-1}/P_{t-2}) + x \log(P_{Rt}/P_{Rt-1}) \quad (\text{A.4})$$

$$\log(P_{Rt}/P_{Rt-1}) = y \log(P_{MCt}/P_{MCt-1}) + (1-y) \log(P_{Bt}/P_{Bt-1}) \quad (\text{A.5})$$

Inserting (A.3) into (A.5) yields

$$\log(P_{Rt}/P_{Rt-1}) = y \log(P_{MCt}/P_{MCt-1}) + (1-y) [z_1 \log(P_{t-1}/P_{t-2}) + z_2 \log(P_{MCt-1} / P_{t-1})] \quad (\text{A.6})$$

Inserting (A.6) into (A.4) yields

$$\log(P_t/P_{t-1}) = (1-x+x z_1 - x y z_1) \log(P_{t-1}/P_{t-2}) + x y \log(P_{MCt}/P_{MCt-1}) + x (1-y) z_2 \log(P_{MCt-1}/P_{t-1}) \quad (\text{A.7})$$

or on collecting terms

$$\log(P_t/P_{t-1}) = (1-x+x z_1 - x y z_1) \log(P_{t-1}/P_{t-2}) + x y \log(P_{MCt}/P_{MCt-1}) + x (1-y) z_2 \log(P_{MCt-1}/P_{t-1}) \quad (\text{A.7})$$

Finally, the production cost function (assuming a homothetic production function) read as

$$\log(P_{MCt}) = g_1 \log(W_t / \text{PROD\_L}_t) + g_2 \log(PX_t / \text{PROD\_X}_t) \quad (\text{A.8})$$

with

$W$ : nominal compensation per employee

$\text{PROD\_L}$ : labour productivity

$PX$ : price of other production factors

$\text{PROD\_X}$ : productivity of other production factors.



Inserting equation (A.8) into (A.7) and adding a term MU to capture a price mark-up, yields an equation that can be estimated as

$$\log(P_t/P_{t-1}) = a \log(P_{t-1}/P_{t-2}) + b \log(NULC_t/NULC_{t-1}) + e \log[(P_{Xt}/PROD_{Xt}) / ((P_{Xt-1}/PROD_{Xt-1})) + f \log(P_{MCt-1} / P_{t-1}) + g MU_t + constant \quad (A.9)$$

with

$$a = (1-x+y)z_1 - x y z_1$$

$$b = x y g_1$$

$$e = x y g_2$$

$$f = x (1-y) z_2$$

### Towards empirical application

The empirical analysis is based on harmonised, seasonally-adjusted and working-time adjusted, quarterly Eurostat data. The business cycle effect is measured by fluctuations in national gross domestic product<sup>(89)</sup>. Prices as well as gross value added are net of indirect taxes and subsidies. The sample size runs from 1995q1 until 2013q2. Quarterly changes are measured compared to the same quarter in the previous year. Due to limited availability of quarterly data, the price of oil is the only other factor cost that has been taken into account in the regression. Equation (A.9) has been estimated using the Engle-Granger Two-Step estimation procedure. First, the error correction term ERT (=log(P<sub>MCt-1</sub> / P<sub>t-1</sub>)) is estimated. Next, the error correction mechanism (as specified in equation A.9) is estimated for each of the Member States of the euro area for which quarterly data are available (i.e. all Member States excluding Ireland, Greece and Malta). Implicitly the constant term in the regression covers variables that can drive a (permanent) discrepancy between prices and nominal unit labour cost, but for which No quarterly data are available.

### Point estimates

Instrumental variables estimation techniques have been used to avoid potential simultaneity biases. Estimation results are shown in Table 1. Point estimates in bold with t-values below. All significant point estimates have the expected sign.

Table A.1: Estimation results — total economy

	Lagged inflation	Nominal unit labour cost	Output	ERT	Price of oil	Constant	Euro dummy		R-squared	Durbin-Watson
<b>BE</b>	<b>0.28</b> 1.87	<b>0.15</b> 2.93	<b>0.28</b> 3.56	<b>-0.24</b> -3.21	<b>0.00</b> -0.53	<b>0.01</b> 3.38			<b>0.56</b>	<b>1.50</b>
<b>DE</b>	<b>0.79</b> 9.87	<b>0.04</b> 1.02	<b>0.02</b> 0.52	<b>-0.14</b> -2.33	<b>0.00</b> -1.31	<b>0.00</b> 2.23			<b>0.72</b>	<b>1.83</b>
<b>EE</b>	<b>-0.18</b> -2.18	<b>0.69</b> 13.4	<b>0.31</b> 10.46	<b>-0.63</b> -8.11	<b>0.01</b> 2.04	<b>0.00</b> 1.65	<b>0.00</b> 1.15		<b>0.92</b>	<b>1.98</b>
<b>ES</b>	<b>0.75</b> 6.06	<b>0.10</b> 1.15	<b>0.11</b> 1.5	<b>-0.13</b> -1.31	<b>0.00</b> 0.41	<b>0.00</b> 0.84			<b>0.88</b>	<b>2.09</b>
<b>FR</b>	<b>0.68</b> 7.43	<b>0.29</b> 2.91	<b>0.21</b> 3.63	<b>-0.03</b> -0.3	<b>0.00</b> -1.12	<b>0.00</b> -1.3			<b>0.84</b>	<b>1.26</b>
<b>IT</b>	<b>0.40</b> 4.45	<b>0.47</b> 7.03	<b>0.15</b> 2.98	<b>-0.41</b> -2.93	<b>-0.01</b> -1.47	<b>0.00</b> 0.68			<b>0.77</b>	<b>1.42</b>
<b>CY</b>	<b>0.52</b> 2.76	<b>0.13</b> 3.58	<b>0.17</b> 1.63	<b>-0.10</b> -1.7	<b>0.01</b> 2.18	<b>0.00</b> 0.59	<b>0.01</b> 1.7		<b>0.72</b>	<b>1.76</b>
<b>LU</b>	<b>0.28</b> 2.29	<b>0.07</b> 0.29	<b>0.22</b> 0.86	<b>-0.56</b> -3.98	<b>0.03</b> 1.84	<b>0.01</b> 0.98			<b>0.41</b>	<b>1.62</b>
<b>NL</b>	<b>0.57</b> 4.88	<b>0.26</b> 2.48	<b>0.21</b> 2.7	<b>-0.29</b> -3.37	<b>0.01</b> 1.18	<b>0.00</b> -0.17			<b>0.81</b>	<b>1.66</b>
<b>AT</b>	<b>0.61</b> 6.69	<b>0.15</b> 4.2	<b>0.13</b> 3.69	<b>-0.16</b> -4.29	<b>0.00</b> 0.62	<b>0.00</b> 1.59			<b>0.72</b>	<b>1.10</b>
<b>PT</b>	<b>0.73</b> 7.26	<b>0.10</b> 2.19	<b>0.05</b> 0.73	<b>-0.08</b> -0.94	<b>0.00</b> -1.11	<b>0.00</b> 1.82			<b>0.90</b>	<b>1.34</b>
<b>SI</b>	<b>0.75</b> 8.47	<b>0.11</b> 1.61	<b>0.17</b> 4.00	<b>-0.07</b> -1.10	<b>-0.01</b> -2.56	<b>0.00</b> -0.12	<b>0.00</b> 0.76		<b>0.93</b>	<b>1.56</b>
<b>SK</b>	<b>0.27</b> 2.27	<b>0.49</b> 3.71	<b>0.35</b> 2.12	<b>-0.60</b> -4.39	<b>0.00</b> 0.06	<b>-0.01</b> -0.43	<b>-0.01</b> -0.47		<b>0.61</b>	<b>1.65</b>
<b>FI</b>	<b>0.54</b> 6.42	<b>0.34</b> 4.99	<b>0.20</b> 3.52	<b>-0.41</b> -3.9	<b>0.00</b> 0.06	<b>0.00</b> -1.89			<b>0.76</b>	<b>1.96</b>

Source: DG EMPL estimates using Eurostat data; sample 1995Q1–2013Q2.

Note: Point estimates in bold, t-values below.

<sup>(89)</sup> A better measure would have been the output gap. However, as quarterly data are used, such data are not readily available.

## ANNEX 2: MEMBER STATES' OVERALL CAPACITY TO PROMOTE PRODUCTIVITY GROWTH: 2013–14 RANKING

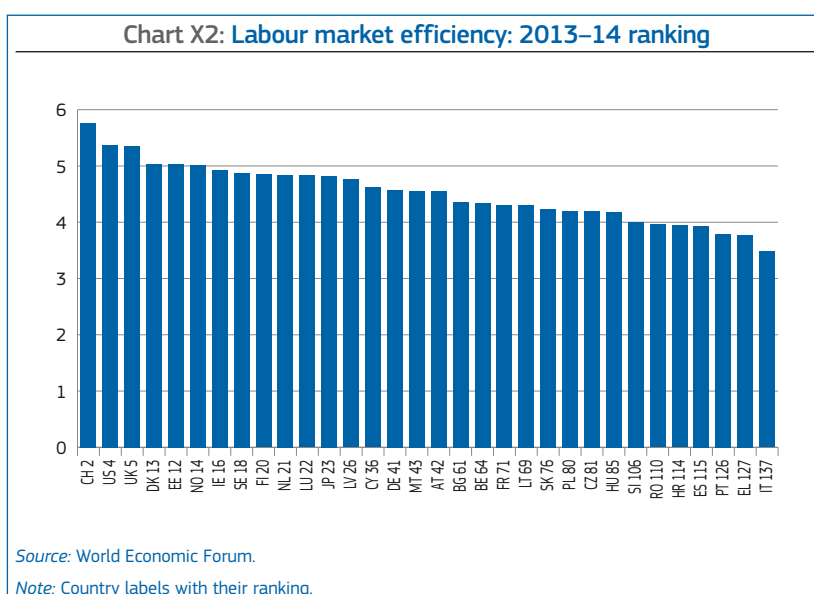
### Capacity to promote productivity

The 'competitiveness indicator' <sup>(90)</sup> of the World Economic Forum provides a benchmark to assess a country's capacity to promote productivity growth that underpins strong sustainable inclusive growth. It aggregates a broad set of indicators that covers a country's institutions, infrastructure, macro-economic environment, technological readiness, and capacity to innovate. See World Economic Forum (2014) for more details.

Chart X1 shows how the EU Member States compare to each other (as well as to the US, Japan, Norway and Switzerland) in terms of their capacity to promote productivity growth. Among the EU Member States, the Nordic Member States as well as Germany, the Netherlands and the United Kingdom show the strongest capacity to promote productivity growth (and they are also among the top performers in the world), while most Member States that joined the EU in 2004 or later, as well as Greece, Portugal and Italy, showed the weakest capacity to promote productivity.

### Labour market efficiency

One of the dimensions to assess a country's 'competitiveness' is its labour market efficiency, which captures, inter alia, the flexibility and cost at which labour



can be reallocated, wage flexibility, incentives to perform on the job, barriers to entry and gender balance.

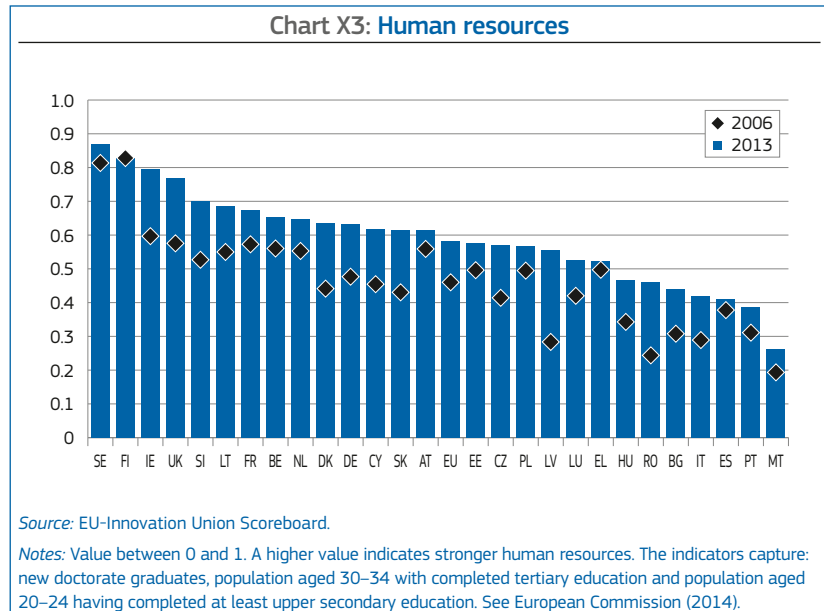
Chart X2 shows that there are some notable differences across EU Member

States. Strong labour market efficiency is to be found in the United Kingdom, Denmark, Estonia, Ireland, Sweden and Finland, while the weakest form of flexibility is to be found in Italy, Greece, Portugal, Spain, Croatia and Romania.

<sup>(90)</sup> Such indicators should not be confused with indicators that measure enterprises' competitiveness. At the level of countries, international trade is about a mutually beneficial exchange in which a country specialises in the production of goods and services for which it has a comparative advantage. In other words, international trade provides a country (as well as its trading partner) the opportunity to improve its production efficiency, thereby also improving its national productivity level — see, for instance, Krugman (1994).

### Human resource potential

Finally, Chart X3 shows developments in human resources across EU Member States for 2006 and 2013<sup>(91)</sup> — based on the EU-Innovation Union Scoreboard. In 2013, Sweden, Finland, Ireland and the United Kingdom scored best, while Malta, Portugal, Spain and Italy scored worst. Nevertheless, several Member States recorded notable increases between 2006 and 2013, including Ireland, the United Kingdom, Denmark, Slovenia and Romania. See European Commission (2014) for more details.



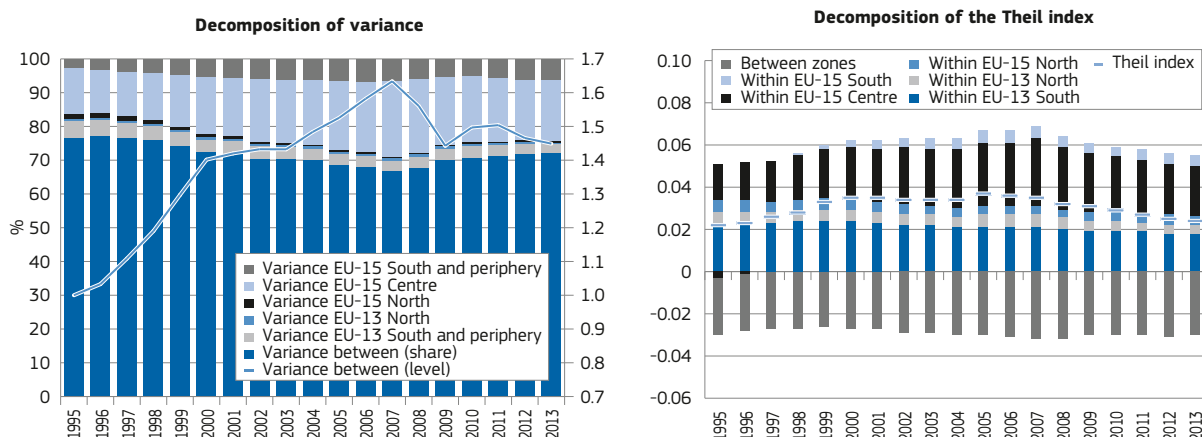
<sup>(91)</sup> i.e. a measure of the availability of a highly skilled and educated workforce which is one of the three dimensions of a country's innovation capacity. See European Commission (2014) at [http://ec.europa.eu/enterprise/policies/innovation/files/ius/ius-2014\\_en.pdf](http://ec.europa.eu/enterprise/policies/innovation/files/ius/ius-2014_en.pdf).

## ANNEX 3: BETWEEN AND WITHIN ZONES CONVERGENCE

This Annex provides detailed information on the relative contribution of between zones and within zones trends in dispersion to the overall dispersion trend in the EU as a complement to section 1. For this purpose, two decomposition methods are used, one the one side the standard decomposition of variance and on the other side the decomposition of the Theil index.

### GDP per capita

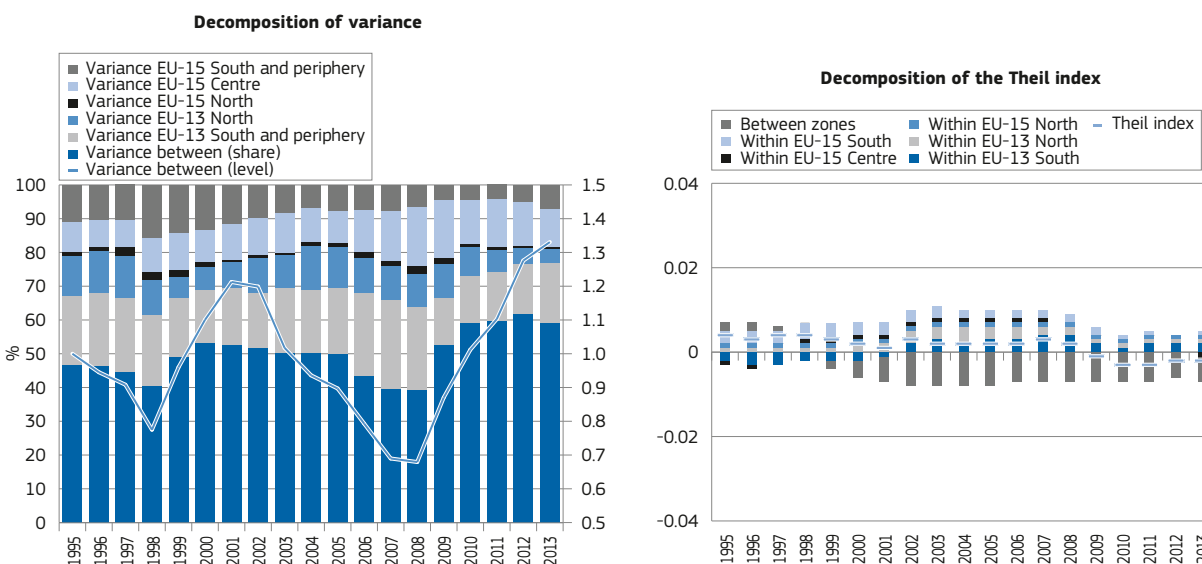
Chart 30: Between and within zones contributions to GDPpc dispersion in the EU (1995–2013)



Source: Eurostat, calculations DG EMPL.

Notes: Calculations based on GDP in real terms, in euros. Between and within contributions to total variance are based on unweighted averages by zone, while the Theil index is based on weighted averages (including the EU-28 weighted average). Some missing values in the beginning of the period were kept constant for the calculation of dispersion and averages: BG, EE, HR, CY, MT (1995–99), LV (1995–98), EL, LT, SK (1995–97), PL, RO (1995–96), HU, SI (1995).

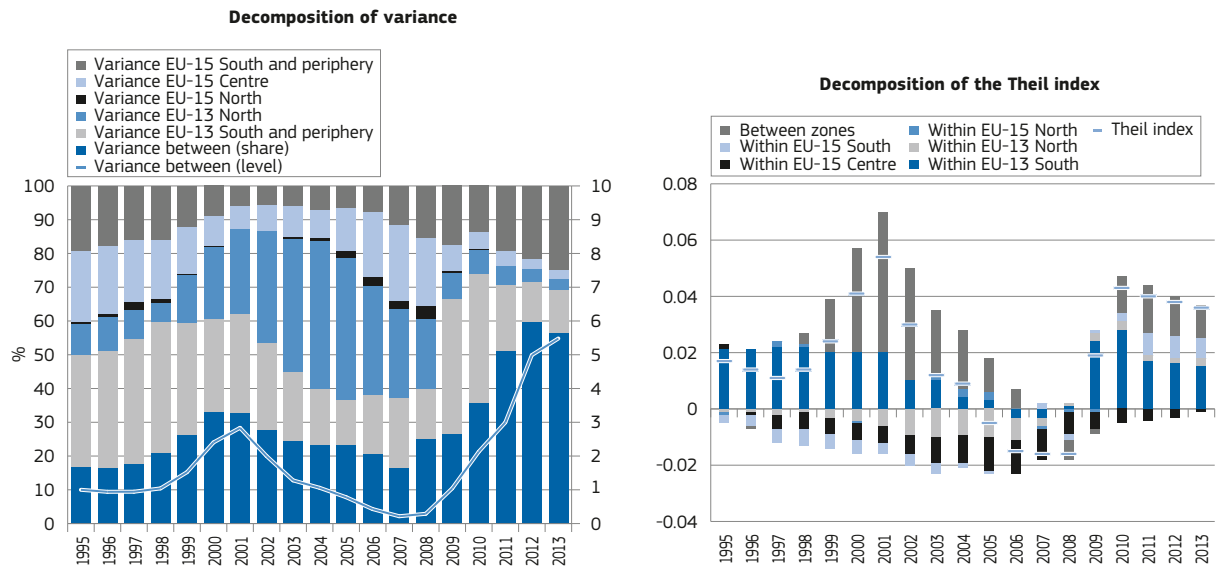
Chart 31: Between and within zones contributions to ER dispersion in the EU (1995–2013)



Source: Eurostat, calculations DG EMPL.

Notes: Between and within contributions to total variance are based on unweighted averages by zone, while the Theil index is based on weighted averages (including the EU-28 weighted average). Some missing values in the beginning of the period were kept constant for the calculation of dispersion and averages: HR (1995–01), BG, MT (1995–99), CY (1995–98), LT, LV, SK (1995–97), CZ, EE, PL, RO (1995–96), HU, SI (1995), AT, FI, SE (1990–94).

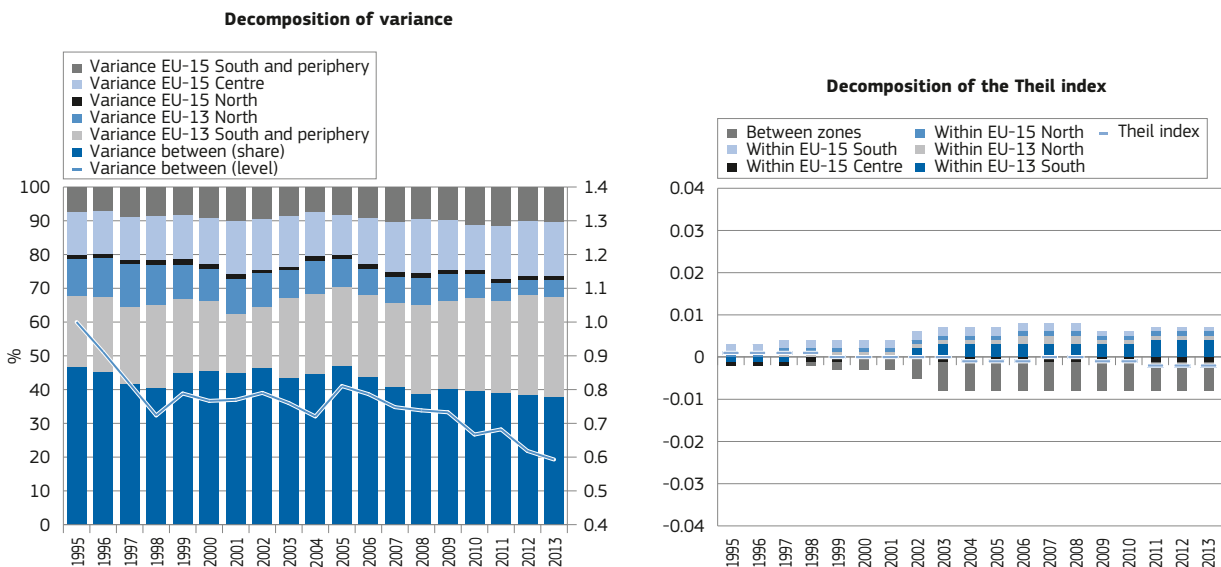
Chart 32: Between and within zones contributions to UR convergence in EU (1995–2013)



Source: Eurostat, calculations DG EMPL.

Notes: Between and within contributions to total variance are based on unweighted averages by zone, while the Theil index is based on weighted averages (including the EU-28 weighted average). Some missing values in the beginning of the period were kept constant for the calculation of dispersion and averages: BG, CY, EE, HR, MT (1995–99), LV (1995–98), LT (1995–97), PL, RO (1995–96), HU, SI (1995), AT (1990–93), DE (1990), EL (1990–97).

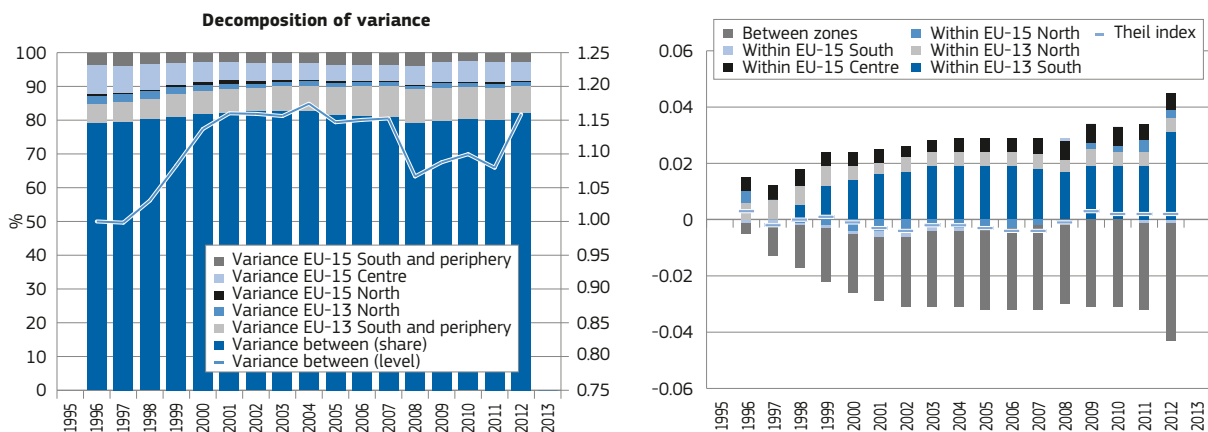
Chart 33: Between and within zones contributions to activity rates convergence in EU (1995–2013)



Source: Eurostat, calculations DG EMPL.

Notes: Between and within contributions to total variance are based on unweighted averages by zone, while the Theil index is based on weighted averages (including the EU-28 weighted average). Some missing values in the beginning of the period were kept constant for the calculation of dispersion and averages: HR (1995–01), BG, CY, MT (1995–99), CZ, EE, LV, LT, SK (1995–97), PL, RO (1995–96), HU, SI (1995), IT (1992), AT (1992–93).

Chart 34: Between and within zones contributions to GDI convergence in EU (1995–2013)



Source: Eurostat, calculations DG EMPL.

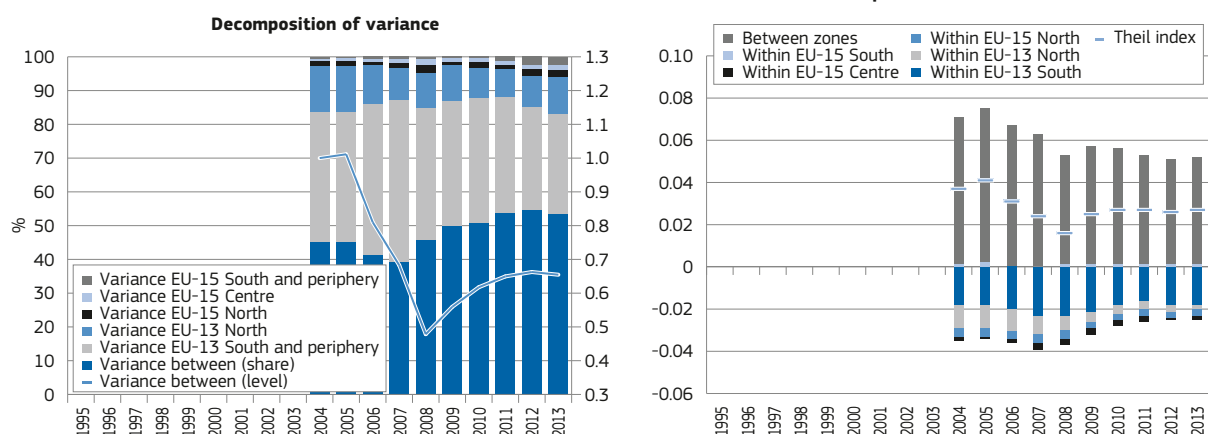
Notes: Values in real Euros deflated by HICP ; between and within contributions to total variance are based on unweighted averages by zone, while the Theil index is based on weighted averages (including the EU-28 weighted average). Missing data for MT, some missing values in the beginning of the period were kept constant for the calculation of dispersion and averages: LU (1996-2005), BG, HR, IE (1996-01), EL, ES, RO (1996-99).

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Chart 35: Between and within zones contributions to AROPE convergence in EU (1995–2013)



Source: Eurostat, calculations DG EMPL.

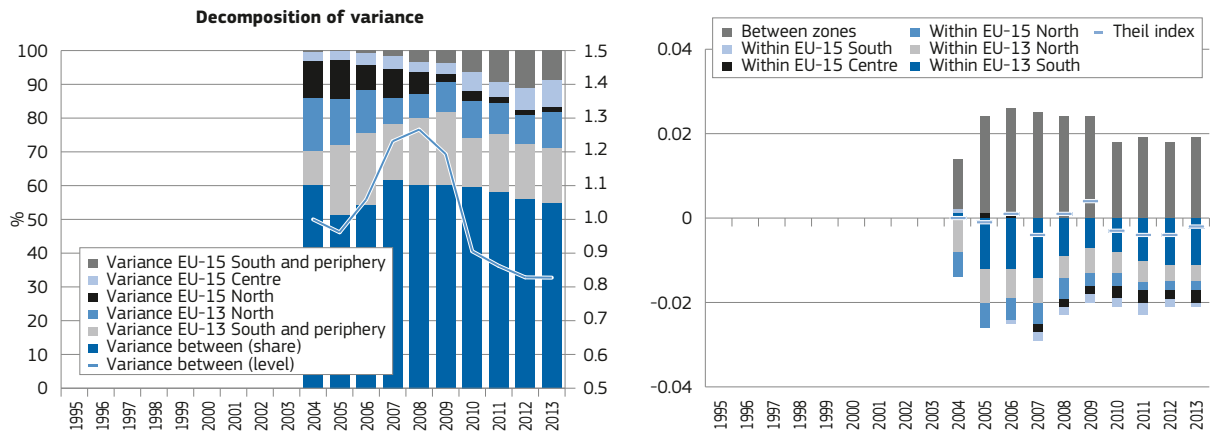
Notes: Between and within contributions to total variance are based on unweighted averages by zone, while the Theil index is based on weighted averages (including the EU-28 weighted average). Some missing values at the beginning of the period were kept constant for the calculation of dispersion and averages: HR (2004-09), RO (2004-06), BG (2004-05), CZ, DE, CY, LV, LT, HU, MT, NL, PL, SI, SK, UK (2004).

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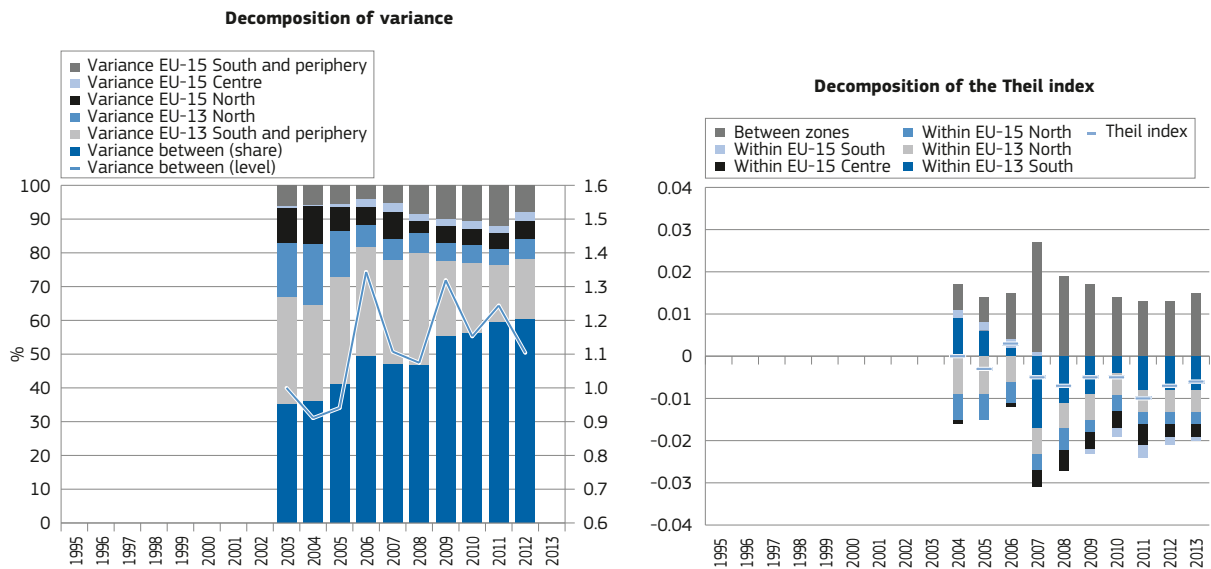
Chart 36: Between and within zones contributions to AROP convergence in EU (1995–2013)



Source: Eurostat, calculations DG EMPL.

Notes: Between and within contributions to total variance are based on unweighted averages by zone, while the Theil index is based on weighted averages (including the EU-28 weighted average). The dates correspond to the dates of the SILC waves which refer to households' incomes on the year before. Some missing values at the beginning of the period were kept constant for the calculation of dispersion and averages: RO (2005-06), CZ, DE, CY, LV, LT, HU, MT, NL, PL, SI, SK, UK (2004).

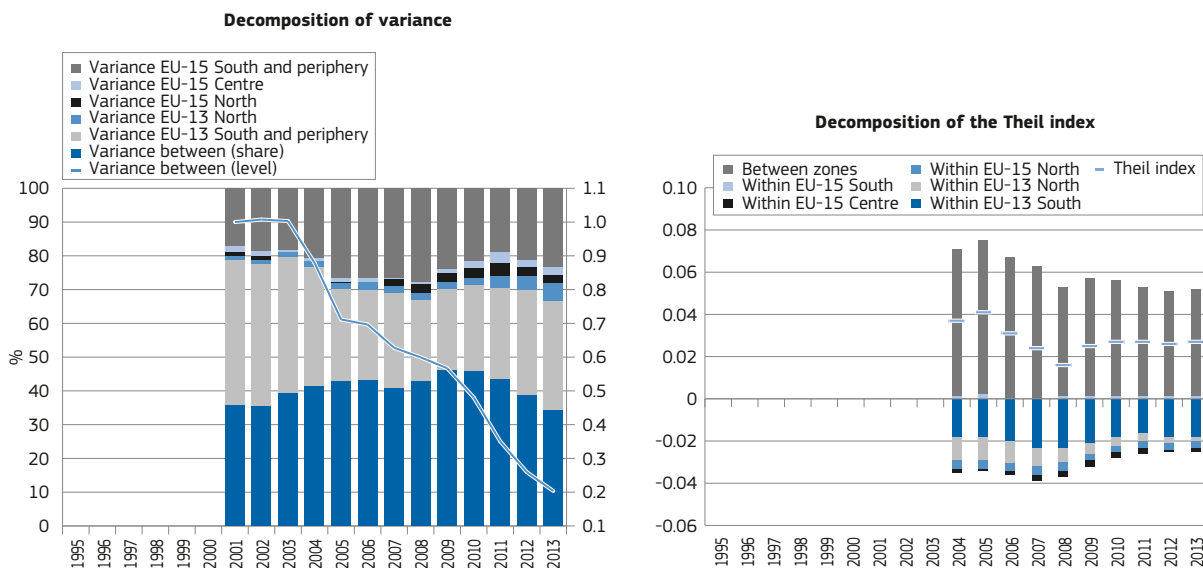
Chart 37: Between and within zones contributions to S80/S20 convergence in EU (1995–2013)



Source: Eurostat, calculations DG EMPL.

Notes: Between and within contributions to total variance are based on unweighted averages by zone, while the Theil index is based on weighted averages (including the EU-28 weighted average). The dates correspond to the dates of the SILC waves which refer to households' incomes on the year before. Some missing values at the beginning of the period were kept constant for the calculation of dispersion and averages: CZ, DE, CY, LV, LT, HU, MT, NL, PL, SI, SK, UK (2004).

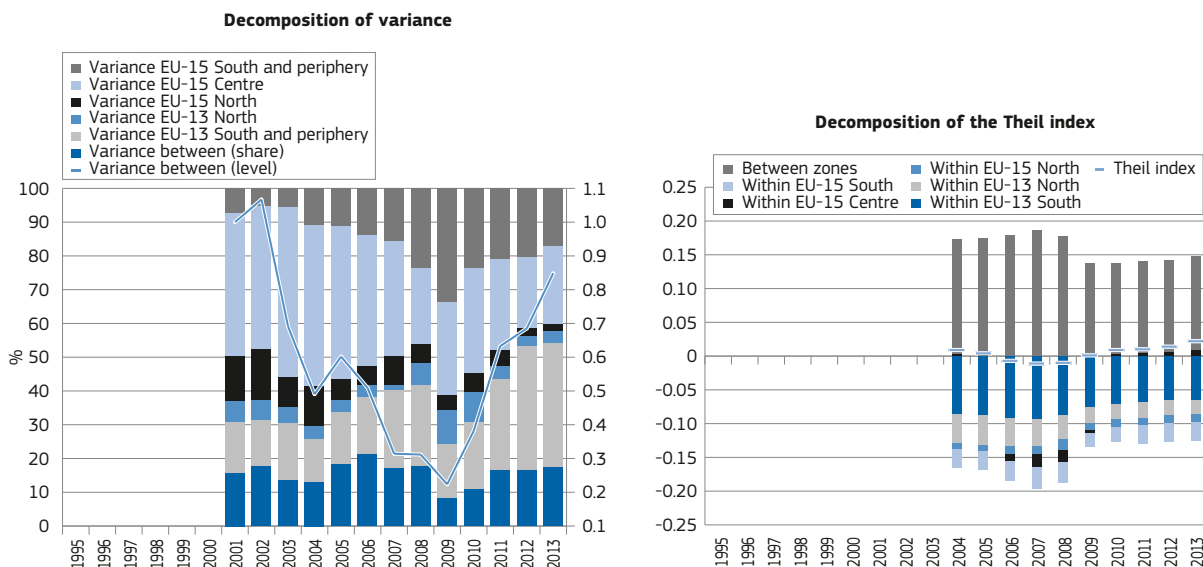
Chart 38: Between and within zones contributions to early school leavers convergence in EU (1995–2013)



Source: Eurostat, calculations DG EMPL.

Notes: Between and within contributions to total variance are based on unweighted averages by zone, while the Theil index is based on weighted averages (including the EU-28 weighted average). The dates correspond to the dates of the SILC waves which refer to households' incomes from the year before. Some missing values at the beginning of the period were kept constant for the calculation of dispersion and averages: CZ, IE, HR, LV, SK (2001) and UK (2003).

Chart 39: Between and within zones contributions to NEETs convergence in EU (1995–2013)



Source: Eurostat, calculations DG EMPL.

Notes: Between and within contributions to total variance are based on unweighted averages by zone, while the Theil index is based on weighted averages (including the EU-28 weighted average). The dates correspond to the dates of the SILC waves which refer to households' incomes from the year before. Some missing values at the beginning of the period were kept constant for the calculation of dispersion and averages: CZ, IE, HR, LV and SK (2001).



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