European Commission

Labour Market and Wage Developments in Europe 2015

Social Europe

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The labour market recovery has gained strength

Labour market outcomes have been improving against the background of a modest recovery. The unemployment rate in the EU appears unusually reactive to the weak recovery. Yet, it stood above pre-crisis levels, at around 9.5% in the EU and 11% in the euro area in May 2015. Labour market disparities have started to fall across the EU and the euro area.

Unemployment in the EU continued to fall amidst modest economic recovery, subdued capital spending and dynamic private consumption

In 2014, economic activity expanded by 1.4% in the EU and by 1% in the euro area, spurred by supportive macroeconomic policies, lower energy prices and a pick-up of private consumption. Subdued capital spending, tight lending conditions and pervasive rebalancing needs in a number of countries are demand factors holding back the recovery. Unemployment dropped by more than expected on the basis of GDP growth. Recent positive labour market developments could be linked to dynamic private consumption, improved expectations and supportive labour costs conditions, as well as to the materialisation of the effects of structural reforms. By April 2015, the Economic Sentiment Indicator was back to its pre-crisis average for 11 countries, while for the majority of the remaining countries it reached values above the 2008-2014 average. The revival of business and consumers' confidence could be explained by a drop in job destruction rates, after a period of protracted downsizing. Analysis in the report suggests that closing the investment gap would enhance the job content of growth.

There are no clear signs of a return toward pre-crisis levels of average hours worked

After two years of consecutive declines, in 2014 the hours worked per person employed have mildly increased. The reduction in the number of hours worked has been a key adjustment mechanism following the 2008 crisis and 2011 recession. However, this could be seen as an acceleration of a long-term trend towards lower hours worked per employee, which was already present before the crisis, driven by a gradual reduction in the number of *usual weekly hours worked* by full-time workers. Factors explaining this reduction include legislated reductions in standard working hours, increased diversification of work schedules, including non-standard and variable working hours, more part-time work and income effects at the household level related to the increase in women's activity rates and/or higher emphasis on education partly related to increasing returns.

Job finding rates have modestly improved, while the rate at which existing jobs are destroyed is gradually converging toward the level prevailing before the crisis

The observed declines in unemployment were mostly linked to reductions in job separation rates, while job finding rates, although recovering, continued to be well below pre-crisis levels. Job separation rates have been falling in the euro-area since early 2012. Yet unemployment continued to rise until mid-2013, driven by a persistent deterioration of job finding rates. The latter have started to recover in 2014, but remain low, particularly for jobseekers with long unemployment spells. Job separation rates fell especially in Greece, Portugal, Spain, Ireland, Lithuania, Poland, the Netherlands, Slovakia and the UK. Conversely, job finding rates increased in Ireland, Greece, Portugal, Lithuania, Spain, Hungary, Poland, and the UK. As a consequence, the share of long-term unemployed in these countries also started to decline, often from very high levels.

The Beveridge curve has shifted outward, but …

The euro-area Beveridge curve, describing the negative relation between vacancies and unemployment, has been affected since 2008 by major demand shocks, leading to less vacancies and more unemployment. In 2012, the curve shifted outward, suggesting a potential increase in labour mismatch. Since early 2014, falling unemployment has been matched by an increase in vacancies; a typical adjustment pattern at an early stage of a recovery.

…not all long-term unemployment reflects persistent worsening of labour matching

It is difficult to say if the current high levels of long-term unemployment - the counterpart of a low job-finding probability - imply that progress in the reduction of unemployment is likely to be slow, because of higher structural unemployment, or whether the shift in the Beveridge curve is mostly temporary, linked to an incomplete adjustment to recent demand shocks. Econometric evidence shows that long-term unemployment does not provide less pressure for wages to adjust than short-term unemployment does. This suggests that those who lost their jobs at the early stage of the crisis are not all completely detached from the labour market; not all long-term unemployed are unresponsive to improvements in cyclical conditions as when unemployment is fully structural. They can come back to employment if the economy strengthens, but this would not be enough get them all back to work.

Participation rates kept rising, reflecting long-term trends in labour supply, a reaction to economic uncertainty, but also a drop in the working age population

Activity rates continued to be resilient, reflecting longer term trends in rising participation of women and older workers and, during the crisis period, of family members willing to contribute to the household with additional income in a situation of increased uncertainty. This so-called *'added worker effect',* which has characterised the EU labour market response since the start of the crisis, compensated falling participation by the youth and the *'discouraged worker effect'* (i.e. people stopping to actively look for a job because they think that none is available). However, the latter could prevail if high shares of long-term unemployed persist. In 2014, the number of discouraged workers increased in few countries, notably Italy, Cyprus, and Slovenia. Demographic factors related to ageing and net outward mobility of younger cohorts played a role, with

a large fall in labour supply among the youth in the Baltic States, Bulgaria and Poland.

Youth unemployment has fallen from historically high levels

The unemployment rate of the young increased substantially during the crisis in light of its sensitivity to economic fluctuations. In 2013, youth unemployment rate was above 25% in 11 countries, with peaks above 40% in Spain, Greece and in Italy. In 2014, it dropped in all countries, except Italy and Luxembourg, but remains above 25% in seven countries. After reaching high levels at the early stages of the crisis, the share of the young not in employment, education or training (NEETs) has recently declined as well, driven by a drop in the share of unemployed among the NEETs. The time that a young person may spend in education has increased significantly, in particular in those countries most affected by the debt crisis.

The dispersion of unemployment rates across the EU and the euro area was reversed, largely reflecting less heterogeneous GDP growth rates, and …

In 2014, the divergence of unemployment rates across the EU and the euro area has become less pronounced on account of less heterogeneity in GDP growth, a stronger than expected reaction of unemployment to the economic recovery and supportive real unit labour cost developments. While in 2013 employment losses were recorded in 15 Member States, in 2014 net job creation was negative only in 4 - Cyprus, Latvia, Netherlands and Finland. A drop in unemployment was observed in particular in countries strongly affected by the debt crisis and persistent rebalancing needs; unemployment remained at high levels in France, Croatia, Latvia and Cyprus and increased further in Italy. Yet, large differences in unemployment rates still persist, reflecting the intensity of the rebalancing and deleveraging challenges.

… supportive developments in wages and real unit labour costs

Despite the revival in economic activity and the drop in unemployment, wage growth has remained subdued. The growth rate of nominal compensation per employee at euro-area level equalled 1.4% in 2014, lower than in 2013, along a Phillips curve consistent with the pre-crisis relationship. Compensation per employee declined in Croatia, Cyprus, Greece, Portugal, and Slovenia; and expanded at a modest rate in countries such as Spain, France, Italy and Belgium. In contrast, very large increases were observed in the Baltics where domestic demand was driven by buoyant private consumption. After substantial declines of previous years, in 2014 real unit labour costs in high unemployment countries have become less sensitive to unemployment levels.

Developments in nominal unit labour costs have been consistent with the rebalancing of external positions

Nominal unit labour costs have been falling in countries having to rebalance their economies after periods of large current account deficits. Cyprus, Greece, Slovenia and Spain recorded marked declines in nominal unit labour costs in 2014, while strong increases took place in the Baltics and Slovakia. Nominal unit labour costs expanded at a modest rate also in countries with current account surpluses; with the exception of Germany, this moderate dynamics was driven by lower growth of compensation per employee. The decline in unit labour costs in the euro-area countries facing stronger rebalancing needs led to

a continued depreciation of their unit-labour-cost-deflated Real Effective Exchange Rates (REERs). Although profit margins have been narrowing in 2014, the adjustment based on the GDP deflator and the export deflator remained more limited, which calls for more action on product market reforms. In deficit countries, the sectoral pattern of wage growth appeared in the past years broadly supportive of reallocation from non-tradable to tradable sectors; in Greece, Portugal and Spain, compensation per employee grew faster in the tradable sector.

In line with the rebalancing needs, jobs were reallocated from the non-tradable to the tradable sector

The job reallocation from the non-tradable to the tradable sector has implications also for institutional features of the labour market, such as the relative importance of temporary contracts. Insofar as temporary contracts are mostly concentrated in non-tradable sector, the adjustment of current account deficits could be accompanied by a fall in the share of temporary contracts. In contrast, stronger job creation in the non-tradable relative to tradable sector could lead, *ceteris paribus*, to more precarious jobs and delay the absorption of current account imbalances.

Labour mobility has attenuated disparities in unemployment

Since the onset of the 2008 financial crisis, the EU has been hit by major adverse demand shocks which affected unemployment differently across countries. In a monetary union, a balanced adjustment through which participating countries adjust to shocks is desirable both for fairness and efficiency. In the case of shocks that require relocation of production across different sectors, a delayed adjustment of relative prices and wages brings protracted output losses and prolonged joblessness, which are harmful in particular for the most vulnerable groups. Geographical mobility may help improve the allocation of labour by limiting skill mismatches and reducing labour shortages in low unemployment countries.

The *analytical chapter* looks at the role of labour mobility as an adjustment mechanism. It presents *stylised facts* regarding mobility in the EU. Then, it estimates the *determinants of mobility flows* between countries. Finally, it assesses the *dynamic response* of labour mobility to asymmetric labour demand shocks, i.e., shocks that affect some EU countries but not others.

Labour mobility in the EU has been on the rise well before the crisis but still remains low as compared to the US

Mobility across the EU has been increasing over the past two decades, in particular following the 2004 EU-enlargement. Yet, *mobility flows* remain *low*, notably in comparisons to the US. Less than 5% of working-age EU citizens live in a different country than the one they were born in, against nearly 30% in the US. After having experienced positive inflows of net labour migration, countries that were greatly affected by *current account reversals* and the debt crisis saw a rapid *reduction in net migration*.

Bilateral mobility flows between countries are affected by the relative level of development of countries and labour market conditions

The estimation of the determinants of gross mobility flows delivers a number of insights. First, long-term trends in bilateral migration are driven by persistent differences in the level of GDP per capita, and are significantly affected by factors like the geographic and cultural distance between countries. Second, fluctuations around these trends are linked to cyclical labour market conditions in the countries of origin and of destination. Third, estimates show that joint EU membership is likely to increase bilateral migration flows by about 25%. Although mutual euro area membership does not appear to affect the overall level of labour mobility by itself, bilateral migration flows among euro area countries appear more responsive to the relative unemployment rate than mobility flows among other countries.

The response of labour markets to economic shocks has become more balanced

The analysis of the dynamic response of EU-15 economies after labour demand shocks affecting only one country shows that most of such asymmetric shocks are absorbed by changes in the unemployment rate and the activity rate, but mobility also plays a role. When the analysis is conducted over different sub-periods it is estimated that the *response of labour mobility to asymmetric shocks* has *increased* over time. Nonetheless, its contribution to the overall fluctuations of unemployment remains low. When the analysis is extended to the response of wages, it turns out that *real wages have become more responsive* to labour market conditions.

Since 2008, there has been increased activity in many policy domains in a large number of countries

While there are clear differences across countries with regard to the type and severity of challenges and related policy response, a general reform trend seems to emerge since the start of the crisis, which can be broadly divided in three phases. Between 2008 and 2009, policy action focused on cushioning the short-term impact of the crisis on employment and incomes. Subsequently, as of 2010, measures were introduced to enhance the adjustment capacity and resilience of labour markets against the background of current account reversals and debt crises, in particular in vulnerable countries and countries under financial assistance programmes. More recently, since 2012-2013, the focus has started to shift towards sustaining labour demand and incomes through tax and welfare reforms. Analysis suggests that reform activity is higher during recessions or when unemployment is high. Estimates also show a negative relationship between the direction of reform measures and the existing policy settings, thus hinting at a sort of policy convergence across the EU.

Returning to sustainable low unemployment poses a number of challenges, requiring strong commitments to time consistent structural reforms, with…

Recent labour market developments raise optimism about a sustained drop of unemployment in a number of countries. Yet, sufficient ambition in structural reforms in product and labour markets needs to be maintained in the light of incomplete adjustment of macroeconomic imbalances, the slack in capital spending and the high long-term unemployment and its consequences for the social situation. Resources need to continue to be transferred towards more productive tradable

sectors, including to contribute to durable deleveraging.

Countries with major deleveraging needs have implemented comprehensive and far-reaching reforms. Maintaining the reform momentum and *avoiding risks of reversal* is challenging and yet necessary to reduce debt overhang, promote further sectoral reallocation and improve growth prospects in a sustainable way. In these countries, it is vital to use the full scope for adjustment introduced with recent reforms. The crisis has also highlighted the importance of strengthening the resilience of European economies. Further improving the capacity to respond to shocks, while effectively minimising economic and social costs, should facilitate a durable return to fair economic growth through unleashing the untapped potential for higher output, employment and welfare. Labour market reforms - and structural reforms more in general - play a central role. Their *design*, the way they are *implemented* and their *interaction with other policy measures* are all critical for their capacity to bring the expected results, as well as to cater for their short-term costs and benefits. Monitoring the effects of these reforms is a key condition for early identification of further policy needs. Segmentation between protected and less protected contracts remains high in countries that enacted major reforms of employment protection and is rising in countries that passed less broad reforms. Stable and sustained economic growth is needed to see if these reforms have had major effects. Yet, reduction of labour market duality depends on a number of factors, including a regulation that does not bias hiring based on the typology of contracts; an effective system to settle labour disputes that does not lead employers to refrain from open-ended hiring to avoid uncertain dismissal procedures; a system that detects abuses of flexible work by employers. An adequate coverage of unemployment risks would contribute to cushion the impact of job losses for employees on flexible contracts.

…resolute efforts to tackle the social consequences of the crisis, and…

The legacy of the crisis is very high long-term unemployment, falling disposable incomes and growing poverty in the EU. Higher unemployment and increased poverty have disrupted social cohesion in some euro-area countries. To prevent joblessness becoming entrenched, activation and job-search assistance measures need to be adequate to cope with a growing number of long-term unemployed and accompanied by measures that boost labour demand, such as well-designed hiring subsidy schemes. With labour markets rapidly changing, it is becoming apparent that many of the jobs lost during the crisis, particularly those of lower skill content, will not come back. The *response to long-term unemployment* must take account of these changes. It necessarily involves a *broader reform agenda* of labour and product markets, taxation and benefit reform, as well as specific support measures such as training and up-skilling, and social policies. Cost-effective social protection systems need to provide adequate income coverage to a growing number of long-term unemployed.

…to boost investment

Looking forward, it is questionable whether the recent reaction of unemployment to growth is likely to continue without a revival of investment. Not only the factors underlying the current unemployment reduction may come to an end, including in countries where substantial deleveraging needs compress domestic demand, but also the accumulated capital gap linked to protractedly low investment rates may start playing a negative role. The presence of an accumulated gap in net capital stock as compared to past trends could result into reduced labour productivity, which in turn is associated with lower demand for labour and a more muted reaction of unemployment to growth. In this respect, a sufficient recovery in investment rates and significant increase of capital spending would be needed to maintain a job rich recovery and a sustained return to low unemployment.

Part I

Labour market developments

1. General labour market conditions in the euro area and the EU

The gradual improvement in economic and labour market conditions that started in the second-half of 2013 continued throughout 2014 and the beginning of 2015, with a moderate but steady reduction in unemployment. Employment growth picked up while the resilience in activity rates continued and the dynamics in the average number of hours worked remained subdued. The observed reduction in unemployment is mainly due to a decline in separation rates, while job-finding rates have also started to improve but from very low levels. Low job-finding rates are coupled with persistently high rates of long-term unemployment. Wage growth in the euro area decelerated further from an already moderate pace despite the increased incidence of long-term unemployment. Looking forward, European labour markets would benefit from the growth revival projected for 2015 and 2016.

1.1. Introduction

After having grown unabated since 2008, unemployment in the euro area and the EU stopped rising in 2013 and started falling since then. Unemployment reacted swiftly to the recovery in output, and reductions in joblessness were visible despite moderate GDP growth. Job separation rates continued to fall and, for the first time since the onset of the crisis, a timid recovery in job-finding rates was observed in 2013, while long-term unemployment remains at historically high levels. Despite the recovery in labour demand, wage growth further declined throughout 2014.

Against this background, this first chapter of the report analyses the main features of the current labour market adjustment by looking at aggregate developments in the EU and the euro area. It compares the EU labour market performance with that of other developed economies and assesses the role of cyclical and structural factors in unemployment dynamics, labour market flows, and the role played by the relevant adjustment margins including employment, participation, working hours and labour costs.

The analysis digs deeper on a number of issues. The possible reasons behind the recent swift reaction of unemployment to GDP growth are discussed, and the question is addressed of whether depressed investment rates since the start of the crisis could act as a drag on the employment content of growth looking forward. In light of the recent drop in wage growth, there is also a focus on the implications of unemployment duration for the response of wages to unemployment.

The remainder of the chapter is organised as follows. The next section compares aggregate labour market developments in the euro area and the EU with those taking place in other world regions. Section 1.3 analyses employment and unemployment dynamics, while section 1.4 reviews latest trends in wages and labour costs. Section 1.5 focuses on salient aspects of European unemployment analysing labour market flows, long-term unemployment and job matching. Section 1.6 concludes.

1.2. Setting the scene: the EU labour market in an international perspective

1.2.1. Recent EU-level developments

After being hit in 2011 by a second recession in the space of less than three years, the EU economy started to experience in 2013 a gradual and more broad-based recovery: economic growth resumed in the second quarter of 2013 and continued throughout 2014 and the beginning of 2015.

Table I.1.1: **Unemployment, compensation per employee and GDP growth in the euro area and European Union (seasonally adjusted data)**

					Quarter over quarter of previous year (1), %						Quarter over quarter same year, %					
		2012	2013	2014	2013Q4	2014Q1	2014Q2	2014Q3	2014Q4	2015Q1	2013Q4	2014Q1	2014Q2	2014Q3	2014Q4	2015Q1
Unemployment rate	EA	11.3	11.9	11.6	0.1	-0.2	-0.5	-0.5	-0.5	-0.6	-0.1	-0.1	-0.2	-0.1	-0.1	-0.2
	EU28	10.5	10.8	10.2	-0.1	-0.4	-0.7	-0.8	-0.8	-0.8	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Unemployment growth	EA	12.4	5.7	-3.4	1.0	-1.7	-3.5	-3.8	-3.4	-4.7	-1.1	-0.7	-1.4	-0.7	-0.7	-2.0
	EU28	9.3	4.0	-5.8	-0.7	-3.6	-6.0	-6.8	-6.6	-7.2	-1.7	-1.4	-2.3	-1.6	-1.4	-2.1
Growth of nominal compensation per employee	EA	1.9	1.8	1.4	2.0	1.3	0.9	0.9	0.9	0.8	0.4	0.0	0.0	0.5	0.4	-0.1
	EU28	3.2	0.9	2.2	0.9	1.9	1.7	2.3	2.4	3.3	0.5	0.5	0.5	0.8	0.5	1.4
GDP growth	EA	-0.8	-0.5	0.9	0.5	1.1	0.8	0.8	0.9	1.0	0.3	0.3	0.1	0.2	0.3	0.4
	EU28	-0.5	0.0	1.3	1.0	1.4	1.3	1.3	1.4	1.5	0.4	0.4	0.2	0.3	0.4	0.4
Employment growth	EA	-0.5	-0.8	0.6	-0.3	0.2	0.6	0.7	0.9	0.8	0.0	0.2	0.3	0.2	0.1	0.1
	EU28	-0.4	-0.3	0.9	0.1	0.6	0.9	1.1	1.2	1.2	0.1	0.3	0.4	0.3	0.2	0.3

Note: for unemployment rate percentage point difference.
Source: Eurostat.

In 2013 unemployment rates had reached historically high levels, 10.9% and 12% in the EU and the euro area respectively. Unemployment stabilised in late 2013 and started to decline thereafter. In the EU, the overall unemployment rate stopped increasing already in the second quarter of 2013 and since then has fallen by 1.2 percentage points up to the first quarter of 2015; for the euro area, the reduction of the unemployment rate over the same period of time was 0.8 percentage points. The reduction of unemployment was matched by employment growth starting from late 2013.

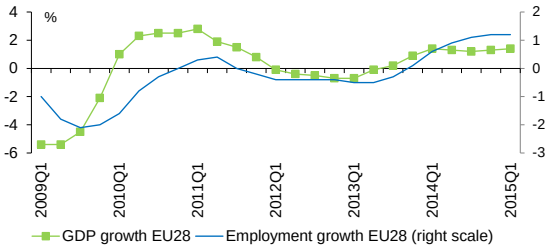
Table I.1.2: **GDP growth and unemployment in selected economies**

	GDP growth %			Unemployment rate %		
	2000-2007	2013	2014	2000-2007	2013	2014
EA	2.2	-0.5	0.8	8.6	12.0	11.6
EU	2.5	0.0	1.3	8.7	10.9	10.2
CAN	2.8	2.0	2.4	7.0	7.1	6.9
JPN	1.5	1.6	0.4	4.7	4.0	3.6
USA	2.7	2.2	2.4	5.0	7.4	6.2
OECD	2.5	1.4	1.8	6.4	7.9	7.3
BRIC:	8.1	5.5	5.3	:	:	:
BRA	*3.5*	*2.3*	*0.2*	*11.1*	*5.4*	*5.5*
RUS	*7.2*	*1.3*	*0.5*	*8.1*	*5.5*	*5.6*
IND	*7.2*	*4.7*	*6.0*	*:*	*8.8*	*:*
CHN	*10.5*	*7.6*	*7.4*	*3.9*	*4.1*	*4.1*

Source: Eurostat and OECD.

The turnaround in unemployment dynamics broadly coincided with GDP growth turning positive. This is an unusually swift reaction, as the unemployment rate normally follows GDP growth with a lag of about two quarters. It is also remarkable that unemployment started falling despite GDP growth remaining relatively weak, while it is well known that reductions in the unemployment rate generally require GDP growth above a certain threshold to compensate for trends in labour supply (growing activity rates) and demand (labour productivity growth). ([1])

Graph I.1.1: **Employment and GDP growth in the EU**



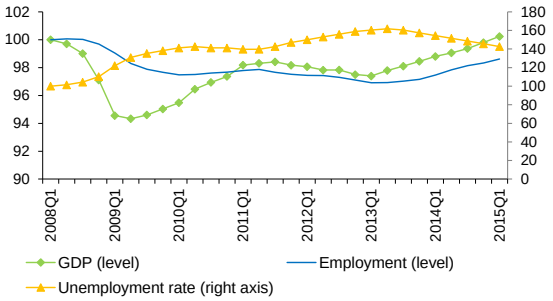
Note: Growth rates are defined as percentage change compared to the corresponding quarter of the previous year.
Source: Eurostat.

A number of tentative explanations could be put forward for the brisk reaction of unemployment to a sluggish recovery. First of all, improved expectations and business confidence could be at the basis of quite a substantial drop in dismissal rates, against the background of large-scale and protracted downsizing that had previously taken place in 2008-2009 and again in 2011. Secondly, operating margins have been improving throughout 2013 and 2014, including in light of supportive labour cost conditions (see section 1.4. below). Thirdly, the dynamics of the average number of hours worked have remained subdued, and have not recovered towards their pre-crisis level.

([1]) The need for positive growth above a certain threshold to ensure unemployment reductions is confirmed by the estimation of Okun law relations. The estimated constant term in Okun law equations is generally positive and significant, implying that unemployment is generally increasing when GDP growth is equal to zero (Box I.1.1).

Despite its recent fall, unemployment remains historically high. The number of unemployed in the first quarter of 2015 was about 18 million in the euro area and 23.8 million in the EU. Overall employment remains below its pre-crisis level by about 3% in the euro area and 2% in the EU, and has so far shown a more modest recovery as compared to GDP (Graph I.1.2).

Graph I.1.2: **Employment and GDP in the EU, levels (index numbers, 2008q1 = 100)**

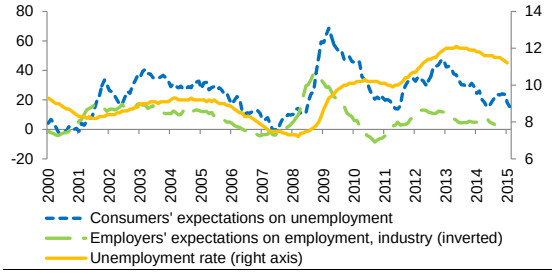


Source: Eurostat.

Quarterly GDP growth in the second quarter of 2014 surprised on the downside, and remained subdued until the end of the year both in the EU and the euro area. Yet, households and business sentiment about labour market prospects improved substantially and fuelled optimism at the end of 2014, possibly on account of consumption growth and favourable real labour costs developments being supported by lower oil prices (Graph I.1.3).

It can be questioned whether the current responsiveness of unemployment to growth is likely to continue also in the future. Not only the factors underlying the current unemployment resilience may come to an end, including in countries where substantial deleveraging needs would compress domestic demand, but also the accumulated capital gap linked to protractedly low investment rates may start playing a negative role.

Graph I.1.3: **Unemployment expectations for the coming 12 months**



Source: European Commission, Business and Consumer Surveys; Eurostat.

As shown in Box I.1.1, the presence of an accumulated gap in the net capital stock as compared to trend could result into reduced labour productivity, which in turn is normally associated with a more muted reaction of unemployment to growth. In this respect, a sufficient recovery in investment rates would be needed to maintain a job-rich recovery. Looking forward, therefore, further progress on the front of EU employment will crucially depend on growth prospects and on the climate for investment. Moreover, recent headwinds linked *inter-alia* to geopolitical tensions and persisting uncertainty with respect to the evolution of the financial assistance programme to Greece may take a toll on the recovery.

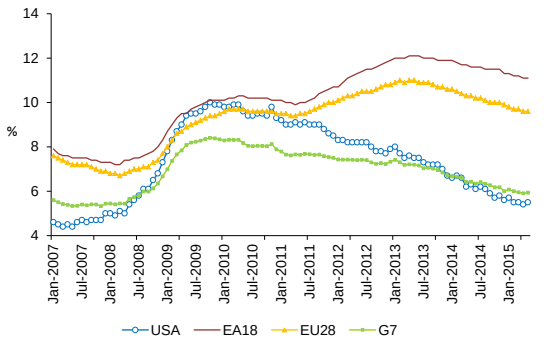
1.2.2. Recent labour market developments in major world regions

In 2014, economic growth gained momentum in Canada and the United States, supported mainly by strong private consumption and investment. The consequent decline in unemployment led to a further divergence in unemployment rates between industrialised countries. At the end of 2014, the US unemployment rate reached 6% and kept falling in the first months of 2015, reaching in April the lowest rate since the beginning of 2008. However, the high share of involuntary part-time employment suggests that there is still some slack in the US labour market.

The fall in the US unemployment rate was partly led by a decline in labour force participation. Since the onset of the crisis, the activity rate has fallen by almost 4 percentage points, with more than half of the decline occurring after the end of the recession in June 2009. On top of long-term demographic trends, labour force exits reflect discouragement from seeking a job and the expiration of extended unemployment benefits.([2]) ([3]) Conversely, the employment rate kept falling for further two years out of the recession, and by December 2014 it had increased only by 1 percentage point – i.e. remaining 4 percentage points below its pre-crisis level. It is only in the first months of 2015 that the labour market racked up stronger employment gains.

In Japan, the fall of unemployment continued to progress thanks to buoyant consumption and residential investments stimulated by accommodative monetary policy.

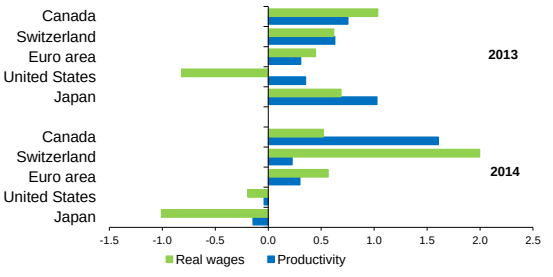
Graph I.1.4: **Unemployment rates in the EU and the US**



Source: OECD.

In Canada, employment growth outperformed all other G7 countries, while the unemployment rate dropped toward its pre-crisis low levels.

Graph I.1.5: **Real wages and productivity growth in the euro area and selected advanced economies**



Note: Real wages are deflated with GDP deflator.
Source: DG ECFIN AMECO database.

Real wage moderation prevailed in all developed countries, in particular in Switzerland, Canada and Japan: productivity growth exceeded the growth of real compensation, thereby supporting labour demand in these countries. In the US, real wage growth in 2013 and 2014 remained subdued despite the recovery in labour demand and the substantial reduction in unemployment. Wage moderation during the US recovery could be seen as the result of a delayed wage adjustment at the onset of the crisis, due to the hesitancy of employers to reduce wages and workers to accept wage cuts. This downward nominal wage rigidity translated into protractedly moderate real wage growth in subsequent years despite declines in the unemployment rate (Daly et al., 2013, 2014, 2015).

1.3. Employment, activity rates, hours worked

Employment growth turned positive in 2014 both in the EU and the euro area, increasing on annual basis by almost 0.6% for the euro area and 0.9% for the EU (see Table I.1.1). The improvement was particularly pronounced in the tradable sectors.

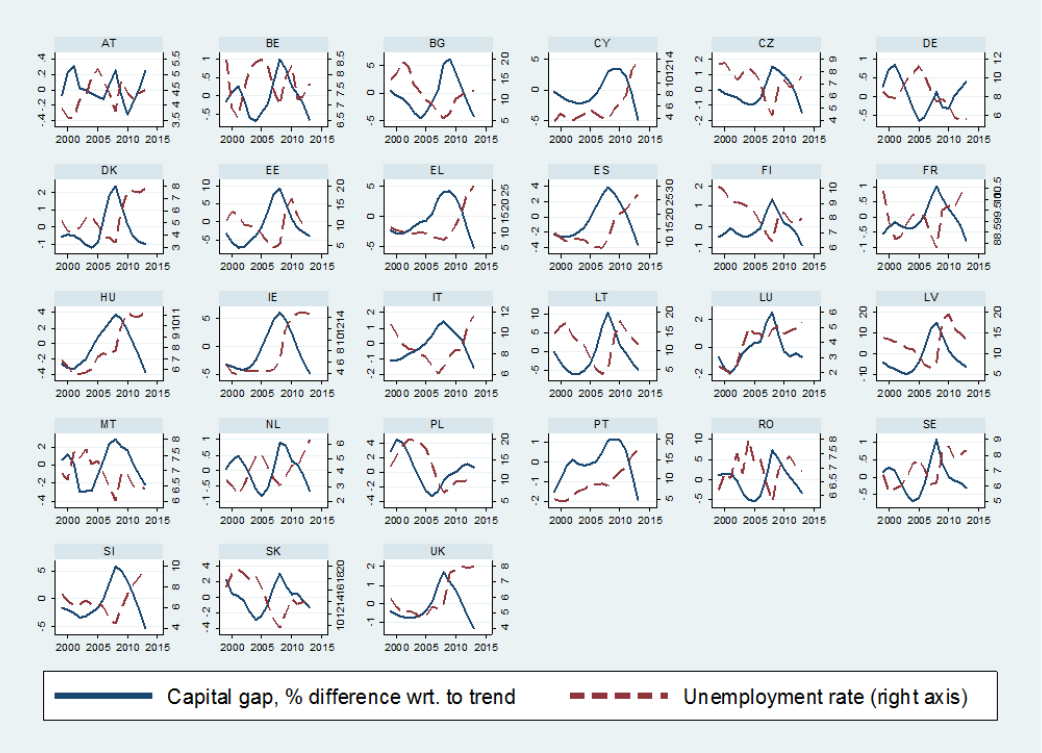
([2]) The increase in the number of those who did not seek a job although they wanted one explains 30% of the drop in participation rate between 2007 and 2011; from 2012, retirement is the main driver of the increase in inactivity (Fujita, 2014).

([3]) The *Emergency Unemployment Compensation* is a federal program providing additional 13 weeks of benefits to individuals who exhausted State benefits. The program, created in 2008, expired in January 2014. Since then, about 1.3 million of long-term unemployed have lost their benefits (Burtless, 2013).

Box I.1.1: Capital gap and unemployment developments

The 2008-2009 crisis was followed in most EU countries by a major contraction in employment and lower investment rates. The protracted reduction of investment has led to a reduction of the net capital stock as compared with trend (Graph 1). The appearance of a negative capital gap parallels the increase in the unemployment rate in most EU Member States. Countries having recorded the largest unemployment rates are also those having recently experienced the largest negative capital gaps. In general, negative capital gaps are associated with capital labour ratios below trend (as revealed by a statistically significant positive relation between capital gap and a measure of a gap in the capital/labour ratio).

Graph 1. Net capital gap (% difference between real net capital stock and its trend level) and unemployment



***Notes*:** Trend real net capital stock is estimated from country-level regressions on a trend and a quadratic term (sample: 1995-2013).
***Source*:** DG ECFIN AMECO database.

How would the reduced capital basis affect the speed of employment recovery looking forward? In principle, one could expect that a shortage of installed productive capital, by reducing labour productivity, could act as a brake to employment growth over the short-to-medium run. The answer however is not fully obvious, as it depends on a number of factors, including the difference between actual production techniques (the relative utilisation of capital and labour) and those desired given technology and factor prices, and whether the existing capacity is fully utilised or there is slack.

With a view to shed light on the above question Table 1 augments otherwise standard Okun law relations with indicators summarising the extent of capital slack.

The first column show results for the basic Okun relation across EU countries. The second column in Table 1 reports results for the Okun law augmented with a measure of the capital gap obtained as the deviation

(Continued on the next page)

Box (continued)

from trend of real net capital stock (the same measure as shown in Graph 1). This net capital gap variable is interacted with the Okun law coefficient linking unemployment changes to GDP growth. Such interaction, if statistically significant, would mean that the presence of a capital gap matters for the extent to which the recovery can be job rich.

Results show that a positive (negative) capital gap is associated with a stronger (weaker) reduction of unemployment for any additional percentage point of growth. For instance, countries with a negative capital gap in the order of 5% would have a reduction in the employment content of growth by about 1/3.

Column (3) repeats the same exercise but using a different notion of capital gap, namely the percentage difference between the capital / labour ratio and its trend. This capital ratio gap, as discussed previously, is correlated with the net capital gap measure, but captures more directly the extent to which factor intensities differ compared with trend. The evidence seems to corroborate the hypothesis that less employment-intensive growth linked to capital shortages would arise from the attempt to reduce the gap between actual and desired capital-labour ratios. The coefficient of the interacted variable is roughly of the same magnitude as that displayed in column (2), and exhibits a higher degree of statistical significance.

Finally, equation (4) uses capacity utilisation as an alternative measure of capital shortage. In this case, the aim is to check whether the fact that existing capital is exploited already at full potential acts as a drag on employment growth. The results tend to exclude this as a relevant channel.

Table 1. Capital gap and the response of unemployment to growth. Evidence from augmented Okun relations. EU27, 2000-2013

	(1)	(2)	(3)	(4)
Dependent variable	Y-o-y change in unemployment rate			
Capital gap variable	None	Net capital gap	Capital ratio gap	Capacity utilisation
Change in unemployment rate, lagged	0.272***	0.281***	0.324***	0.277***
	(0.053)	(0.051)	(0.044)	(0.055)
GDP growth	-0.294***	-0.282***	-0.261***	-0.272***
	(0.029)	(0.029)	(0.024)	(0.030)
Change in the growth Okun law coefficient associated with a unit change in the capital gap variable		-0.018*	-0.015***	-0.000
		(0.009)	(0.004)	(0.001)
Constant	0.782***	0.731***	0.638***	0.781***
	(0.069)	(0.073)	(0.061)	(0.077)
Observations	378	378	378	369
R-squared	0.604	0.608	0.628	0.607
Number of countries	27	27	27	27

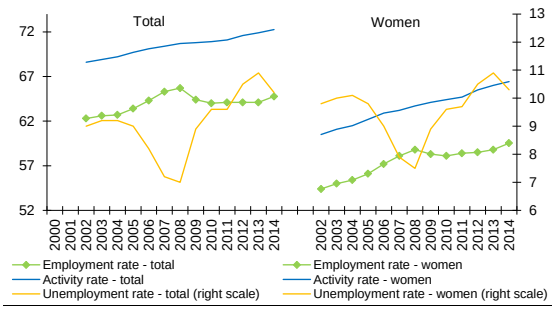
Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Estimation method: least square dummy variables, country effects included. Net capital gap: % difference between real net capital stock and its trend. Trend value estimated from country-level regressions on a trend and a quadratic term (sample: 1995-2013).
Source: DG ECFIN AMECO database, and European Commission Business Surveys.

In spite of the hesitant labour market recovery, and contrary to the US pattern, labour market participation continued to increase in the EU and the euro area. Between 2013 and 2014, the *activity rate* increased by 0.3 percentage points for the EU and by 0.1 percentage points at 72.3% for the euro area. Over the same period, the labour force increased by about 800 thousands individuals in the EU and 220 thousands in the euro area, driven predominantly by an increase in female participation.

As shown elsewhere (European Commission, 2012, 2013, 2013a, Bredtmann et al. 2014), the *added worker effect*, whereby income shocks to household income and increased uncertainty over job prospects of primary

earners in a household raise the willingness of second earners to supply labour, may have played a role in sustaining female participation after the crisis. ([4]) In addition, social security reforms and the choice to delay retirement in response of reduced pension income may also explain rising activity rates for the elderly.

Graph I.1.6: **Employment, unemployment and activity rates**

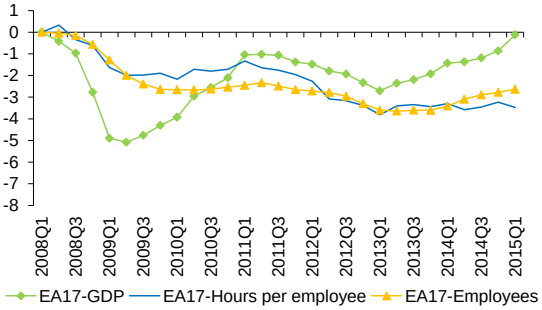


Source: Eurostat, LFS.

Developments in activity rates should be read in conjunction with those of the working age population (i.e., the population aged 15 and 64 years, the denominator of the activity rate statistics). Between 2008 and 2014, despite a growing labour force, the working age population declined (by 4.7 million in the EU and 2.6 million in the euro area), while in the years predating the crisis *both* the labour force and the working age population were growing. Hence, the decline in the working age population (the denominator of the activity rate) could also have influenced the evolution of the activity rates during the crisis.

The reduction in *hours worked* has been a key adjustment mechanism in Europe, whereby firms achieved labour cost savings while avoiding excessive labour shedding during the recession. After having rebound throughout most 2009 and 2010, hours worked kept falling again until 2013, and broadly stabilised since then (Graph I.1.7). As a consequence, hours worked have not returned to the levels experienced prior to the Great Recession.

Graph I.1.7: **Cumulative change in GDP, number of employees and average hours worked per employee, Euro area**



Source: Eurostat.

The adjustment in hours worked contributed to soften the employment impact of the crisis in 2008-2009 and the recent subdued dynamics in hours could partly be at the basis of the swift and resilient response of headcount employment to the weak recovery since mid-2013.

On the negative side, the persistent gap in average hours worked compared with the pre-crisis period could act as a drag on future employment dynamics in case hours worked start growing again at the expense of headcount employment. This concern is corroborated by the increased number of "hours paid but not worked" and the decline of overtime hours observed since the onset of the crisis.([5])

However, in assessing such a risk it should be considered that a trend towards a reduction in the average hours worked was present already *before* the crisis. Between the first quarter of 2000 and the first quarter of 2008, hours worked per employee in the EU declined

([4]) An extensive descriptive analysis of the added worker effect can be found in European Commission 2013a. The aging of the population of groups with higher activity rates explains the rising trends in activity rates.

([5]) The gap between the usual and the actual weekly hours worked (LFS statistics) represents hours paid but not worked net of overtime hours. This gap generally widens when demand is weak.

at an average annual rate of 0.3%. ([6]) Such fall observable at the aggregate level is driven not only by an increase in the share of part-time employment (linked in particular to increased female activity rates), but also by a gradual reduction in the number of *usual weekly hours worked* by full-time workers. ([7]) The drop in hours worked observed since the 2008 recession can therefore be seen as an acceleration of a longer-term decrease in average hours worked, and it is unlikely that hours worked will fully revert back to their pre-crisis levels.

1.4. Wages and labour costs

Wage growth in the euro area further dropped in 2014, starting from a situation of already subdued wage inflation by historical standards. It is to be taken into account, however, that wage inflation in 2012 and 2013 was stronger than implied by the historical Phillips curve relationship between wage growth and unemployment. A key issue is whether and to what extent the most recent developments can be seen as a delayed adjustment of wages in line to what would have been implied by the Phillips curve.

As widely documented in the literature, the two decades preceding the crisis were characterised by a remarkable decline in the variability of output and inflation (the so-called "Great Moderation"). In that period, inflation in advanced economies became less responsive to economic slack, with a consequent "flattening" of the Phillips curve. ([8])

With the advent of the crisis and the sudden and major drop in output and labour productivity, euro-area countries experienced on average a sharp increase in the sensitivity of inflation to unemployment, with a steepening of the Phillips curve at the beginning of the Great Recession. This can be gauged by an estimation of the Phillips curve across a panel of euro area countries for different periods. The increased sensitivity of wage growth to unemployment is visible in the difference of the values of the coefficient of unemployment in column (2) and (1) of Table I.1.3.

Table I.1.3: **Phillips curve relationship: wage growth and unemployment across euro area countries over different time periods**

	(1)	(2)	(3)
Dependent variable: wage growth	1999-2013	2007-2013	2010-2013
Lagged wage growth	0.354**	-0.202	-0.260
	(0.132)	(0.125)	(0.213)
Unemployment rate, %	-0.287**	-0.593***	-0.264
	(0.111)	(0.091)	(0.175)
Constant	4.252***	8.478***	4.533*
	(1.206)	(1.157)	(2.165)
Observations	180	72	36
R-squared	0.630	0.735	0.159
Number of countries	12	12	12

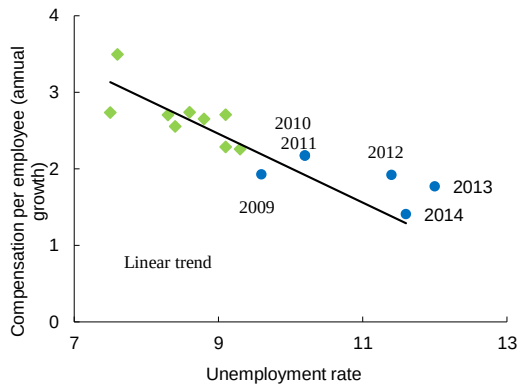
Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The sample includes euro area countries except Estonia, Cyprus, Latvia, Malta, Slovenia and Slovakia. Wage growth is measured by the rate of change of nominal compensation per employee.
Source: DG ECFIN AMECO database and Eurostat, LFS.

Such increase in the unemployment rate coefficient of the wage growth regression was however short-lived, with the Phillips curve for the euro area flattening again after 2009 (column 3, Table I.1.3).

Graph I.1.8 shows that such flattening of the Phillips curve in 2010 was visible also for the euro-area aggregate. ([9]) As briefly discussed in section 1.2.2, this phenomenon of Phillips curve flattening after the crisis was not confined to the euro area but concerned other world regions as well, most notably the US. Several explanations have been put forward.

([6]) This is calculated as the coefficient of a trend in a regression, over the period 2000Q1-2008Q4, of the hours worked per employee in logarithms on a constant and a linear trend.
([7]) Such reduction in average number of average usual weekly hours of work is explained in the literature by legislated reductions in standard work hours and increased diversification of work schedules, including non-standard and variable work hours (see for example OECD 2014).
([8]) See for instance IMF (2013).
([9]) See, for instance IMF (2013) and European Commission (2013a).

Graph I.1.8: **Phillips curve for the euro area 2000-2014: annual growth rate of compensation per employee**

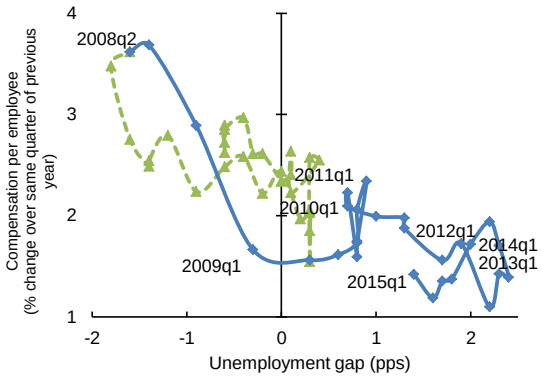


Source: DG ECFIN AMECO database and Eurostat, LFS.

First, the flattening of the Phillips curve, implying that wage growth settled around 2% even with high unemployment rates, was attributed to the credibility of the price inflation target, and its implications for the expectations of wage setters and actual wage developments.

Second, it has been stressed that the presence of downward nominal rigidities in a low inflation environment could explain the flattening of the Phillips curve in correspondence of sufficiently low rates of wage growth (Daly and Hobijn, 2014).

Graph I.1.9: **Phillips curve for the euro area: growth rate of nominal compensation per employee, 2000q1-2014q4**

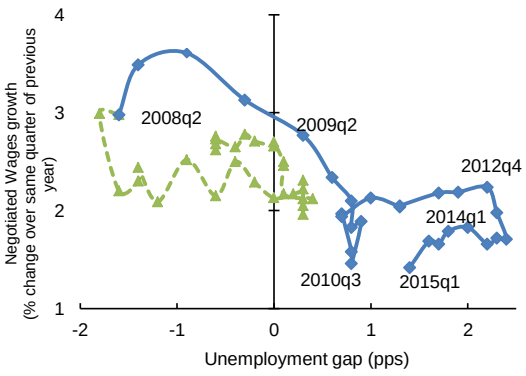


Source: DG ECFIN AMECO database and Eurostat, LFS.

Third, the reduced sensitivity of wage growth to unemployment could just be the result of unemployment becoming increasingly structural, and that a better measure of labour market slack is cyclical unemployment.

Graph I.1.9 depicts the Phillips curve for the euro area aggregate using, rather than unemployment, a measure of cyclical unemployment obtained as the difference between the unemployment rate and the Non Accelerating Wage Rate of Unemployment (NAWRU). Despite the possibility that also the NAWRU may contain a cyclical element so that fluctuations in the standard measure of the NAWRU follow closely that of overall unemployment and movements in cyclical unemployment are underestimated, Graph I.1.9 shows nonetheless some flattening of the Phillips curve after 2010. ([10]) The phenomenon is even more evident when the growth rate of negotiated wages is used instead of the growth rate of nominal compensations per employee (Graph I.1.10).

Graph I.1.10: **Phillips curve for the euro area: growth rate of negotiated wages, 2000q1-2014q4**



Source: ECB and Eurostat, LFS.

Some recent analyses on the US have tested whether the flattening of the Phillips curve is linked to the growing incidence of the long-term unemployed, less easily employable even at reduced wage rates. While some findings point to a lower Phillips curve coefficient for long-term unemployment (e.g., Krueger et al., 2014), more recent analysis exploiting also the cross-section dimension to

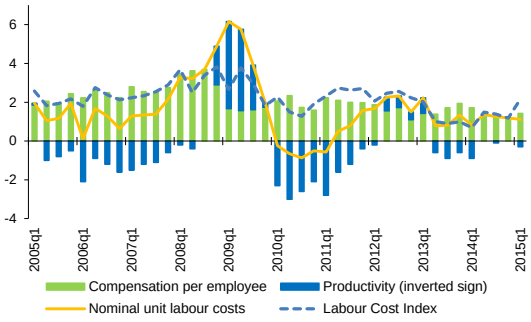
([10]) See European Commission (2013a) for a discussion of the cyclicality of the NAWRU.

identify the effect of unemployment of wages (Kiley, 2014) sheds doubt that the composition of unemployment has a significant effect in driving the slope of the Phillips curve. As shown in Box I.1.2, also for the euro area it appears not obvious that long-term unemployment exerts a reduced downward pressure on wages. Moreover, the analysis questions whether the relationship between Phillip curve sensitivity and unemployment duration needs to be monotonic, as there is some support to the possibility that the Phillips curve is flat at the two extremes, either very short or very long term unemployment.

The fact that wage growth is still sensitive to unemployment despite the growing share of long-term unemployment appears consistent with the steepening of the Phillips curve that took place since late 2012. This reduction in wage growth predates the stronger than expected drop in HICP inflation which occurred between the third and fourth quarter of 2013 and appears to be stronger for actual rather than negotiated wages. ([11]) A further fall in wage growth can be observed in the first three quarters of 2014, amid a decreasing unemployment gap and with HICP inflation persisting at very low levels, with a sudden rebound in the last quarter of 2014.

The drop in wage growth in 2013, coupled with a pick-up in productivity growth, translated into a reduction in the dynamics of unit labour costs at euro-area level, with growth rates in 2014 falling below 1% (Graph I.1.11).

Graph I.1.11: **Compensation per employee and unit labour costs in the euro area, growth rate on same quarter of previous year**



Source: Commission Services.

It is early for a firm assessment of the recent Phillips curve steepening. It is quite likely that the protracted labour market slack played a role, in combination with the usual lags characterising the response of wages to labour market conditions (i.e. similar to the evolution of the Phillips curve for the US) and the materialisation of the impact of wage setting reforms in a few countries. However, the drop in wage growth in 2013 and 2014 was relatively broad across the euro area, not only in countries characterised by a more substantial degree of labour market slack.

Actually, as discussed further in Chapter I.3, wage developments in a low-unemployment country like Germany weighted considerably on the evolution of the overall wage growth of the euro area. Looking forward, the evolution of wages will depend on the extent to which the recent fall in the wage drift (the difference in the growth rate of actual wages as compared with contractual wages) will feed through a new round of feeble growth in contractual wages and on the interplay between growth and inflation expectations in the behaviour of wage-setting agents.

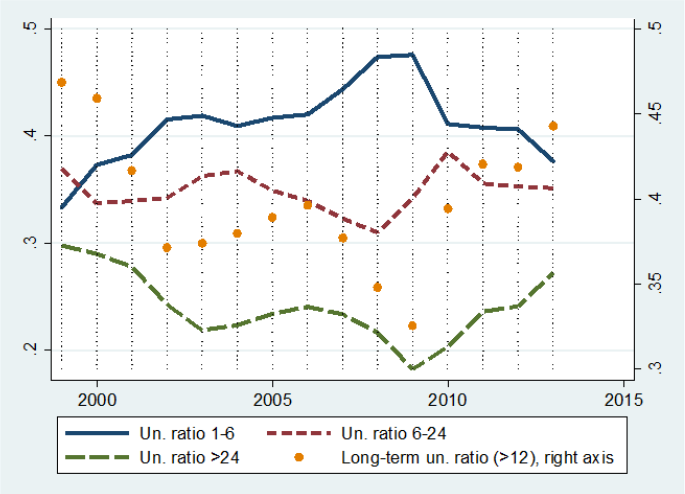
([11])Such drop in price inflation can be mostly attributed to the fading of one-off factors (notably fiscal and regulatory measures), and it is debated the extent to which structural factors also played a role. For a more detailed analysis of recent disinflationary trends in the euro area, see Box I.4 in European Commission (2014), and ECB (2014).

Box I.1.2: Does unemployment duration matter for wage growth?

The growing duration of unemployment is among the factors that could explain a muted response of wage growth to indicators of labour market slack. The relevance of unemployment duration for the slope of the Phillips curve was recently at the centre of the US debate (e.g., Gordon, 2013; Krueger et al., 2014; Kiley, 2014). Against the background of a growing share of unemployed with more than 6 months of unemployment history (the US definition of long-term unemployment), the expectation is that wages and prices would start exhibiting a weaker response, as the long-term unemployed are increasingly detached from the labour market and difficult to absorb also after wage cuts. Although the prior expectation is seldom put in doubt, views differ on the empirical relevance of the argument.

Gordon (2013) estimates separately the sensitiveness of inflation to total and long-term unemployment in a "triangle" Phillips curve model including both demand and supply determinants of inflation, and finds evidence in favour of a higher coefficient for short-term unemployment. Krueger et al. (2014) estimate an "accelerationist" Phillips curve (i.e., a Phillips curve where unemployment matters for the change in inflation, rather than its level) and find that short-term unemployment appears to have a somehow stronger impact than long-term unemployment, although the hypothesis of equality of the two coefficients cannot be rejected statistically. Kiley (2014) estimates a Phillips curve allowing for coefficient of inflation inertia below unity, and finds broadly similar coefficients for short and long-term unemployment, with no possibility of rejecting the hypothesis of equal coefficients. Moreover, he finds that the sensitivity of inflation to short and long-term unemployment appears to be very similar if estimated on a cross-section of municipalities rather than over time.

Graph 1. Unemployment ratios of different duration groups (% of total unemployment) euro area countries (see footnote to Table 1), simple average



Despite the incidence of long-term unemployment concerns also euro-area countries (Graph 1), recent evidence of its implications for wage growth is scant, with some exceptions (e.g., Llaudes, 2005). With a view to fill this gap, Table 1 presents Phillips curve estimates across a panel of euro-area countries that try to account for the role of unemployment duration.

When both short and long-term unemployment are included among the explanatory variables, they appear imprecisely estimated in light of the well-known multicollinearity problem arising with highly correlated regressors; a Wald test cannot reject the hypothesis that the two coefficients have the same value.

By adopting an accelerationist specification (column 3) where the dependent variable is the change in wage growth and lag of wage growth is included as in Krueger et al. (2014), the coefficient of long-term unemployment becomes insignificant, with the wrong sign, and the Wald test rejects the hypothesis of equality of the coefficients for short and long-term unemployment at the 10% level. Such a specification is however subject to an omitted variable bias, linked to the fact that the coefficient for lagged wage growth is

(Continued on the next page)

Box (continued)

significant and clearly lower than one (columns 1-2), which does not justify omitting it among the explanatory variables and using a dependent variable in first differences.

Table 1: Phillips curve estimates, alternative specifications, 12 euro-area countries, 1999-2013

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	Wage growth			Δ Wage growth			Wage growth	
Estimation method	LSDV			GMM			LSDV	
Wage growth, lagged	0.354**	0.329**		0.447***	0.304**	0.260*	0.318***	0.350**
	(0.132)	(0.117)		(0.122)	(0.101)	(0.137)	(0.100)	(0.126)
Un. rate	-0.287**						-0.253	
	(0.111)						(0.155)	
Short-term un. rate (1-12 m.)		-0.289	-0.385**	-0.495**		-0.232		
		(0.249)	(0.162)	(0.219)		(0.228)		
Long-term un. rate (>12)		-0.277**	0.199		-0.471***	-0.36***		
		(0.094)	(0.157)		(0.104)	(0.092)		
Unemployment rate*standardised long-term unemployment ratio							-0.026	
							(0.039)	
Un. rate 1-6 m.								-0.227
								(0.351)
Un. rate 6-24 m.								-0.429*
								(0.198)
Un.rate >24 m.								-0.115
								(0.214)
Constant	4.25***	4.21**	0.78	4.33**	3.68***	4.69***	4.70***	3.97**
	(1.206)	(1.367)	(0.510)	(1.489)	(0.735)	(1.285)	(1.445)	(1.533)
Observations	180	153	153	165	162	146	162	153
R-squared	0.630	0.614	0.199	0.582	0.632		0.636	0.616
Number of countries	12	12	12	12	12	11	12	12
Wald test for equality of coefficients for unemployment (P value)		0.96	0.08			0.62		0.73

Notes: Robust standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1. All regressions include country and year fixed effects. GMM estimation method: Arellano-Bond. The same level of statistical significance for short and long-term unemployment in the specification in column (2) is obtained with Newey-West standard errors (3 lags). The sample includes euro area countries except EE, CY, LV, MT, SI and SK. Wage growth is measured by the rate of change of nominal compensation per employee.

Source: DG ECFIN AMECO database and Eurostat LFS.

Columns 4 and 5 use short and long-term unemployment as alternative explanatory variables. Both coefficients appear significant and of similar magnitude. Such a specification does not suffer from multicollinearity, but the estimated coefficients are likely to suffer from an upward bias due to omitted variables.

A bias associated with the inclusion of the lagged dependent variable in a panel dataset is likely to characterise also specification (2). Using GMM estimation to deal with biased and inconsistent estimators yield a slightly higher coefficient for long-term unemployment (column 6); the coefficients for the two unemployment definitions are however not statistically different.

A different strategy to test whether unemployment duration matters is to check if the incidence of long-term unemployment matters for the sensitiveness of wage growth to overall unemployment. To this purpose, the specification in column (7) interacts unemployment with the ratio of long-term unemployment on total unemployment, standardised in such a way to have zero mean and unit variance across the sample. The value of the this interacted variables indicates by how much the coefficient of unemployment increase for any standard deviation increase in the incidence of long-term unemployment. Results show that the incidence of long-term unemployment has no significant impact.

Finally, column (8) explores whether the apparent lack of relevance of unemployment duration for wage growth could be linked to the particular breakdown used to define long-term unemployment in EU statistics (12 months). For that purpose, it presents a different breakdown of unemployment by duration: 1-6 months, 12-24 months and more than 24 months. As shown in Graph 1, these groups are of broadly similar size

(Continued on the next page)

Box (continued)

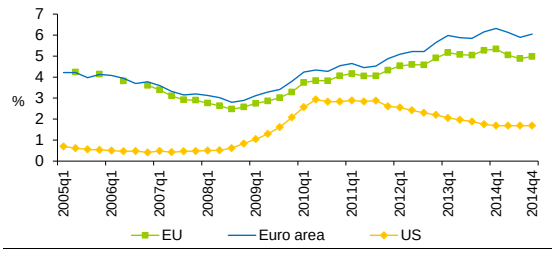
across euro-area countries, and since the aggravation of the crisis there was variation especially with the incidence of very short-term (falling) and very long-term (rising) unemployment. Quite interestingly, the evidence seems to support the view that wage growth is relatively insensitive to both very short-term and very long-term unemployment: on the one hand the long-term unemployed are detached from the labour market, while on the other hand the short-term unemployed may be less ready to accept wage reductions (e.g., due to relatively high reservation wages linked, inter-alia, to unemployment benefit entitlements). However, the evidence also in this case does not reject the hypothesis of equal coefficients for the three unemployment variables.

All in all, although on principle there are *a priori* reasons why unemployment duration should matter for wage growth, empirical evidence on a panel euro-area countries does not seem to provide strong support to such a view: additional research on the topic would be warranted.

1.5. Long-term unemployment and labour market matching

The proportion of the labour force unemployed for one year or more kept increasing until the first quarter of 2014, peaking at 5.3% in the EU (6.4% in the euro area). It then fell gradually during the year hovering around levels that remained twice as high as those prevailing before the 2008 crisis (Graph I.1.12).

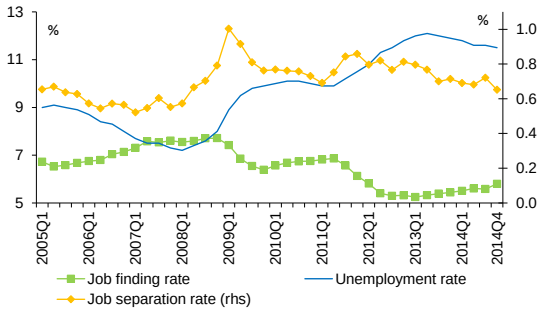
Graph I.1.12: **Long-term unemployed (for 1 year or more) in the EU, the euro area and the US (% of total labour force)**



Source: Eurostat and U.S. Bureau of Labor Statistics.

As stressed in the current policy debate (Draghi, 2014) and confirmed in recent analyses (e.g., Arpaia et al. 2014), the persistence of long-term unemployment has implications for the efficiency of labour market matching and the risk that unemployment becomes entrenched ("unemployment hysteresis"). Long-term unemployment is also relevant for its social implications, since it is found to be one of the factors most closely linked to the growth in poverty in the EU since the crisis. ([12])

Graph I.1.13: **Job-finding and separation rates in the euro area**



Source: Commission Services based on Eurostat data.

Changes in the structure of unemployment duration reflect fluctuations in the job-finding and separation rates (Graph I.1.13). After the initial surge at the onset of the 2008 and 2011 recessions, *separation rates* declined steadily at a fairly sustained rate, almost reaching their pre-crisis levels by the end of 2013. In contrast, *job-finding rates,* albeit bottoming out in 2013 and slightly recovering afterwards, continue to remain at historically low levels.

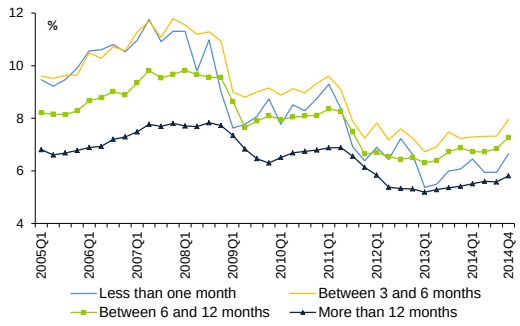
Persistently depressed job-finding rates find their counterpart in the lengthening of unemployment spells and a historically high share of long-term unemployment.

([12])The relation is significant with two measures of poverty: "severe material deprivation" and the "anchored at risk-of-poverty rate", namely the at-risk-poverty rate anchored to the median income of a chosen base year (see Duiella and Turrini, 2014).

The expected duration of unemployment spells was about 16 months in 2014Q4, up from about 10 months before the crisis. ([13]) At the end of 2014, it dropped to 17 months, well above the pre-crisis average duration.

Despite a timid recovery in job-finding rates, the share of long-term unemployment in the labour force was still growing both in the euro area and in the EU up to the first quarter of 2014, stabilising thereafter. A possible explanation could be that job-finding rates remain depressed, especially for the long-term unemployed. Job-finding rates are distinguished according to length of time spent in unemployment in Graph I.1.14. It is visible that the job-finding probability has been increasing since 2013 more sharply for jobseekers with short durations.

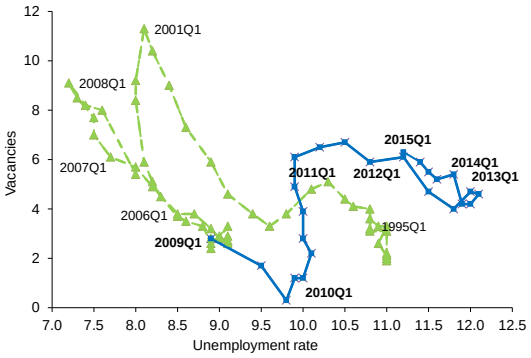
Graph I.1.14: **Job-finding rate by duration of unemployment, euro area**



Source: Commission Services based on Eurostat data.

The evolution of job-finding probabilities is also behind the movements of the *Beveridge curve* depicting the relationship between the level of the unemployment rate and the availability of job vacancies (Graph I.1.15). Post-crisis movements in the euro-area Beveridge curve were the result of a mix of temporary, demand-related and structural factors (European Commission 2013b). The outward shift of the Beveridge curve since 2008 observed at the aggregate level was to some extent linked to worsened labour market matching, with however major differences across countries (e.g., improved labour matching in Germany).

Graph I.1.15: **Beveridge curve for the euro area, 1995q1-2014q4**



Note: Job vacancies are approximated with the survey based indicator of labour shortages in industry.
Source: Commission Services.

Labour demand also played an important role. At the onset of the 2008 crisis, the number of vacancies dropped sharply and the unemployment grew. Vacancies started to increase visibly during the short-lived 2010 recovery while the response of unemployment was relatively muted, a pattern that can be attributed to the typical counter-clockwise movements of the vacancy-unemployment relation during the adjustment to negative labour demand shocks. As the euro area entered again in recession, unemployment and vacancies moved along the negative relationship usually attributed to cyclical labour market developments. Since 2013 a new phase has started where vacancies are growing together with a reduction in unemployment: the pattern expected in response to strengthening labour demand.

1.6. Conclusions

In 2013, the EU and euro area labour markets started to recover slowly from the 2011-2012 recession. The decline in unemployment commenced in the second half of 2013 and continued at a more rapid pace during 2014 and the beginning of 2015. Although the unemployment rate has fallen, it remains at the highest

([13])The expected duration of unemployment equals the reciprocal of the job-finding rate.

levels since almost two decades, standing at 9.8% and 11.3% respectively for the EU and the euro area in the first quarter of 2015.

Labour markets responded quite swiftly to the gradual improvement of the economic outlook. Factors explaining this rapid response include a significant deceleration of real wage growth and a limited recovery of average hours worked consistent with a pre-crisis downward trend. However, the current low level of average hours worked does not represent necessarily a *new normal*, as it is accompanied by a significant increase in involuntary part-time employment, which has a clear cyclical pattern and can be expected to be reabsorbed during the recovery.

However, output growth has been insufficient to generate sizable job creation also possibly in light of the capital gap that is observed in several Member States. In 2014, the euro area employment stood 3% below its level of 2008.

The decline in the real wage rigidity has been associated with an increase in nominal wage rigidity. Nominal wage growth has become less sensitive to the current high unemployment rates. Such "flattening" of the Philips curve may be related to a number of factors including the difficulty of engendering nominal wage cuts in a low inflation environment and the reduced number of unemployed competing for jobs in a period of increasing long-term unemployment.

However, according to the econometric evidence in this chapter, unemployment duration is not a discriminatory factor in identifying the flattening of the Phillips curve. This suggests that not all long-term unemployment is structural. An important implication is that measures supporting the demand for labour would trickle down also to the benefit of long-term unemployed.

After the initial surge, separation rates are gradually returning towards their pre-crisis levels, while the job-finding rates have improved only slightly and for durations of unemployment shorter than one year. This implies that employment prospects remain difficult for those who have lost a job during the 2008-2009 economic and financial crisis. The fact that the job-finding rates remain persistently low might influence the labour market dynamics: lower job-finding rates imply that unemployment will stay for longer far from the level that corresponds to the pre-crisis inflows and outflows rates.

Looking forward, labour market developments are encouraging. Yet, labour market prospects are intimately linked to medium-term growth prospects, which remain weak in light of the legacies of the economic and financial crisis and underlying long-term economic trends.

2. Recent employment developments

Starting from 2013, and more clearly in 2014, labour market conditions across EU countries ceased to diverge: unemployment started decreasing not only in the countries where it had surged at the onset of the 2008-2009 recession (e.g., the Baltic states, Hungary), but also in countries concerned by the sovereign debt crisis. Ireland, Portugal and Spain saw their unemployment rates fall and signs of a turnaround became visible also in Greece and Cyprus towards the end of 2014 and beginning of 2015. Yet, in some of the countries with unemployment rates above 10% like France and Italy unemployment appears to be more persistent. The observed improvements were mostly linked to reductions in dismissal rates. Job finding rates, although recovering, continued to be well below pre-crisis levels. Participation rates remained resilient in most countries, while variations in the working age population played an important role in employment dynamics in Member States with relatively weak cyclical labour market conditions, especially the Baltic states and, to a less extent, countries hit by the debt crisis. Reductions in the participation rate of the young were mostly linked to increased time spent in education. Finally, although youth unemployment fell at faster rates than overall unemployment, youth unemployment levels remain record-high.

2.1. Introduction

In 2014, for the first time since the beginning of the crisis, a timid convergence in labour market conditions was observed within the EU, with unemployment decreasing also in Member States that recorded the highest increase in unemployment after the sovereign debt crisis (i.e. Greece, Spain, Croatia, Portugal and Cyprus), while unemployment remained broadly stable in non-stressed countries.

This chapter takes a closer look at labour market developments at Member States' level, with the objective of providing a better understanding of the factors behind the different trends observed across countries. In particular, changes in activity, employment and unemployment are presented for each country disaggregated by different characteristics such as age, education, nationality, sector of employment and type of contract.

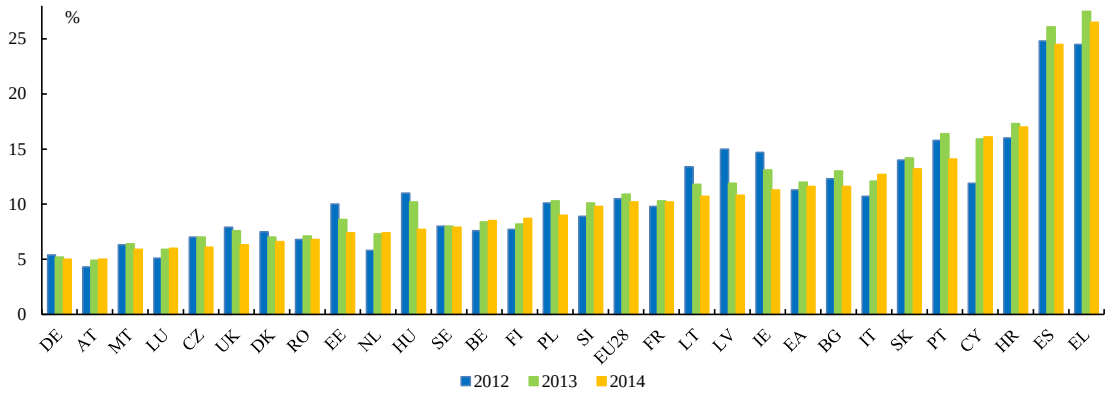
The analysis digs deeper into a number of issues: it discusses the role of changes in the composition of the labour force, and it addresses the question of human capital deterioration in the crisis by looking at the evolution of school expectancy rates. The chapter also sheds light on how the sectoral structure of the economy can influence the distribution of employment between open-ended and temporary contracts. Finally, in light of the recent pick-up in employment in Spain, a focus is made on the recent reform of the Spanish employment protection legislation. The remainder of this chapter is structured as follows: Section 2.2 looks at unemployment rates; Section 2.3 provides data on employment and activity rates, including across sectors; Section 2.4 describes job flows; Section 2.5 presents developments for specific demographic groups and contract types, and Section 2.6 concludes.

2.2. Unemployment rates

The situation improved significantly in 2014 with a relatively broad-based fall in unemployment that was especially strong in Hungary, Ireland, Portugal and Spain (Graph I.2.1).

Amongst debt-crisis countries, Spain and Portugal had the most remarkable performance (Table I.2.1). At the beginning of 2015, unemployment rate was 2.8 percentage points lower than it had been in early 2013 in both countries. Unemployment fell steadily also in the Baltic states, Greece, Hungary and

Graph I.2.1: **Unemployment rate, 2012-2014**



Source: Eurostat, LFS.

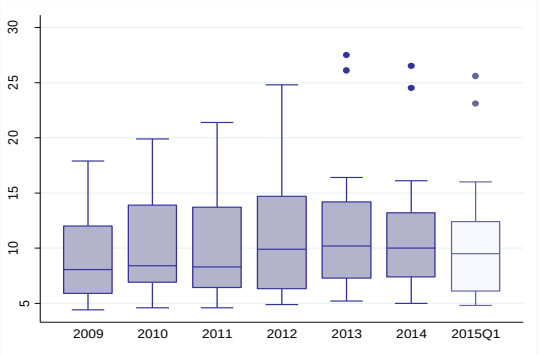
Ireland and, to a lesser extent, in Bulgaria, Denmark, Czech Republic and Poland.

Broadly stable unemployment rates were recorded in Belgium, Luxembourg, Austria and Sweden. The reduction in the German unemployment rate that had started in 2009 slowed down, while unemployment kept rising gradually in Finland. Lack of labour market improvement characterised countries with high unemployment rates, most notably France and Italy – although in the latter unemployment declined at the end of 2014.

Improvements recorded in stressed countries put an end to labour market divergence within the EU and the euro area that followed the financial crisis. However, variation remains high.

In 2010 and 2011, the increase in unemployment rate was quite widespread, being more pronounced for countries with the unemployment rate *not far* from the median - this is visible from the widening of the box representing the core of the distribution (Graph I.2.2). In the subsequent two years, the increase in unemployment divergence was mainly driven by the surge in Spain and Greece, and, in 2012, by the impact of the 2011 recession in countries with a relative small increase of unemployment at the onset of the crisis (e.g. Italy and France). In 2013, the divergence reached its peak as unemployment rates started to decline in a number of countries, while they kept rising in debt ridden countries. The reduction in unemployment rates concerned in particular non-euro area countries like the Baltic States and Hungary. Convergence in the euro area became visible in 2014 as conditions started improving in debt-ridden crisis countries, namely Ireland, Portugal and Spain, with later signs of improvement becoming visible also in Greece and Cyprus.

Graph I.2.2: **Distribution of unemployment rates for euro area Member States: 2010-2015**



Note: The bottom and top of the boxes represent the 1st and 3rd quartiles of the distribution of unemployment rate by euro area Member States; the horizontal mark inside the box represents the median. The two whiskers show the upper and lower most extreme values falling within a range of 1.5 of the interquartile range (the spread between the first and third quartile), while the dots represent the outliers falling outside such range.
Source: Commission services based on Eurostat, LFS

Table I.2.1: **Unemployment rates, recent evolution: 2013q1-2015q1**

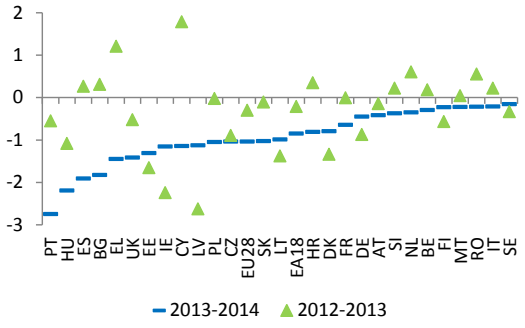
	2013Q1	2013Q2	2013Q3	2013Q4	2014Q1	2014Q2	2014Q3	2014Q4	2015Q1
EU28	10.9	11.0	10.9	10.7	10.5	10.3	10.1	9.9	9.7
EA19	12.0	12.1	12.0	11.9	11.8	11.6	11.5	11.4	11.2
BE	8.3	8.4	8.4	8.5	8.4	8.4	8.6	8.6	8.7
BG	13.0	13.0	12.7	12.9	12.3	11.5	11.4	10.5	9.9
CZ	7.2	7.0	6.9	6.8	6.6	6.2	5.9	5.8	5.9
DK	7.2	6.9	7.0	7.0	6.8	6.4	6.6	6.3	6.2
DE	5.4	5.3	5.2	5.1	5.1	5.0	5.0	4.9	4.8
EE	9.1	8.0	8.3	8.8	7.9	7.2	7.7	6.6	6.2
IE	13.7	13.7	12.7	12.2	12.1	11.6	11.1	10.4	10.0
EL	26.9	27.7	27.8	27.7	27.1	26.9	26.2	26.0	25.6
ES	26.2	26.2	26.2	25.8	25.3	24.7	24.2	23.7	23.1
FR	10.3	10.4	10.3	10.1	10.1	10.1	10.3	10.4	10.3
HR	17.0	17.4	17.9	17.3	17.4	17.0	16.9	17.7	17.1
IT	11.8	12.1	12.2	12.4	12.7	12.5	12.7	12.7	12.4
CY	14.6	15.9	16.4	16.6	15.7	16.1	16.3	16.5	16.3
LV	12.6	11.5	11.7	11.5	11.6	10.7	10.7	10.3	9.9
LT	12.4	12.0	11.8	11.5	11.3	11.0	10.5	10.1	9.2
LU	5.6	5.8	6.0	6.0	6.0	6.0	6.0	5.9	5.8
HU	10.9	10.3	10.1	9.2	7.9	8.1	7.5	7.3	7.4
MT	6.3	6.3	6.4	6.5	6.0	5.9	5.8	6.0	5.9
NL	6.8	7.1	7.5	7.6	7.8	7.6	7.2	7.2	7.1
AT	5.4	5.2	5.4	5.5	5.6	5.6	5.6	5.6	5.5
PL	10.6	10.5	10.3	10.0	9.8	9.2	8.6	8.3	8.0
PT	17.3	16.9	16.0	15.4	14.9	14.4	13.5	13.5	13.5
RO	7.0	7.2	7.1	7.1	7.0	6.8	6.7	6.6	6.9
SI	10.3	10.5	10.0	9.6	10.1	9.7	9.6	9.4	9.2
SK	14.2	14.3	14.3	14.2	13.8	13.3	13.1	12.6	12.1
FI	8.1	8.1	8.1	8.3	8.4	8.6	8.8	9.0	9.2
SE	8.1	8.0	8.0	8.0	8.1	8.0	7.8	7.8	7.8
UK	7.8	7.7	7.6	7.1	6.7	6.3	5.9	5.6	5.5

Note: Data seasonally adjusted.
Source: Eurostat, LFS.

Recent improvements did not only stem from the fact that economic growth resumed, but also from a stronger than expected reaction of unemployment to GDP recovery. Graph I.2.3 displays the difference between the actual change in unemployment and the change predicted on the basis of GDP growth. When the symbols are close to zero, there is a small difference between the two changes, implying that GDP growth accounts for a large proportion of the change in unemployment.

In 2014, unemployment declined more than expected on the basis of GDP growth for the large majority of EU countries. Stronger than expected reductions in unemployment were recorded in debt-crisis hit countries, especially in Portugal and Spain. This implies a reversal of the pattern that characterised the debt crisis, when the surge in unemployment in crisis-hit countries was well above what explained by the decline in output, in light of worsened employers' expectations and financial fragmentation.

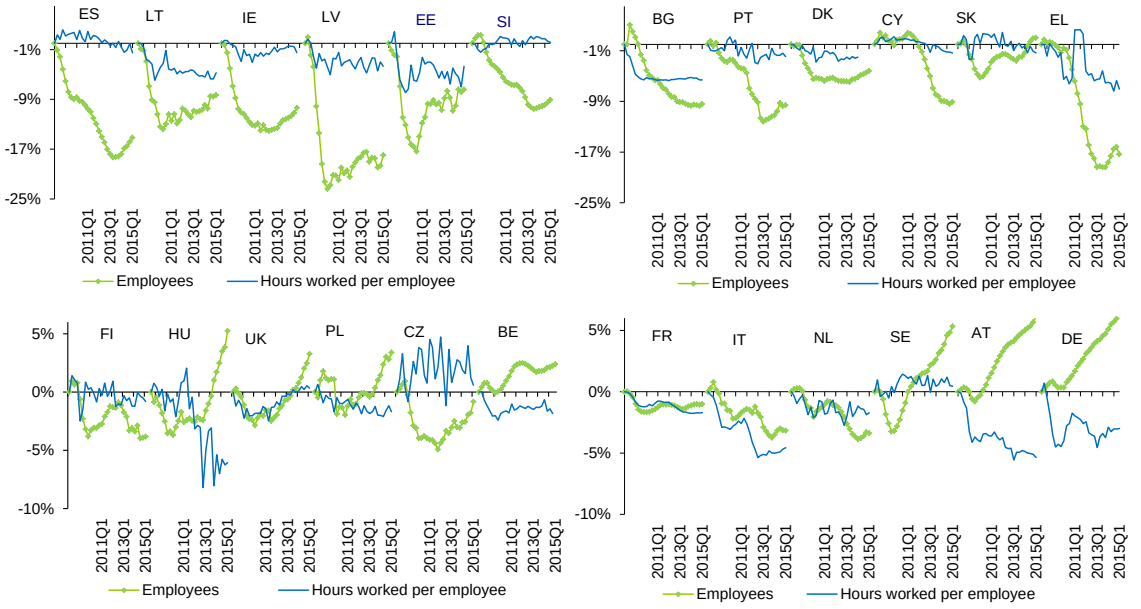
Graph I.2.3: **Changes in unemployment rate unexplained by GDP growth, different annual periods**



Note: The chart shows the gap between the actual change in unemployment and the change predicted on the basis of GDP growth, with Okun's coefficient of 0.28 and a constant of 0.7.
Source: Commission services based on Eurostat.

In contrast, unemployment changes were closer to those predicted on the basis of GDP growth in a small number of countries including Slovenia, Finland, Malta, Italy and Romania.

Graph I.2.4: **Change in total hours worked (cumulative change since 2009q4)**



Note: Full data are not available for Croatia, Luxembourg, Malta and Romania.
Source: Eurostat, National accounts.

As discussed in Chapter 1, the swift and sizable reaction of unemployment to a modest pickup in economic growth can be attributed to improving confidence, higher margins against the backdrop of moderate unit labour cost increases, and subdued growth in hours worked. The implementation and scaling up of active labour market programmes may also have played a role by taking participants temporarily out of unemployment. ([14])

Differences in the response of unemployment to GDP growth may not only come from the degree of confidence and credit conditions but also from changes in activity rates and from demographic and migration trends, which impact the working age population. For example, the drop in unemployment in the Baltic states is to a certain extent influenced by the increased mobility of many young individuals that during the crisis left for neighbouring countries (see also Appendix 1 to this chapter and Part II of the report).

2.3. Employment, activity rates, hours worked

2.3.1. Employment and activity rates

In 2014, the increase in labour market participation contributed offsetting discouragement effects in a number of EU countries including Cyprus, Finland, Italy, Slovakia, and Slovenia.

The only countries where the increase in participation came to a halt were Spain, Greece, Hungary, Austria and the Netherlands. In Greece, Hungary, the Netherlands and Spain, activity rates fell despite a parallel drop in the number of *discouraged workers* (individuals that do not look for a job because they believe no work is available). Inactivity increased in Greece mainly due to retirement and in Spain and Austria as a result of retirement and a larger number of people going in education or training; finally a pick-up of disability and retirement

([14]) For example, in Portugal, between the first and the third quarter of 2014, employment rose by 120,000. At the same time, the number of people in employment programmes rose from 65,900 to 151,000 between January and September 2014.

Table I.2.2: **Participation rates, employment rates and shares of discouraged workers in EU Member States**

	Activity rate				Employment rate				Share of discouraged workers			
	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014
EU28	71.1	71.7	72.0	72.3	64.2	64.1	64.1	64.9	5.2	5.4	5.6	5.7
EA19	71.5	72.0	72.2	72.3	64.2	63.7	63.5	63.9	5.4	5.8	6.1	6.3
BE	66.7	66.9	67.5	67.7	61.9	61.8	61.8	61.9	5.1	4.7	4.8	4.4
BG	65.9	67.1	68.4	69.0	58.4	58.8	59.5	61.0	14.8	15.2	14.0	13.5
CZ	70.5	71.6	72.9	73.5	65.7	66.5	67.7	69.0	0.7	1.3	0.6	0.8
DK	79.3	78.6	78.1	78.1	73.1	72.6	72.5	72.8	0.5	0.6	0.5	0.5
DE	77.3	77.2	77.6	77.7	72.7	73.0	73.5	73.8	1.9	1.9	1.9	1.6
EE	74.7	74.8	75.1	75.2	65.3	67.1	68.5	69.6	5.5	4.0	3.9	3.6
IE	69.2	69.2	69.8	69.8	58.9	58.8	60.5	61.7	:	6.6	4.2	3.4
EL	67.3	67.5	67.5	67.4	55.1	50.8	48.8	49.4	0.9	1.4	1.9	1.6
ES	73.9	74.3	74.3	74.2	58.0	55.8	54.8	56.0	5.9	6.7	7.4	7.1
FR	70.4	70.9	71.1	71.3	63.9	63.9	64.1	64.2	:	:	2.7	2.8
HR	64.1	63.9	63.7	66.1	55.2	53.5	52.5	54.6	6.0	6.0	7.8	5.3
IT	62.1	63.5	63.4	63.9	56.8	56.6	55.5	55.7	10.2	11.2	12.5	13.9
CY	73.5	73.5	73.6	74.3	67.6	64.6	61.7	62.1	4.7	5.3	6.4	7.5
LV	72.8	74.4	74.0	74.6	60.8	63.0	65.0	66.3	9.6	8.2	8.5	7.9
LT	71.4	71.8	72.4	73.7	60.2	62.0	63.7	65.7	2.8	2.5	2.5	2.3
LU	67.9	69.4	69.9	70.8	64.6	65.8	65.7	66.6	0.7	0.8	1.2	1.2
HU	62.4	63.7	64.7	67.0	55.4	56.7	58.1	61.8	6.5	6.7	6.6	5.3
MT	61.8	63.1	65.0	66.3	57.9	59.1	60.8	62.3	1.2	1.4	1.4	0.8
NL	78.4	79.3	79.7	79.3	74.9	75.1	74.3	73.9	3.4	4.4	6.2	5.8
AT	74.6	75.1	75.5	75.4	71.1	71.4	71.4	71.1	0.5	0.5	0.7	0.8
PL	65.7	66.5	67.0	67.9	59.3	59.7	60.0	61.7	4.9	5.3	6.2	6.3
PT	73.6	73.4	73.0	73.2	63.8	61.4	60.6	62.6	7.9	10.9	12.6	12.1
RO	64.1	64.8	64.9	65.7	59.3	60.2	60.1	61.0	11.4	9.7	9.1	8.6
SI	70.3	70.4	70.5	70.9	64.4	64.1	63.3	63.9	2.2	2.8	3.8	5.2
SK	68.7	69.4	69.9	70.3	59.3	59.7	59.9	61.0	1.4	0.8	0.9	1.4
FI	74.9	75.2	75.2	75.4	69.0	69.4	68.9	68.7	4.7	4.6	6.1	6.8
SE	79.9	80.3	81.1	81.5	73.6	73.8	74.4	74.9	2.6	2.9	3.0	2.8
UK	75.5	76.1	76.4	76.7	69.3	69.9	70.5	71.9	0.7	0.8	0.5	0.5

Note: Discouraged workers defined as inactive persons (aged 15-74) who are available to work but not seeking employment because they think no work is available, expressed as a share of total inactive population. Employment data based on the resident concept.
Source: Eurostat, LFS.

explains the increase in the inactivity rate in Hungary.

As stressed in Chapter 1, the resilience of EU participation rates could in part be attributed to the dynamics of the working age population, which has been declining on aggregate after the crisis, while it was growing in the preceding years. The reduction in the working age population was particularly acute in Member States such as Bulgaria, the Baltic states, the Czech Republic, Hungary, Poland and Romania where it was mostly linked to outflow migration (see Appendix 1 and Part II of this report) but also to low fertility rates. In these countries, activity rates kept rising during the crisis.

A sizable contraction in the working age population was recorded also in Portugal, without major changes in the activity rate. In countries with a growing working age population, activity rates increased in the majority of them (e.g. Austria, Belgium, Netherlands, Luxembourg, Italy, Sweden and the UK); they fell only in Denmark and Ireland.

As a result of declining unemployment rates and broadly constant activity rates, employment rates improved over 2013-2014 in the majority of Member States, with the exception of Finland and the Netherlands (Table I.2.2). In 2014 in particular, employment growth turned positive in Croatia, Portugal, Spain, Greece and Cyprus, not least as a consequence of significant reform efforts.

Employment rates can change because of changes in employment for different age groups and because of demographic shifts between age groups with different employment rates. The decomposition of employment changes presented in the Appendix to this chapter shows how the demographic component played a substantial role only in few Member States. In Bulgaria, the Czech Republic, Romania, Slovakia, Estonia and Latvia in particular, the overall increase of the employment rate between 2008 and 2013 can be attributed to a reduced incidence of young cohorts, which exhibit lower employment rates. In Croatia, composition effects played in the direction of reducing the overall employment rate, as the incidence of prime-age workers fell.

2.3.2. The adjustment of hours worked

The evolution of hours worked was broadly in line with that of employment, mostly increasing in countries where employment was also on the rise (Graph I.2.4). In a majority of Member States, hours worked have not recovered, remaining at levels below those prevailing before the crisis. Major reductions in hours worked compared to pre-crisis levels took place in the Baltic states, Bulgaria, Hungary, Italy, Austria, Germany, Greece, Belgium, France, and Poland. By converse, hours worked have been growing in a few countries, notably the Czech Republic, Portugal, and Sweden. Year-on-year, hours worked per employee rose further in the Czech Republic, Portugal, and Spain. They continued to recover in Ireland and the UK, while they reversed a negative trend in Estonia, Germany, Greece and Italy. In Ireland, hours worked rose at the same time as headcount employment. Instead, hours worked continued to decrease in Austria, Cyprus, Hungary, and Slovakia, a development that was associated in all countries but Cyprus with an increase in the number of employees.

2.3.3. Employment developments at sectoral level

Capital inflows influence the sectoral allocation of resources. In countries having experienced boom-bust cycles (e.g. Spain, Latvia and Ireland), the inflows of foreign capital and the ensuing increase of domestic credit in the years preceding the 2008 crisis fuelled unsustainable domestic demand and an expansion of the non-tradable sector, which increased imports and widened the current account deficit. A similar dynamics was observed in Portugal, where a prolonged period of low growth was accompanied by large capital inflows. The expansion of the non-tradable sector was accompanied by an increase of non-standard forms of employment (temporary contracts and self-employment), usually more prevalent in this sector.

The adjustment of current account imbalances started after the 2008 crisis when external financing of current accounts dried up ("current account reversal"). The adjustment occurred through two main mechanisms: an *expenditure reduction*, which lowered imports via compressed domestic demand, with negative effects on employment and domestic production; and an *expenditure switching*, with a shift of resources away from the non-tradable sectors and foreign goods towards domestic tradable sectors. Remarkable cross-country differences appear for what concerns sectoral pattern of employment growth in recent years, i.e. the 2010-2014 period (Table I.2.3).

Sectoral employment shifts over the period 2010-2014 appear supportive of rebalancing within the euro area. As shown in Graph I.2.5, jobs were reallocated from the non-tradable to the tradable sector especially in countries that had experienced protracted current account deficits before the crisis, namely Ireland, Portugal, Spain and Greece. In "surplus" countries, the reversal of capital inflows was also accompanied by a shift in

the employment structure toward non-tradable sectors. However, in countries such as Latvia and Estonia the dynamics of employment were more sustained in the non-tradable sector, reflecting dynamic private consumption.

Table I.2.3: **Employment growth in different sectors: 2010-2014, (%)**

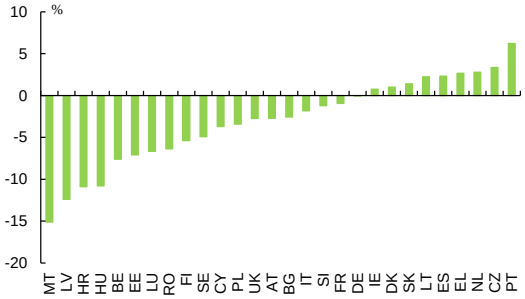
	Agriculture	Industry	Construction	Market services
EU28	0.9	-1.0	-10.9	0.4
EA19	0.5	-1.0	-13.4	0.8
BE	-8.2	-5.7	-0.5	-1.0
BG	-6.2	-5.4	-20.9	-4.2
CZ	3.5	5.0	-10.1	-0.4
DK	1.4	-1.6	1.8	0.8
DE	-0.8	4.2	5.0	3.9
EE	-0.9	3.9	30.4	14.6
IE	27.9	-2.9	-9.8	0.7
EL	-10.2	-25.7	-54.9	-16.0
ES	-7.8	-11.7	-40.1	-4.0
FR	-1.9	-3.2	-3.8	0.1
HR	-38.2	-5.4	-18.2	-2.7
IT	-5.5	-5.5	-18.6	-0.7
CY	-20.3	-17.5	-32.1	-6.3
LV	-1.5	2.2	14.3	-1.6
LT	9.7	3.3	14.2	7.1
LU	10.5	-1.1	3.1	7.7
HU	-1.8	-4.1	-1.1	4.1
MT	-9.8	4.9	5.7	9.4
NL	3.9	-3.9	-12.2	0.8
AT	-6.8	3.6	4.2	4.7
PL	-9.8	6.2	-7.0	3.5
PT	-19.0	-6.1	-39.1	-0.8
RO	-12.4	-5.5	-9.6	2.0
SI	-3.7	-3.1	-24.8	-4.0
SK	-0.3	3.5	-11.4	4.6
FI	-3.9	-3.4	2.7	-0.1
SE	6.0	-3.5	9.0	5.8
UK	-4.8	0.8	-1.3	3.3

Note: For Finland, France, Greece, Luxembourg the EU28 and euro area, data refer to 2010-2013. Employment is based on domestic concept, which includes all employed nationals irrespective of the place of residence.
Source: Eurostat, National Accounts

Employment in the tradable sector fell relatively to the non-tradable sector in Austria, Belgium and Finland, but not in Germany and the Netherlands. Relative growth of the non-tradable sector picked up in Estonia and Latvia, the last two countries to have joined the euro area, after the major shrinking that took place in the 2008-2009 period.

Employment in market services grew on average across the euro area and the EU, although strong reductions were registered in countries where domestic demand was compressed in light of the rebalancing process and the need to tackle the debt crisis (Bulgaria, Greece, Portugal, Spain, and Slovenia).

Graph I.2.5: **Gap between employment growth in the tradable and in the non-tradable sector: 2010-2014, cumulative (%)**



Note: The tradable sector includes (i) agriculture and fishing; (ii) industry (excluding construction); (iii) wholesale and retail trade, transport, accommodation and food service activities. The non-tradable sector includes (i) construction; (ii) finance and insurance; (iii) real estate; (iv) professional, scientific and technical activities; (v) administrative and support activities; (vi) public administration, defence, education, human health and social work; (vii) arts, entertainment and recreation; other services; activities of household and extra-territorial organizations and bodies.
Source: Commission services based on Eurostat, National Accounts.

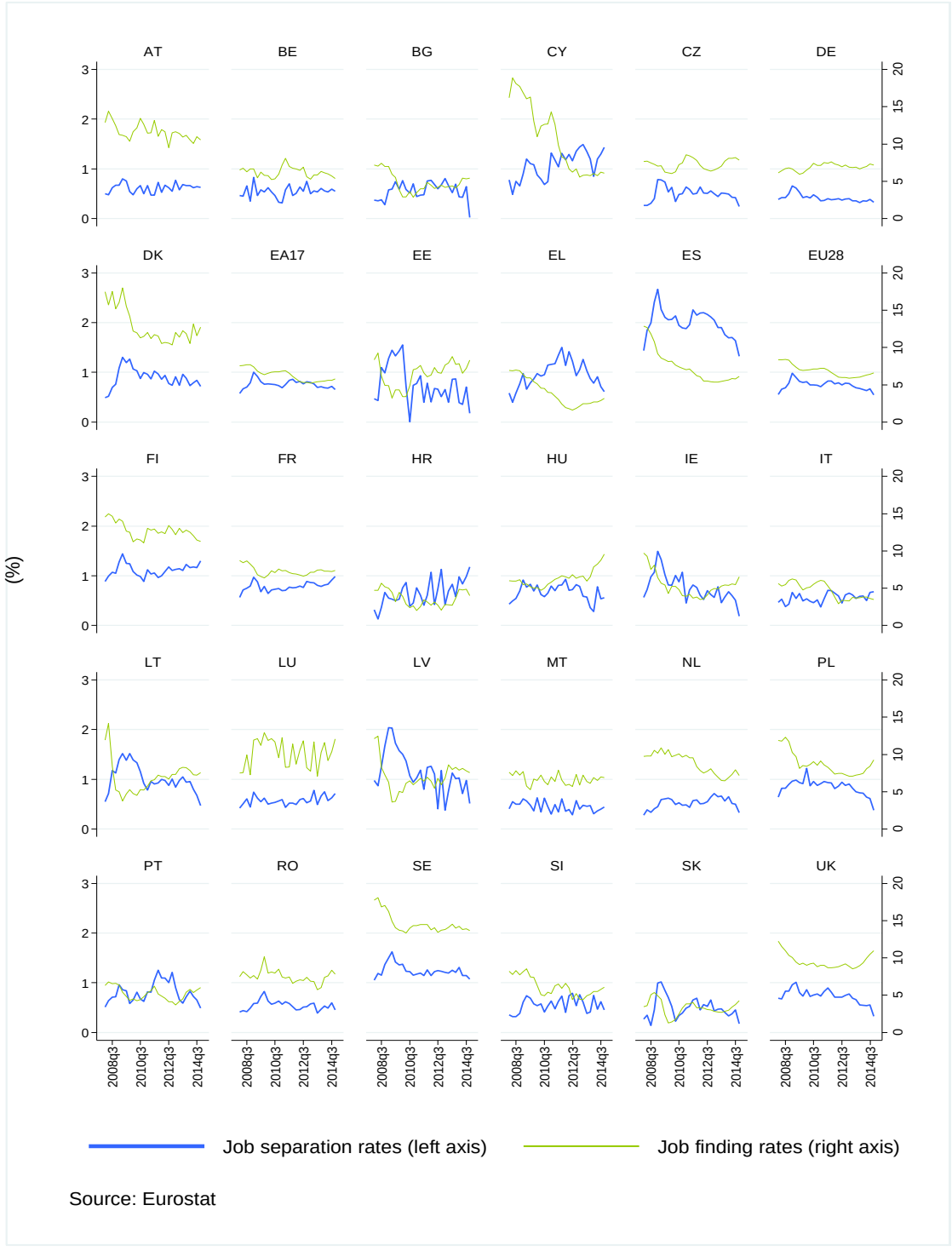
Employment in the construction sector grew especially in Latvia and Lithuania, as well as in the Baltic states and Sweden, while it fell considerably in all other countries, with reductions above 20% in Bulgaria, Greece, Portugal, Spain and Slovenia. Employment dynamics in industry were relatively sustained in Austria, Czech Republic, Estonia, Germany, Malta, Poland and Slovakia, while job losses in this sector were sizable in Cyprus, Greece, Portugal and Spain.

2.4. Job market flows

Job separation rates have been decreasing significantly since 2013, especially in those countries where they had increased the most during the crisis, including Greece, Ireland, Lithuania, Spain and Portugal (Graph I.2.6). ([15])

([15])The methodology for computing job separation and finding rates follows the one as in Elsby (2009).

Graph I.2.6: **Job finding and job separation rates 2008q1-2014q4**



Source: Commission services based on Eurostat.

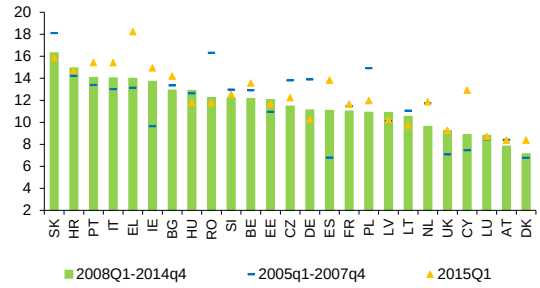
In many cases, current levels are close to those observed before the crisis. The probability of losing a job rose in the fourth quarter of 2014 mostly in France, Cyprus, and Finland.

Despite having improved in a majority of countries, *job finding rates* remain in general depressed and well below the levels observed in pre-crisis years. Among the debt-crisis-hit countries, some

improvements in job finding rates were recorded in Greece, Ireland and Portugal, while a stabilisation is observed in Spain after a period of protracted decline. Job finding rates have been rising also in the Czech Republic, Denmark and continued improving in the Baltic states.

Depressed job finding rates find their counterpart in the lengthening of unemployment spells. In most EU countries, the average duration of unemployment measured in the first quarter of 2015 was higher than that characterising on average not only the pre-crisis but also the post-crisis period up to 2014 (Graph I.2.7).

Graph I.2.7: **Unemployment duration in months**



Source: Commission services based on Eurostat.

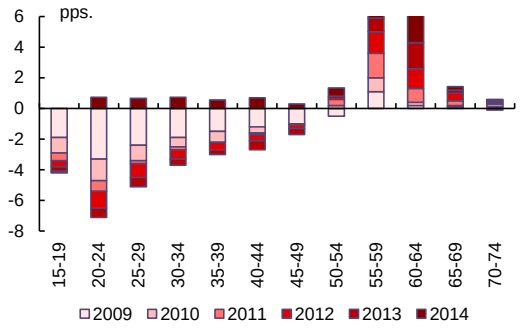
Unemployment duration is strongly associated with the cycle, but it may also be affected by the fact that the crisis hit disproportionally workers more likely to experience longer unemployment spells (due to their age, education level or sector-specific skills and experience). For instance, in Italy, the crisis period was associated with more long-term unemployment for older workers than for any other group, while in Austria, Belgium, France and Croatia younger workers were affected the most. To the extent that older workers are less likely to be re-employed than younger workers, the possibility that such long-term unemployment becomes structural can be expected to be greater for Italy than for the other countries.

2.5. Labour market status of different groups

2.5.1. Age

Since the onset of the crisis in 2008, the strongest decreases of employment rates were observed for the younger age groups (20-24 and 25-29), in particular in the first year of the crisis (Graph I.2.8). A remarkable exception has been the steady increase in the employment rates of older cohorts (especially 55-59 and 60-65). In 2014 employment rates started recovering also for individuals of less than 50 years of age.

Graph I.2.8: **Employment rate by age group EU28, percentage point change from 2008**



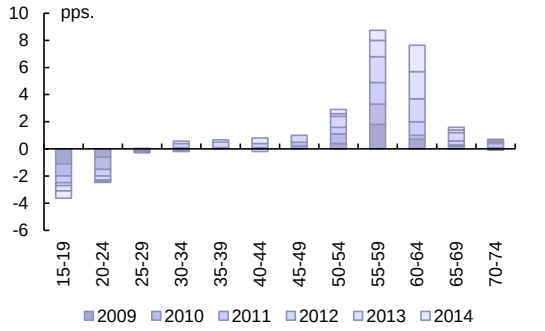
Source: Eurostat, LFS.

There are few exceptions to these developments. Malta experienced a steady increase in employment rates across all age cohorts, driven in particular by strong increases in participation rates of prime-age women. In the Baltic states, both the fall in employment rates that took place in the period 2009-2010 and the gradual recovery that followed were rather uniform across age groups. In Ireland, Greece, Spain, Portugal, Cyprus and Croatia employment rates of older workers did not increase over the period, but remained rather stable against the backdrop of a sharp decline in employment rates of younger cohorts. Finally, the recent recovery in employment rates of workers under 55

was not yet visible in Belgium, France, Italy and the Netherlands in 2014. ([16])

The increase in the employment rate of older workers can depend on a series of factors. These include in particular *demographic effects*, whereby cohorts entering the group of older workers have higher employment rates than previous cohorts; and, the effect of pension reforms on the effective retirement age. This is clearly illustrated by the increase in the activity rate for the age groups 55-59 and 60-64, which is even more pronounced than the increase in employment rates (see Graph I.2.9).

Graph I.2.9: **Participation rate by age group EU28, percentage point change from 2008**

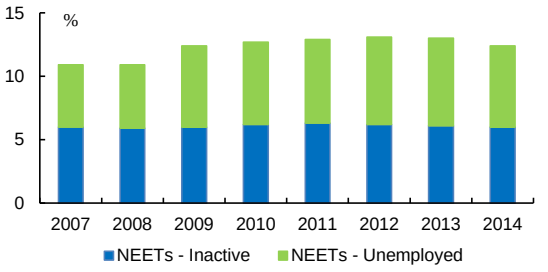


Source: Eurostat, LFS.

Looking at younger cohorts, the observed sharp decline in employment rates can be explained in terms of poor labour market outcomes of younger workers during the crisis, who typically have limited work experience and are more likely to be hired with less stable contractual relationships, determining a higher probability of being out of work and a lower probability of finding again employment in a context of weak labour demand. In addition, the lack of job openings put an extra burden on those who have not yet managed to get a foothold on the labour market, making the transition from education to work even more challenging.

From Graph I.2.9 it appears however that, for the age groups 15-19 and 20-24, not only the employment but also the activity rates have been falling steadily since 2008. This phenomenon can be possibly explained by an increase in time spent in education (due to a lower opportunity cost of continuing or re-entering education, given the unfavourable labour market conditions prevailing in most Member States), or by an increase in discouragement – whereby young unemployed stop searching for jobs and become inactive.

Graph I.2.10: **NEET rate by participation status, EU28**



Note: share of young people aged 15-24 not in employment, education or training over total youth population (15-24).
Source: Eurostat, LFS.

However, while the total share of young people not in employment, education or training (i.e. the NEET rate) increased after the crisis, the share *inactive* young not in education was roughly stable (see Graph I.2.10), which suggests that the observed decrease of the activity rate for the age group 15-25 was largely due to an increase in education attendance. ([17])

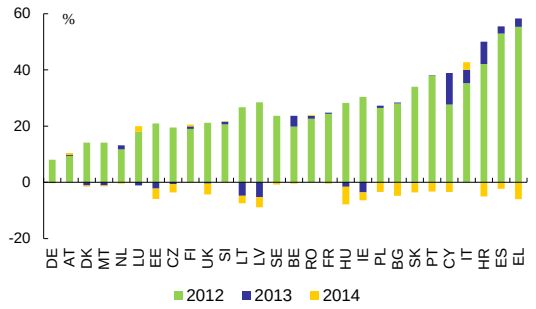
Looking more specifically at youth unemployment, in the EU as a whole the

([16]) Country-level data on employment and activity rates by age group is provided in the Statistical Annex at the end of this report.

([17]) This result at aggregate EU level holds broadly also for Member States individually: while a lot of variation can be observed with respect to youth unemployment and NEET rates (both in levels and in trends), no particular differences emerge with respect to changes in the rate of *inactive* youth not in education or training.

unemployment rate for individuals under 25 started decreasing in the second half of 2013, with further improvements in 2014 and beginning of 2015. Among high-youth unemployment countries, substantial reductions were registered from the peak of 2013 in Greece, Croatia, Portugal, Slovakia, Bulgaria, Cyprus and Spain. Italy stands out as the only high-youth unemployment country in which the situation continued to deteriorate for most of 2014.

Graph I.2.11: **Youth unemployment rate, 2012-2014**



Note: age group 15-24. 2012 level and change to 2013 and 2014.
Source: Eurostat, LFS.

2.5.2. Education

The employment rate of both low-skilled and medium-skilled individuals started rising in 2014 driven by an increase in the flows out of unemployment and also by higher activity rates for the medium-skilled. It is the first time since the start of the crisis that those most hardly hit face better labour market prospects.

Table I.2.4: **Employment, participation and unemployment rate by education**

Education	Low	Medium	High
EU28 Employment rate 2014	51.9	70.1	82.0
change 2013-2014	0.5	0.8	0.3
change 2012-2013	-0.7	-0.2	-0.2
EU28 Activity rate 2014	63.6	77.1	87.4
change 2013-2014	0.0	0.4	0.0
change 2012-2013	0.0	0.1	0.1
EU28 Unemployment rate 2014	18.6	9.1	6.2
change 2013-2014	-0.5	-0.6	-0.3
change 2012-2013	1.1	0.4	0.3

Note: Age 20-64.
Source: Eurostat, LFS.

Yet, the number of low-skilled that remains unemployed in 2014 continues to be the highest in Slovakia, followed by Spain, Lithuania, Greece and Bulgaria just as in 2013. The crisis is likely to have changed the incentives for individuals to engage in education. Evidence shows that, in some high-unemployment countries (Greece, Ireland and Spain), the expected duration of participation in formal education for an average 5-year old child has increased significantly since the crisis (see Box I.2.1).

This is partly related to the relatively poor current employment prospects of low-skilled workers. Access to formal education is likely to have reduced the size of the cohort of potential low-skilled unemployed. In crisis-hit countries, though, the significant rise in school expectancy is also to be interpreted as a correction from the boom period when low-skilled workers abandoned education on the back of attractive employment prospects.

Table I.2.5: **Unemployment rates of the low-skilled by country, and recent changes**

	2014	Δ 2013-14	Δ 2012-13		2014	Δ 2013-14	Δ 2012-13
SK	40.5	-1.2	-1.6	IT	16.4	0.8	2.4
ES	33.2	-1.3	1.7	BE	16.0	0.6	1.7
LT	30.2	-3.6	-2.0	SE	15.9	0.5	1.2
EL	28.5	-1.3	3.6	PT	15.6	-2.3	1.1
BG	28.4	-1.2	1.7	FR	15.1	-0.4	0.1
HR	25.8	3.9	2.8	FI	13.8	0.2	1.0
LV	24.2	-0.6	-0.2	EE	13.2	-1.3	-9.1
CZ	21.7	-3.4	-2.5	LU	12.8	3.5	1.6
EA19	20.3	-0.2	1.3	DE	12.6	-0.1	-0.5
PL	20.1	-1.1	1.2	AT	12.0	2.5	0.6
CY	19.9	0.4	5.9	NL	10.2	1.1	2.2
IE	19.7	-1.8	-3.7	UK	10.1	-2.3	0.0
EU28	18.6	-0.5	1.1	DK	9.1	-0.8	-0.6
HU	18.2	-4.8	-1.4	MT	8.4	-0.6	0.6
SI	16.8	-2.6	3.6	RO	7.2	-0.4	0.0

Note: Countries are ranked by unemployment rate of low-skilled. Age 20-64.
Source: Eurostat, LFS.

2.5.3. Nationality

Intra-EU mobility garnered further momentum in 2014. The number of employed EU foreigners (EU citizens working in a country other than their own) grew by almost 8% respectively against a growth rate of 4%, 3.6% and 2.2% the three preceding years. Also the number of non-EU foreigners working in the EU rose by 1% after registering mild reductions in the previous years.

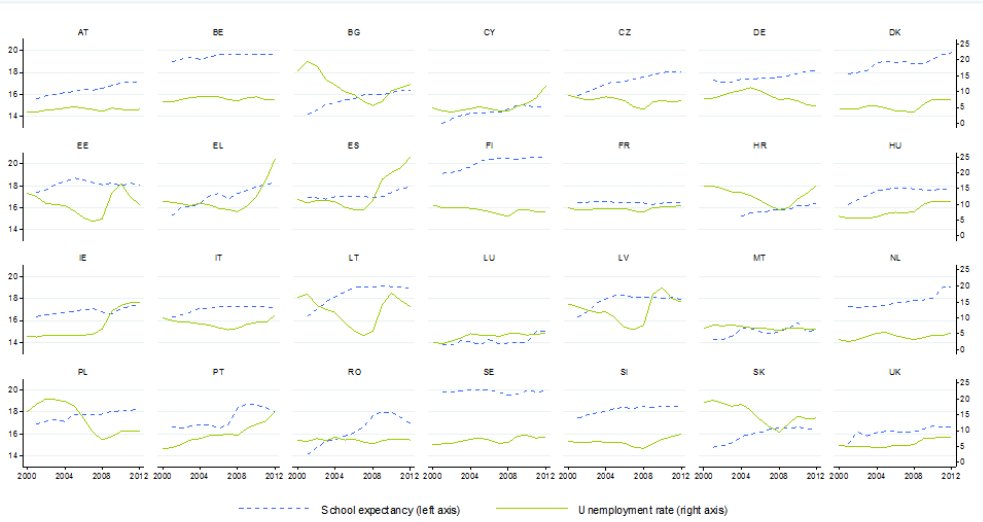
Box I.2.1: **Building skills in times of crisis**

Recessions have been argued to reduce the opportunity cost of continuing education (e.g., Pissarides 2011). As a result they may raise the demand for education and, possibly, effective time spent in education. ([1]) If the rise in education demand is matched with the required resources, negative "scarring effects" on human capital may be mitigated and the post-recession recovery may benefit from increased labour productivity resulting from a better educated labour force.

A convenient way to measure aggregate decisions on time spent in education is by looking at *school expectancy*, defined as the average duration of formal education a 5-year old child is expected to undertake over his/her lifetime. ([2])

Graph 1 presents trends in school expectancy since 2000 across EU countries, jointly with trends in unemployment rates. It shows that growing unemployment during the crisis period has been associated with an increase in school expectancy in several, but not all EU countries.

Graph 1: The severity of the crisis and the impact on school expectancy



Source: Eurostat and DG ECFIN AMECO Database

School expectancy increased significantly in a number of countries where the labour market impact of the crisis was particularly severe, notably Greece, Spain, and Ireland. This strong response can partly be attributed to the relatively good job prospects for low-skilled workers in the pre-crisis period (e.g. in construction and retail), luring youngsters out of school. A positive response is also observed in the Netherlands, Denmark, Sweden, and the UK. The increases in Austria, Germany, the Czech Republic and Poland rather seem to reflect a continuation of past trends. School expectancy was instead hardly affected by the crisis in Belgium, France, Estonia, Finland, Hungary, Italy, Lithuania, Latvia, Slovenia and Slovakia. In Portugal and Romania, school expectancy reduced markedly as of 2010, after a steep initial increase.

([1]) In an OECD survey of Ministry of Education officials in 2010, most officials expected demand for education to increase as a result of the crisis, especially in vocational education (Van Damme and Karkkainen, 2011). However, if school fees are high, and household budgets are constrained, a crisis could as well reduce demand for education. For example, Adamopoulou and Tanzi (2014) argue that in Italy the demand for education responded positively to youth unemployment (reflecting own opportunity costs of youth), but negatively to adult unemployment (reflecting parental budget constraints).

([2]) School expectancy is calculated by adding single-year enrolment rates for all ages as of the age of 5. Data are available from Eurostat and originate from the joint UIS/OECD/Eurostat (UOE) data collection on education statistics.

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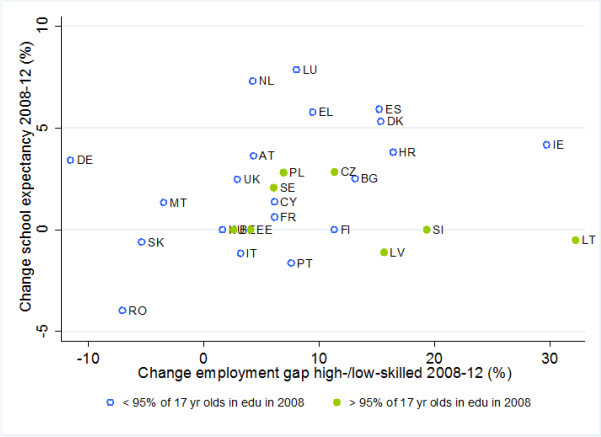
Box (continued)

Graph 2: School expectancy and employment gains linked to education



Source: Eurostat.

Different factors may contribute to explaining the different response of school expectancy to the crisis across EU countries. A first factor are the improved prospects the high-skilled have on the labour market as compared to low-skilled workers. ([3]) This can be measured through the *employment gap*, the ratio of the employment rate of high-skilled workers to that of low-skilled. Graph 2 shows that in countries such as Denmark, Spain and Ireland, the employment gap widened substantially over the period 2008-2012 (by more than 15%) and this may have motivated youngsters to stay in school instead of dropping out. The employment gap increased also in Lithuania, Latvia and Slovenia but this was not matched by sizable improvements in school expectancy, possibly because more than 95% of 17-year-olds and more than 50% of 22-year-olds were already in education in these countries at the onset of the crisis. In countries such as Malta, Slovakia, Romania and Germany, the employment gap narrowed. This may contribute to explaining why school expectancy worsened in Slovakia and Romania over the period 2008-2012.

Another factor which is likely to have an impact on school expectancy is the evolution of public expenditures on education. Graph 3 plots changes in school expectancy against per student government expenditures on education over the crisis period. It shows that in some countries, substantial budget cuts coincided with a marked fall (Romania, Portugal) or a near-stagnation (Latvia, Italy, Hungary, Slovenia, Cyprus) in school expectancy. There were, however, also a number of countries where school expectancy increased despite significant budget cuts (e.g., Spain, Greece, Bulgaria, Ireland, UK). It is interesting to note that those countries which increased their public expenditures on education the most (Slovakia, Malta, Germany and Poland) showed only modest improvement in school expectancy at best. To explain these differences, a deeper analysis of institutional features of education systems in these countries, and of the orientation of budget cuts, may be required.

([3]) High-skilled workers are commonly defined as those workers with at least a tertiary degree (ISCED 5 and 6). Low-skilled workers are defined as those without an upper secondary school degree (ISCED 1 and 2).

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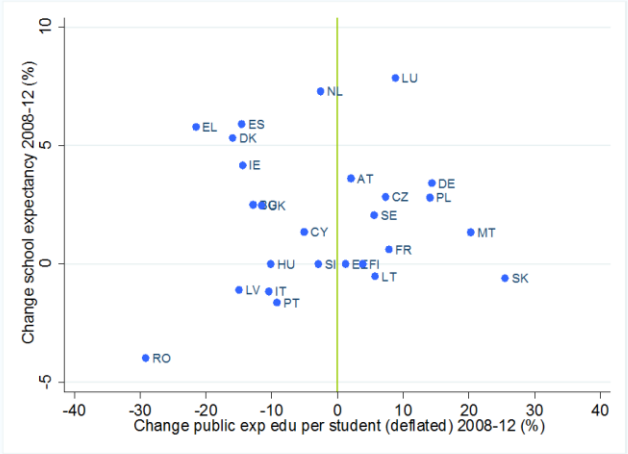
Box (continued)

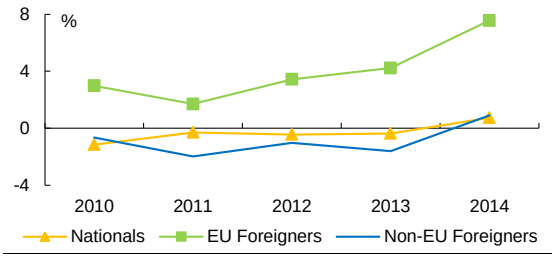
Graph 3: School expectancy and trends in public expenditures on education (5)



Source: Eurostat, DG ECFIN AMECO Database.

(5) Public expenditure per student is a commonly used indicator. It is calculated based on COFOG data, available from Eurostat, deflated by the AMECO GDP price deflator at market prices, and divided by the total number of enrolled students (in fulltime equivalents) available from Eurostat. Note however that education budgets usually move relatively slow in response to changing student numbers. As a result, if student numbers grow faster than expenditures (such as in Denmark and the Netherlands), public expenditures per student may decline even while total expenditures increase.

Graph I.2.12: **Employment growth by nationality, EU28**

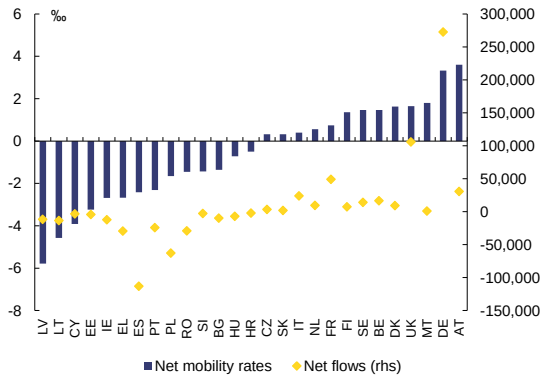


Note: Age 15-64.
Source: Eurostat, LFS.

The marked rise in EU citizens working in another EU country reflects increased mobility from crisis to non-crisis countries. In countries like Austria, Germany but also Bulgaria and Lithuania, the share of foreigners employed for 12 months or less rose in 2014 from the previous year, while that of nationals dropped. In Denmark, Estonia, Greece, France, Croatia, Cyprus and Hungary, the opposite happened, with the newly employed being predominantly nationals. In all other countries, it was purely cyclical conditions that contributed to either a fall or a rise in newly employed, whether foreigners or nationals(Graph I.2.12).

From migration data based on administrative records it is possible to discern clear patterns of intra-EU mobility, with net flows from crisis-hit countries to better performing Member States (see Graph I.2.13). It can be seen how the Baltic states continue to experience negative net EU-mobility rates notwithstanding the economic recovery (although in Latvia and Lithuania the net outflows are considerably reduced compared to the levels reached in 2010-2011), while negative rates for Cyprus represent a swift reversal from the sizable positive net flows recorded until 2011. Germany in particular experienced a sharp increase in the net inflows of EU citizens, from 85 thousand in 2010 up to 272 thousand in 2013, while for the same years Spain recorded an increase in outflows from 25 thousand to 113 thousand EU citizens.

Graph I.2.13: **Net intra-EU mobility rates and flows, 2013**



Note: Luxembourg omitted as out-of-scale outlier (rate of 19‰). Net intra-EU mobility rates are computed as the difference between immigration and emigration to and from other EU countries over total population at the beginning of the year (per 1000 in habitants).
Source: Commission services based on Eurostat.

2.5.4. Contract type

Differences across Member States with respect to contractual relationships tend to be relatively stable over time as they are linked to institutional and structural factors (Table I.2.6). In some countries, the low share of open-ended employment goes hand in hand with a comparatively high incidence of self-employment, while in others it is linked to the prevalence of fixed-term employment that often serves specific sectors (e.g. construction). But the distribution of employment across different types of contracts is also strongly influenced by cyclical conditions.

During downturns dismissals become more frequent, and to a large extent they take the form of non-renewal of temporary contracts. At the same time, the creation of new posts takes place increasingly through the opening of temporary rather than open-ended positions, even if with significant cross-country variation. Overall, the former effect generally prevails. This implies that during downturns the share of temporary employment on total employment falls, to re-bounce at the beginning of the subsequent upturn.

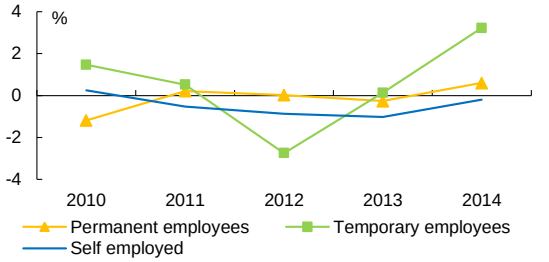
Table I.2.6: **Distribution of contract types among the employed in %**

	Open-ended contracts		Temporary contracts		Self employed	
	2014	chg	2014	chg	2014	chg
RO	98.6	*1.9*	1.4	*6.2*	43.8	*-1.1*
LT	97.3	*1.5*	2.7	*5.3*	13.8	*5.0*
EE	96.9	*1.3*	3.1	*-10.3*	10.2	*-0.4*
LV	96.7	*-0.3*	3.3	*-23.7*	13.4	*-1.9*
LU	95.1	*-0.8*	4.9	*18.4*	5.6	*-14.3*
BG	94.6	*0.1*	5.4	*-5.3*	37.0	*1.9*
UK	94.0	*1.5*	6.0	*5.4*	16.3	*5.7*
MT	92.9	*4.7*	7.1	*3.6*	13.4	*1.0*
DK	92.0	*1.2*	8.0	*-2.0*	7.2	*-1.1*
BE	91.3	*-0.4*	8.7	*6.7*	20.0	*1.0*
AT	91.2	*0.9*	8.8	*-0.5*	16.1	*1.4*
IE	91.0	*2.5*	9.0	*-5.6*	21.0	*2.0*
CZ	90.9	*-0.4*	9.1	*7.1*	19.0	*1.6*
SK	90.8	*0.0*	9.2	*30.7*	17.3	*-3.0*
EL	90.1	*1.2*	9.9	*17.4*	47.3	*-3.0*
HU	89.6	*3.3*	10.4	*3.9*	10.7	*1.2*
DE	88.0	*1.4*	12.0	*-1.0*	11.5	*-1.2*
IT	87.5	*-0.3*	12.5	*3.7*	34.4	*-0.2*
EU28	86.9	*0.6*	13.1	*3.2*	18.4	*-0.2*
EA19	86.0	*0.6*	14.0	*1.9*	17.4	*-0.5*
FR	85.4	*0.2*	14.6	*-1.1*	10.7	*0.4*
FI	85.4	*-0.9*	14.6	*-1.0*	14.3	*3.9*
SE	84.5	*1.1*	15.5	*4.3*	5.1	*-1.8*
SI	83.5	*0.4*	16.5	*0.3*	25.1	*1.8*
HR	83.2	*2.9*	16.8	*23.2*	19.2	*-11.1*
CY	80.6	*-4.4*	19.4	*8.0*	20.3	*-0.1*
NL	80.0	*-1.4*	20.0	*3.4*	20.2	*1.0*
PT	79.7	*1.2*	20.3	*4.4*	20.1	*-0.5*
ES	78.1	*0.7*	21.9	*5.4*	16.2	*-1.2*
PL	71.8	*0.1*	28.2	*8.1*	27.1	*-0.2*

Note: Countries ranked by share of open-ended contracts. Change is in the ratio compared with the previous year, in percentage points.
Source: Commission services based on Eurostat, LFS.

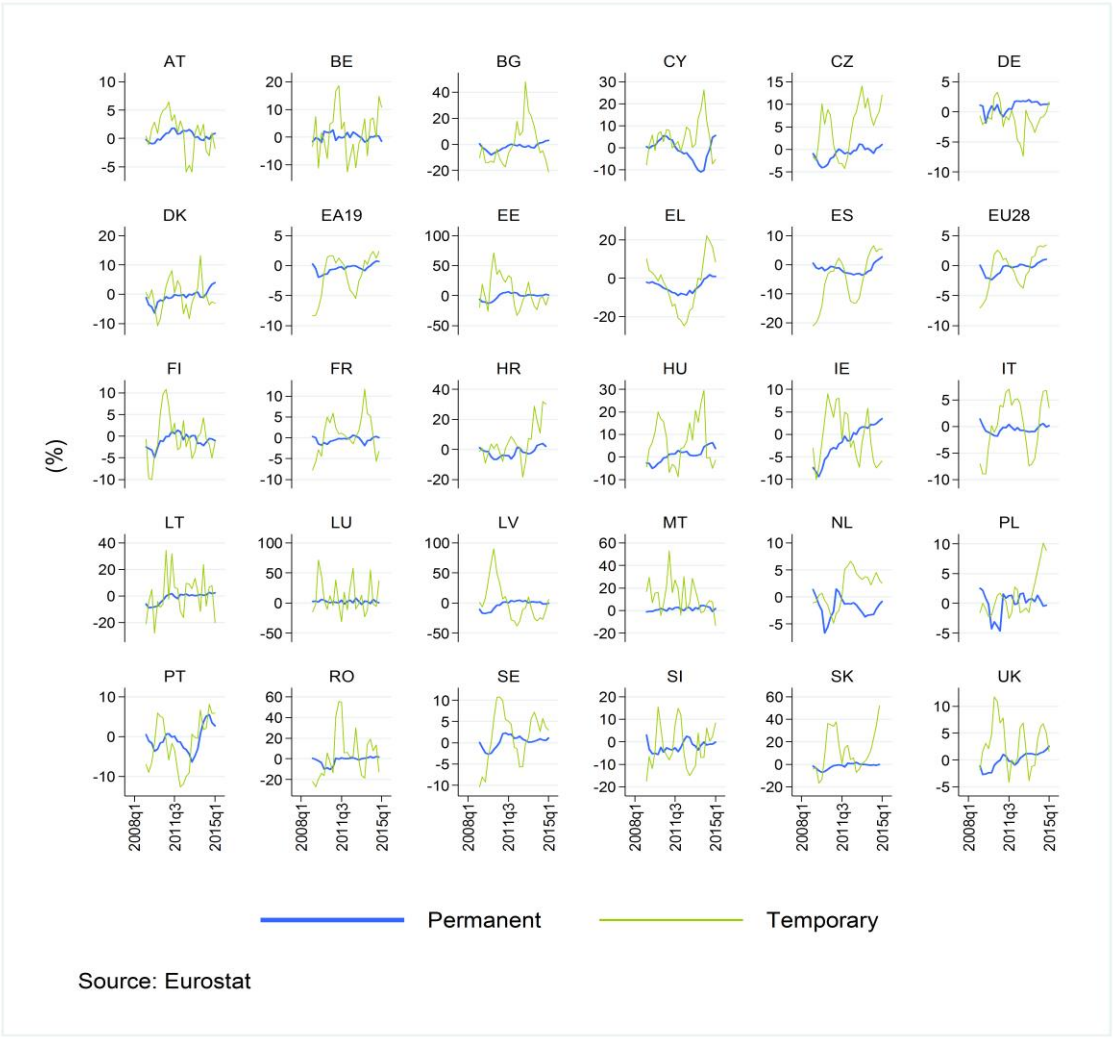
This pattern is visible from (Graph I.2.14). Indeed, in the EU as a whole self-employment and open-ended employment growth was relatively stable throughout the post-crisis period, whereas fluctuations in temporary employment were much more marked. Temporary employment fell considerably during the 2009 and 2011 recessions, with a pick-up in 2010-2011, and again in 2013-2014.

Graph I.2.14: **Employment growth by type of contract, EU28**



Source: Eurostat, LFS, age 15-64.

Graph I.2.15: **Dynamics of open-ended and temporary contracts (growth rate on same quarter of previous year), 2009q1-2015q1**



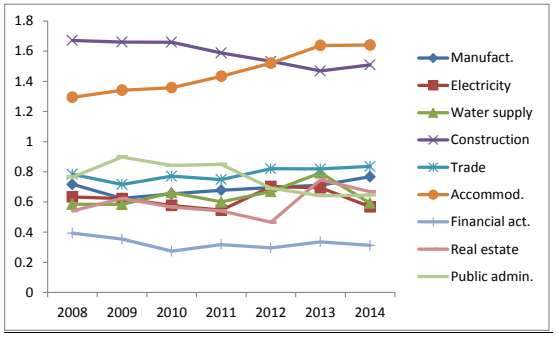
Note: Age 15-64.
Source: Own calculation based on Eurostat, LFS.

The stronger fall in temporary employment as compared with open-ended employment was a typical feature of countries most hardly hit by the bust of the housing bubble and the reversal of capital inflows, and characterised by segmented labour markets (Spain, Portugal), where job shedding took place mostly in terms of not renewal of expiring fixed-term contracts. In other countries, the dynamics of temporary contracts was less negative than that of open-ended contracts at the peak of the crisis (e.g., France, Italy), reflecting the lack of permanent job creation.

In a similar vein, the labour market recovery that started in 2013 was characterised by a sustained growth of temporary contracts, while open-ended employment has shown some dynamism only recently, with positive growth concentrated in Member States that recovered at an early stage from the 2009 crisis (Germany, the Baltic states, Hungary and the UK). Only since the last quarters of 2014, the growth rate of open-ended contracts has become positive also in countries strongly hit by the sovereign debt crisis and the bust of the housing bubble (Ireland, Portugal, Greece, Spain).

In Portugal, the change came already in the first quarter of 2014. The number of employees with open-ended contracts rose by 1.5% compared with the same quarter of the previous year, while the number of those on temporary contracts fell by 1% (Graph I.2.15), bringing the share of open-ended over total contracts up by about 1% from the first quarter of 2013 to the same quarter of 2014. This trend continued into the second quarter of 2014, with the number of open-ended contracts increasing further by 2.5% on a quarterly basis. In Spain, the observed improvement is mostly concentrated in the second quarter. It is noteworthy that the number of new full-time open-ended contracts rose in July 2014 by 18% from the same period in 2013, also a result of the recent reforms (see Box I.2.2), even if they continue to represent just about 7% of all new contracts.

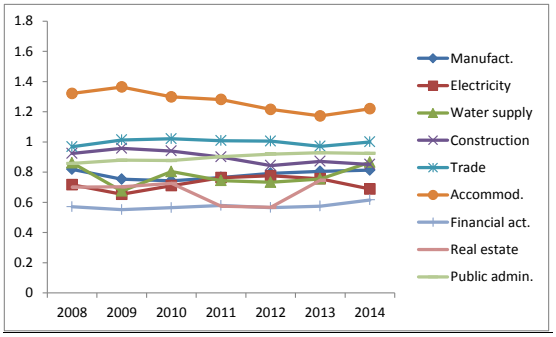
Graph I.2.16: **Spain: share of temporary contracts relative to those in the total economy**



Note: Probability of a temporary contract is defined as the share of temporary employees over total in each sector relative to the total economy.
Source: Own calculation based on Eurostat, LFS.

It should be noted that the share of temporary contracts is also linked to the structure of the economy, with temporary contracts more likely to be found in the non-tradable sector. This is quite clear from Graphs I.2.16 and I.2.17, which show the share of temporary contracts in each sector relatively to those in the total economy in Spain and Germany, respectively. In both countries, temporary contracts are more likely to be found in the non-tradable sector, even if the odds are higher in Spain than in Germany.

Graph I.2.17: **Germany: share of temporary contracts relative to those in the total economy**



Note: Probability of a temporary contract is defined as the share of temporary employees over total in each sector relative to the total economy.
Source: Own calculation based on Eurostat, LFS.

Also at the aggregate, the share of temporary to permanent jobs in the total economy is positively correlated with the share of non-tradable to tradable employment. This has implications for the process of rebalancing, in particular inside the euro area. As current account reversal continues, with more resources shifted from the non-tradable to the tradable sector, the share of temporary contracts is expected to be falling. This is likely to be relevant for countries such as Spain, where further adjustment to the current account with the relative share the tradable sector rising is likely to be accompanied by a fall in the share of temporary contracts (see Box I.2.3).

Table I.2.7: **Share of temporary employees in EU 28 by age**

Age	2010	2011	2012	2013	2014
15-24	42.4	42.5	42.2	42.6	43.3
25-49	12.1	12.4	12.2	12.3	12.7
50-64	6.8	6.8	6.7	6.6	6.7
over 65	18.0	17.9	17.6	18.2	17.6

Source: Eurostat , LFS

Temporary jobs are typically prevalent amongst the young of 15-24 years of age. Whilst almost 43% of those aged between 15 and 24 have fixed-term contracts, only just above 12% of those aged 25-49 are on temporary jobs, a percentage that decreases further to 6.6 for those between 50 and 64 years (Table I.2.7).

Box I.2.2: Tackling labour market segmentation in Spain

A comprehensive labour market reform was enacted in Spain in July 2012, continuing the process started with the reforms of 2010. The reform was designed to tackle rigidities in the labour market and reduce labour market duality. One important change concerned the costs of dismissals for permanent workers. In particular, the reform has: i) reduced the severance payment for unjustified dismissals from 45 to 33 days per year of service, up to a maximum of 24 months (down from 42 months); ii) limited workers' entitlement to back pay only when the employer opts for the reinstatement in case of unfair dismissal; iii) introduced more detailed specification of the conditions for justified dismissals for economic reasons; iv) introduced a new open ended contract for SMEs (*contrato emprendedores*) with less than 50 employees with a trial period of 1 year and hiring incentives for firms keeping the worker for at least 3 years. To tackle segmentation, chaining of temporary contracts to 24 months was reinstated (it was introduced for the first time in 2010). Another key objective of the reform was to enhance internal flexibility and functional and geographical mobility if justified by economic, organisational and technical reasons.

An independent assessment of the Spanish EPL reform of 2012 was carried out by OECD upon request of government authorities and published in 2013. The analysis carried out in the OECD assessment aims at isolating the impact of the reform from that of the other multiple factors that affect the labour market. The analysis concludes that the reform has promoted hiring with permanent contracts, in particular, but not exclusively, in firms with 50 employees or less. According to the empirical analysis, the reform was successful in bringing down the overall separation rate and in increasing the hiring of permanent contracts by 30%. In absence of the reform, hiring, in particular of permanent contracts, would have continued falling. The OECD assessment reports also that the reform could be considered responsible for about 25 000 new permanent contracts each month, with the effect concentrated in small and medium firms. In addition, the reform improved by 24% the probability for an unemployed of entering into a permanent contract during the first 6 months of unemployment.

Graph 1: Number of new contracts signed, Spain

Source: SEPE

Graph 1 reports the number of new permanent and temporary labour contracts signed in Spain on a monthly basis. Data on temporary contracts are seasonally adjusted with an OLS regression on seasonal dummies. It is visible that, throughout the whole period, the number of new temporary contracts signed is a multiple of that of permanent contracts, as temporary contracts are characterised by relatively short duration. Since the onset of the crisis, the fall in the number of new contracts was more contained for fixed-term contracts, despite a major drop in the *stock* of temporary contracts on total labour contracts (as job shedding concerned especially temporary labour). The fall in the number of new permanent contracts bottomed out broadly in coincidence with the 2012 reform, and some recovery is visible since then.

Evaluating the effect of the reform on job creation is a daunting task. First, reforms may take time to exert their effect on hiring behaviour, in particular in the case of comprehensive reforms which aim at different groups and modify the legislative framework relevant for different adjustment margins. Secondly, the sheer size of the shock and its persistency may make difficult to extract from data the effect of policy change. The timing of the reform may also add to the difficulty of the evaluation, as the 2012 reform was enacted in a

(Continued on the next page)

Box (continued)

period of rising unemployment but not at its peak, so that the subsequent periods of increasing unemployment could be interpreted as evidence of the non-effectiveness of the policy change.

With these caveats, an attempt to evaluate the effect of the reform on job creation of temporary rather than permanent contracts is possible by means of methods that look for discontinuous patterns in the variables of interest, while controlling for business cycle developments and trends to account for non-observables. It is essentially, the same approach adopted in the above mentioned OECD study.

Table 1 presents estimates of the impact of the reform on the ratio between newly signed temporary and newly signed permanent contract, which is indicative of the relative probability that a newly employed is hired with one of the two contracts. In all specifications, a positive constant implies that on average a newly hired is more likely to get a temporary than a permanent contract. The negatively signed post-reform dummy, statistically significant at 1%, implies that after the reform a newly hired individual is still more likely to be in a temporary contract, but this likelihood, in our preferred specification (column 1), is almost halved. Thus, these results suggest that after the reform temporary contracts remain the prevalent contract for new hires, but much less so after the 2012 reform. This is independent from cyclical conditions as the regression controls for GDP growth. The negative coefficient of GDP growth suggests that temporary contracts are less likely in a recovery (the opposite when in downturns), consistent with these contracts being a "buffer stock" to adjust to economic fluctuations (i.e. the stock of temporary is more volatile than the stock of permanent). After the 2012 reform, the negative impact GDP growth becomes stronger (i.e. a pick-up in economic growth is accompanied by a stronger reduction in temporary job matches). Thus, a pick-up in GDP growth would reduce the likelihood of temporary contracts. Although this effect seems stronger after the 2012 reform, it cannot be excluded that it is in reality capturing the sheer effect of the recession on the hiring rate.

Table 1: The effect of the reform on ratio of newly signed temporary to newly signed permanent contracts

	(1)	(2)	(3)
Dependent variable	Ratio of newly signed temporary to newly signed permanent		
Post-reform dummy	-8.84***	-31.1***	-13.96***
	(1.81)	(6.27)	(0.40)
GDP growth lagged	-0.31***		
	(0.06)		
Post-reform dummy * GDP growth lagged	-1.46***		
	(0.33)		
Trend	0.6***		0.26***
	(0.098)		(0.098)
Trend squared	0.02***		
	(0.003)		
Unemployment rate lagged		0.39***	
		(0.035)	
Post-reform dummy * unemployment rate lagged		1.13***	
		(0.25)	
Output gap lagged			-0.38***
			(0.15)
Post-reform dummy *output gap lagged			-1.80***
			(0.58)
Constant	14.9***	5.24**	13.97
	(0.76)	(1.367)	(0.40)
Observations	36	36	36
R-squared	0.85	0.85	0.80

Box I.2.3: Current account imbalances and the share of temporary employees

There is a vast literature on the determinants of macroeconomic imbalances and their reversal. Current account imbalances can stem from fiscal policy, wage and price developments or be driven by more structural features such as relative per capita income, the dependency ratio of a country and financial regulation regimes. Starting with Ingram (1973), there has been also increasing attention to the destination of use of capital inflows in countries that register severe current account deficits. The underlying reasoning is that sustainability of external debt would be preserved only when foreign capital is used for productive investment in the tradable sector (Altomonte and Marzinotto 2010; Giavazzi and Spaventa 2010). More recently, it was pointed out that episodes of excessive external imbalances are accompanied by an above-average rise in the ratio of non-tradable to tradable value added, and that this ratio is a good predictor of so-called twin crises (Kalantzis 2015).

One corollary is that sectoral dynamics of this kind are likely to be reflected also in the labour market. If, as the evidence indicates, temporary employment is concentrated in the non-tradable sector (e.g. construction), shifts in the relative importance of the non-tradable to the tradable sector that impact on external balances will also be reflected in changes in the share of temporary to permanent jobs.

Firstly, the relation between the share of employment in non-tradables relative to tradables and movements in the current account is tested. It is indeed found that a rise in non-tradable jobs relative to tradable is associated with a deteriorated current account in the majority of euro area countries (Graph 1). ([1])

Table Column (1) shows results from a fixed effect estimation looking systematically at the impact of the share of jobs in the non-tradable sector relatively to those in the tradable, on the one hand, and the current account, on the other, for the whole EU sample over 1980-2013 that also includes a measure of the cycle (i.e. real GDP growth). The negative relation is indeed confirmed. Additionally, results are reported from a specification using 2SLS where the share of temporary to permanent jobs is instrumented by share of non-tradable to tradable contracts (Column 2). The indication is that a rise in the relative importance of temporary jobs/contracts leads to a worse external balance. Interestingly enough, the relation is stronger for the euro area, where the current account remains unaffected by movements in the nominal exchange rate.

Table 1: the relation between the current account and types of contracts

	(1) FE EU	(2) 2SLS EU	(3) 2SLS EA
Share of non-tradable to tradable employment	-21.02** [-8.707]		
Real GDP growth	-0.133* [-2.102]	-0.133** [-2.816]	-0.106+ [-1.843]
Share of temporary to permanent jobs		-1.941* [-2.166]	-2.866** [-3.058]
Constant	-10.16** [-8.624]	-4.929 [-0.663]	-6.975 [-0.367]
Observations	527	442	327
Number of countries	21	21	15

t-statistics in brackets
** p<0.01, * p<0.05, + p<0.1

([1]) All the data have been standardised.

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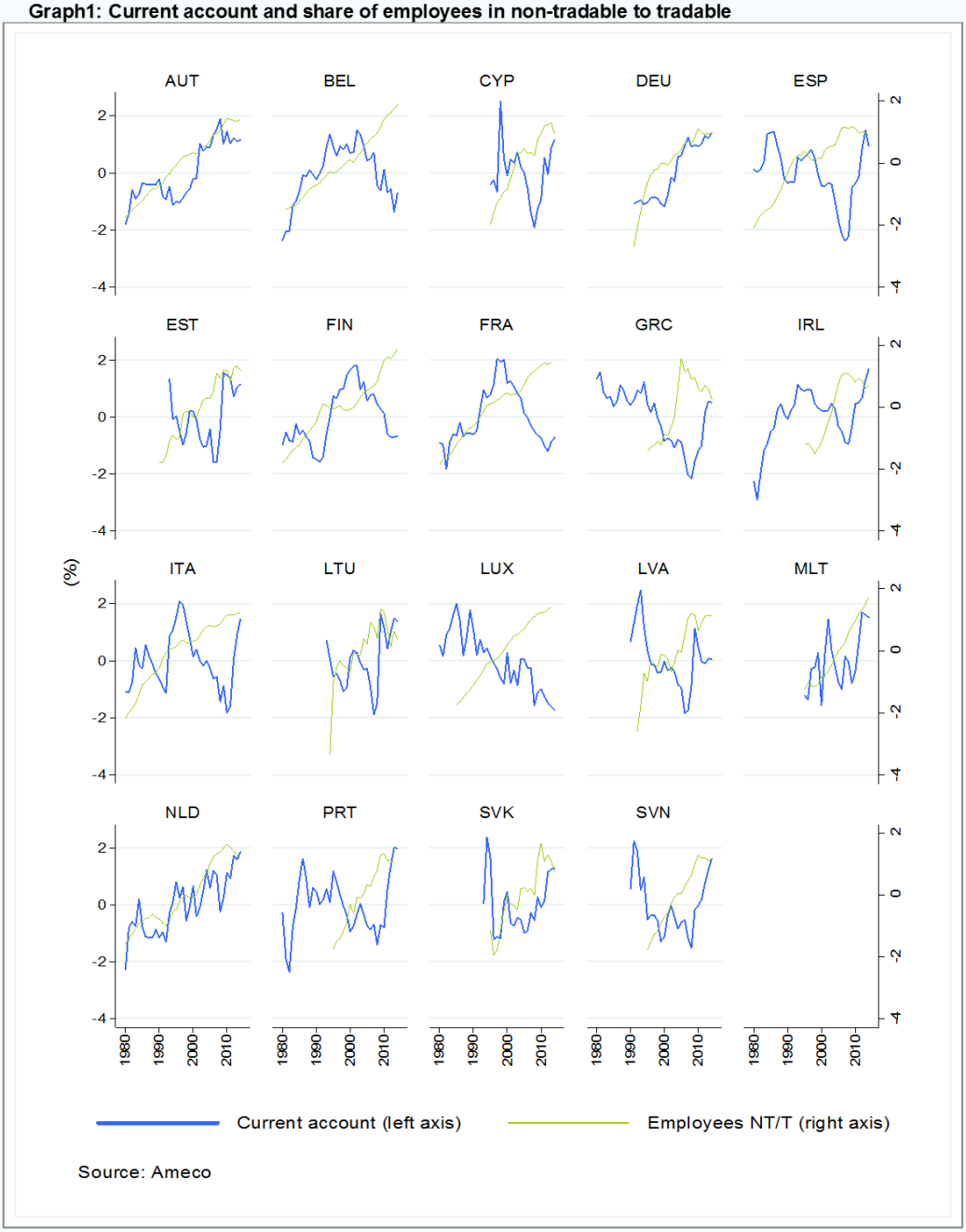
Box (continued)

Graph1: Current account and share of employees in non-tradable to tradable



The share of temporary contracts increases again for the over 65, most likely due to the possibility of combining retirement income with income from work. The latest available year of 2014 marks an increase in fixed-term contracts amongst the youth aged 15-24, while for the other age groups the values remain rather stable (Table I.2.8).

Table I.2.8: **Part-time to total employment and involuntary part-time in EU28 (15-64 years): 2012-2014**

	2012	2013	2014
Part-time to total employment	19.2	19.6	19.6
Part-time to total employment (women)	32	32.4	32.2
Part-time to total employment (men)	8.4	8.7	8.8
Share of involuntary part-time	27.4	29.2	29.4
Share of involuntary part-time (women)	24.2	26	26.2
Share of involuntary part-time (men)	38.1	39.8	40.0

Source: Eurostat, LFS.

The share of part-time over total employment had increased between 2013 and 2012 up to 19.6% from 19.2, involving equally men and women, even if part-time employment continues to be more prevalent amongst female workers. These levels were stable in 2014. What continued increasing since 2012 is the incidence of involuntary part-time employment, which concerns male workers proportionally more than for women.

2.6. Conclusions

Employment stabilised in 2013 and 2014 throughout the EU. Unemployment stopped rising and, in spite of the still poor macroeconomic environment, it fell in some of the crisis-hit countries. In countries that have enacted broad labour market reforms, such as Portugal and Spain, the growth rate of permanent jobs increased in 2014, also as a result of the implemented reforms; but their share in total employment remains amongst the lowest in the EU. The fall in the number of hours worked, which is often interpreted as a measure of labour market slack, eventually stopped. In line with the rebalancing needs of countries experiencing current account imbalances, jobs were reallocated from the non-tradable to the tradable sector. This has important implications also for more institutional features of the labour market, such as the relative importance of temporary contracts. Insofar as temporary contracts are mostly concentrated in the non-tradable sector, a further adjustment of current account deficits would imply a fall in the share of temporary to open-ended contracts. A shift from tradable to non-tradable employment is occurring only to a limited extent in surplus countries.

Unemployment spells remain long and above pre-crisis levels in at least half of the Member States, a development that may raise concerns about individual employment probabilities after such a long period of unemployment. The young and prime-age individuals fare worse in terms of employment relative to older individuals. But the observed increase in the employment rate of those aged more than 55 years reflects mainly long-term demographic trends.

Low-skilled workers were the ones hit hardest by the crisis. An important consequence was a rise in the demand for education, especially in countries mostly affected by the crisis. While the return to education may have in the short-term a negative impact on production levels, in the medium- to long-term it may enhance human capital accumulation with positive effects on productivity growth, provided that the medium- and high-skilled are not forced to move down the occupational ladder, in particular if weak labour demand conditions persist.

APPENDIX A.2.1 Decomposing employment changes after the crisis

Employment changes can be decomposed into changes in the size of the working-age population, in the activity rate and in the number of unemployed according to the following identity:

$$\Delta e_t = (wap_t \times AR_t) - (wap_{t-1} \times AR_{t-1}) - \Delta u_t$$

Where *e* is employment, *wap* is the working-population, *AR* is the activity rate and *u* is the number of unemployed. Dividing the above expression by *wap* of the year before (*t-1*) and rearranging:

$$\frac{\Delta e}{wap_{t-1}} = AR_t \times \frac{\Delta wap_t}{wap_{t-1}} + \Delta AR_t - \frac{\Delta u_t}{wap_{t-1}}$$

The decomposition provides an indication of the contribution to employment growth of changes in i) the working age population, ii) the activity rate, and iii) the number of unemployed. Table 1 displays the decomposition cumulated over the 2008- 2013 period.

Table 1: **Decomposing employment growth (cumulative), EU countries (2008-2013)**

	Percentage change in employment (over working-age population)	=	Activity rate * Percentage change in population	+	Percentage-point change in activity rate	-	Percentage change in unemployment (over working-age population)
BE	1.92		2.34		0.40		0.89
BG	-6.29		-4.56		2.10		3.84
CZ	-0.11		-1.93		3.00		1.23
DK	-3.77		0.73		-2.00		2.55
DE	3.98		-0.41		1.90		-2.48
EE	-3.91		-2.96		1.90		2.87
IE	-7.99		0.61		-2.70		5.91
EL	-11.94		0.12		1.00		13.03
ES	-10.91		-0.11		2.50		13.35
FR	0.21		0.20		1.30		1.50
HR	-7.97		-0.01		-3.80		4.26
IT	-2.18		0.92		1.00		4.06
CY	-1.71		7.85		-0.30		9.75
LV	-9.95		-8.33		1.40		3.15
LT	-7.17		-7.06		4.50		4.75
LU	10.08		8.74		3.00		1.85
HU	0.15		-1.08		3.20		2.01
MT	6.37		0.56		6.60		0.39
NL	-1.47		0.20		1.20		2.86
AT	2.43		1.56		1.40		0.52
PL	1.21		-1.98		3.80		0.67
PT	-8.26		-1.83		-0.50		5.97
RO	0.28		-0.67		1.60		0.59
SI	-1.16		-0.16		-0.80		0.76
SK	-0.82		-0.06		1.60		2.31
FI	-1.57		-0.17		-0.40		1.01
SE	1.65		1.54		2.00		1.86
UK	0.78		1.61		1.10		1.96
Average	-2.08		-0.16		1.29		3.27

Source: Own calculation based on Eurostat, LFS.

Headcount employment fell in particular in Bulgaria, Croatia, Greece, Ireland, Latvia, Lithuania, Portugal and Spain. The drop in employment is mostly explained by job losses as reflected in changes in the number of unemployed, in particular in Bulgaria, Croatia, Greece, Ireland, Lithuania, and Spain.

Employment growth was held back also by a fall in the working-age population in the Baltic states, Bulgaria, and to some extent Portugal. In these countries the fall in labour supply was concentrated amongst those aged 14-25 years, usually more mobile than other age groups, with a drop in the number of young potential workers by 29.3%, 17% and 22.4% in Latvia, Lithuania and Bulgaria, respectively (see Table 2). This was accompanied by a fall in the number of nationals amongst the working-age population of 14.6%, 8.6% and 6% in Latvia, Lithuania and Bulgaria, respectively.

The largest employment gains registered in Luxembourg and Malta were not only the consequence of intense job creation but also due respectively to rising working-age population in Luxembourg and higher activity rates. As concerns countries with positive employment growth during the crisis (eg Austria, Belgium, Germany, Poland and Sweden), the number of people in employment grew mostly as a result of a rise in the working age population or the activity rate; only in Germany employment expanded thanks to a reduction of number of jobless people.

Table 2: **Percentage change in the working age population by age group (cumulated), 2002-2013**

	Young		Prime-age		Older	
	2002-2007	2008-2013	2002-2007	2008-2013	2002-2007	2008-2013
BE	3.3	3.1	-0.1	0.0	13.2	10.1
BG	-5.1	-26.7	-0.2	-6.9	-7.2	6.8
CZ	-9.4	-15.2	2.9	2.7	12.5	-4.8
DK	3.8	15.1	-3.0	-2.5	8.1	-1.7
DE	7.2	-7.5	-1.4	-5.9	-6.2	13.0
EE	3.1	-23.7	-5.5	-3.0	-3.2	8.3
IE	-0.7	-16.4	20.2	2.2	17.7	12.2
EL	-19.3	-9.5	6.0	-1.5	6.8	8.9
ES	-9.9	-12.2	16.8	-2.6	16.1	13.0
FR	3.5	3.0	-0.5	-1.6	17.5	6.7
HR	-5.8	-2.1	-11.1	-13.8	18.1	18.3
IT	-7.2	-0.5	2.5	-1.8	2.2	8.9
CY	8.3	15.3	16.5	12.2	19.9	16.4
LV	-0.1	-35.3	-7.8	-10.4	-9.2	5.5
LT	-2.1	-18.4	-7.6	-16.3	-2.8	9.7
LU	7.4	12.3	5.0	10.7	13.1	18.8
HU	-12.9	-9.2	-1.9	0.1	10.0	-0.3
MT	-2.2	-6.2	5.5	0.1	15.4	3.2
NL	4.3	3.7	-4.3	-4.5	12.5	6.5
AT	9.0	-0.1	0.7	-3.0	3.4	13.5
PL	-6.0	-22.4	-3.9	-2.3	19.5	9.2
PT	-14.8	-12.1	5.9	-4.3	9.2	6.9
RO	-9.0	-21.4	-2.2	3.2	6.8	5.3
SI	-11.2	-16.0	-0.4	-1.6	12.5	10.3
SK	-4.9	-18.3	1.6	1.1	18.9	11.7
FI	0.0	0.0	-4.4	-1.0	11.7	0.8
SE	13.6	4.2	0.1	4.0	6.7	-3.1
UK	12.0	-1.1	1.3	1.9	6.5	4.8

Source: Own calculation based on Eurostat, LFS.

Table 3: **Decomposing changes in the employment rate (cumulated), EU countries (2008-2013)**

Enployment rate change		Demographic component				Employment rate component				Interaction component			
2008-2013		Total	*Young*	*Prime age*	*Old*	Total	*Young*	*Prime age*	*Old*	Total	*Young*	*Prime age*	*Old*
BE	-0.2	-0.6	0.0	-1.5	0.9	0.3	-0.7	-0.8	1.8	0.02	0.00	0.00	0.02
BG	-2.2	1.1	-0.8	-0.1	2.0	-3.5	-0.6	-3.6	0.8	0.11	0.02	0.04	0.05
CZ	1.6	1.4	-0.6	2.3	-0.4	0.3	-0.5	-0.1	0.9	0.01	0.01	0.00	0.00
DK	-4.5	-0.5	1.6	-1.5	-0.5	-4.0	-2.1	-2.4	0.5	-0.04	-0.05	0.01	0.00
DE	4.3	-0.2	-0.6	-2.3	2.7	4.6	0.2	1.5	2.8	0.04	0.00	-0.02	0.06
EE	-1.3	1.5	-1.2	0.4	2.3	-2.7	-0.4	-2.2	-0.1	0.01	0.01	0.01	-0.01
IE	-8.7	0.9	-1.2	0.6	1.5	-9.6	-4.4	-4.5	-0.7	0.08	0.08	0.01	-0.01
EL	-12.1	0.2	-0.3	-0.7	1.3	-12.3	-1.9	-8.1	-2.4	0.03	0.03	0.02	-0.02
ES	-11.0	0.2	-0.6	-1.0	1.8	-11.3	-3.5	-7.1	-0.7	0.08	0.08	0.02	-0.02
FR	-0.2	-0.2	-0.2	-0.9	1.0	0.0	-0.5	-0.9	1.4	0.01	0.00	0.00	0.01
HR	-7.9	-1.6	-0.1	-4.6	3.1	-6.5	-2.3	-3.5	-0.7	0.08	0.00	0.10	-0.02
IT	-3.1	-0.3	-0.1	-1.3	1.0	-2.8	-1.3	-3.2	1.8	0.04	0.00	0.02	0.02
CY	-9.3	1.5	0.1	0.5	0.9	-9.0	-2.6	-4.6	-1.9	-0.06	-0.01	-0.03	-0.02
LV	-3.1	1.7	-1.5	0.3	2.8	-4.7	-1.9	-1.8	-1.0	0.02	0.04	0.00	-0.02
LT	-1.3	0.1	-0.4	-2.7	3.2	-1.4	-0.1	-1.4	0.0	0.01	-0.01	-0.01	0.03
LU	1.5	-0.4	0.0	-1.1	0.8	1.8	-0.1	0.1	1.9	0.02	0.01	-0.01	0.02
HU	1.1	0.6	-0.3	0.7	0.2	0.5	-0.2	0.0	0.8	0.00	0.00	0.00	0.00
MT	5.8	-0.7	-0.7	-0.3	0.2	6.1	0.0	4.0	2.1	0.03	0.01	0.00	0.02
NL	-1.7	-0.6	0.4	-2.1	1.2	-1.2	-1.1	-1.8	1.8	0.02	-0.01	0.01	0.02
AT	0.9	-0.8	-0.2	-2.4	1.8	1.7	-0.3	0.2	1.8	0.03	0.00	0.00	0.03
PL	3.0	0.9	-1.0	0.3	1.6	2.1	-0.3	0.4	2.0	0.05	0.01	0.00	0.04
PT	-6.7	0.2	-0.5	-0.8	1.5	-7.0	-2.1	-3.9	-1.0	0.04	0.03	0.02	-0.01
RO	0.9	1.6	-1.0	1.7	0.9	-0.7	-0.2	-0.4	-0.2	0.01	0.01	0.00	0.00
SI	-4.5	0.2	-0.9	-0.5	1.6	-4.7	-1.9	-2.5	-0.3	0.03	0.06	0.00	-0.03
SK	-0.8	1.3	-0.8	0.5	1.7	-2.2	-1.5	-1.4	0.8	0.05	0.04	-0.01	0.02
FI	-1.4	-0.1	0.0	-0.3	0.2	-1.3	-0.6	-1.4	0.7	0.00	0.00	0.00	0.00
SE	-0.2	0.0	0.2	0.9	-1.1	0.3	-0.1	-0.5	0.8	-0.02	-0.01	0.00	-0.01
UK	-0.7	0.1	-0.3	-0.1	0.5	-0.8	-1.2	-0.3	0.7	0.01	0.01	0.00	0.00
Average	-2.2	0.3	-0.4	-0.6	1.2	-2.4	-1.1	-1.8	0.5	0.03	0.01	0.01	0.01

Source: Own calculation based on Eurostat, LFS.

To shed additional light on compositional effects and provide for a more granular view of age-composition dynamics, changes in the employment rate are decomposed by age groups as follows:

$$ER_t - ER_{t-1} = \Sigma_i [ER_t^i - ER_{t-1}^i] p_t^i + [p_t^i - p_{t-1}^i] ER_{t-1}^i$$

where ER_t is the employment rate at time *t*, ER_t^i is the employment rate of age-group *i* and p_t^i is the population share of group *i* at time *t*. Three demographic groups are considered: the young (15-24 years), prime age (25-49 years) and older persons (50-64 years). By rearranging the terms in the above expression, it is possible to decompose the change in the employment rate into i) a demographic component, ii) an employment rate component, and iii) an interaction component:

$$ER_t - ER_{t-1} = \Sigma_i ER_{t-1}^i \times (p_t^i - p_{t-1}^i) +$$
$$+ \Sigma_i p_{t-1}^i \times (ER_t^i - ER_{t-1}^i) +$$
$$+ \Sigma_i (p_t^i - p_{t-1}^i) \times (ER_t^i - ER_{t-1}^i)$$

This decomposition suggests that the fall in the employment rate was driven mainly by the drop in employment rates of prime age workers, while the contribution of the demographic component was rather negligible, also in light of the short time horizon considered. Layoffs affected prime age workers, but in Ireland and Slovenia also younger workers were concerned. With the exception of Cyprus, in countries where the fall in the employment rate was largest (e.g. Greece, Ireland, Slovenia, Spain, and Portugal), the share of the young in total population fell to the advantage of older workers. This shift in the structure of the population contributed to push up the employment rates up (as usually older workers have higher employment rates). Yet, this effect was not sufficient to offset the reduction in employment during the crisis. Demographics contributed significantly to changes in employment only in few countries, in particular Belgium, Czech Republic, Slovakia and Romania. In Belgium and Slovakia, a demographic shift from prime-age to older workers led to lower employment rate; in the Czech Republic and Romania, it was mostly about a rising share of prime age workers; in Slovakia, results are mostly driven by an increase in the share of prime age and older workers.

3. Recent wage and labour cost developments

Subdued wage dynamics remain a distinct feature of recent labour market developments. Growth of compensation per employee continued to decelerate in the euro area in 2014 in a broad-based manner. As a result of the latter, unit labour costs also grew at a slower pace while productivity grew at low rates similarly as in 2013. The correlation between real unit labour costs and compensation per employee became weaker than in past years, also due to sluggish growth of compensation in low-unemployment countries. Notwithstanding such developments in net creditor countries, labour costs developments continued being supportive of rebalancing within the euro area.

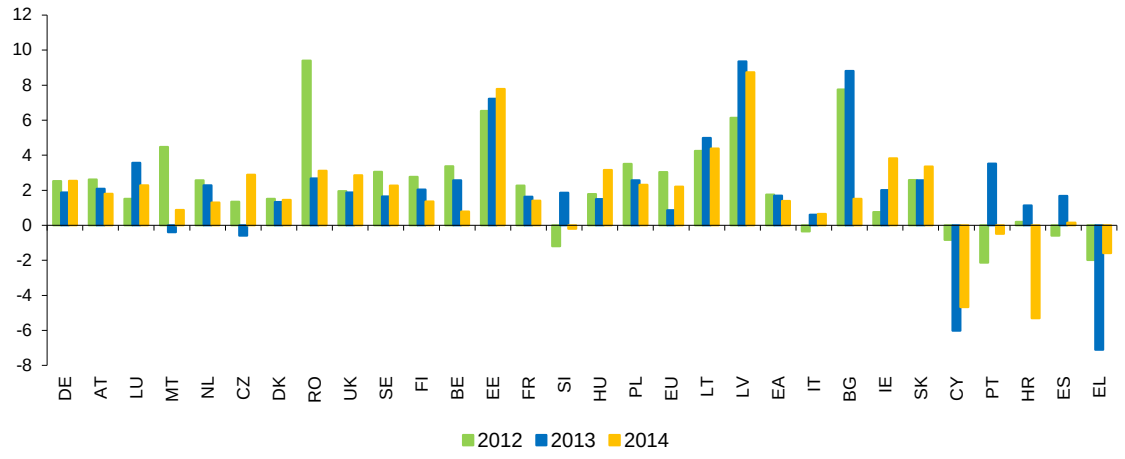
3.1. Introduction

The analysis presented in the chapter points to a very subdued wage growth for the euro area and the EU; large differences across countries are found, with some Member States (such as Estonia, Latvia and Lithuania) recording growth rates in nominal compensation per employee above 4% and other countries (such as Croatia, Cyprus, Greece, Portugal and Slovenia) displaying negative rates. The analysis presented in the chapter aims at eliciting the causes of the observed developments, in a context of enduring labour market slack and low inflation that characterised 2014. The chapter presents a comparison between real wage and productivity developments, highlighting again a high degree of heterogeneity across countries. The analysis of sectoral patterns of wage adjustment aims at understanding whether these can support the reallocation of resources towards the tradable sector and accompany the rebalancing of the economy.

Two in-depth analytical contributions are provided. The first one (Box I.3.1) assesses the importance of composition effects, which may hide significant sector-specific wage developments, most notably when the economy is hit by sector-specific shocks with important consequences on employment. The second (Box I.3.2) illustrates wage benchmarks to assess the extent to which the observed wage developments reflect underlying economic conditions.

The chapter is structured as follows: Section 3.2 describes the main trends in wages and labour costs, analysing the

Graph I.3.1: **Nominal compensation per employee, y-o-y % change**



Note: Countries are displayed in ascending order of the unemployment rate in 2013.
Source: DG ECFIN AMECO database and Eurostat.

relationship with productivity developments and looking at the decomposition of wages at sectoral level, including in the public sector. Section 3.3 analyses the evolution of unit labour costs (ULC) and their main components; Section 3.4 takes a closer look at the evolution of external competitiveness, including the adjustment within the euro area. Section 3.5 concludes.

3.2. Trends in wages and unit labour costs

Compensation per employee grew in the euro area at 1.4% in 2014, a record low since the inception of the EMU.([18]) At Member State level, wage dynamics differed across countries reflecting the effect of ample slack in the labour market on the outcomes of collective bargaining. A negative correlation is generally found between the growth of wages and the level of unemployment. However, robust growth in compensation per employee was recorded in some high-unemployment countries while wage restraint was observed also in countries with low or falling unemployment rates (Graph I.3.1).

Compensation per employee dropped in Cyprus, Greece, Portugal and Slovenia. Among the largest euro area countries, it grew below 1% in Spain and Italy, and between 1% and 2% in France and the Netherlands. In Germany, compensation per employee grew by 2.5% on the back of an increase in the number of hours worked per employee. ([19]) Growth rates above 4% were registered in the Baltic states, in particular in Estonia and Latvia.

For the EU, wages expanded at 2.2%. Among the non-euro area countries, Romania and Hungary recorded growth rates above 3%. By contrast, wages declined by about 5% in Croatia. In the United Kingdom, wages accelerated to 2.8%, significantly higher than the average rates recorded since the onset of the crisis.

As shown in Box I.3.1, the average wage growth observed since the onset of the crisis was influenced by the shift in the employment structure towards high paying occupations which followed the destruction of low paid jobs. Thus, in countries strongly hit by the crisis, wage adjustment has been blurred by shifts in the composition of employment. ([20])

To assess whether wage developments have been responding to the underlying economic variables, Box I.3.2 compares the evolution of wages against predictions based on inflation, unemployment rate and productivity. In recent years, wages have been growing below the level consistent with underlying economic conditions, in particular in countries where unemployment is high. Reforms of collective bargaining enhancing the response of negotiated wages to market conditions, the sheer size of the labour market shock and rebalancing needs in countries with large stocks of external debt may explain this subdued wage dynamics.

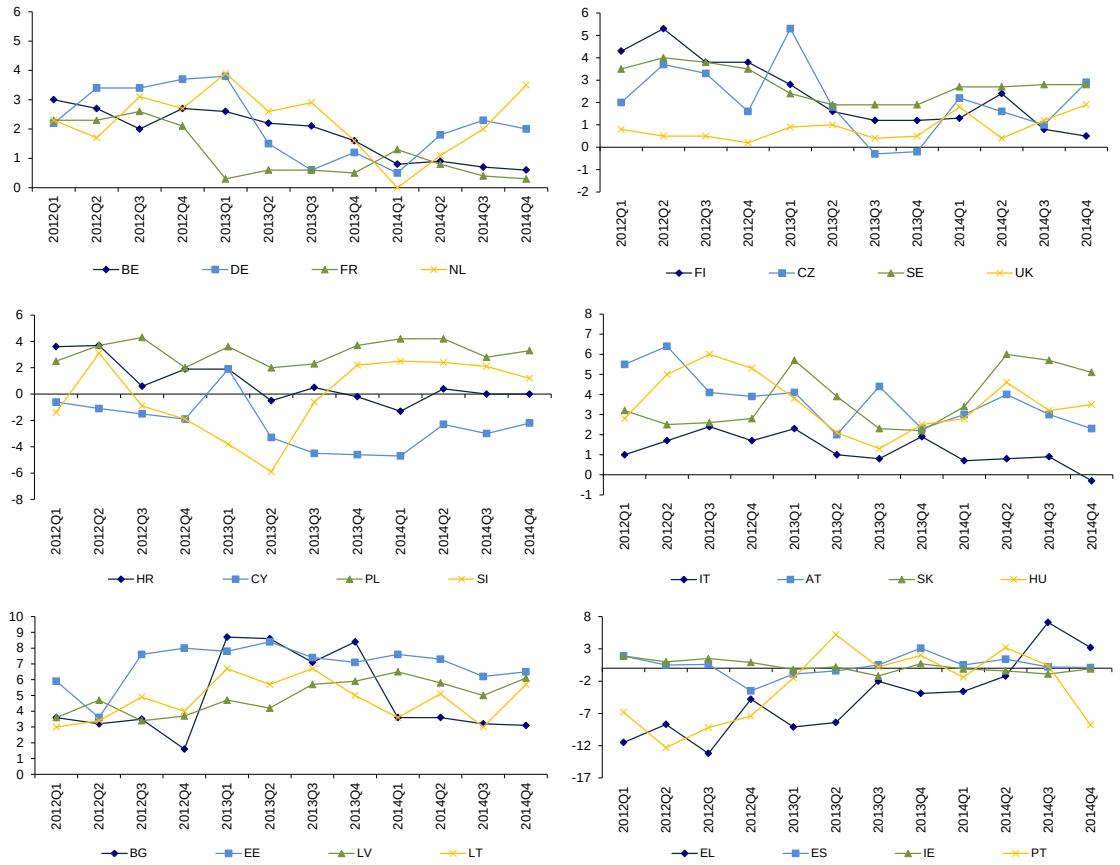
The Hourly Labour Cost Index (HLCI) grew by 1.2% in the euro area (1.4% in the EU). It declined by more than 3% in Cyprus and by about 2% in Portugal. In the Baltic states and Slovakia the index grew at rates above 4%. In Germany, the HLCI broadly stabilised despite the acceleration in the growth rate in compensation per employee, which may reflect the increase in the number of hours worked per employee (0.8%) (Graph I.3.2).

([18]) Compensation per employee is obtained from National Accounts as Compensation of employee divided by total number of employees. Compensation of employees has two components: 1) Wages and Salaries payable in cash or in kind; 2) Social insurance contributions payable by employers. When not relevant the terms Compensation and wages are used inter-changeably.

([19]) Compensation per hour worked increased by 1.7% while the number of employee increased by about 0.8%.

([20]) Recent studies analysing employment composition effects on wages include ECB (2012) and OECD (2014).

Graph I.3.2: **Hourly Labour Cost Index, y-o-y % change, selected countries**



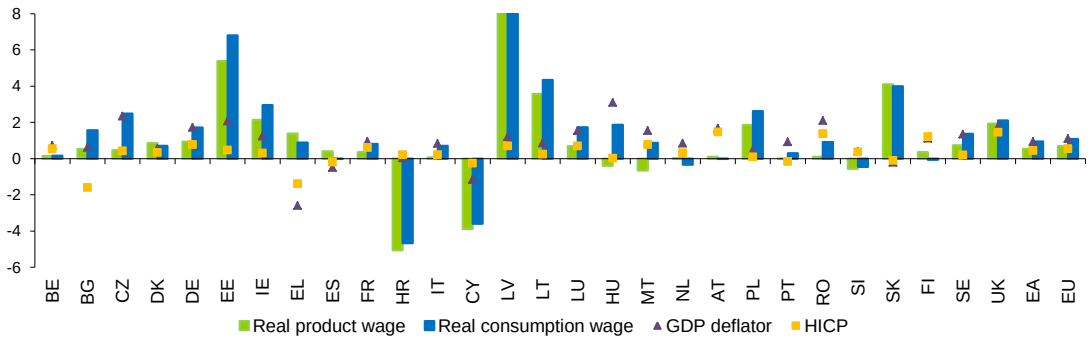
Note: Industry, construction and services (except activities of households as employers and extra-territorial organisations and bodies). Countries grouped according to the magnitude of variations in the HLCI. Data for Denmark, Luxembourg, Malta and Romania not displayed.
Source: Eurostat.

The HLCI broadly confirms the developments in compensation per employee. Some important country differences include Croatia, Ireland, Slovenia and the United Kingdom. As for the patterns throughout 2014, it is noticeable an acceleration in the HLCI in the Netherlands and Germany and a deceleration in France. In Italy and Portugal, the last quarter was marked by negative growth in the HLCI, while in Greece the HLCI grew after several quarters of negative growth. In Cyprus, the HLCI continued to throughout 2014, but at decelerated rates compared to 2013.

3.2.1. Real consumption and production wage

Real consumption wages (i.e. wages deflated by harmonised consumer price index - HICP) increased at faster rates despite the deceleration in compensation per employee. Real consumption wages grew more than the historical average - by 0.9% in the euro area and 1.1% in the EU - benefiting from very low HICP growth rates (Graph I.3.3), and thereby contributing to support domestic demand. On the other side, real production wages (wages deflated with GDP deflator) increased more moderately, as the GDP deflator grew faster than the HICP.

Graph I.3.3: **Real product and consumption wages, HICP and GDP deflator, y-o-y % change, 2014**



Source: DG ECFIN AMECO database.

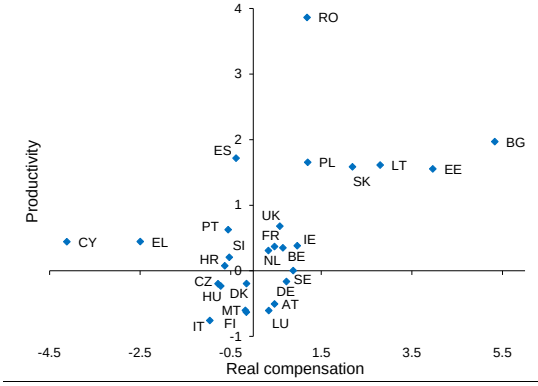
The country level disaggregation shows that real product wages fell by more than 5% in Croatia and declined also in Cyprus, Malta, Slovenia, Hungary and Portugal. Real production wages grew in Greece after four years of strong declines. The fastest growth rate in real product wages was recorded in Latvia, above 8%. Real consumption wages increased at robust rates in Slovakia and the Baltic states. By contrast, Croatia and Cyprus recorded accentuated declines. Real consumption wages stabilised in Slovenia, the Netherlands, Finland, Austria, Spain, Belgium and Portugal.

3.2.2. Real compensation per employee, productivity and unemployment

Between 2012 and 2014, real wages evolved on average in line with productivity. Nonetheless, the aggregate picture conceals rather different patterns across countries. Substantial deviations between growth of real wages and growth of productivity were observed in Cyprus, Greece, Romania and Spain, where the average productivity growth was at least 2 percentage points higher than the average growth in real compensation per employee.

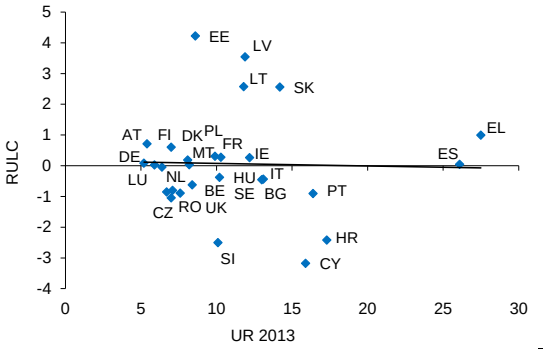
Real wages over the last three years grew substantially faster than productivity in Latvia, Bulgaria and Estonia (Graph I.3.4). Graph I.3.5 plots the variation in real unit labour costs in 2014 against the unemployment rate in 2013.

Graph I.3.4: **Real compensation per employee and productivity, average growth rates 2012-2014**



Source: DG ECFIN AMECO database.

Graph I.3.5: **Real unit labour costs, y-o-y % change 2014 and unemployment rate in 2013**



Source: DG ECFIN AMECO database.

While in the past years there was a strong negative correlation between the two variables, an indication of a market driven adjustment, in 2014 the correlation line is flat.

Box I.3.1: Assessing aggregate wage developments: employment composition effects

Aggregate wage levels can be influenced by changes in the composition of employment. High-skill workers typically have higher earnings than low-skill workers; if employment becomes on aggregate more skill intensive an increase in the average wage would follow. This effect may be relevant when sector-specific shocks occur and during periods of intense sectoral reallocation. Composition effects of employment on wages may be especially important in periods of large employment losses, as was the case during the recent economic and financial crisis. ([1])

This box compares employment composition effects in two groups of countries since the onset of the economic and financial crisis. The first group of countries comprises Austria, Belgium and Finland, where unemployment rates were little affected by the crisis. The second group of countries comprises Spain, Portugal and Slovenia, where unemployment increased drastically instead. Composition effects on average annual earnings by occupation are computed by means of a disaggregation into nine occupation categories according to the ISCO classification. ([2]) The data have been provided by Eurostat. ([3])

A shift-share analysis is used to decompose the change in the level of wages into three components: a wage component; an employment composition component; and an interaction component. ([4]) The wage component identifies changes in wages by different occupations for an unchanged employment structure. The employment component measures the effects of the shift in the structure of employment, at given wage structure. The interaction component measures the wage change that can be attributed to changes in wages and changes in employment in a specific occupation. More formally:

$$W_t - W_{t-1} = \sum_{j=1}^{J} \left(\frac{E_j}{E}\right)_t * \Delta W_j + \sum_{j=1}^{J} W_{jt}\, \Delta\left(\frac{E_j}{E}\right) + \sum_{j=1}^{J} \Delta W_{jt}\, \Delta\left(\frac{E_j}{E}\right)$$

Where:
W_t = nominal wage in period t
$j = \{1, \dots, 9\}$ ISCO occupation classification
E = employment

Results of the shift-share analysis show that employment composition effects have contributed to a faster wage growth at aggregate level in five of the six countries under analysis (Graph 1). This means that higher-paying occupations on total employment increased, so that the average wage growth would have been lower in the absence of such employment shift. The employment composition component was stronger in Portugal, Spain and Slovenia. In Portugal, where total earnings declined substantially, composition effects limited the fall in earnings by contributing with a positive growth of about 5%. In Spain, almost 60% of the wage variation in the period 2008-2011 was due to employment composition effects. In Slovenia, employment composition effects contributed for about 40% of the change in earnings. By contrast, the contribution of employment composition for earnings growth was around 20% in Austria and Belgium, while it was slightly negative in Finland.

([1]) Bils (1985) and Solon et al. (1994), have argued that cyclical changes in the composition of employment may explain the apparent lack of real wages response to business cycles.
([2]) The definition of earnings differs from that of compensation per employee. Annual gross earnings cover remuneration in cash paid by the employer before tax deductions and social security contributions payable by wage-earners and retained by the employer. Compensation per employee includes, in addition, payments in kind and employers' social security contributions. Reported earnings for Belgium, Spain, Portugal and Finland concern employees working in firms with at least ten employees, while for Austria and Slovenia the reported earnings concern all firms.
([3]) Managers; Professionals; Technicians and associate professionals; Clerical support workers; Service and sales workers; Skilled agriculture, forestry, and fishery workers; Craft and related trade workers; Plant and machine operators and assemblers; Elementary occupations.
([4]) A similar analysis was carried out, for instance, by Keller (2009).

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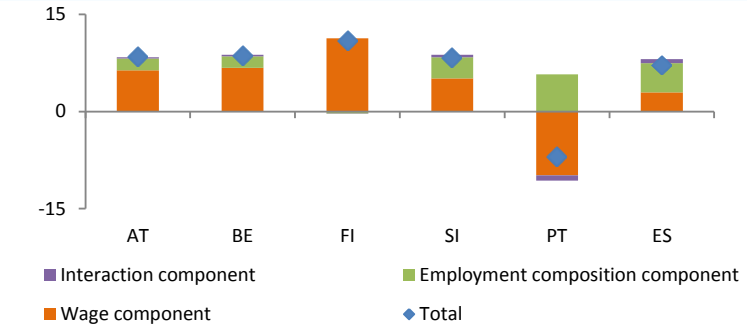
Box (continued)

Graph 1: Decomposition of cumulative growth of earnings, 2008-2011

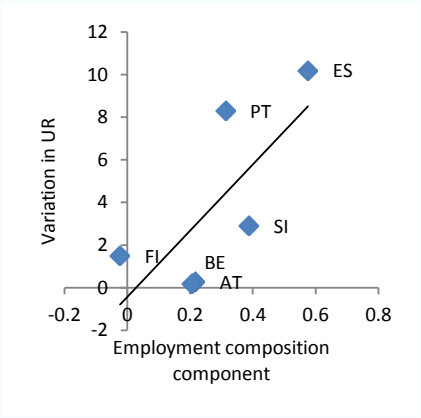


Note: For Portugal and Finland 2008-2012, for Slovenia 2008-2010.
Source: Commission services based on Eurostat, LFS.

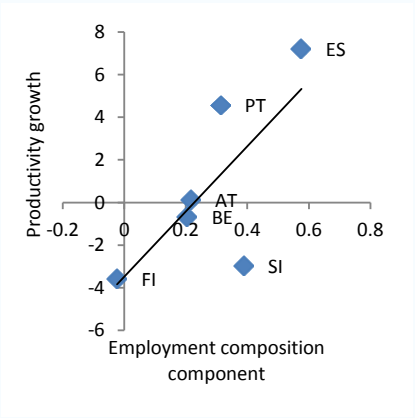
The employment component was higher in countries that recorded highest increases in unemployment rates (Graph 2). Spain, Slovenia and Portugal recorded the highest wage components in percentage of the total variation in earnings and were also the countries that registered the highest increases in unemployment rates. Austria, Belgium and Finland with lower variation in the unemployment rate also recorded a lower unemployment component in percentage of the total variation in earnings.

The employment composition component is also positively correlated with productivity per person employed (Graph 3). Indeed, an increase in employment component indicates that higher paying occupations are gaining employment shares and it is expected that higher paying occupations are also those with higher productivity.

Graph 2: Employment component and increase in unemployment (percentage points)



Graph 3: Employment component and productivity growth per person employed

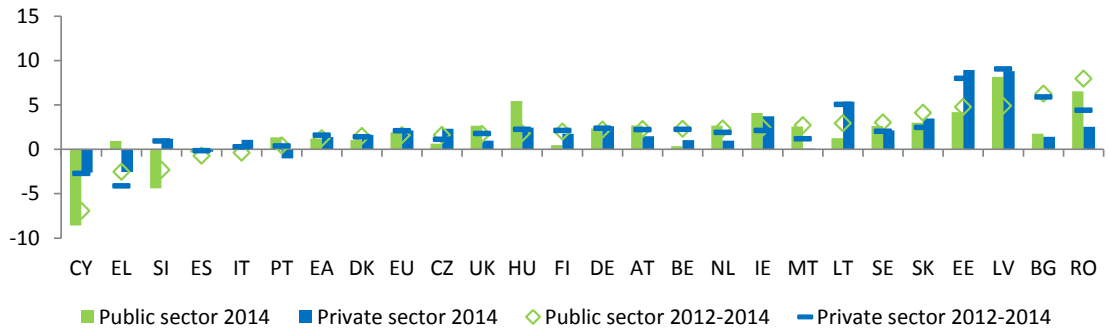


Source: Eurostat.

All in all, the presence of significant employment composition effects reveals that downward flexibility of wages may have been underestimated for aggregate data, as already shown in previous analysis (e.g. ECB, 2012). However, it is important to take into account that employment composition effects have a symmetrical implication on aggregate productivity: a growing incidence of high-skill occupations result in productivity increases. Hence, actual productivity growth is overestimated, with would have implications for unit labour costs.

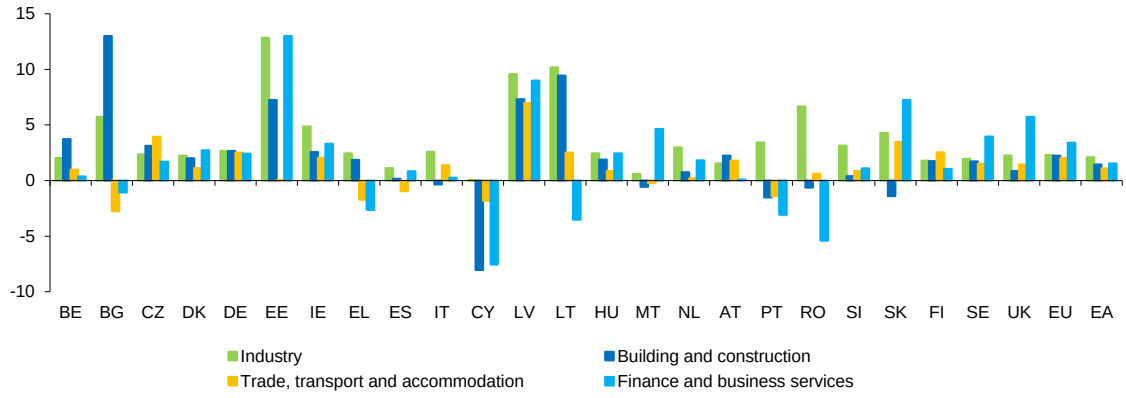
Several explanations can be given to real unit labour costs being less responsive to the unemployment rate, including the substantial adjustment that has already taken place in previous years in several countries and the presence of widespread downward real wage rigidities in a low inflation scenario. In particular, countries such as Spain, Greece and Portugal, which still record very high unemployment rates, have seen their real unit labour costs decreasing in the past

Graph I.3.6: **Compensation per employee in public and private sectors, y-o-y % change, 2014**



Note: Public sector proxied by public administration and defence, education, health and social work, personal service activities.
Source: Eurostat.

Graph I.3.7: **Compensation per employee by sector, y-o-y % change, 2014**



Note: France, Croatia, Luxembourg and Poland not included because of missing data. Values out of scale for the construction sector in Bulgaria (value equal to 18.1%) and for the financial sector in Estonia (value equal to 27.3%).
Source: Eurostat.

years. The Baltic states and Slovakia, despite the still high unemployment rates recorded a growth rate of real unit labour costs above 2%. However, in the Baltic states there has been a substantial adjustment in real unit labour costs in previous years and unemployment has also receded, although remaining at high levels, especially in Latvia and Lithuania.

3.2.3. Compensation per employee at sectoral level

Wage moderation was broad based across sectors. With growth rates below 1.5%, trade, transport and accommodation, building and construction, finance and business services contributed the most to moderate wage developments in the euro area; in industry, wages expanded at a slightly higher rate, about 2%. For the EU as a whole, the fastest growth rates were observed in finance and business services sector (Graph I.3.7).

Box I.3.2: **Benchmarking wage developments in the euro area**

Are wages evolving in line with labour market fundamentals? Are wage developments supporting labour market adjustment? Addressing these questions require comparing the actual evolution of wages to appropriate benchmarks taking into account economic fundamentals. Such a benchmark has been estimated based on a reduced-form wage equation estimated on a panel of EU countries over 1995-2014 (for more details about the methodology and results, see Arpaia and Kiss, 2015). The benchmark is estimated following a 3-step procedure. In the first step, the determinants of the wage level are estimated from the long-run relation:

$$\ln(\text{wage}_{it}) = \alpha_i + 1.10 \cdot \ln(\text{CPI}_{it}) - 0.005 \cdot \text{UR}_{it} + 0.83 \cdot \ln(\text{prod}_{it}) + \varepsilon_{it} \quad (1)$$

Here, wage_{it} is nominal compensation per employee in country *i* and year *t*, α_i is a country-specific constant, CPI_{it} is the consumer price index, UR_{it} is the unemployment rate, prod_{it} is labour productivity, measured by real GDP per person employed, and ε_{it} is the error term. The estimated coefficients suggest that the wage level moves very closely together with the price level and productivity in the long run and it is negatively affected by unemployment. All coefficients are statistically significant at the 1% level and the equation explains about 97% of the variance of the dependent variable. In the second step, the determinants of wage growth are estimated as a function of the change in the underlying economic conditions:

$$\Delta\ln(\text{wage}_{it}) = \mu + 1.14 \cdot \Delta\ln(\text{CPI}_{it}) - 0.004 \cdot \Delta\text{UR}_{it} + 0.54 \cdot \Delta\ln(\text{prod}_{it}) - 0.22 \cdot \hat{e}_{i,t-1} + \epsilon_{it} \quad (2)$$

This short-term equation includes a term $\hat{e}_{i,t-1}$ which stands for the gap between the actual wage level and the level predicted from the long-run relation in (1) for the previous year. This term is also called the 'error-correction term' because it provides an estimate of the speed of adjustment toward the estimated long-run relationship in the case of a temporary deviation. The estimated coefficient is about –0.2 which suggests that about one-fifth of the gap between the actual and predicted wage level is closed in a given year. The other estimated coefficients suggest that wage growth is closely linked to inflation in the short term, but the link between wages and productivity is less close in the short run than in the long run. All coefficients are statistically significant at least at the 5% level and the equation explains about 78% of the variance of the dependent variable.

The third step for the estimation of the benchmark consists of obtaining predictions for nominal wage growth on the basis of equation (2).

Graph 1 reports actual and benchmark wage growth, focusing on euro-area countries. The graph shows that benchmark wage growth was not constant over the post-crisis period. In particular, the reduction around 2009 was linked to the drop in productivity ensuing from real GDP losses not accompanied by proportionate employment losses, while the rebound around 2010 was mainly explained by productivity growth resulting from the combination of a pick up in production and job shedding. The most recent reductions in benchmark wage growth are linked to growing unemployment and falling consumer price inflation. All in all, the analysis suggests that for almost all euro-area countries growth of compensation per employee in recent years was not above what could have been expected on the basis of fundamentals. However, patterns have varied considerably across countries. Member States concerned by exceptionally subdued labour demand amid current account reversals and bond market tensions like Greece, Spain, Ireland, Portugal, and Slovenia have generally recorded actual pay growth below benchmark since 2010, with Greece currently recording a significant gap. Such subdued wage growth in countries with large stocks of net foreign liabilities and a major surge in unemployment after the crisis is supportive of both domestic and external rebalancing. In countries with net external assets and relatively low or falling unemployment, like Austria, Germany or Luxembourg, the sluggish patterns of recent years seem to be a continuation of a longer trend of subdued wage growth.

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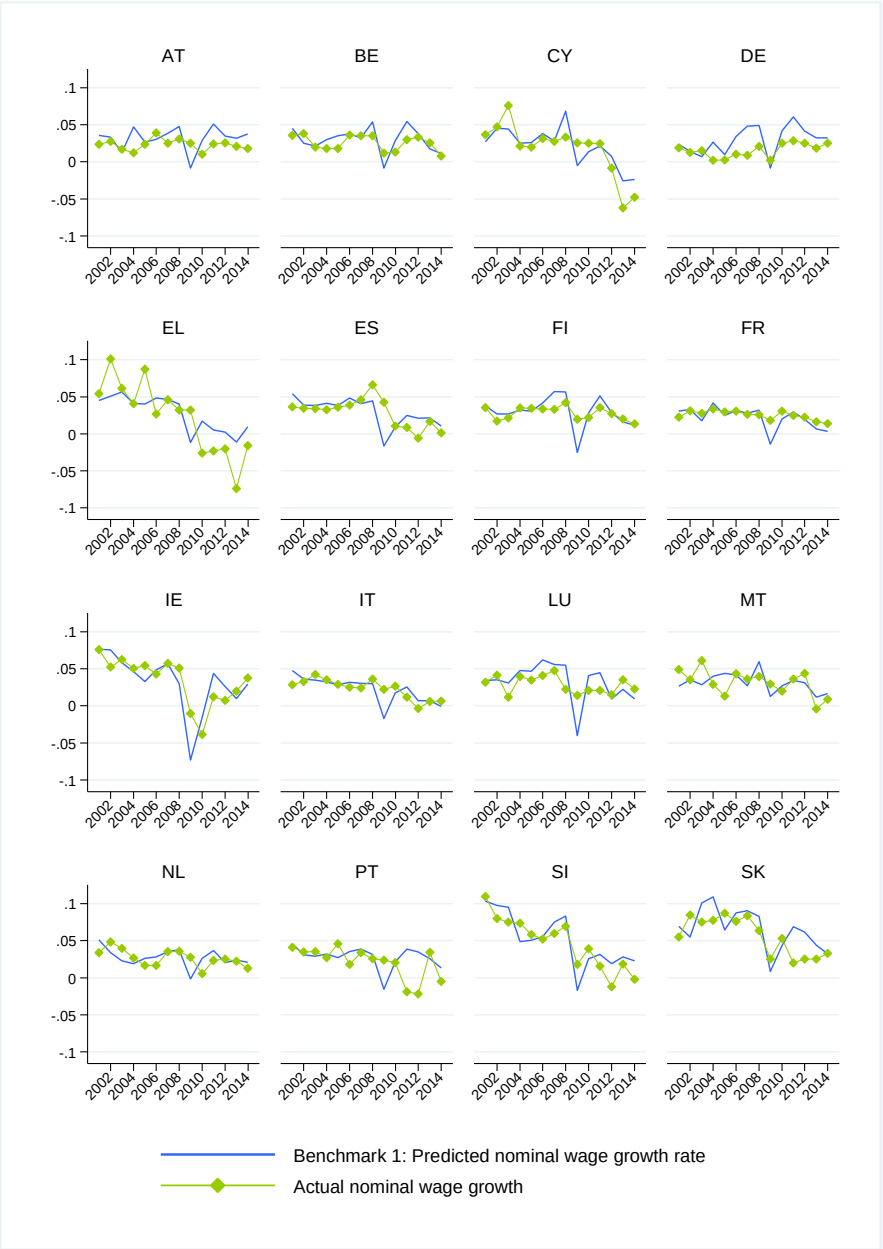
Box (continued)

Graph 1: Actual and benchmark wage growth, euro-area countries



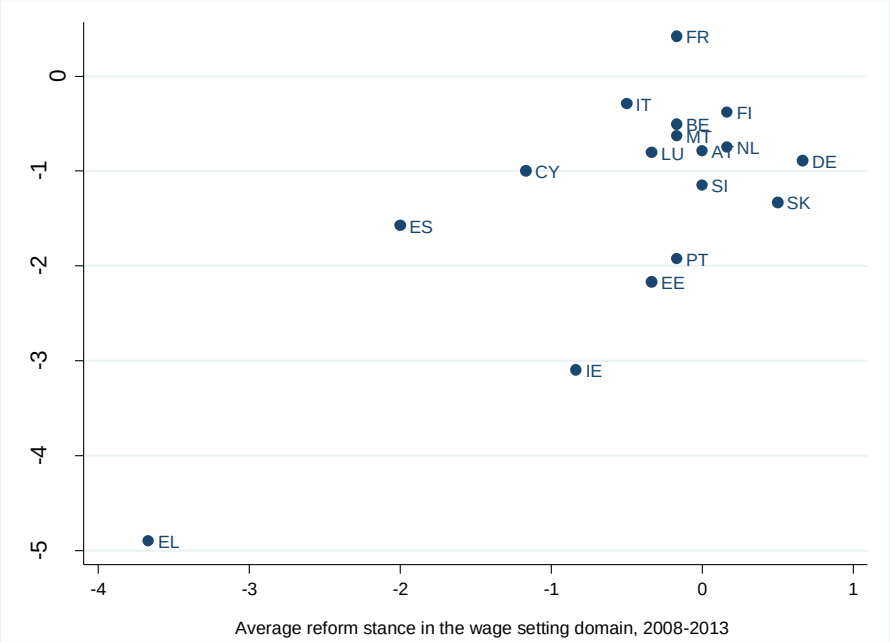
Reforms of the wage-setting system are one possible factor that could explain deviations of wage growth from benchmark. Graph 2 below plots, for euro-area countries, the cumulated deviation of wage growth from the benchmark during the period 2010-2013 against the average 'reform stance' in the wage setting domain during the period 2008-2013. The measure of 'average reform stance' is based on the LABREF database of labour market reforms and is defined as the average number of reform measures increasing the stringency of regulation in the wage-setting system *net of* the number of reform measures decreasing the stringency of regulation. The reforms considered pertain both to public and private employment and exclude recurrent decisions by governments

(Continued on the next page)

Box (continued)

setting systems in a direction potentially leading to reduced wage floors were those recording wage growth more clearly below benchmark in the post-crisis period. The relation is driven by a substantial extent by the few countries having carried out substantial wage setting reforms, notably Greece and Spain.

Graph 2: Difference between actual and benchmark wage growth and reform stance in the wage setting domain, euro-area countries



Source: European Commission, LABREF database.

At Member State level, the largest declines in compensation per employee were observed in Cyprus in the construction and the business and financial services sectors. In contrast, the largest increases were registered in the Baltic states in all sectors, with Bulgaria also experiencing a sharp increase in construction.

In several countries wages have been more dynamic in Industry than in other sectors, thereby supporting the reallocation of resources towards the most productive tradable sector. These developments helped to rebalance current accounts and net external positions. In Cyprus and Portugal, the drop of wages was driven by sharp adjustments in Construction and Finance, while in Industry compensation broadly stabilised (Cyprus) or grew substantially (by 3.5% in Portugal). Similarly, in Greece, Slovenia, Spain and Italy compensation per employee in industry grew relatively faster than in other sectors.

Compared to the private sector, the dynamic of wages was in 2014 more contained in the public sector both in the EU and the euro area. Yet, significant differences exist across countries. The decline in total compensation per employee in Cyprus was generalised to both the public and the private sector. In contrast, in Greece, Portugal and Spain the wage restraint was driven by the drop in private sector wages after wage declines in the public sector. In Slovenia, the negative growth in compensation per employee in 2014 was driven by the public sector.

Among the countries recording the largest increases in compensation per employee in 2014, the growth rate was higher in the private sector in the three Baltic states, while in Ireland compensation per employee grew slightly faster in the public sector.

In the period 2012-2014, Cyprus, Greece, Slovenia, Spain, and Italy recorded an annual negative growth in compensation per employee in the public sector. Portugal recorded an average annual growth below 0.5%. These countries were also those more exposed to the market pressures throughout the economic and financial crisis. In the private sector, the average annual growth rate over the last three years was negative in Greece, Cyprus and Spain, and very moderate in the other vulnerable countries.

3.3. Prices, unit labour costs and the tax wedge

3.3.1. Contributions to the final demand deflator

In 2014 the final demand deflator continued to expand at a modest rate as in 2013 both in the EU and the euro area. For the euro area, its growth rate in 2014 was the second lowest since the inception of the euro, after having declined in 2009. Besides the moderate growth of nominal unit labour costs, moderate developments in other components, in particular import prices and gross operating surplus, accounted for the low growth rate of the final demand deflator. Half of the EU countries recorded a fall in the latter. The highest declines were recorded in Greece, Cyprus and Slovakia. The contribution of unit labour costs to the overall inflationary pressures was relatively low in 2014 and even negative in Greece, Spain, Croatia, Cyprus, and Slovenia (Table I.3.1).

Table I.3.1: **Contributions to the final demand deflator, y-o-y % change, 2014**

	Import prices	NULC	Indirect taxes	G. oper. surplus	F. demand deflator
BE	-0.7	0.0	0.1	0.2	-0.3
BG	-0.8	0.1	0.9	-0.6	-0.4
CZ	1.0	0.4	-0.4	1.4	2.4
DK	-0.8	0.4	-0.1	0.0	-0.5
DE	-0.4	0.7	0.1	0.4	0.8
EE	-0.7	1.8	0.7	-1.3	0.7
IE	0.3	0.2	0.2	0.3	0.8
EL	-0.7	-0.6	1.3	-2.6	-2.6
ES	-0.3	-0.2	0.1	-0.3	-0.7
FR	-0.5	0.6	-0.1	0.3	0.2
HR	-0.2	-1.0	0.2	0.8	-0.2
IT	-0.5	0.5	0.3	-0.2	0.1
CY	-0.8	-1.3	0.9	-0.3	-1.7
LV	-0.1	1.4	0.7	-1.3	0.6
LT	-1.4	0.8	0.3	-0.7	-1.0
LU	1.2	0.3	0.0	0.3	1.8
HU	0.1	0.7	0.4	0.6	1.8
MT	-0.7	0.3	0.3	0.1	-0.1
NL	-1.0	0.0	0.1	0.4	-0.5
AT	-0.2	0.9	0.2	0.1	1.1
PL	-0.8	0.2	0.1	-0.1	-0.5
PT	-0.7	0.0	0.4	0.3	-0.1
RO	-0.4	0.4	-0.1	1.2	1.1
SI	-0.4	-0.8	0.2	0.8	-0.2
SK	-1.6	0.5	0.0	-0.7	-1.6
FI	-0.5	0.5	0.1	0.3	0.4
SE	0.5	0.6	0.1	0.3	1.5
UK	-0.9	0.4	0.2	0.8	0.5

Source: DG ECFIN AMECO database.

3.3.1. Unit labour costs

Nominal unit labour costs decelerated in the euro area and the EU in 2014, with a growth rate around 1%. The evolution of unit labour costs resulted from the deceleration in the growth rate in compensation per employee and a stabilisation of productivity growth at very low levels.

The dynamics of unit labour costs were subdued in countries with the most pressing adjustment needs. Cyprus registered the sharpest fall due to the decline in compensation per employee. Unit labour costs also fell in Croatia, Slovenia, Greece and Spain, while broadly stabilised in Portugal. In Slovenia and Spain, the decline was mainly driven by the increase in labour productivity, while in Portugal their stabilisation occurred on the back of equal decreases in both compensation per employee and productivity (Table I.3.2).

Table I.3.3: **Decomposition of tax wedge**

	Total Tax Wedge 2014	Of which			Difference 2013 - 2014				Difference 2008 - 2014			
		Personal Income Tax	Social Security Contributions Employee	Social Security Contribution Employer	Total Tax Wedge	Personal Income Tax	Social Security Contribution Employee	Social Security Contribution Employer	Total Tax Wedge	Personal Income Tax	Social Security Contribution Employee	Social Security Contribution Employer
BE	55.6	21.8	10.8	23.0	-0.1	0.0	0.0	-0.1	-0.3	0.0	0.1	-0.3
BG*	33.6	7.4	10.9	15.3	0.0	0.0	0.0	0.0	-1.5	0.2	0.1	-1.8
CZ	42.6	9.1	8.2	25.4	0.2	0.2	0.0	0.0	-0.8	0.8	-1.1	-0.6
DK	38.1	35.6	2.8	-0.3	-0.1	-0.2	0.0	0.0	-2.8	5.4	-7.9	-0.3
DE	49.3	16.0	17.1	16.2	0.1	0.1	0.0	0.0	-2.0	-1.7	-0.2	-0.2
EE	40.0	13.2	1.5	25.4	0.1	0.1	0.0	0.0	1.7	0.2	1.0	0.4
IE	28.2	14.9	3.6	9.7	1.1	1.1	0.0	0.0	5.9	7.0	-1.1	0.0
EL	40.4	7.1	12.7	20.6	-1.2	-0.1	-0.2	-0.9	-1.1	0.0	0.2	-1.3
ES	40.7	12.8	4.9	23.0	0.0	0.0	0.0	0.0	2.7	2.9	0.0	-0.1
FR	48.4	10.6	10.2	27.7	-0.4	0.2	0.3	-1.0	-1.3	0.8	0.6	-2.7
HR*	39.5	8.9	17.4	13.2	:	:	:	:	:	:	:	:
IT	48.2	16.7	7.2	24.3	0.4	0.4	0.0	0.0	1.6	1.6	0.0	0.0
LV*	43.9	15.6	8.9	19.4	-0.6	-0.6	0.0	0.0	2.3	0.7	1.6	0.0
LT*	41.1	10.5	6.9	23.7	0.2	0.2	0.0	0.0	-0.5	-5.1	4.6	-0.1
LU	37.6	15.7	11.0	11.0	0.3	0.3	0.0	0.0	2.9	1.9	0.1	1.0
HU	49.0	12.5	14.4	22.2	0.0	0.0	0.0	0.0	-5.1	-3.4	1.8	-3.5
MT*	25.3	11.7	6.8	6.8	0.8	0.4	0.2	0.2	2.5	3.0	-0.3	-0.3
NL	37.7	14.6	13.9	9.2	0.7	0.1	-0.2	0.8	-1.5	0.6	-1.8	-0.2
AT	49.4	12.8	14.0	22.6	0.2	0.2	0.0	0.0	0.3	0.2	0.0	0.1
PL	35.6	6.0	15.3	14.4	0.0	0.0	0.0	0.0	0.9	-0.3	-0.3	1.5
PT	41.2	13.1	8.9	19.2	-0.1	-0.1	0.0	0.0	4.3	4.3	0.0	0.0
RO*	44.6	9.8	12.9	21.9	0.1	0.1	0.0	0.0	2.2	0.4	0.6	1.2
SI	42.5	9.6	19.0	13.9	0.1	0.1	0.0	0.0	-0.4	0.2	0.2	-0.8
SK	41.2	7.2	10.2	23.8	0.1	0.1	0.0	0.0	2.4	-0.2	-0.4	3.0
FI	43.9	18.3	6.5	19.1	0.8	0.0	0.3	0.5	0.1	-1.2	1.5	-0.3
SE	42.5	13.2	5.3	23.9	-0.5	-0.6	0.0	0.0	-2.4	-1.8	0.0	-0.6
UK	31.1	13.0	8.4	9.7	-0.3	-0.2	0.0	0.0	-1.7	-1.8	0.1	0.0

Note: Single person without children, 100% of average wage. * 2013 data. Data for Cyprus not available. Data for Croatia not available before 2013.
Source: European Commission, based on OECD Taxing wages models.

Table I.3.2: **Decomposition of unit labour costs, y-o-y % change, 2014**

	NULC	Compensation per employee	Labour productivity	GDP deflator	RULC
BE	0.1	0.8	0.7	0.7	-0.6
BG	0.2	1.5	1.3	0.6	-0.5
CZ	1.3	2.9	1.6	2.3	-1.0
DK	1.1	1.4	0.3	0.5	0.6
DE	1.8	2.5	0.7	1.7	0.1
EE	6.4	7.8	1.3	2.1	4.2
IE	0.8	3.8	3.0	1.2	-0.4
EL	-1.6	-1.6	0.0	-2.6	1.0
ES	-0.5	0.1	0.6	-0.5	0.0
FR	1.3	1.4	0.1	1.0	0.3
HR	-2.4	-5.3	-3.0	0.0	-2.4
IT	1.1	0.7	-0.4	0.8	0.3
CY	-4.3	-4.7	-0.4	-1.2	-3.2
LV	4.8	8.7	3.8	1.2	3.5
LT	3.4	4.4	0.9	0.9	2.6
LU	1.6	2.3	0.7	1.5	0.0
HU	2.7	3.2	0.4	3.1	-0.4
MT	1.5	0.9	-0.6	1.5	0.0
NL	0.0	1.3	1.3	0.9	-0.9
AT	2.4	1.8	-0.6	1.7	0.7
PL	0.7	2.3	1.6	0.5	0.3
PT	0.0	-0.5	-0.5	0.9	-0.9
RO	1.3	3.1	1.8	2.1	-0.8
SI	-2.1	-0.2	2.0	0.4	-2.5
SK	2.3	3.4	1.0	-0.2	2.6
FI	1.1	1.4	0.2	1.1	0.0
SE	1.5	2.3	0.7	1.3	0.2
UK	0.9	2.8	2.0	1.8	-0.9

Source: DG ECFIN AMECO database.

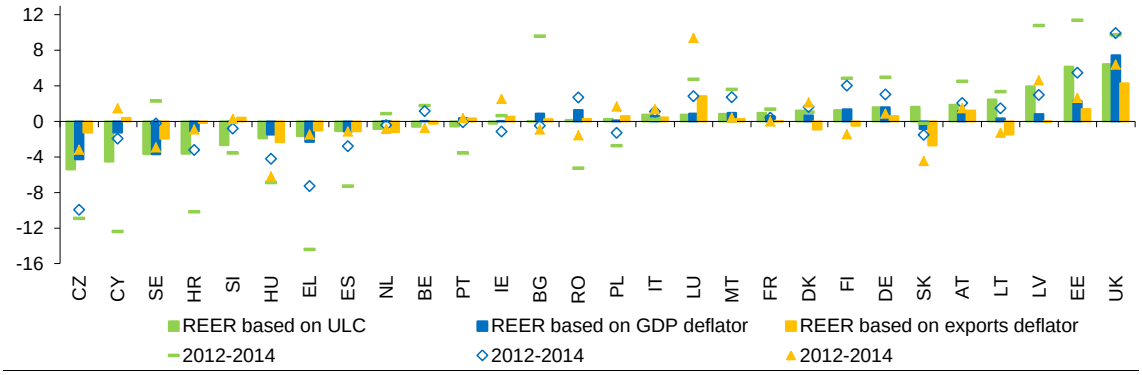
The Baltic states registered the fastest increase in unit labour costs. Estonia, in particular, recorded a strong acceleration, owing to a sharp increase in compensation per employee and weak productivity growth. Germany, Slovakia and Austria registered increases in nominal unit labour costs near 2%.

The dynamics of real unit labour costs reflect normally that of unit labour costs. The Baltic states and Slovakia registered an increase in real unit labour costs above 2%. Cyprus, Slovenia and Croatia registered the largest falls. In Greece, real unit labour costs increased by about 1% due to a large negative GDP deflator.

3.3.2. The tax wedge

The average tax burden remained broadly stable in 2014. There are, however, some notable differences across the EU countries. Greece recorded a decrease in the tax wedge of about 1 percentage point, mostly owing to employers' social security contributions. By contrast, in Ireland the average tax wedge for a single worker earning the average wage increased by about 1 percentage point

Graph I.3.8: **REERs based on ULC deflator, GDP deflator and export prices deflator, y-o-y % change, 2014 and over the period 2012-2014**



Source: DG ECFIN AMECO database.

owing to the component personal income taxes (Table I.3.3). Ireland, Portugal and to some extent Spain are among the countries that recorded the highest increases in taxes on labour in the period 2008-2014, mostly due to increases in personal income taxes. This could be a factor to take into account in view of the need to absorb the high unemployment rates facing these countries, especially in Portugal and Spain where the total tax wedge is above 40%.

3.4. Price competitiveness developments

In 2014, developments in the ULC-based real effective exchange rate (REER) in relation to a group of 37 industrialised countries were more muted and broadly reflected the development in nominal unit labour costs discussed in the previous section (Graph I.3.8). Some exceptions include, for instance, the depreciation in the Czech Republic and Sweden and the appreciation in the United Kingdom, which are partly linked to movements of the exchange rate. Between 2012 and 2014, Greece recorded the strongest improvements in cost competitiveness, with a depreciation of the ULC-based REER above 14%. Cyprus, Spain, Slovenia and Portugal are also among the euro area countries having experienced substantial depreciations.

While REER changes based on different deflators appear to be strongly correlated across countries, the correlation between the REER based on export deflator and the alternative ones (ULC and GDP deflator-based) is weaker.

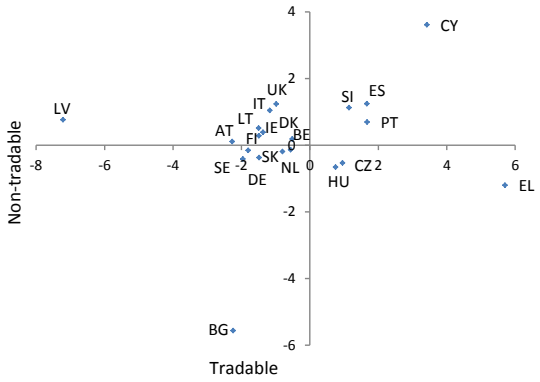
The variations in the export deflator are more contained, as export prices are to a certain extent determined in international markets and less sensitive to domestic developments.

The sharp downward adjustment in ULC-based REER in countries facing higher external adjustment needs was followed by a more muted decline in the REER based on GDP deflator. This may indicate a more limited responsiveness of price-cost margins to weak economic conditions, and are consistent with the adjustment of real wages to the labour market slack. Moreover, as long as profit margins are higher in the tradable than in the non-tradable sectors, developments in the unit labour costs alone could play an important role in boosting the export sector and provide the right incentives to shift resources towards the more productive tradable industries.

Graph I.3.9 plots the profit margins in the tradable and non-tradable sectors in the period 2012-2014. In Greece, margins have been substantially higher in the tradable sector. Also in Portugal margins in tradable sector grew on average 1

percentage point faster than in non-tradable sector.

Graph I.3.9: **Average growth rate in profit margins, 2012-2014**



Note: Growth in profit margins is defined as the average growth rate of the GDP deflator at basic prices minus that of unit labour cost.
Source: Elaborations based on ECFIN AMECO database.

3.4.1. Competitiveness and adjustment in the euro area

The evolution of unit labour costs reflects the needs of rebalancing the external positions in euro area countries. While between 1999 and 2008 unit labour cost grew faster in "deficit" countries than in "surplus" countries, since 2009 unit labour costs increased substantially faster in surplus countries (Graph I.3.10). ([21])

Graph I.3.10: **Unit labour costs in deficit and surplus countries, euro-area groups weighted averages, y-o-y % change**

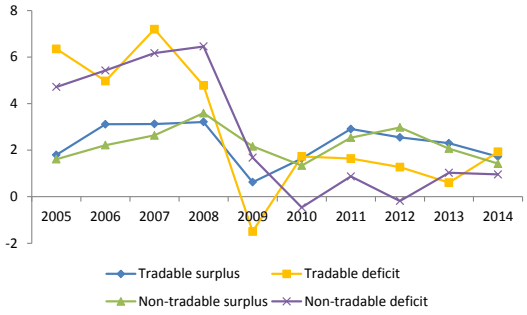
Note: Surplus countries are Belgium, Germany, Luxembourg, the Netherlands, Austria and Finland. Deficit countries are all euro area member States.
Source: DG ECFIN AMECO database.

([21])The group of "surplus" countries include: Belgium, Germany, Luxembourg, the Netherlands, Austria and Finland. Deficit countries are all euro area member States.

Yet, in 2014, the rebalancing was more moderate owing to a deceleration in the growth rate in nominal unit labour costs in surplus countries.

The decomposition of compensation per employee between tradable and non-tradable sectors in deficit and surplus countries shows that the moderation in unit labour costs in recent years in deficit countries benefitted from a sharp deceleration in the growth rate of compensation per employee in non-tradable sectors (Graph I.3.11).

Graph I.3.11: **Compensation per employee, tradable and non-tradable sectors, in deficit and surplus countries (euro area)**



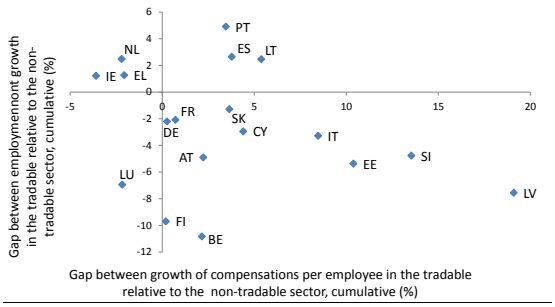
Note: Surplus countries are Belgium, Germany, Luxembourg, the Netherlands, Austria and Finland. Deficit countries are all euro area member States.
Source: Eurostat.

This wage pattern can help reallocation of labour from non-tradable to tradable sectors and contribute to the external rebalance in deficit countries. However, the more moderate dynamics in compensation per employee in non-tradable sector is partly linked to the deceleration in compensation in the public sector, hence the rebalancing potential is a function of the extent to which their skills are transferable to other sectors. ([22])

([22])Tradable sectors include: Agriculture, forestry and fishing; Industry (except construction); Wholesale and retail trade, transport, accommodation and food service activities. Non-tradable sectors include: Construction; Information and communication; Financial and insurance activities; Real estate activities; Professional, scientific and technical activities; Administrative and support service activities; Public administration, defence, education,

Some euro area countries where compensations per employee in the tradable sector grew faster than in the non-tradable sector over 2010-2014 witnessed also greater job creation in the former than in the latter. This suggests that the process of rebalancing is under way, with labour moving to the tradable sector where salaries are increasing (Graph I.3.12) together with productivity (Table I.3.2) (i.e. Spain and Portugal).

Graph I.3.12: **Employment and wage growth differential between tradable and non-tradable sectors: 2010-2014, cumulative (%)**

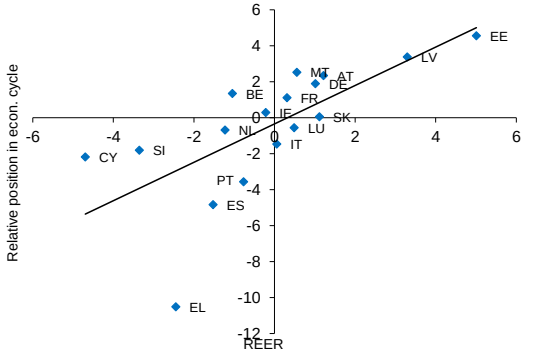


Source: DG ECFIN AMECO database and Eurostat.

Yet, in a country like Greece, wages in the tradable sectors have grown more slowly than in other sectors and yet employment went up, arguably driven by the fact that also additional capital moved to the exposed sector attracted by substantial profit margins (Graph I.3.9). In all other euro area countries mostly unaffected by labour market slack, slower wage growth in the tradable sectors was accompanied by a relative decline in employment.

The adjustment in ULC-based REER in 2014 relative to the 18 euro area members (Lithuania not included) appears broadly consistent with the business cycle position of the different countries.

Graph I.3.13: **REERs based on ULC, y-o-y % change, 2014, and relative output gap in 2013**

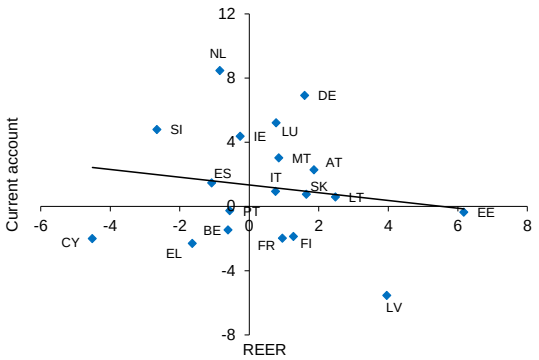


Note: REER relative to the rest of the euro area (18 countries).
Source: Commission services, based on DG ECFIN AMECO database.

Graph I.3.13 plots the change in ULC-based REER in 2014 with the relative output gap in 2013. Countries in a relative worst cycle position in 2013 such as Greece, Cyprus, Spain Slovenia and Portugal recorded a higher downward adjustment in ULC-based REER.

Contrary to what has occurred in the previous years, the adjustment in ULC-based REER in 2014 was not higher in countries facing higher needs of external rebalancing (Graph I.3.14). This in part reflects the substantial adjustment in current accounts that has been recorded in deficit countries and a moderate evolution in the ULC-based REER in some surplus countries.

Graph I.3.14: **REERs based on ULC, y-o-y % change, 2014, and current account balance in 2013**

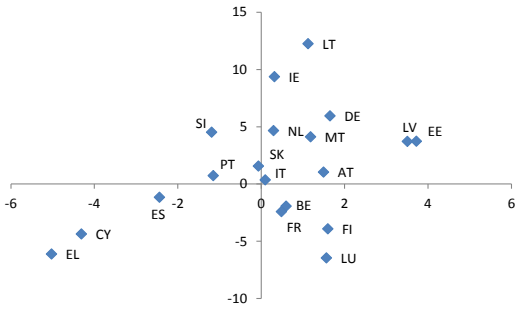


Note: REER relative to the rest of 37 industrial countries.
Source: DG ECFIN AMECO database.

human health and social work activities; Arts, entertainment and recreation; Other service activities; Activities of household and extra-territorial organizations and bodies.

Graph I.3.15 is more in line with development in REERs supportive of external adjustment. It plots the current account gap (measured as the difference between underlying current account and Net International Investment Position stabilising current account) and the ULC based REER. It reflects the component of the current account that is more reactive to cyclical conditions. Generally, countries with a wide gap between their actual and their underlying current account have recorded more moderate ULC-based REERs, which is consistent with a stabilisation and/or correction in the Net International Investment Position.

Graph I.3.15: **REERs based on ULC, y-o-y % change, 2014, and current account gaps in 2013**



Note: REER relative to the rest of 37 industrial countries.
Source: DG ECFIN AMECO database.

3.5. Conclusions

In 2014, wage moderation was observed across the EU and the euro area, and not only in countries with major adjustment needs. Different factors can explain this broad moderation, including the persistent labour market slack, the effects on bargaining outcomes of a protracted labour demand shock, adjustment in public sector wages, labour market reforms and expectations regarding the strength of the economic recovery. Despite the deceleration in compensation per employee, real consumption wages increased in view of lower consumption prices, thereby sustaining the purchasing power of households.

Nominal compensation per employee fell in Cyprus, Greece, Portugal and Slovenia. In Cyprus and Slovenia compensation per employee declined more in the public sector, while in Greece and Portugal the decline was driven by the private sector.

The sectoral decomposition shows that wages grew on average faster in tradable sectors than in the non-tradable sectors. For the euro area, this pattern of wage growth across sectors is consistent with the rebalancing of the external positions through the reallocation of labour from non-tradable to tradable sectors.

In the period 2012-2014, real wage developments evolved broadly in line with average productivity growth. Productivity grew faster than real wages, especially in countries with high unemployment rates. The recovery of profit margins is a condition for the absorption of the still very high unemployment. The responsiveness of real unit labour costs to the unemployment rate seems to have weakened in 2014, owing to the previous adjustment and the subdued wages dynamics in low-unemployment countries.

Unit labour costs grew moderately in 2014 owing to a deceleration in compensation per employee and a stabilisation of productivity growth at very low levels. In the euro area, Cyprus and Greece recorded accentuated falls in nominal unit labour costs, mostly due to the fall in compensation per employee. Spain and Slovenia also recorded a decline in unit labour costs, supported by productivity developments. Euro-area surplus countries recorded on average stronger dynamics in unit labour costs.

Overall, the developments in unit labour costs can be considered as being supportive of the gradual rebalancing of the euro area economies, as noticed by the developments in ULC-based REER, though to a lower extent given the previous adjustment and also developments in net creditor countries.

4. Policy developments

The 2008 crisis triggered increased reform activity in a large number of European countries. This was initially to cushion the short-term impact of the crisis on employment and incomes and subsequently to improve the adjustment capacity of labour markets amidst the rapid unwinding of imbalances accumulated since the early 2000s. More recently, it was to sustain labour demand and boost incomes through tax and social security reforms. Regression analysis on annual indicators of reform action shows that reform activity is higher in deep recessions and when unemployment is high. Reform activity is also affected by the initial policy settings. The observed negative relation between the reform stance and the existing level of labour market policy settings seems to reveal a tendency towards convergence in policy settings across the EU. Priorities looking forward at both EU and national level confirm these broad findings.

4.1. Introduction

This Chapter looks at the evolution of national reform strategies to tackle the labour market challenges that emerged with - or were aggravated by - the economic and financial crisis.

The analysis makes extensive use of the LABREF database, an inventory of all labour market reforms implemented by the Member States since the year 2000. The policy fields considered include active labour market policies (*ALMPs*), employment protection legislation (EPL), labour taxation, unemployment and other social benefits, wage setting institutions and working time.

Different reform patterns can be discerned across countries and over time since the start of the crisis, reflecting different institutional settings, varying economic conditions and challenges, as well as shifts in priorities occurring as the economic situation evolves. Despite these differences, average results across the EU in the different policy domains show broadly consistent reform trends, with increased attention to structural reforms in the tax and social protection fields adding most recently to significant reform activity to improve labour market adjustment capacity in preceding years.

The observed trends are analysed in more depth by looking at the factors that can influence *reform activity* in individual countries (Box I.4.1). This is done by means of econometric regressions that link the number of reforms and the overall reform stance to explanatory variables accounting for the underlying economic and labour market environment as well as the initial policy settings.

The remainder of the Chapter is structured as follows. Section 4.2 reviews the main reform trends in the various policy domains, with a focus on developments since the start of the crisis. Section 4.3 takes a closer look at policy initiatives from 2013 up to the first half of 2015, while Section 4.4 summarises country-specific priorities and plans looking forward. Section 4.5 concludes.

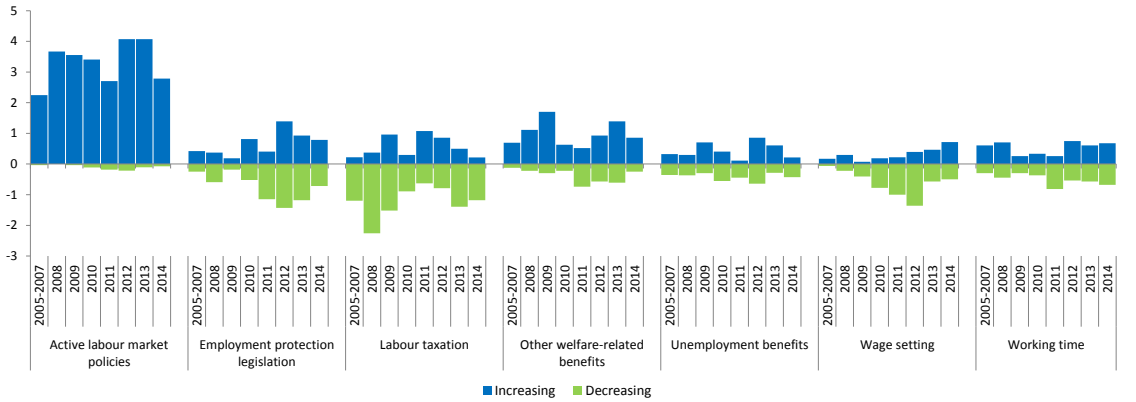
4.2. Policy trends

Since 2008, following the outbreak of the financial crisis, EU Member States have put in place reform strategies to respond effectively to the major labour market challenges and weaknesses that had emerged.

Despite marked differences across countries with regard to the severity of challenges and related policy responses, a general trend can be discerned, which can be broadly divided in three phases.

In the immediate aftermath of the crisis, between 2008 and 2009, practically all countries put in place fiscal stimuli and temporary measures to cushion the short-term employment and social impact of the recession, in line with the

Graph I.4.1: **Average number of labour market measures per country and per year by policy domain and direction, EU28**



Note: Information for Bulgaria and Romania starts in 2003, while information for Croatia starts in 2012. Reform measures are classified as "increasing" ("decreasing") if they lead to an increase (decrease) in the associated underlying policy setting: the tax burden on labour; the generosity of unemployment and other benefits; the stringency of regulations on employment protection, wage setting, and working time; the availability, generosity or effectiveness of ALMPs.
Source: European Commission, LABREF database.

European Economic Recovery Plan of November 2008. Starting from 2010, with the sovereign debt crisis unfolding, the fiscal room enjoyed by Member States started to shrink dramatically. Tight fiscal constraints reduced the space for measures financed via the public budget without cuts in expenditure or other compensatory measures. Countries also became aware of the need to enhance the adjustment capacity of their labour markets against the backdrop of protractedly compressed domestic demand due to deleveraging, and the necessity - for debtor countries - to favour a smooth rebalancing of their external position. More recently, since 2013, a third phase seems to have emerged, where tackling the social impact of the crisis is becoming a policy priority, including through better targeting of *ALMPs*, enhanced social safety nets and labour tax wedge cuts.

The slight reduction in the number of measures passed in 2013 and 2014 needs to be seen against the background of the unusually high reform activity in 2012 and ensuing implementation needs.

Evolving reform strategies

The evolution of the reform strategies through the different phases of the crisis can be gauged from Graph I.4.1. The height of the bar under each policy domain represents the average number of reforms in that domain which were carried out in the period under consideration. The Appendix to this chapter explains the direction attributed to the measures reported in the graph.

Initially, policy action focussed on strengthening short-time working schemes to prevent excessive labour shedding, increasing benefits to smooth income loss, granting targeted labour cost reductions and wage subsidies to sustain employment, besides enhancing the capacity of job-search services and training support. This is reflected in the sharp increase in the number of measures taken between 2008 and 2009 to increase the *generosity* (i.e. coverage and level of benefits), of *unemployment* and *other welfare-related benefits*([23]), to enhance the availability and effectiveness of *ALMPs*, and to lower *labour taxation.*

([23]) This category also includes measures taken in the field of 'short-time working schemes'. *Generosity* is used in the chapter in broad terms meaning increasing level and coverage of benefits and not with reference to an ideal benchmark.

Box I.4.1: Assessing reforms determinants: a regression-based approach

When and where are labour market reforms more likely to take place? What factors trigger reforms? Regression analysis on annual indicators of reform action, constructed on the basis of the LABREF database, can help answering these questions.

Table 1 below reports results from regressions of reform variables on a broad set of explanatory variables. The estimation sample covers 27 EU Member States over the years 2000-2011 (LABREF contains information on Croatia only from 2012 onwards). Column (1) shows the determinants of the overall number of reform measures in a given country and a given year, while columns (2) to (4) show the determinants of the 'reform stance' in three policy domains: labour taxation, unemployment benefits, and employment protection legislation (EPL). The reform stance is the number of reform measures in a given country and a given year *increasing* the tax burden on labour, the generosity of unemployment benefits, or the stringency of EPL, net of the number of reform measures *decreasing* them.

Explanatory variables include factors controlling for initial conditions (GDP *per capita* in 2000 and a dummy variable taking the value of 1 if the country joined the EU in or after 2004), besides economic, political and fiscal conditions (for more detail about this and alternative specifications, see Turrini et al., 2015).

Results show that, during the period of study, there was more reform activity in countries that had a lower initial GDP *per capita*, suggesting that the evolution of labour market institutions was faster in EU countries at earlier stages of economic development. This relationship is not linear: while reform activity in New Member States was high, it was lower than predicted solely based on their initial GDP *per capita*.

Overall reform activism is higher in deep recessions (i.e. when the output gap is below -4%) and when unemployment is high. It is affected by political conditions: fewer reforms are passed in election years than in others while reform activism is positively associated with the Parliamentary majority of the government.

Looking at the determinants of the '*reform stance*' by policy domain, the economic and fiscal environment affects policy action in expected ways. Reforms decreasing the tax burden on labour are more likely in an environment of high unemployment rates. Expectedly, a better fiscal position (as measured by the net lending, or budget balance, of the general government) is associated with reforms easing the tax burden and increasing the generosity of the unemployment benefit system. While the reform stance in the EPL domain is not affected by the budget balance, reforms loosening employment protection appear to be more likely under financial market pressure, as indicated by the negative and significant coefficient of the long-term interest rate spread (against the benchmark of Germany).

Finally, reform action is also linked to the existing policy context. The tax burden on labour is more likely to be reduced in countries with a high tax wedge; rules of the unemployment benefit system are more likely to be tightened in countries where the net replacement rate is high; employment protection is more likely to be loosened in countries where the regulation for regular contracts was strict in the first place. Overall, the observed negative relation between the *reform stance* and the existing level of policy settings reveals a tendency towards convergence in labour market settings across the EU.

(Continued on the next page)

Box (continued)

Table 1. Determinants of labour market reforms, evidence from pooled regressions

	(1) Number of reforms, all domains	(2) Reform stance, labour taxation	(3) Reform stance, unempl. benefits	(4) Reform stance, EPL
Per-capita GDP in 2000	-0.157***	-0.036	-0.004	-0.005
	(0.046)	(0.022)	(0.011)	(0.014)
New Member State (dummy)	-5.761***	-0.538	-0.359	0.194
	(1.180)	(0.495)	(0.292)	(0.368)
Unemployment rate (lag)	0.186**	-0.105**	0.019	-0.030
	(0.086)	(0.043)	(0.021)	(0.035)
Output gap < - 4 (dummy)	2.943*	1.203	-0.420	0.104
	(1.709)	(0.738)	(0.324)	(0.385)
Parliamentary election year (dummy)	-2.167***	0.022	0.105	0.047
	(0.682)	(0.249)	(0.154)	(0.159)
1 year after parl. Elections (dummy)	0.632	0.126	-0.334	-0.253
	(0.740)	(0.266)	(0.221)	(0.211)
Fraction of seats held by the government in Parliament	6.506*	-0.878	-0.764	1.375
	(3.483)	(1.199)	(1.089)	(0.886)
Fixed exchange rate (dummy)	0.045	-0.129	0.237	-0.082
	(0.580)	(0.223)	(0.179)	(0.210)
Long-term real interest rate spread (lag)	0.066	0.011	-0.012	-0.096**
	(0.139)	(0.046)	(0.032)	(0.038)
Net lending of general government (lag)	-0.123	-0.091**	0.043**	0.012
	(0.079)	(0.041)	(0.019)	(0.020)
Tax wedge (lag)		-0.032**		
		(0.014)		
Net replacement rate of unempl. benefit, average, (lag)			-0.014***	
			(0.005)	
Employment protection index, temporary contracts (lag)				0.030
				(0.088)
Employment protection index, regular contracts (lag)				-0.194*
				(0.113)
Year dummies	Yes	Yes	Yes	Yes
Observations	302	241	229	222
R-squared	0.322	0.229	0.113	0.179

Note: OLS regressions, pooled cross section and time series data. The sample includes EU-27 countries for the period 2000-2011. Robust standard errors in parentheses. Asterisks indicate estimated coefficients that are statistically significant at the 1% (***), 5% (**), or 10% (*) level.

Sources: Reform count, stance: LABREF; Labour market, fiscal and macroeconomic variables: AMECO. Political variables are taken from the World Bank's Database of Political Institutions (DPI, described by Beck et al., 2001). Tax wedge (single-earner couple two children, earning the average wage), EPL indices, Net replacement rate of unemployment benefit (average over four durations): European Commission, based on OECD Tax-benefit models.

Some of these measures were only temporary (e.g. tax cuts, temporary increases in social benefit provision), while others introduced from scratch new policy tools to deal with temporary shortfalls of aggregate demand (e.g. the setting up of short-time working schemes in countries where they were non-existent before).

Shifting priorities are visible from 2010. In this second phase, fiscal constraints and the need to correct macro-economic imbalances, notably in vulnerable countries and in countries under financial assistance programmes, were at the origin of commitments to *macro-relevant* structural reforms in domains such as *EPL, wage setting* and *unemployment benefits*. The frequency of reforms in these policy domains peaked in 2012, in

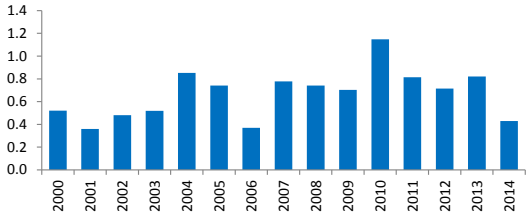
an effort to strengthen the adjustment capacity of the labour market, and to favour and sustain resource reallocation.

More recently, a growing concern has been emerging about the *social implications* of the crisis and the *redistributive effects* of fiscal consolidation and structural measures. ([24]) Policy priorities have been gradually shifting towards enhancing the effectiveness of social safety nets and reducing the tax wedge on labour, to stimulate job creation and protect incomes. This pattern is reflected in the frequency and direction of measures recorded in 2013 and 2014 in the domains of *labour taxation* and *other welfare-related benefits*, with many recent measures aimed at reducing the tax burden on labour and at increasing the generosity and effectiveness of means-tested benefit and family-related schemes. Compared to the temporariness of measures implemented in the aftermath of the crisis in the same policy fields, the changes introduced in the design of tax and benefit systems over 2013 and 2014 are more often of permanent nature.

As concerns labour taxation, recent action reveals an increased awareness by Member States of the need to pursue systemic tax reforms and to move away from past interventions with a limited scope. Despite a broad consensus on the relevance of reducing the tax wedge on labour, *limited progress* or even *setbacks* were observed in previous years. ([25]) A high tax burden on labour may be particularly relevant for individuals with more elastic labour demand and labour supply (low skilled and low-income earners) and interact with other labour market features such as the minimum wage. Reducing non-wage labour costs is also related to the need to improve cost competitiveness, while avoiding a reduction in the take-home pay. While targeted reductions in the tax wedge for low-income earners may be cost-effective and help overcome implementation obstacles related to equity concerns, untargeted reductions of the tax wedge, if affordable, might be more effective for the purpose of raising both competitiveness and employment.

The surge of *ALMP* measures after the crisis underscores the growing recognition of the need to support employment via active instruments. The most popular instruments introduced in this regard were employment subsidies and training programmes, often targeted at redundant workers and the low-skilled. These measures went hand in hand with measures aimed at restructuring and increasing the efficiency of Public Employment Services (PES), as shown in Graph I.4.2.

Graph I.4.2: **Average number of Public Employment Services measures per country, EU28**



Source: European Commission, LABREF database.

PES reforms passed prior to the crisis, notably in 2004 and 2005, were largely aimed at modernising the employment services by introducing or enhancing one-stop-shops, collaboration with private employment agencies, internet services, an individualised approach to customers, and cooperation between different agencies. Reforms taken following the outbreak of the crisis, in contrast, essentially focused on enhancing the capacity of the PES and on increasing the coverage and outreach of employment services, training and other activation instruments for a wider range of jobseekers. Since 2010, PES reforms in the majority of Member States have been primarily directed at improving the

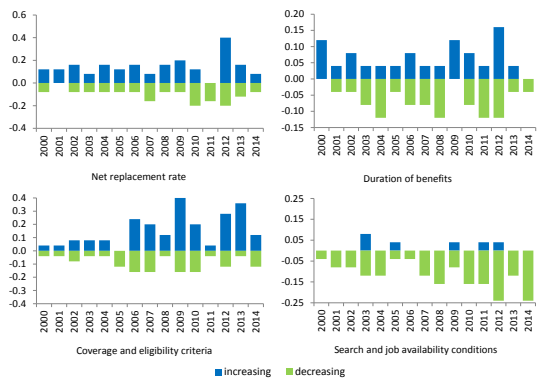
([24]) E.g. Avram et al. (2013).

([25]) Eurogroup Statement, "Structural reform agenda - thematic discussions on growth and jobs - Common principles for reforms reducing the tax burden on labour". The tax burden on labour fell at the edge of the economic crisis, but grew again to pre-crisis levels from 2010 onwards.

targeting of services, especially through the development of individualised pathways, customised offers and counselling, with a focus on groups such as low-skilled youth, older workers and long-term unemployed.

Regarding the *unemployment benefits* domain, Graph I.4.3 shows that measures were taken at the onset of the crisis - especially starting from 2009 - to increase the generosity of unemployment benefits systems for what concerns benefit duration and net replacement rates, thus increasing protection against income losses.

Graph I.4.3: **Average number of measures per year by direction and by policy field, in the unemployment benefit policy domain, EU28**

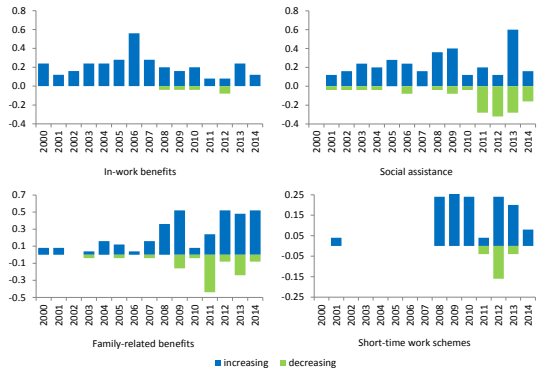


Note: For a definition of reform direction see Graph I.4.1.
Source: European Commission, LABREF database.

At the same time, and increasingly since 2010, reform intensity was stepped up aimed at strengthening job availability requirements, with a view to ensuring continued labour market attachment for benefit recipients (measures marked as 'decreasing' generosity in Graph I.4.3). Action in this field can be seen as complementary to the continuous trend, started already before the crisis, towards broadening the coverage by easing the eligibility conditions to unemployment benefits, to better respond to evolving labour markets structures.

Policy trends in the unemployment benefit field can be compared with evolutions in *other welfare-related benefits*. As shown in Graph I.4.4, after the peak of measures intended to increase the generosity of social assistance between 2008 and 2009, and after the streamlining and rationalisation efforts that took place in 2011-2012, including via stronger activation elements in benefit design, reform measures went again in the direction of increasing the generosity of social assistance in 2013 and to a lesser extent in 2014. Similar trends can be observed for family-related benefits.

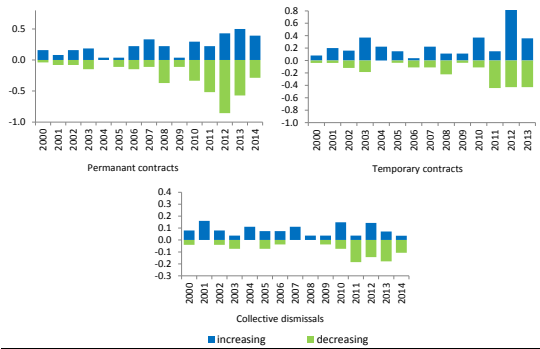
Graph I.4.4: **Welfare-related benefits**



Source: European Commission, LABREF database.

Reforms in the domain of *EPL* became more frequent in the second phase of the crisis.

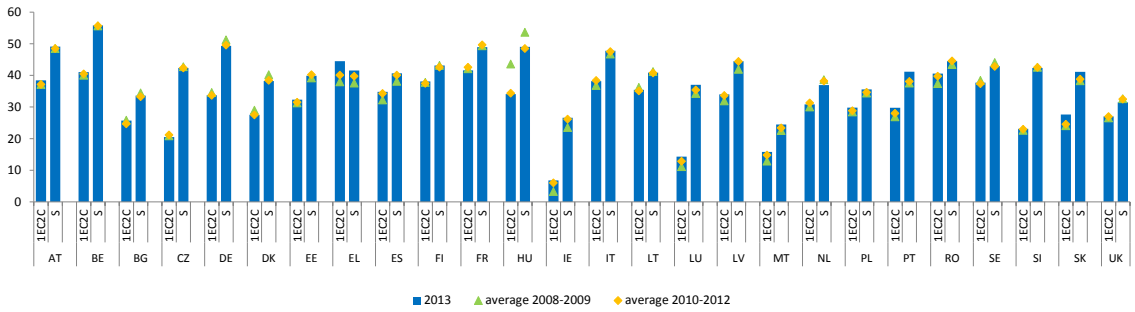
Graph I.4.5: **Average number of measures per country and year by direction and by policy field in the EPL policy domain, EU28**



Source: European Commission, LABREF database.

Graph I.4.5 shows that while reforms in fixed-term contracts took place in both directions (either tightening or loosening conditions for the use of fixed-term

Graph I.4.7: **Tax wedge (as % of total labour cost)**



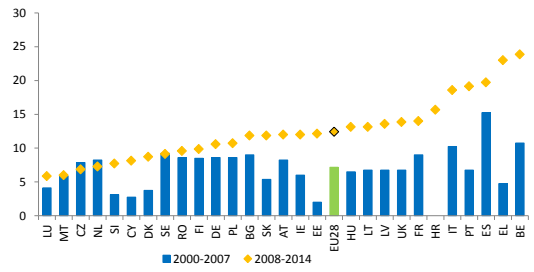
Note: data refers to a one-earner couple with two children and to a single individual working full-time at the average wage. Data not available for Cyprus.
Source: European Commission, based on OECD Taxing Wages models.

contracts, even within the same country), changes made in permanent contracts were more often aimed at reducing the stringency of existing regulations. These comprise adaptation of notice periods and severance payments, longer trial periods, simpler procedural requirements and less strict definitions of dismissals. Reforms in collective dismissals also eased existing procedures and regulations.

Cross country patterns

The evolution of policy action varied quite substantially across countries (Graph I.4.6). Member States experiencing large macro-economic imbalances since the outbreak of the crisis - especially those under financial assistance programmes - have been the most active during recent years, mainly as a consequence of the crisis and its persistency.

Graph I.4.6: **Average number of labour market measures by country, before and after the crisis**



Source: European Commission, LABREF database.

This contrasts with the lower reform activity on the side of several Continental Countries, which have been implementing incremental measures until recently, in spite of facing medium-term challenges in some cases. From their part, despite having undertaken many reforms in the years prior to the crisis as part of their economic transition and EU accession, a number of Central and Eastern European Countries continued to adjust their labour market institutions and to strengthen institutional capacity, especially for what concerns skills formation and labour market matching. Finally, the economic crises of the early 1990s had already triggered reforms in the Nordic Countries, which strengthened their economies and led to resilient labour markets in the following years.([26])

Action taken in the *EPL* domain was concentrated in countries exhibiting problems of labour market segmentation coupled with stringent protection for permanent contracts. Often, measures were aimed at reducing the discrepancy between protection for workers on temporary and those on permanent contracts. This was notably the case in Portugal, Spain, Italy and Slovenia. Changes in the regulation of fixed-term contracts were also most often directed at fighting labour market segmentation by making the conditions for the use of such contracts more restrictive. In other cases (e.g. Greece, Romania, Lithuania), the aim was on the contrary to reduce restrictions, against the background of little use of fixed-term labour contracts. Some countries, including Greece, Spain,

([26])Andersen et al., 2007.

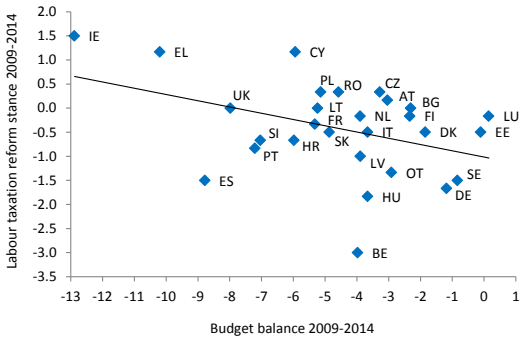
France and Italy, also changed their regulations to ease the conditions and requirements for collective dismissals.

Wage setting systems were revised in a number of countries, with the frequency of reforms in this domain having substantially increased in 2011 and 2012. Actions were taken in different areas, including public sector wages, minimum wage setting, and wage bargaining frameworks for the private sector. Reforms in the private wage bargaining framework were often aimed at promoting decentralised collective bargaining, or facilitating the renewal of collective agreements. Graph 2 in Box I.3.2 shows, however, that the substantial increase in the number of reforms in the wage setting field in 2011-2012 was largely driven by action in a few countries (notably Greece, Spain, Portugal and Cyprus), where they were motivated by the need to facilitate ongoing economic adjustment. More recently, in 2014, this trend was followed by some reform activity in the opposite direction, aimed for instance at reintroducing the after effects of expired collective agreements (e.g. Croatia) and making less stringent the conditions for the extension of collective agreements (Germany).

Action in the field of *labour taxation* is progressively moving towards reducing the high tax wedge on labour, with several of the countries that are slowly regaining some budgetary room for manoeuvre having recently passed measures to lower the tax wedge and foster job creation. Looking back at the evolution of the *tax wedge* over the different phases of the crisis until 2013 (Graph I.4.7), it is interesting to note that countries under tight budgetary conditions, among others Ireland, Greece, Spain, Portugal and Latvia, had increased the tax wedge the most, yet from a comparatively lower initial level. In contrast, the countries that reduced the tax wedge to a noticeable extent are those that enjoyed more fiscal space, such as Germany, Denmark, Sweden, the Netherlands and the UK. Hungary has also significantly reduced the overall level of taxation by introducing a flat rate, though with limited impact on lower income earners.

Graph I.4.8 further confirms this trend. It shows the relationship between government budget balance and the direction of labour taxation reforms between 2008 and 2013: on average, countries with persistent negative budget balance have passed more reforms measures that increased the taxation on labour.

Graph I.4.8: **Labour taxation reform stance vs government budget balance, 2008-2014**



Note: The chart shows the change in the reform stance against the change in the budget balance. The reform stance is the difference between increasing and decreasing reforms.
Source: European Commission, LABREF and AMECO database.

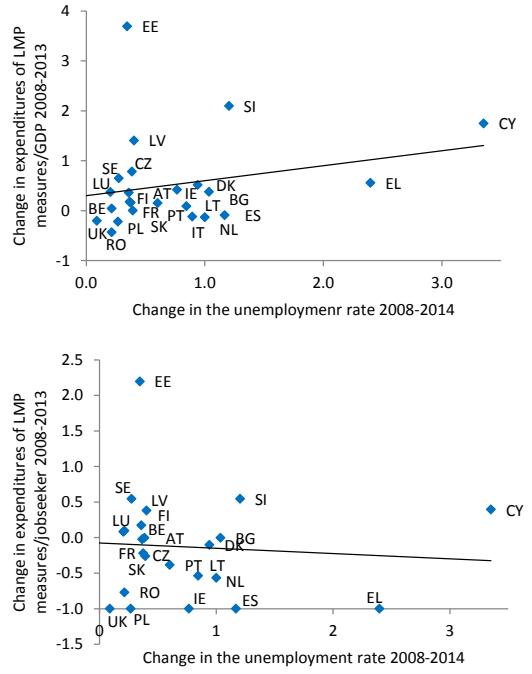
In spite of the considerable reform activity in the *ALMPs* domain, and the increased expenditures on *active policies* as a percentage of GDP in the majority of Member States over the period 2008-2012, expenditure per jobseeker declined in a majority of countries, especially those that were hit by the largest increases in unemployment, in light of the surge in the take-up of *ALMPs* not matched by commensurate budgetary resources (Graph I.4.9). ([27])

Growing unemployment over the crisis years also led to an inevitable rise in total expenditures on passive labour market policies, mostly *unemployment benefits*.

([27])Badea, P. and A. Xavier (2015).

Out-of-work income support and maintenance as a percentage of GDP increased in all EU countries over the period 2008-2012, with the exception of Germany, Latvia and Romania. The income support per jobseeker however did not increase proportionately in all countries, with most notable increases in Bulgaria, Slovenia and Slovakia; while in Latvia, Romania and Lithuania expenditures per jobseeker dropped comparatively more. These developments also reflect different changes across countries in unemployment benefits entitlement and generosity, as well as in unemployment duration spells.

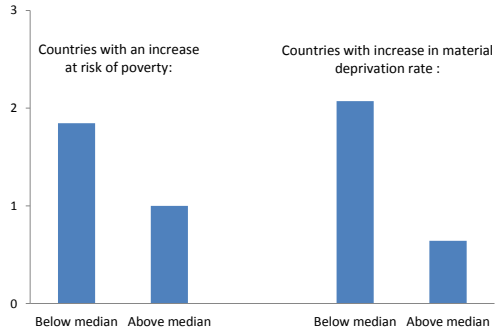
Graph I.4.9: **Change in expenditures on labour market policy measures (categories 2 to 7 of the LMP database) vs change in the unemployment rate**



Source: European Commission, LMP database; Eurostat.

As concerns social assistance (including in-work benefits, which are relevant for providing a link with the labour market for those on social assistance and on other out-of-work benefits), Graph I.4.10 shows that on average those countries that have been witnessing a sharper increase (above the median) in the at-risk-of-poverty and material deprivation rates since the start of the crisis, have pursued a lower number of reforms in the direction of increasing the generosity of their social assistance, as compared to those that, having probably been hit less hard by the crisis, have seen less or no worsening of the social situation, while being also able to enjoy a larger fiscal space.

Graph I.4.10: **Reform stance in social assistance and in-work benefits: average 2008-2013, EU28**



Note: Reform stance indicates in which direction the underlying policy variable is moving as a result of reforms (see Box). Countries with an increase in at risk of poverty rate in percentage points higher than median include Cyprus, Germany, Estonia, Greece, Spain, Hungary, Ireland, Italy, Lithuania, Luxembourg, Latvia, Portugal, Slovenia and the UK. Countries with an increase in material deprivation include Bulgaria, Cyprus, Denmark, Estonia, Greece, Spain, Hungary, Ireland, Italy, Lithuania, Latvia, Malta, Netherlands, UK.
Source: European Commission, LABREF database; Eurostat.

4.3. Policy actions since 2013

With the recovery gaining ground in 2013, European countries continued to address their labour markets challenges, primarily introducing or implementing previously passed changes to employment protection legislation and wage setting systems, and continuing to reform their training and education systems. Increased reform activity is noticeable in labour taxation and social benefits.

Active labour market policies

With the recovery slowly getting back on track, governments kept pushing for measures supportive of job creation and skills development and improving labour market matching. An increasing focus

was put on promoting lifelong learning and strengthening the labour market relevance of education systems.

Employment subsidies remain a widely used instrument to support employment, with some countries having scaled-up existing programmes (e.g. Lithuania, Sweden, Ireland), and others having introduced new schemes altogether (e.g. Cyprus, France, Romania and Italy). Further targeted subsidies are introduced to improve labour markets prospects for vulnerable groups (e.g. France, Sweden, Greece, Latvia, Poland and Hungary) or support the developments of start-ups (e.g. Slovakia, Bulgaria, and Ireland). Direct job creation schemes are losing ground instead, with public work scheme reinforced only in Hungary and launched from scratch in Greece.

Youth unemployment remains a policy priority. Specific actions were taken in several countries, with all Member States having launched their *Youth Guarantee* implementation plans in 2014. In a number of countries (e.g. France, Spain, Austria, Bulgaria and Romania), a raising attention was given to *vocational training*. Some countries reinforced the targeting of their training offer, particularly to low- or medium-skilled workers (e.g. Latvia, Austria), while others launched new lifelong learning strategies (e.g. Estonia, Spain, Poland). Vocational education and training reforms were passed, among others, in Denmark, France and Slovakia. Some Member States introduced measures aimed at easing the recognition of work-related competences obtained informally by jobseekers (e.g. Portugal, Romania and Bulgaria).

In line with action undertaken in previous years, enhancing the effectiveness of *public employment services* continued to be on the front-stage in a considerable number of countries. For instance, Denmark and Latvia improved jobseekers' profiling and targeting of job search assistance and services, while Poland and Slovakia enhanced the focus of services on vulnerable groups. Sweden and Lithuania improved the case handling of young people and school drop outs. Enhanced cooperation between different actors, in some cases linked to conditional allocation of funds across offices, was decided in Belgium, the Netherlands, Spain and Slovakia. The reorganisation and privatisation of employment services with a focus on the long-term unemployed was part of the *Job-Path* programme in Ireland.

Benefits

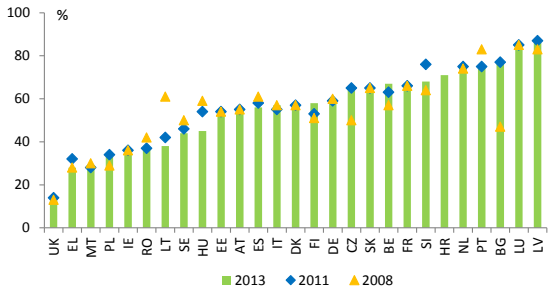
Two main trends emerge: the rationalisation of social benefits - including by addressing related disincentives to work - and the broadening of their coverage and adequacy.

Starting already from 2012, measures have largely focused on strengthening the incentives to take-up work for social benefit recipients, including by offering the possibility to combine benefits with employment and self-employment (e.g. Finland, Ireland, Slovakia, Lithuania, Malta, Spain), or strengthening job search requirements (e.g. Latvia and Belgium). To reinforce the position of young people in the labour market, Denmark reformed the cash benefit scheme into an education benefit with specific requirements attached to it. It also reformed the sickness benefit scheme to strengthen the support and activation of those on sickness leave. The maximum duration of *unemployment benefits* was reduced in the Netherlands, and their level reduced for young people in Ireland. In Belgium, part-time unemployment benefits were lowered to increase incentives to work more hours, as was the top-up allowance for older long-term unemployed, and the access restricted to unemployment benefits for youth with no work experience. In other countries, eligibility conditions for unemployment benefits were extended to ensure coverage of specific groups previously not benefiting from any insurance (e.g. self-employed and free-

lance workers in Greece, third country nationals in Latvia, and public employees in Estonia). France's unemployment benefit's convention of March 2014 increased the protection of atypical workers in lower income groups.

With many measures aimed at increasing benefit coverage and improving the link with the labour market, little changes intervened until 2013 in the level of net replacement rates (Graph I.4.11).

Graph I.4.11: **Unemployment benefit net replacement rates at the beginning of the unemployment spell - 100% AW**



Note: Single worker, earning 100% of the average wage. Data not available for Cyprus. Data not available for Croatia before 2013.
Source: European Commission, based on OECD Tax-benefit models.

Several countries simplified existing *social assistance* schemes and broadened their coverage. Cyprus streamlined its social protection by introducing a single Guaranteed Minimum Income *englobing* most of pre-existing social assistance benefits. Similarly, Croatia started a reform leading to the consolidation of existing social benefits and offering a simplified, means-tested guaranteed minimum income linked to activation. Romania extended the coverage of the guaranteed minimum income.

In line with action pursued since the start of the crisis, public support to *short-time working schemes* was introduced or stepped up in a further number of countries (e.g. Poland, Sweden, Spain, Belgium and Luxembourg), to be eventually made less generous in some cases (e.g. Belgium). Existing schemes were simplified in France.

Participation-friendly schemes

Continued efforts were devoted to keeping older workers longer in employment, by limiting access to *early retirement* (e.g. in Austria, Belgium and Spain) or by allowing older workers to combine benefits and work (e.g. Spain). These measures are often part of wider active ageing strategies and come together with targeted measures, including training, employment subsidies and adaptation of workplaces (e.g. Luxembourg, Lithuania, The Netherlands).

With a view to help reconcile work and family life, measures were enacted to make *work organisation* less rigid and more family-friendly (for instance in the UK, Poland), to implement *tax incentives and wage subsidies* (e.g. Malta, Poland) or increase the availability and affordability of *childcare* provision (e.g. Austria, Czech Republic, Malta, UK, Poland, Cyprus). In Germany, parents were allowed to combine parental allowances with part-time. Finally, a new system for acquiring *disability benefits* was established and the occupational rehabilitation system strengthened in Croatia and Bulgaria. Estonia passed a Work Capacity reform to promote the employment of people with partial work ability.

Labour taxation

In spite of fiscal consolidation needs, efforts were made to reduce the cost of labour and raise incentives to take-up work. Structural reductions of social security contributions were introduced or reinforced to support labour demand, notably in France, Greece, Latvia, Belgium, Italy, Romania and Sweden. Targeted reductions for vulnerable groups were made in countries such as Slovenia, Portugal, Slovakia, Belgium and the UK. Spain introduced in 2015 a reduced social security contribution rate for hiring on open-ended contracts. Finland reduced employee social security contributions to counterbalance low wage growth. In

Italy, the 2015 Stability Law introduced several measures to lower the tax wedge on labour, including reduced labour costs for employers, tax credits for low-wage earners and a three-year reduction of social security contributions for open-ended hires in 2015. The French "*Pacte de responsabilité et de solidarité*" of April 2014 added further reductions in social security contributions for low and minimum wage earners to those made available by the tax credit for competitiveness and employment in 2012. Greece introduced a new tax scale, abolished the tax free threshold and replaced it by targeted tax credits.

Reductions in personal income taxes, notably to tackle the poor financial position and disincentives to work of worse-income groups, were passed among others in Spain, Latvia and Romania. Others increased the lower income threshold or tax credits (e.g. Sweden, Latvia, Lithuania, the Netherlands and Germany). Finally, Austria made significant changes in the personal income tax in March 2015, including, through a reduction in the entry rate for personal income tax from 36.5% to 25%, an increased maximum assessment base for social security contributions and increased tax rates for top income earners.

Wage setting

Compared to previous years, fewer and less comprehensive actions were taken between 2013 and the first quarter 2015. This can partly be explained by the fact that countries most affected by the crisis had already engaged in far reaching reforms starting from 2010. Recent action includes new mechanisms to set the minimum wage in Greece (as of 2017) and Croatia, and the introduction in Germany of a national statutory minimum wage as of 2015. Slovakia and Portugal eased the criteria for the extension of sectorial collective agreements, the latter partially undoing what implemented under the financial assistance programme. The unlimited validity of expired collective agreements (the so-called *ultra-activity)* was abolished in Croatia (though still possible if parties to the agreement decide so). ([28]) In Portugal, the survival of expired and not renewed collective agreements was reduced in August 2014, and the possibility introduced of negotiated suspension of collective agreements in firms in difficulties whenever that is considered necessary for the viability of the firm and maintenance of employment levels. The Italian social partners signed an inter-sectorial agreement that clarifies the criteria for the measurement of the representativeness of trade unions and sets the pace for broadening the scope of decentralised collective bargaining. New legislation to regulate trade union activity was passed in Slovenia.

To ensure better alignment between wage and productivity developments, Belgium revised the health index used as a basis for wage indexation and decided a temporary suspension of automatic wage indexation (*index jump*), while in Cyprus the suspension of wage indexation was extended until 2016 also for the private sector. In Portugal, the 13th and 14th months of salary were reinstated, following a Constitutional Court ruling. Inter-sectoral wage moderation agreements were signed in Finland for 2014-2015 and in Spain for 2015-2016. The latter also promotes the use of internal flexibility to adjust labour costs within firms. The Slovenian social partners agreed in January 2015 on wage settlements at the sectorial level for 2015-2016 not above productivity growth.

Employment protection legislation

Action continued, to modernise employment protection legislation particularly in countries with major imbalances and segmented labour markets. Slovenia started to implement

([28]) The ultra-activity principle guarantees the validity of collective agreements after their expiration. This validity may be permanent or last for certain number of years.

the revised Employment Relationship Act 2013, which reduced strictness of permanent contracts, while increasing protection of economic dependants and temporary contracts. In Italy, a broad-ranging enabling law (the so-called *Jobs Act*) was adopted in December 2014, involving simplification of contracts and labour law procedures, the reduction of the scope for reinstatement following unfair dismissals, the reform of unemployment benefits and of active and passive labour market policies, and improved conciliation between work and family life. The Act on Securing Jobs passed in France in June 2013 eased the administrative burden for collective dismissals and increased the involvement of social partners and work councils. In December 2013, Belgium passed the single status law, which harmonises notice periods between blue and white collar workers and redefines unfair dismissal. The Work and Security Act passed in the Netherlands in 2014 introduces a cap on severance payments or damages for unfair dismissal, while increasing protection for temporary workers. The level of severance payments was also reduced in Portugal. A broad labour code reform was passed in Croatia, leading to lower costs, simplified procedures for individual and collective dismissals, easier access to temporary agency work and more flexible working time organisation. Collective dismissal procedures were simplified in Latvia. Other countries reinforced regulations on fixed-term contracts, more specifically on the use of temporary agency work - e.g. Slovenia, France, Denmark and Slovakia. In contrast, despite a high degree of segmentation and to foster job creation, a number of countries facilitated the access to fixed-term contracts (e.g. Spain, Czech Republic) and temporary agency work (e.g. Greece, Lithuania, Spain), or increased their duration or renewal possibilities (e.g. Croatia, Italy, Latvia and temporarily also in Portugal). Finally, the UK introduced a fee for employment tribunals, to contain the number of cases brought to court.

4.4. Policy priorities and plans looking forward

The crisis has put labour market institutions under heavy strain and tested the resilience and effectiveness of social protection systems across Europe. For several Member States, it has been the opportunity for enacting comprehensive reforms. More recently, the focus has moved to ensuring effective implementation and monitoring of reforms enacted in previous years. At the same time, with yet historically high numbers of long-term unemployed despite unemployment starting to fall and employment picking up in most countries, the policy discourse has progressively turned into setting the conditions for a sustainable, job-rich and inclusive growth looking forward.

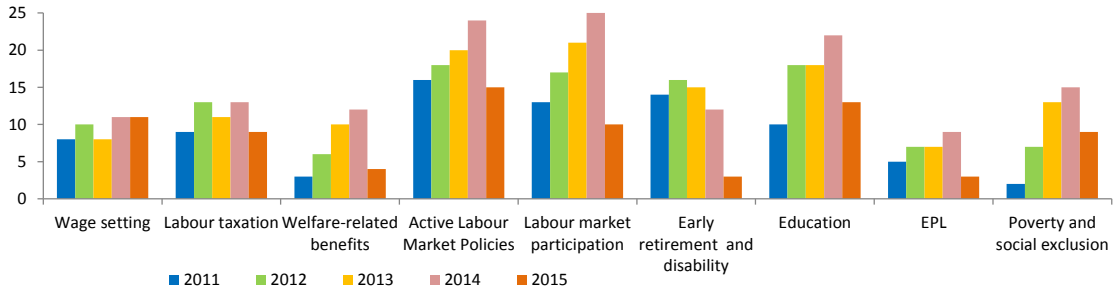
EU policy recommendations

With uncertainty looming around the strength and duration of the recovery in light of insufficient investment, high long-term unemployment and large imbalances, the European Council of June 2014([29]) made clear in its *Strategic Agenda for the Union in times of change* that efforts to implement growth-enhancing structural reforms must continue and be reinforced over the coming years. The European Council called in particular for increased action to reduce the tax wedge on labour, improve the functioning of labour markets, and reform education systems. The Council also stressed that priority must go to skills' developments and to ensuring that social protection systems are fair, efficient and effective.

Strengthening Europe's competitiveness and stimulating investment for the purpose of job creation was presented as the top priority by President Juncker in his *Agenda for Jobs, Growth, Fairness*

([29]) European Council of June 2014: "Strategic Agenda for the Union in times of change".

Graph I.4.12: **Number of Country-Specific Recommendations (CSRs)**



Source: Council Recommendations for the periods 2011-2012, 2012-2013, 2013-2014, 2014-2015 and 2015-2016. Programme countries are excluded from the European Semester, and as such do not receive CSRs, for the duration of the programme.

and Democratic Change.([30]) In the Annual Growth Survey for 2015, the approach of the new Commission translated into an integrated approach to structural, fiscal and monetary policies. In the labour market field, the 2015 Annual Growth Survey confirmed the importance of continuing with structural reforms to boost job creation while correcting distortions, *inter alia* the high long-term unemployment, the high level of segmentation, the presence of evident skills mismatches. Policy interventions are advocated in the following fields:

- employment protection legislation, insofar as existing rules hamper job creation of open-ended contracts and restrict occupational mobility;
- labour taxation, whenever it inhibits job creation and incentives to work especially for low income earners;
- wage setting, to ensure that wages take into account productivity developments across and within sectors, so as to support both competitiveness and aggregate demand;
- education, vocational education and training, to ensure that skills developments are commensurate to labour market needs;
- *ALMPs*, to ensure efficient targeting, strengthen lifelong learning, and improve the performance of public employment services;
- social protection, to simplify and better target social policies, and ensure that benefit systems combine adequate income replacement with activation and enabling services.

A simple count of the country-specific recommendations (*CSRs*) addressed to Member States over the five-year horizon since the start of the European Semester in 2011 shows an increasingly large coverage of employment and social issues until 2014, along the above policy priorities.([31]) With the 2015 Semester, the streamlined and integrated approach brought forward by the new Commission translated into a sharp reduction in the number of CSRs across the board, the stated objective being to improve implementation record and to increase ownership at national level. The focus is on major challenges and on key priority areas for reform over a short time horizon (see Graph I.4.12).

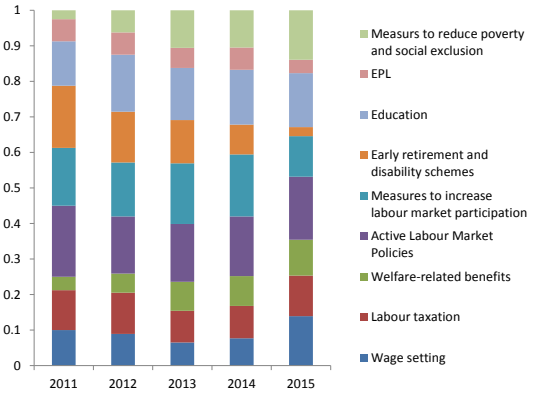
This has also translated into increased differentiation across countries. While for few countries with overall well-

([30]) Political Guidelines for the new Commission of 15 July 2014: http://ec.europa.eu/about/junckercommission/docs/pg_en.pdf

([31]) The counting of CSRs is done by systematically classifying them by policy instrument (e.g. active labour market policies), rather than by expected outcomes (e.g. increasing employability). This is not always an easy task, as the recommendations can concern both objectives/expected outcomes and required policy actions.

functioning labour markets employment-related CSRs have indeed been cut altogether in 2015 (e.g. Denmark, Sweden), countries experiencing excessive imbalances have received a broad range of CSRs, including in the labour market field, to tackle the root-causes of their imbalances. Moreover, CSRs have generally not been addressed wherever concrete reforms have already been undertaken in a given policy area, or where implementation is ongoing, to leave time to the reform process to produce its effects and possibly be refined before new action is recommended. For instance, no CSR on job protection legislation (EPL) has been addressed in 2015 to countries that have recently passed major reforms (e.g. Netherlands, Portugal and Spain).

Graph I.4.13: **Country-specific recommendations, distribution of CSRs by policy area**



Source: Council Recommendations 2011-2015.

All in all, looking at the relative evolution of CSRs by policy fields over the total number of CSRs per year shows that for most policy fields the share of CSRs has remained stable in 2015 as compared to previous years.

A closer look at labour market and social policy-related CSRs over the period 2011-2015 gives a good overview of national policy priorities from an EU perspective (Graph I.4.12):

- In countries with adjustment needs and segmented labour markets, CSRs in the fields of wage setting and employment protection legislation have been consistently addressed to Member States during the five-year period of implementation of the European Semester (e.g. Belgium, France, Italy, Spain).

- As concerns wage-setting, 8 Member States received in 2015 a CSR calling for wages to evolve in line with productivity (same number as in 2014). For Belgium, Croatia and Finland, the concern is the effect on cost competitiveness. For other countries, the challenge mainly lies with ensuring that the structure of wages supports rebalancing of the economy (Portugal, Spain) and/or the need to better account for differences in productivity across sectors (Luxembourg), firms/local labour markets (Italy) and skill levels (France, Italy).

- In 2015, five Member States have received a CSR on the minimum wage: in Bulgaria, Portugal and Romania, this depends on the fact that the absence of established guidelines and clear criteria for setting the minimum wage may reduce its predictability and result in changes in the minimum wage which do not reflect the underlying economic and labour market conditions. In France and Slovenia, high minimum wages when expressed as a share of median wages may reduce the room for wage differentiation and have a cost in terms of employment.

- In light of the high tax wedge on labour and overall limited action in past years, alleviating labour taxation with a view to both increase incentives to work and stimulate labour demand remains a priority for many countries. CSRs aimed at reducing the tax burden on labour, especially for low-income earners, have been regularly addressed to Member States between 2011 and 2015 (to 9 countries in 2015, against 13 in 2014 and 11 in 2013). In 2015, CSRs were dropped

for countries having passed tax reforms along the lines of previous recommendations (e.g. Austria, Italy).

- The heavy toll of the crisis in terms of poverty and social exclusion and the growing awareness about the need to modernise social protection systems can explain the remarkable increase in the number of CSRs addressing poverty and social exclusion since the start of Europe 2020 (from only 2 CSRs in 2011 to 15 in 2014 and 10 in 2015), including in relative terms (Graph I.4.13). Priority is on striking a balance between, on the one hand, adequate coverage and income support, and, on the other, strengthened benefits conditionality and other activation measures to support people back to work. With a view to increasing the effectiveness of social protection systems, a number of recommendations aim at simplifying and streamlining benefit provision (e.g. Spain and Croatia in 2015). Also, ensuring access for disadvantaged pupils to enabling services such as education and childcare is gaining in importance as a key element of social inclusion strategies (e.g. Bulgaria, Czech Republic and Ireland). Indeed, CSRs recorded in Graph I.4.10 under the category *measures to fight poverty and social exclusion* include both recommendations aimed at fighting poverty by intervening on social protection setups and others aimed at the social inclusion of disadvantaged groups through better access to education and childcare.

- CSRs in the field of ALMPs were addressed to 24 Member States in 2014, against 20 in 2013, 18 in 2012 and 16 in 2011. Their number has dropped to 14 in 2015, to focus on key action needs and in light of consistent reform activity being pursued in several countries since the start of the crisis. While this seems to be a strong decrease, recommendations on ALMPs as a share of total number of CSRs have remained stable over time (same graph I.4.13).

- Many of the CSRs in this field focus on increasing the efficiency of public employment services and developing integrated approaches for those at the margins of the labour market, notably low-skilled, youth and long-term unemployed. Combating youth unemployment emerged as a priority between 2013 and 2014. This is reflected in the important number of recommendations dealing with (i) facilitating the school-to-work transition, including through a wider use of work-based training and apprenticeships, (ii) improving the matching of skills with labour market needs, including by enhancing the effectiveness of vocational training, and (iii) improving the targeting of active labour market policies.

- Finally, a certain number of recommendations are expressly directed at creating the conditions for enhancing labour market participation of specific groups (women, older workers and the low-skilled), and support their labour market attachment in a situation of protracted slowdown. Member States are asked to enhance the employability of older workers and increase financial incentives to work longer, as well as to support female activity rates, notably by increasing childcare provision and pre-school education, favouring flexible working time and reducing disincentives to work for second earners.

Box I.4.2: National plans

Enhancing the effectiveness of *active labour market policies* and facilitating the school to work transition remain key priority in several Member States looking forward. Further changes in the organisational structure of PES, to improve synergies among services and develop individualised counselling and profiling systems, are notably planned in Croatia, the Czech Republic, Poland and Hungary. A package of measures is being prepared in Finland, aimed at better targeting wage subsidies and employment services to the long-term unemployed. Interventions specifically aimed at *supporting youth employment* are, among others, being developed in Ireland and Malta, with a reform of the apprenticeship system being in the pipeline in both countries, but also in Slovakia, Sweden and Denmark. The development of a new framework for life-long learning is planned in Belgium.

A number of countries are pursuing reforms of their *social support schemes*, notably to simplify benefit provision and better link it to activation mechanisms (e.g. Estonia, Poland and Lithuania), or to increase their coverage and adequacy (e.g. Latvia). Both Greece and Italy have started in 2014 a pilot test for a universal minimum guaranteed income benefit, providing beneficiaries with income support in combination with job-assistance and social-inclusion components, with the intention to extend it nationwide.

With a view to increasing labour *market participation*, proposals to reform *disability benefit schemes* are being studied in the Czech Republic and Estonia, with the latter country wanting to reform its incapacity to work policy by changing benefit eligibility rules and reforming social and vocational rehabilitation services. Further changes in the *early retirement* system are also under way in Croatia, Belgium and Luxembourg. Measures to increase *childcare* availability are being put forward among others in the Czech Republic and Estonia, while this issue counts among the priorities for action set by the Irish government.

In both Belgium and Ireland, the newly elected government coalitions committed to a *tax shift from labour*, notably to reduce the income tax facing low- to middle-income earners. In the Netherlands, the government intends to present a proposal for a tax reform to strengthen financial incentives to work in the run up to the 2016 budget. Plans to reduce the personal income tax rate are also being made in Hungary.

Further changes in *job protection legislation* are planned in Croatia, including concerning severance pay and *working time legislation* to make work organisation more flexible for employers. In Lithuania, following a review of labour legislation on flexible employment agreement conditions, dismissal provisions and flexible working time arrangements, draft amendments were prepared in consultation with social partners. France is discussing proposals to increase the effectiveness of social dialogue at company level by rationalising the rules and giving companies greater leeway with regard to collective agreements, and to reform the size thresholds for the application of labour law. The French government is also planning to merge the earned income supplement (RSA *Activité*) and the employment bonus (PPE) into a single activity bonus. Belgium plans to further complete the unification of the statute of blue-collar and white-collar workers started in 2013. Adapting the wage formation system is also an integral part of the reform agenda of the Belgian government.

4.5. Conclusions

Despite a slight decrease in the overall pace of reforms in 2014, recent trends confirm the significant acceleration in reform activity in the majority of EU Member States since the start of the crisis. Reform patterns vary across countries, with progress being particularly noticeable, especially until 2013, in stressed economies and in countries under financial assistance programmes. Other countries, notably those having weathered relatively well the first phase of the crisis, started only recently to address in a more systematic way the challenges they are faced with, through the adoption of comprehensive reforms.

While there are clear differences across countries with regard to the type and severity of challenges and related policy response, a general trend seems to emerge since the start of the crisis, which can be broadly divided into three phases. Initially, between 2008 and 2009, policy action focussed on cushioning the short-term impact of the crisis on employment and incomes, through either temporary fiscal stimulus measures or the setting up of new policy tools to deal with temporary shortfalls of aggregate demand. Subsequently, as of 2010, fiscal constraints and the emerging need to address large macro-economic imbalances led a number of countries to push for reform strategies centred on improving the adjustment capacity and resilience of their labour markets. Finally, since 2012-2013, policy priorities have started to shift towards enhancing the effectiveness of social safety nets and reducing the tax wedge on labour, driven by growing concerns about a fair distribution of the adjustment burden, and the need to support job creation and protect incomes in a sustainable way looking forward. Overall, a sort of convergence seems to emerge in policy making towards greater capacity to adjust to changing economic conditions in exchange for greater support and protection for workers to adapt.

The progressive reinforcement of the European economic governance framework, including by taking concrete steps to build collective ownership and a shared understanding of country-specific challenges, as well as by setting streamlined policy priorities as of 2014, have allowed for more focused country-specific recommendations in the 2015 European Semester. Despite the fewer number of recommendations, the balance between different policy fiends in the labour market, social and education domains has remained overall stable. In particular, recommendations in the field of poverty and social exclusion have gained in relative importance. The same goes for recommendations in the fields of labour taxation, education, *ALMPs* and wages, the latter as part of the continuous attention paid to facilitating absorption of macro-economic imbalances and competitiveness challenges looking forward. Yet, there is more differentiation in the recommendations across countries to take better into account the nature and severity of country-specific challenges.

The significant reforms enacted in previous years and the recently improved labour market conditions are not good reasons for ambitious reform being over. The crisis has painfully exposed the structural weaknesses of many European economies. Unbalanced growth in some countries in the pre-crisis period often went hand in hand with lower productivity, a decline in competitiveness and little investment in human capital. This has led to unprecedented divergences between countries, especially between those in the South or the periphery of the euro area and those in the North or the Centre, with higher unemployment and increased inequality having disrupted social cohesion in many of them.

In turn, these developments have highlighted the importance of strengthening the resilience of European economies and welfare institutions. A durable return to economic growth would benefit the entire population by

unleashing the untapped potential for higher output, employment and welfare, while reducing poverty in the society. It needs to be accompanied by reforms that improve the capacity to respond to shocks while effectively minimising economic and social costs.

Recent trends also reveal a number of policy challenges looking forward:

- First, well-designed, packaged and sequenced reforms require a *strong commitment to time-consistent economic policies*. Maintaining reform momentum and avoiding backtracking might be particularly challenging in vulnerable countries that have enacted far-reaching reforms to improve their adjustment capacity, but where, for instance, the necessary medium-term reforms to improve their growth prospects in a sustainable way (e.g. in the education field) could be more difficult to pass at this stage; very high long-term unemployment may also cause reform fatigue. The reinforced EU economic governance framework can play as a catalyst in this respect.

- Second, effective structural reform strategies to support employment and social cohesion must go *beyond the labour market*. Macro-economic and fiscal measures are necessary to address poverty and inequalities as much as labour and social measures. At the same time, efficient product markets and effective legal frameworks are key ingredients to reduce bottlenecks to investment, which are a source of sustainable growth and job creation.

- Finally, with labour markets changing rapidly and fundamentally, it is becoming apparent that many of the jobs lost during the economic crisis, and particularly those of lower skill content, will not come back. The *response to long-term unemployment* must account for these changes. It cannot be a one dimensional approach, but necessarily involve a *broader reform agenda* for labour markets, product and other market reforms, taxation and benefit reform, as well as specific labour market intervention such as training and up-skilling, and social policies.

APPENDIX A.4.1
The LABREF database

LABREF ([32]) contains information on the basis of pre-defined criteria on the characteristics of labour market and welfare policy measures introduced in the EU Member States. As compared with similar existing databases, LABREF contains information on a larger set of reform characteristics. These databases are useful to analyse the reform process, to investigate commonalities and characteristics of reform strategies, and to analyse the effects of reforms with alternative designs and features, notably using micro data.

The measures reported in LABREF refer to information on enacted legislation, executive or administrative acts, court rulings or agreements likely to have an impact on labour market performance, including those entailing changes in the implementation framework of previously adopted reforms. Recurrent decisions by the government concerning wages according to standard rules and practice (e.g. level of minimum wages) are not recorded, while derogations to current rules and practice are, as well as changes in wage setting modalities by the government. The database does not record information on planned reforms or draft bills.

Policy measures are organised into 49 policy fields and further grouped in 9 broad policy domains. The breakdown of policy domains and fields covered by the database reflects standard classifications of labour market and welfare institutions (e.g. Nickell and Layard, 1999), notably labour taxation, employment protection legislation, unemployment benefits, wage setting, working time regulation, and extends to a wide typology of active labour market policies (ALMPs), welfare benefits, early withdrawal schemes, labour mobility and migration policies.

For each policy measure, the database provides information on the main features of the measure and the reference to the text establishing the measure (e.g. the budget law); indicates the information source used to fill the database, the date of approval of the measure, scheduled timing of implementation; identifies whether the measure targets specifically the young; specifies if it applies to new entrants only or to current incumbents as well, and if the measure is embedded in a long-term policy programme or is part of a formal reform package. For analytical purposes, reforms are distinguished according to their effect on the underlying policy setting, with no a priori judgement on their implications on labour market functioning. Reform measures are classified as increasing (decreasing) if they have an *increasing* (*decreasing*) effect on the associated underlying policy setting, namely: the tax burden on labour; the generosity unemployment and other benefits; the stringency of regulation on employment protection, wage setting and working time; the availability, generosity or effectiveness of ALMPs.

LABREF covers policy measures for the EU-28 over the period 2000-2014 (for Romania and Bulgaria information start in 2003; for Croatia in 2013). Information up to 2013 has been validated by the Members of the *Economic Policy Committee* (EPC) of the *ECOFIN* Council. The database was developed upon initiative of the European Commission and the EPC in 2005 with the aim to improve the information basis for the surveillance of labour market policies in the framework of the EU economic policy coordination process. The compilation of the database is carried out in two steps. In the first step information is collected by the services of the European Commission, in the second step, the information collected is sent for validation to national authorities.

As a general caveat, it is important to highlight a number of limitations of reform

([32]) The link to LABREF: http://ec.europa.eu/social/main.jsp?catId=1143&intPageId=3193&langId=en

count data. First, recording a larger number of reforms in a given country and in a given period does not necessarily imply that more extensive or effective policy actions have been put in place. Second, there is an inevitable risk of missing information and non-obvious classification for the policy field or direction. More fundamentally, reform measures are far from being homogenous objects. A single piece of legislation may cover several policy areas and may consequently include several *reforms* to be codified in LABREF. In the database, reforms involving different policy measures are broken down into as many measures as many policy fields are affected. For instance, if the reform affects both the replacement rate of the unemployment benefit and its duration, these will also be recorded as separate measures because they affect two different policy fields in the same domain. It follows that, while that database takes into account the possible presence of multiple measures in a single policy act (e.g., 'umbrella laws', reform packages), no account is taken of the fact that reform counting can create a bias in favour of gradual reform strategies (spread over time, in different formal acts).

Part II

Analytical chapter

1. Labour mobility and labour market adjustment in the EU

This chapter assesses macroeconomic determinants of labour mobility and its role in the adjustment to economic shocks that hit some countries only (asymmetric shocks). ([33]) First, the chapter looks at stylised facts of mobility at the national and sub-national levels in the EU. Then, it explores the macroeconomic determinants of bilateral migration flows. Econometric evidence suggests that labour mobility increases significantly when a country joins the EU. While euro area membership seems not to be associated with an overall rise in the magnitude of mobility flows, workers do appear more ready to move from countries where unemployment is high to those where it is lower. Thirdly, the chapter looks at mobility as a channel of economic adjustment. The analysis suggests that workers have become more likely to move in response to shocks that affect only some countries. Movements in response to shocks have almost doubled since the introduction of the euro. Real wages have also become more responsive to asymmetric shocks during the same period.

1.1. Introduction

Labour mobility received attention in the early debate on the Economic and Monetary Union (EMU). It was stressed that the reduced room for absorbing asymmetric shocks (economic shocks that affect some countries only) via macroeconomic policy tools in a monetary union required a sufficient degree of labour mobility as an alternative adjustment channel. Empirical analysis revealed that, as compared with other monetary unions, notably the US, EU countries participating in EMU did not exhibit a comparable degree of mobility, and mobility played a minor role in the process of adjustment (Blanchard and Katz, 1992; Decressin and Fatás, 1995). Several years have passed since the outburst of the financial crisis, and there is growing attention to the potential contribution of labour mobility to counteract the divergence in growth and unemployment among EU countries and particularly within the euro area.

The financial crisis and the ensuing current account and debt crises in the euro area acted as persistent macroeconomic shocks with asymmetric effects, radically changing the landscape of the euro area. The convergence in income per capita observed during the first decade of EMU was to a large extent reversed. Countries in the euro-area periphery witnessed capital flights, a protracted contraction in domestic demand amid deleveraging, and a marked deterioration in public finances. The rebalancing process involving an adjustment in relative costs and prices between net debtor and net creditor members of the euro area is necessary for a durable reduction of external macroeconomic imbalances and the narrowing of unemployment divergences. Such a process, however, can be long-lasting and marked by considerable distress in the countries enduring competitive internal devaluation and high and protracted unemployment.

Against this background, labour mobility would help easing adjustment: it would permit a more moderate reaction of activity rates and part of the divergence in unemployment rates would be absorbed by mobility rather than real wages.

The chapter starts out by assessing main stylised facts and trends. Cross-country mobility flows in the EU appear to remain considerably lower as compared with those recorded in other highly integrated

([33]) An earlier version of this chapter was published as Economic Paper 539 (European Commission, European Economy series), and an abridged, nontechnical version appeared in the Quarterly Report on the Euro Area of the European Commission (2015, 1st quarter).

areas, most notably the United States, and well below mobility within countries. Moreover, the majority of the population of migrants in most EU Member States is from outside the EU rather than from other EU countries. Nevertheless, cross-EU mobility is on an upward trend, and not only due to the enlargement of the EU to Eastern European countries with high outward migration rates.

The analysis then focuses on the macroeconomic determinants of mobility flows by means of '*gravity equations*', linking gross mobility flows some observable characteristics of origin and destination countries, their distance, and variables capturing the costs of mobility. Previous analyses mostly focused on long-term economic determinants of migration flows (e.g., Lewer and Van den Berg, 2008; Mayda, 2010; Ortega and Peri, 2013). Compared to existing analyses, this study makes a step forward in assessing the extent to which mobility flows have been influenced by the EU integration process and its interaction with labour market developments. Additionally, the estimation of gravity equations provides a benchmark to assess whether actual mobility trends reflect underlying fundamentals. Econometric evidence suggests that EU membership raises mobility significantly. While membership of the euro area does not affect the size of mobility flows by itself, it increases the response of mobility to changes in the unemployment rate. This suggests that, within the euro area, labour mobility contributes to the adjustment to asymmetric shocks to a greater extent.

Finally, the analysis focuses on identifying the dynamic response of labour mobility to labour demand shocks that affect some countries only (asymmetric shocks). To that purpose, a Vector Auto Regressive (VAR) model in the spirit of Blanchard and Katz (1992) is estimated for a panel of EU countries. The aim is to assess simultaneously the co-movement of unemployment, inactivity rates and labour mobility in response to shocks to labour demand. As compared with recent analyses (e.g., Dao et al., 2014; Beyer and Smets, 2014), the focus is on mobility across countries rather than across regions. This is for two reasons. First, it keeps the analysis close to the type of adjustment that matters in response to country-specific shocks. Second, it permits to explore the behaviour of real wages in response to asymmetric shocks, as this is a key variable to allow the adjustment of relative unemployment rates. Results indicate that labour mobility absorbs about 25% of asymmetric shocks after one year and about 50% at peak, i.e., after about 5 years. It is also shown that the response of mobility, as well as that of real wages, has increased after monetary unification. At peak, the response of mobility for the post-unification period is about twice as large as that for the pre-EMU period.

Some caveats are in order in interpreting these results. First, the chapter focuses on labour mobility within the EU. However, due to data availability, it is in some cases hard to disentangle whether mobility takes place fully within the EU or also with third countries. In particular, while the 'gravity equations' in the second part of the chapter distinguish between flows within the EU and with third countries, the VAR analysis in the last part of the chapter cannot. Such a distinction, although relevant from the perspective of the smooth working of the monetary union, is seldom pursued in similar analyses, partly because of the lack of sufficient data, partly because what is relevant from the viewpoint of the adjustment for the single country is the response of labour mobility to shocks, irrespective whether mobility flows take place with another member of the monetary union.

In the chapter, the terms "mobility" and "migration" will be used interchangeably, although in the EU policy context, mobility refers to movements within the EU and migration to movements between EU and non-EU countries.

The chapter is organised as follows. Section 2 reviews the case for labour mobility as an adjustment channel. Section 3 presents a number of stylised facts. Section 4 analyses the determinants of mobility flows by means of gravity equations. Section 5 assesses the dynamic response of labour mobility to country-specific shocks. Section 6 concludes.

1.2. Labour mobility as an adjustment channel

Since the onset of the monetary union, labour mobility within the EU attracted attention in the academic and policy debate. In the early debate on EMU it was stressed that the relatively low degree of labour mobility among EU countries would be a weakness of the forthcoming monetary union. The loss of exchange rate flexibility and an independent monetary policy would require alternative channels of adjustment in the presence of asymmetric shocks. Countries hit by persistent negative shocks would face high unemployment for protracted periods. Avoiding the economic and social costs linked to persistently diverging unemployment rates would require a sufficient degree of flexibility in real wages or a sufficiently mobile labour force. These were seen among the conditions for the EMU countries to be part of an "optimal currency area".

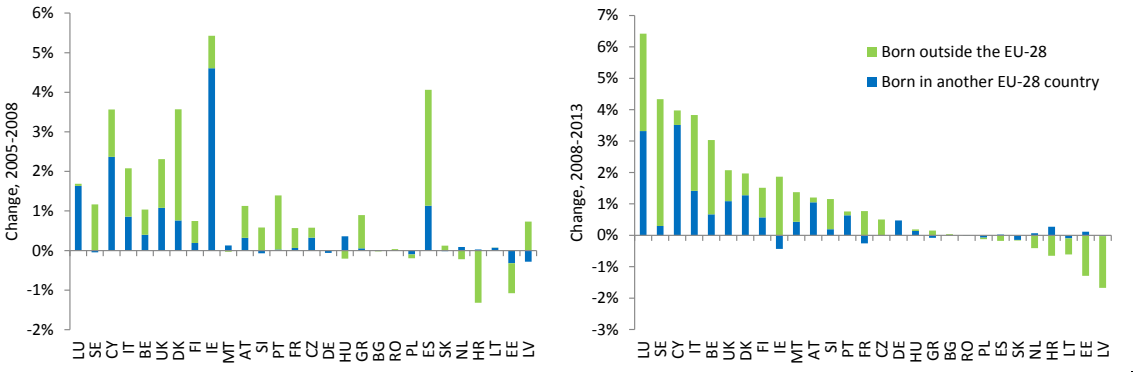
The low degree of labour mobility across EU countries as compared with US States can be linked to language and cultural differences, largely heterogeneous policy contexts, notably concerning the labour market, fiscal and social welfare policies. Some reasons underlying reduced labour mobility within Europe were considered to be linked to persisting legal and administrative barriers to the Single Market ensuing notably from limited portability of welfare rights, recognition of qualifications, access to regulated professions. Despite being a relevant adjustment channel, there are limits to what labour mobility can achieve in terms of shock absorption and there are costs that need not be neglected.

The strongest case in favour of adjustment through labour mobility is provided by situations in which persistent asymmetric labour demand shocks lead to persistent unemployment differences due to the rigidity of real wages. In such a context labour mobility is likely to result in lower overall unemployment and relatively limited impact on the rest of the population in both the source and the destination country. On the other hand it is well-known that, under fully flexible wages, migration is likely to bring aggregate gains, but with redistribution in favour of source country workers and against destination country workers, which see their earnings reduced in light of an increased supply of labour (e.g., Borjas, 1999). Moreover, migration may not be justified in case of short-lived, temporary shocks, as national automatic stabilisers could be sufficient to deal with temporary unemployment.

It should also be added that the effects of labour mobility go beyond those considered in standard, simplified, static models of international economics. In particular, from the viewpoint of the source country, the migration of skilled labour and the consequent phenomenon of *brain drain* may lower TFP and income growth rates (Commander et al., 2004). Moreover, in presence of large differences in tax and welfare policies across countries, migration could entail additional redistribution effects via the public budget, and the implications of government debt for future generations could be exacerbated by large-scale outward migration.

Finally, there is ample evidence showing that individual perceptions and attitudes towards migration tend to be more negative than justified on the basis of economic outcomes only, which constitutes an additional limit to what labour mobility can achieve by itself as a channel of adjustment to asymmetric shocks (e.g., Mayda, 2006).

Graph II.1.2: **Change in the share of working-age population born abroad, before and during the crisis**



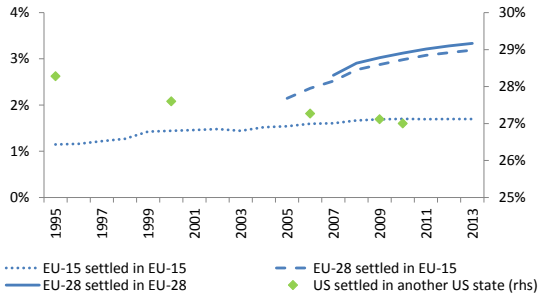
Note: For Bulgaria, Germany and Ireland, 2006 instead of 2005. For Germany, the value is for all foreigners, no breakdown available. Countries are ranked according to change 2008-2013.
Source: Commission services, based on a Eurostat special extraction from LFS.

1.3. Labour mobility in the EU: Stylised facts

1.3.1. Trends in cross-country mobility after EMU and enlargement

Mobility across the EU has been increasing over the past two decades, as measured by the share of EU population born in a different EU country (Graph II.1.1). The increase is particularly evident when looking at data for the post-enlargement EU. Mobility rates are higher across the enlarged EU, and have been on an upward trend since the mid-2000s. This is mostly the result of large and growing flows from countries of new accession, notably Eastern European countries. However, growing mobility is not only from East to West. Mobility among countries that were Members of the EU before the 2004 enlargement also exhibits a positive, albeit moderate, trend over the past two decades. ([34]) Conversely, over the same period, mobility within the US appears to be on a downward trend, although from a higher level.

Graph II.1.1: **Share of EU working age population born in other EU countries, and share of US population born in a different US state**



Note: All three EU series are expressed as a percentage of EU-28 working age population. Data for the EU series excludes Germany, since no time series is available about the breakdown of foreigners living in Germany by origin country.
Source: Eurostat population statistics and Eurostat special extraction from the Eurostat LFS; US Census Bureau, Census and American Community Survey.

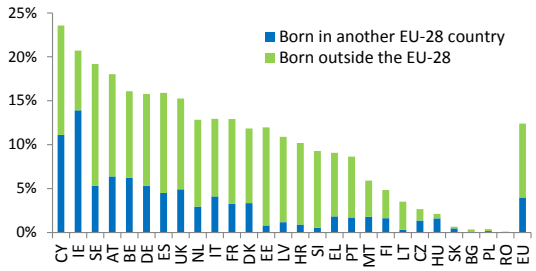
Despite this rising trend, mobility across EU Member States remains lower as compared to other world regions, most notably the US (OECD, 2012). In 2013, about 4% of working-age EU citizens lived in a different EU country than where they were born (Graph II.1.3). In the US, as a comparison, about 30% of the working age population lives in a state different from their state of birth. ([35]) Intra-EU mobility is relatively low also

([34]) Recent surveys of EU mobility trends include European Commission (2014a, pp. 282-286; 2014b) and Barslund and Busse (2014).

([35]) Own calculations based on 2010 data of the U.S. Census Bureau (2011). Comparable recent figures and historical data for the U.S. have been published by Molloy et al. (2011).

when compared to migration from outside the EU. ([36])

Graph II.1.3: **Share of working-age population born in other countries, 2013**



Note: Luxembourg omitted as out of scale. In Luxembourg, 38% of the population was born in another EU-28 country, and 9% outside the EU-28.
Source: Eurostat for Germany and EU-28, for others calculations based on a Eurostat special extraction from the European LFS.

The share of intra-EU migrants in the working-age population is about half of the share of migrants born outside the EU (8.4%). ([37]) Within-EU labour mobility appears somewhat higher if cross-border workers are taken into account: there are about 1.1 million EU citizens who work in another EU country (0.3% of the working age population) but do not reside there. In addition, there are about 1.2 million posted workers (0.4%), who were working for their home companies in another Member State for a limited period of time.

There are considerable differences in the size and composition of the foreign born population across EU Member States, with some regularities that are worth noting (Graph II.1.3). First, the share of foreign-born population is in general lower in New Member States. In 2013, this share exceeded 12% in 12 of the 15 "old" Member States, while it remained below 12% in 12 the 13 New Member States. Second, in most countries the share of population born outside the EU exceeds the share of population born in other EU countries.

Recent developments in the share of foreign-born population also show great differences across countries (Graph II.1.2). ([38]) It appears that in general the weight of intra-EU mobility is higher in recent migration flows as compared to stock data (compare with Graph II.1.3).

Inward migration flows were generally stronger in "old" Member States both before and after the crisis, but some changes took place with the crisis. The countries where the stock of migrants grew most before the crisis included countries on the euro area periphery like Ireland and Spain. In light of the crisis, in these same countries inflows adjusted downward to a large extent, while the stock of foreign-born population fell substantially in the Baltic countries.

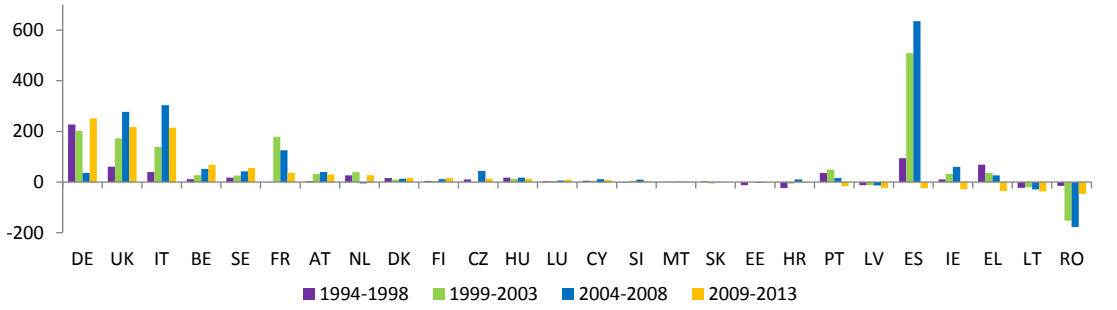
Net migration flows in absolute terms (i.e. number of people rather than expressed as a share of population) are shown in Graph II.1.4. Not surprisingly, the biggest flows in absolute terms are observed most populous Member States. The graph also confirms that net migration flows varied greatly through time in a number of Member States. In a number of EU countries such as the UK, Italy, Spain, net inward flows grew since the nineties, peaked at mid-2000s and fell after the crisis. Net migration flows turned from positive to negative after the financial crisis in countries severely hit by current account and debt crises, such as Spain, Greece, Ireland and Portugal. In a number of Eastern EU countries, notably Romania and the Baltics, net migration flows were generally negative since mid-1990s.

([36]) Surveys indicate that the actual number of mobile Europeans is only a tiny fraction of those who would consider working abroad (e.g. in European Commission, 2013).

([37]) In the US, the population share of working age people born outside the US is 16%, or about half the share of people who moved from one state to another (own calculations based on Pew Research Center (2012) tabulation of the 2010 U.S. Census).

([38]) Data, based on the EU Labour Force Survey, that allows a differentiation between EU and non-EU migrants, go back to 2005 (Box 1).

Graph II.1.4: **Average annual net migration flows (thousand)**

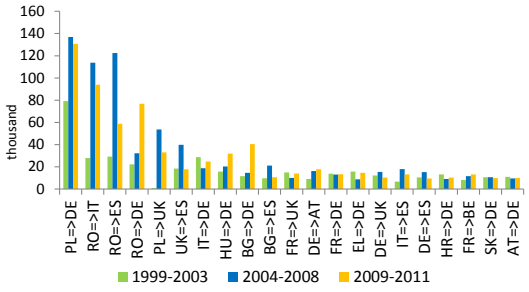


Note: Bulgaria and Poland have been omitted as the size of reported flows was consistently below what is suggested by other sources. Countries are ordered according to net migration in the latest period 2009-2013.
Source: Commission services, Eurostat population statistics.

Data on gross bilateral migration flows allow a more disaggregated look at the patterns of European mobility. ([39]) Graph II.1.5 shows the largest absolute bilateral mobility flows observed in the data. A number of observations are in order:

- Most of the large absolute bilateral flows involve large countries. Germany is the most frequent destination country, but it also features as the origin country in three bilateral relationships.
- About half of the largest absolute gross bilateral flows, and notably the five largest ones, concerned pair of countries including a new Member State.
- The other half of the largest absolute gross bilateral migration flows are among two old Member States. These include flows from the "South" to the "North" (from Italy and Greece to Germany), from the "North" to the "South" (from the UK and Germany to Spain), within the "South" (from Italy to Spain) and six bilateral relationships within the "North" (from France to Belgium, Germany and the UK, from Germany to Austria and the UK, and from Austria to Germany).
- The aggregate time pattern of migration flows to different countries is reflected also in bilateral relationships: in particular, large bilateral flows to Spain peaked in the pre-crisis period, while large bilateral flows to Germany increased in the post-crisis period.

Graph II.1.5: **Average gross bilateral flows exceeding 10,000 over the period 1999-2011, within EU-28**

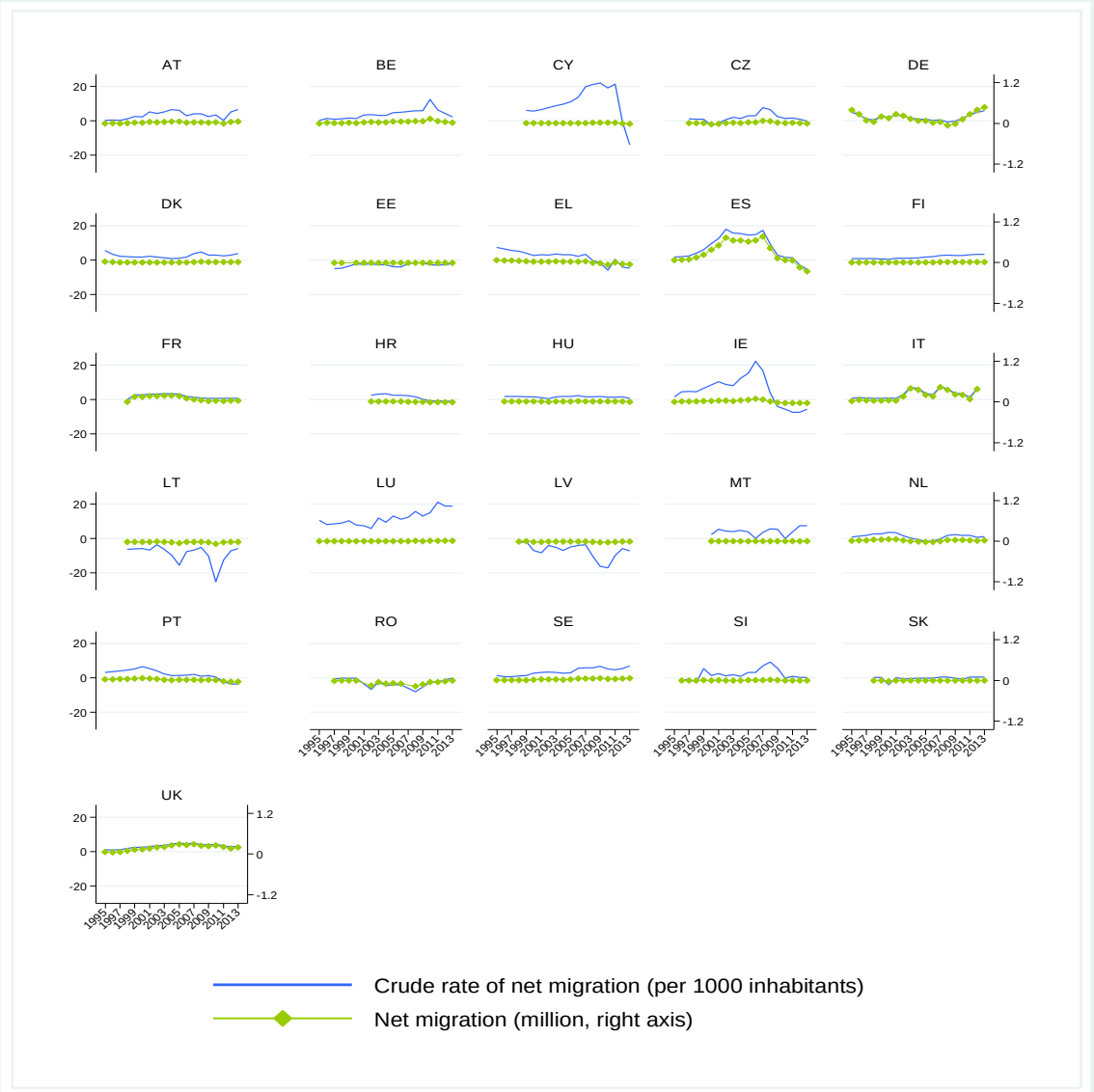


Note: The results may be affected by data availability and differing data collection methodologies applied by different countries. Bilateral relations are ordered according to the overall period average.
Source: Commission services, OECD International Migration Database.

Graph II.1.6 provides a detailed time profile of absolute and relative annual net migration by destination country. The graph confirms that countries that were greatly affected by current account reversals and debt crises (e.g. Spain, Cyprus, Ireland) saw a rapid reduction in net migration. It is also visible that this did not happen in a parallel fashion in all affected countries: the decrease occurred more rapidly in Ireland than in Spain, and it occurred in Cyprus only after 2011, reflecting broader economic

([39]) Gross bilateral migration flows are taken from OECD's International Migration Dataset (Box 1). The results shown in the following graphs may depend on data availability, as data availability is uneven across bilateral relationships.

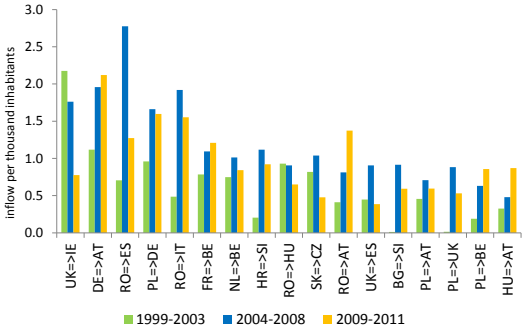
Graph II.1.6: **Relative and absolute net migration, 1995-2013**



Note: Statistics on net migration include statistical adjustment by national statistical offices. The results may be affected by differing data collection methodologies applied by different countries. Bulgaria and Poland have been omitted as the size of reported flows was consistently below what is suggested by other data sources. Outliers in the data for Estonia, Italy and Romania have been removed.
Source: Eurostat population statistics.

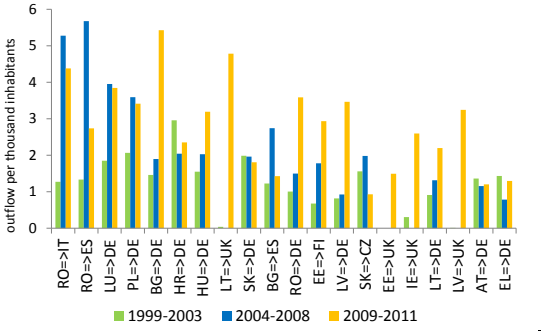
developments. Net migration was negative before the crisis In Latvia and Lithuania; it fell further and considerably in the first years of the crisis and rebounded in the latest years.

Graph II.1.7: **Average gross bilateral flows exceeding 0.5 per 1000 of destination country population over the period 1999-2011, within EU-28**



Note: The results may be affected by data availability and differing data collection methodologies applied by different countries. Migration flows to Luxembourg have been omitted for better visibility. The highest flows per 1000 inhabitants into Luxembourg over the period were from PT (7.5), FR (5.2), BE (2.4), DE (1.8), IT (1.3), UK (0.9), PL (0.5).
Source: Commission services, OECD International Migration Database.

Graph II.1.8: **Average gross bilateral flows exceeding 1 per 1000 of source country population over the period 1999-2011, within EU-28**



Note: The results may be affected by data availability and differing data collection methodologies applied by different countries. Data on migration inflows to the UK are missing for various years depending on the source country. There is only 1 year available on migration from EE, 3 years (LV), 5 years (LT) and 6 years (IE).
Source: Commission services, OECD International Migration Database.

Graph II.1.7 and Graph II.1.8 show the largest gross bilateral migration flows relative to the population of the destination and origin countries, respectively. Some of the largest absolute flows appear among the largest relative flows as well, but a number of additional insights can be gained:

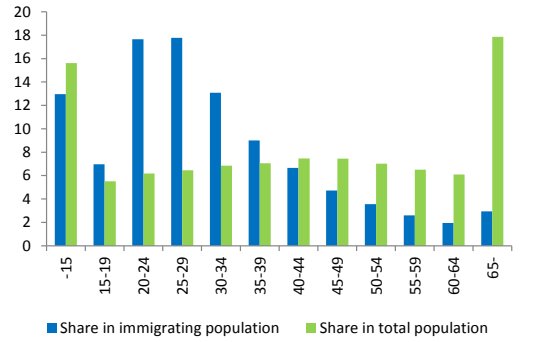
- Some bilateral migration flows are large in relative terms in both directions. Relative to the smaller country's population, flows in both directions between Austria and Germany, Ireland and the UK, appear among the largest.

- A number of bilateral flows that are large relative to the population of the destination country are between neighbouring countries (e.g., from France and the Netherlands to Belgium, from Croatia to Slovenia, Romania to Hungary, Slovakia to the Czech Republic, Hungary to Austria).

- Most of the bilateral flows that are large relative to the population of the origin country are from new Member States to large old Member States.

Migrants differ from the rest of the population for a number of characteristics. Graph II.1.9 shows the age composition of the total population and that of the population of individuals migrating to EU countries in 2012. The graph shows that the majority of migrants is between 20 and 40 years, an age bracket typical of individuals in tertiary education or prime working age.

Graph II.1.9: **Share of different age groups among the total population and among the flow of migrants in 2012**

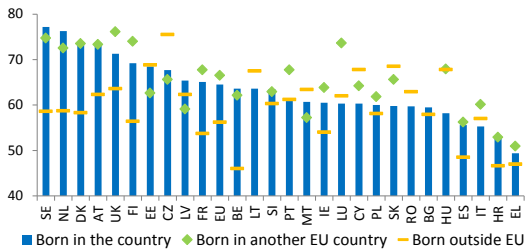


Source: Commission services, Eurostat population statistics.

Finally, Graph II.1.10 compares the employment rate of the population born in EU countries to that of migrants born in other EU Member States and outside the EU. On average, the employment rate

of migrants from other EU countries is about 2 percentage points higher than that of the population born in a given country, while the employment rate of migrants from outside the EU is about 8 percentage points lower. This evidence is largely driven by the fact that relatively few migrants are not in working age, and that migrants coming from outside the EU have in general a lower education background and have to face higher legal and administrative obstacles.

Graph II.1.10: **Employment rate by country of birth, 2013**



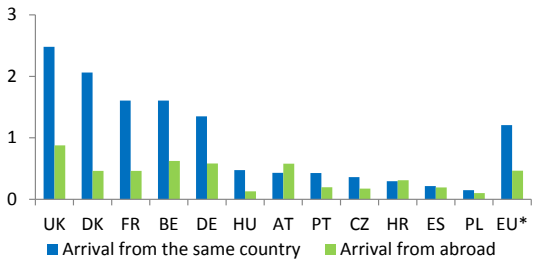
Note: Germany is omitted because the employment rate for EU and non-EU migrants is not available for this country. For Bulgaria, Lithuania and Romania the of the employment rate of people born in another EU country is not available.
Source: Eurostat LFS.

1.3.2. Sub-national mobility

Economic shocks in a monetary union can have a differential effect not only on different Member States but also on different regions of the same Member State. Thus, sub-national mobility continues to play a role in the adjustment to asymmetric shocks after monetary unification.

Graph II.1.11 summarises information on annual sub-national and cross-country mobility rates for countries where data are available. About 1% of the population was mobile between NUTS2 regions of the same country, while about 0.5% of the population has migrated from another country (about the half of which from another EU Member State). Thus, in 2013 about five times as many people moved to another region in the same EU Member State than moved between two EU Member States. This ratio is comparable to that by Gáková and Dijkstra (2008) for 2005 and 2006 (their result was somewhat higher, in the order of 6 to 1). This is an indication that between-country mobility may have increased in the EU relative to subnational mobility.

Graph II.1.11: **Annual rates of sub-national and international inward mobility, 2013, % of total population**



Note: 'Arrival from the same country' refers to working-age individuals who were residents of another NUTS2 region of the same country 1 year before the interview. The EU average is a weighted average that covers the available countries, representing 70% of EU's working age population. Data not available for Bulgaria and Ireland. Countries for which the data are unreliable for internal mobility (Italy, Romania, Slovenia, Slovakia), for external mobility (Greece, Finland, the Netherlands, Sweden) have been excluded.
Source: Eurostat special extraction from the European LFS.

Graph II.1.11 also shows that there are considerable differences across countries concerning the relative importance of sub-national (regional) and international mobility. Countries with high regional mobility rates include large member States (France, Germany and the UK). At the same time, countries in which the regional mobility rate exceeded 1% in 2013 included smaller countries like Belgium and Denmark, while larger countries like Poland and Spain recorded a regional mobility rate below one-quarter of a percent.

These figures are well below those for the U.S., where the annual inter-state mobility rate ranges between 1.5% and 3% depending on the methodology used for the calculations (Molloy et al., 2011). ([40]) Contrary to the U.S. long-term trend

([40]) Molloy et al. (2011) argue that NUTS2 regions (the population ranging between 0.8 and 3 million) are of comparable size to many U.S. states. On this basis, mobility in the EU is about

Box II.1.1: **Data sources on migration**

A number of data sources on migration statistics are available for EU countries, with different sources providing insights on different aspects of migration. Below a description is provided of the main features of the statistical sources used in the present analysis.

Eurostat population statistics

Eurostat data on net migration plus statistical adjustment give a snapshot of migration balances. Net migration flows are constructed as the difference between the total population change and the estimated 'natural population change' (i.e., the change due to natality and mortality). Such flows, expressed as shares of population are named crude rate of net migration. The advantage of these net migration flows is that they are available for most countries in long time series. The statistic is available also at regional (including NUTS2) level. The main shortcoming is that these flows are affected by inaccuracies in the estimation of population change, as underlying administrative registers are not always up-to-date. Statistical adjustments, including census-related population revisions, lead to outliers and breaks in the series in some instances. Since this indicator is calculated on a residual basis, it does not allow the identification of actual inflows and outflows, or their composition.

Comprehensive statistics on population by citizenship and country of birth are made available by Eurostat since 2008. The data sources are administrative records or national surveys. The advantage of these statistics is that they capture migration directly, rather than on a residual basis. Such statistics also allow for a breakdown by sex, age. However, shortcomings may be related to imperfect comparability of administrative data and lack of compliance of migrants to register or deregister as residents.

Eurostat Labour Force Survey

The Eurostat Labour Force Survey (LFS) is a standardised survey primarily aiming at assessing employment and unemployment in the EU. Harmonised data, allowing assessment of EU27 mobility, are available in general starting 2005. As the survey asks questions about recent changes of residence, the data provides an estimate of recent sub-national and international migration movements. It also allows researchers to analyse the age profile and labour market status of migrants. Its shortcomings are those of surveys in general: migrants, among other vulnerable groups, may be underrepresented in the sample partly due to a higher non-response rate. As a result, mobility flows implied by LFS are usually lower than those implied by Eurostat population statistics. Also, not all statistical breakdowns are available for all countries. A somewhat more detailed discussion of European data sources and, in particular, of the EU LFS is provided by European Commission (2012, p. 282-283).

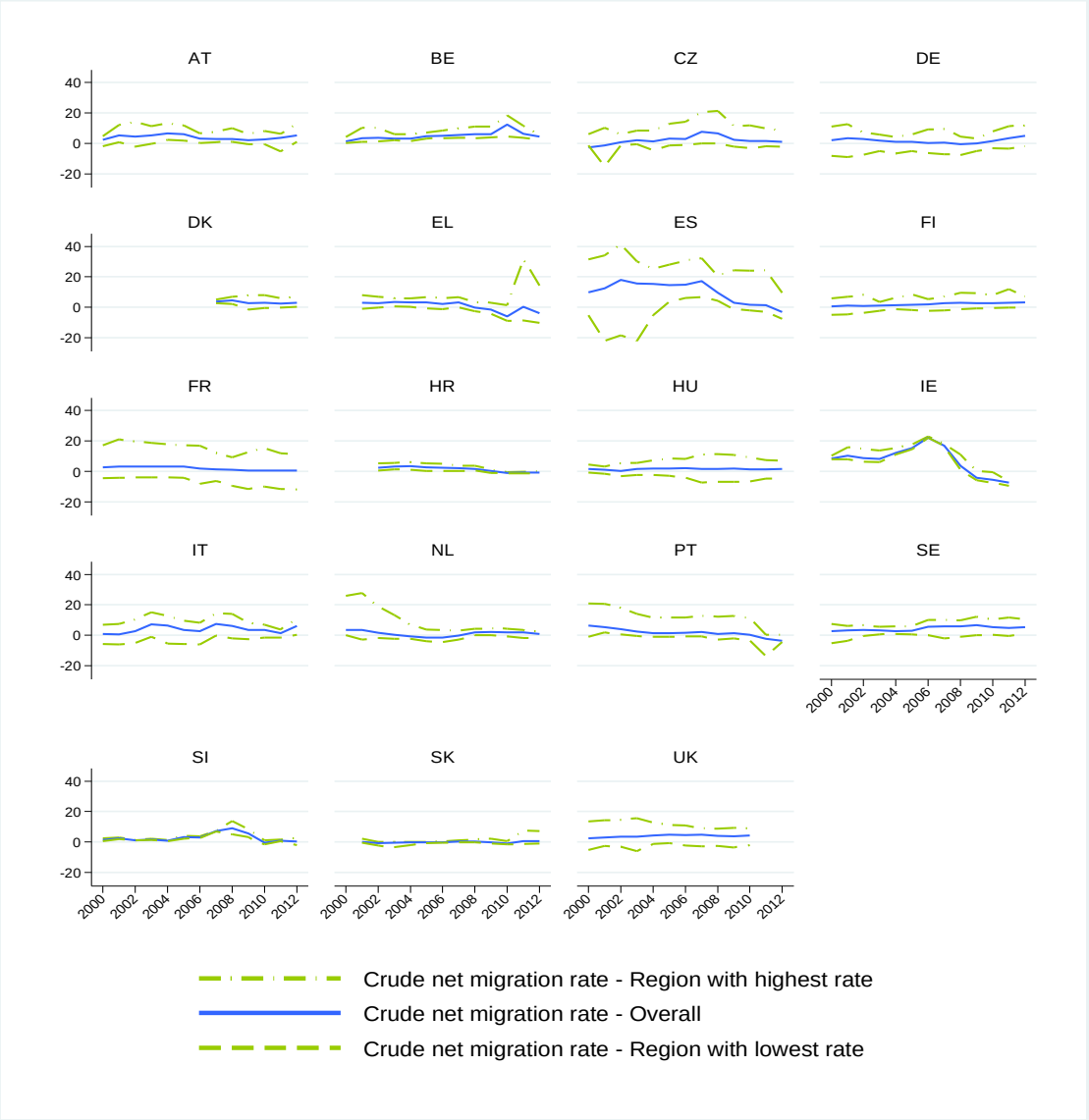
OECD International Migration Database

The OECD International Migration Database cover migration flows into most OECD Member countries as well as the Baltic States, Bulgaria and Romania from more than 200 origin countries. The period covered is 1990-2011, and coverage is higher for more recent time periods. The data are based on submissions by national correspondents and reflect existing national statistics, so that methodologies and definitions are not always harmonised (OECD, 2013, Statistical annex, pp. 311-315).

(Molloy et al. 2011; 2014), migration between EU Member States has recently increased (see next Section). Regional and cross-country migration interact because international migration flows may affect regions of the same country differently.

80% of mobility in the US (taking lower-end estimates for the U.S.) lower estimates.

Graph II.1.12: **Crude rate of net migration and the country level, and region with the highest and lowest value**

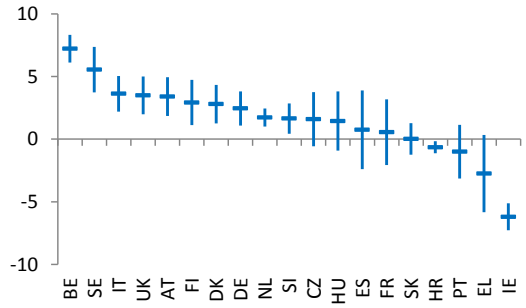


Note: Only countries with more than one NUTS2 level region are shown. Bulgaria, Poland and Romania have been omitted because of data concerns.
Source: Commission services, Eurostat population statistics.

Graph II.1.12 shows for each country the overall net migration rates and the same statistic for the region with the highest and lowest net migration rate. A comparison between the different lines helps identifying whether migration developments are characterised by country specific patterns common to all regions or by disparate migration rates across regions of the same country. The data suggest that among large Member States, large regional differences appear for Spain and France, while in Germany, Italy and the UK regional deviations from country-level trends appear to be somewhat smaller. Among smaller Member States, it is notable that large swings of the overall net migration rate in Ireland were reflected in almost parallel developments of both Irish regions. In contrast, relatively large and sustained regional disparities are observed in the Czech Republic, Hungary and Portugal. A high degree of dispersion of mobility rates across regions is also found in Greece and in the Netherlands

respectively during the crisis period and in the early 2000s.

Graph II.1.13: **Crude rate of net migration, country-level and one standard deviation range, average, 2009-2012**



Note: Crude rate of net migration and statistical adjustment. The standard deviation is calculated as the average of annual standard deviations.
Source: Commission services, Eurostat population statistics.

Graph II.1.13 focuses on a different measure of disparity across regions: it shows, besides the average country-level net migration rate for the post-crisis period, the standard deviation of regional net migration rates. The graph confirms that the regional disparity of regional net migration rates is greatest in the post-crisis period in Spain, France, the Czech Republic, Greece, Hungary and Portugal.

1.4. Explaining mobility flows

This section investigates determinants of bilateral migration flows. Besides estimating the main drivers of migration flows globally, the section intends to answer the following questions. Does membership in the European Union and the euro area increase migration flows between countries? How do cyclical economic conditions affect bilateral migration?

1.4.1. The approach

A 'gravity equation' of migration flows is an appropriate method to analyse the determinants of bilateral migration flows. The term 'gravity equation' or 'gravity model' refers to a type of empirical regularity in economic interactions between countries. As a prominent application of the gravity model, it has been long noted that a country's trade with other countries is positively related with the trading partners' economic size but negatively related with the distance between both. ([41])

Recent improvements in the quantity and quality of available data on bilateral migration have spurred a new literature on the determinants of migration making use of the gravity model. ([42]) The literature has found consistent evidence for a number of intuitive relationships: bilateral migration is positively related with the population of countries and negatively with the distance between them; furthermore, common language and past migration between pairs of countries increase migration flows. ([43])

Recent studies have chosen a more structural approach, motivating the estimated gravity equations with a theoretical model of migration choice. ([44]) Only a few studies, however, have investigated the effect of business-cycle fluctuations on migration flows. Beine et al. (2013) show that the business cycle has a statistically significant effect on migration flows. They also find that mutual euro area membership increases migration flows, although their specification does not control for mutual EU membership. ([45])

This chapter complements previous analyses in that it places more emphasis of how the EMU and the crisis affected the magnitude and direction of migration

([41])The gravity equation has been first used by Tinbergen (1962) to explain trade flows. Anderson (2010) and Head and Mayer (2013) provide surveys of the literature.
([42])E.g., reviews of the literature by Greenwood (2005), Anderson (2010) and Beine et al. (2014).
([43])E.g., Lewer and Van den Berg, 2008; Mayda, 2010; Pedersen et al., 2008. Studies with a focus on North America include Clark et al. (2007) and Karemera et al. (2000).
([44])E.g. Ortega and Peri (2013), which estimate the effects of immigration policies of destination countries on migration flows.
([45])The controls the authors employ only include mutual membership in the Schengen agreement.

Box II.1.2: **Specifying the gravity equation for migration**

The gravity equation migration estimated in this report is specified as follows:

$$\ln MIG_{ijt} = \beta_0 + \beta_1 \ln(POP_{it} \cdot POP_{jt}) + \beta_2 \ln(DIST_{ij}) + \beta_3 \ln\left(\frac{PCGDP_{jt}}{PCGDP_{it}}\right) + \beta_4 \ln\left(\frac{UR_{jt}}{UR_{it}}\right) + \beta_5 \ln(STOCK_{ij0}) + \beta_6(LANG_{ij}) + \beta_8(LINK_{ij}) + \beta_9(EU_{ij}) + \beta_{10}(EA_{ij}) + a_t + a_i + a_j + u_{ijt}$$

The dependent variable (defined in logarithm as all variables except for the dummies) is gross migration flow (MIG) from origin country i to destination country j in year t. Explanatory variables include standard 'gravity' controls like the product of both countries' populations (POP) and geographical distance ($DIST$). Some variables are included to control for factors that influence the expected individual gain from migration: the ratio of per-capita incomes ($PCGDP$) and unemployment rates (UR) of both countries. The relative unemployment rate is included in first lag to avoid potential endogeneity. Further variables control for the cost of migration, such as dummies for common language ($LANG$), and past colonial links ($LINK$) between both countries, as well as the stock of immigrants ($STOCK$) in destination country j from origin country i prior to the period of study. The effect of mutual membership of country pairs in the EU and the euro area (EA) is controlled for by suitably generated dummy variables. Time dummies (a_t) control for global trends and cycles.

Many unobserved factors may influence the propensity of a country's inhabitants to choose emigration and the relative attractiveness of destination countries. These factors are sometimes called 'multilateral resistance terms' in the literature. Origin and destination country dummies (a_i and a_j) are included to control for such time-invariant factors. Origin and destination country dummies also allow control for the possible problem of differing statistical methodologies used by different countries in the sample.

The log-log specification allows the estimated parameters to be interpreted as elasticities. While weaknesses and alternatives to the logarithmic specification have been discussed in the literature (see, e.g., Head and Mayer, 2013; Beine et al., 2013), it remains a standard way to estimate the gravity equation.

flows, with a view to investigate whether mobility has gained importance in recent years as adjustment channel.

1.4.2. Data

Gross bilateral migration flows are taken from the OECD International Migration Database. ([46]) The database includes information of annual gross migration flows from about 200 origin countries to 38 destination countries. Data for the years 1992-2011 are used. Data are scarce for earlier years and incomplete for 2012.

Control variables were collected from the World Bank World Development Indicators. 'Dyadic' control variables describing the geographic distance between country pairs as well as information about common language and colonial history were collected from the publicly available database of CEPII as documented by Mayer and Zignago (2011). Past bilateral migration stock, used as a control variable, is from the World Bank. For a description of these data, see Ozden et al. (2011).

1.4.3. Estimation results

Bilateral gross migration flows are estimated in the context of a gravity

([46]) OECD (2013, pp. 311-315). See Box 1 on data sources.

model. The dependent variable is gross migration flow from a given origin country to a given destination country. Explanatory variables include standard gravity controls, such as the product of populations of and distance between the origin and destination country; the expected gain from migration (proxied with per-capita GDP and unemployment rate in the destination country relative to that in the origin country); historical factors influencing the bilateral migration flows (common language, colonial history, as well as the magnitude of past migration between both countries, measured as the stock of migrants in 1990). A series of dummy variables is included to capture the interplay between the process of European integration and the economic context.([47]) First, dummy variables control for mutual membership in the EU and the euro area. Appropriate interaction terms allow testing whether the importance of relative unemployment rates has increased since the start of the EMU or during the crisis. More detail on the specifications is presented in Box II.1.2.

In the following, two sets of results are presented. The first is from regressions run over the full sample; after the introduction of control variables, it includes 163 origin countries and 38 destination countries. The specifications run on the full sample are able to simultaneously analyse the determinants of migration among EU countries, among countries not belonging to the EU and between pairs of countries of which only one is a member of the EU. They therefore allow exploring the effect of accession to the EU on migration flows to and from other EU Member States. The second set of results is from regressions run on a sample restricted to EU15 countries, which allows focussing on the determinants of migration among pre-enlargement EU Member States.

([47])A dummy variable is one that takes the value 0 or 1 to indicate the absence or presence of some categorical effect that may be expected to influence the outcome.

Table II.1.1: **Determinants of gross bilateral migration flows: Gravity equations on the full sample**

Dependent variable: Log gross migration flow	(1) No country effects	(2) Country effects	(3) Full specifi-cation
Log product of populations	0.491***	0.274*	0.244
	(0.005)	(0.164)	(0.163)
Log weighted distance	-0.514***	-0.669***	-0.668***
	(0.010)	(0.014)	(0.014)
Log relative GDP per capita in the destination country	0.061***	-0.002	-0.003
	(0.006)	(0.068)	(0.069)
Log relative unemployment rate in the destination country (lag)	-0.099***	-0.137***	-0.138***
	(0.011)	(0.022)	(0.022)
Log bilateral migrant stock in the destination country, 1990	0.358***	0.301***	0.302***
	(0.004)	(0.005)	(0.005)
Common language	0.779***	1.028***	1.027***
	(0.024)	(0.026)	(0.026)
Past colonial relationship	0.556***	0.615***	0.613***
	(0.041)	(0.041)	(0.041)
Both countries are EU members in given year	0.179***	0.248***	0.249***
	(0.035)	(0.034)	(0.034)
Both countries are EA members in given year	0.160***	0.020	-0.024
	(0.041)	(0.039)	(0.040)
Interaction term: Relative Unemp. * Post-2008 crisis			0.040*
			(0.024)
Interaction term: EMU * Post-2008 crisis			0.081
			(0.061)
Interaction term: EMU * Relative Unemp.			-0.179***
			(0.039)
Double interaction: EMU * Rel. Unemp. * Crisis			-0.115
			(0.080)
Constant	-15.950***	-9.472**	-8.673*
	(0.173)	(4.492)	(4.480)
Source country effects	no	yes	yes
Destination country effects	no	yes	yes
Year effects	yes	yes	yes
Observations	27,924	27,924	27,924
R-squared	0.721	0.823	0.823

Note: OLS estimations. Sample period: 1992-2011. After the introduction of control variables, the sample includes 163 origin countries and 38 destination countries. For a more detailed documentation of the time and country coverage, see Appendix. Asterisks indicate estimated coefficients that are statistically significant at the 1% (***), 5% (**), or 10% (*) level.
Source: Commission services, based on data from the OECD International Migration Database.

Table II.1.1 shows results obtained from the specifications run on the full sample. The table goes from a 'bare-bones' specification in column (1), through one including origin and destination country effects in column (2), to the full specification including interaction terms in column (3). The following observations can be made:

- The product of both countries' populations and their relative level of GDP per capita have a strongly significant effect on migration flows. The estimation suggests that if either the origin or the destination country's population increases by 1%, gross

bilateral migration increases by about half a percent. In a similar vein, if per-capita GDP in the destination country increases by 1% relative to the origin country, the gross bilateral migration flow increases by about 0.06%. When the equation is estimated with country effects, relative per-capita GDP and population lose explanatory power. This means that country dummy variables reflect country size and relative level of development on global migration flows.

- Other traditional control variables (distance, common language, past colonial relationship, initial bilateral migrant stock) have a strongly significant effect on bilateral migration in the expected direction. These effects are robust to the inclusion of country effects.

- The relative unemployment rate is estimated to affect migration significantly. If the unemployment rate of the destination country increases by 1% relative to the origin country, the bilateral migration flow to this country is estimated to decrease by about 0.14% in the specifications with country effects.

- Mutual EU membership is estimated to increase bilateral migration flows by about 25%, everything else being equal, in the specification with country effects.

- Finally, mutual euro area membership does not appear to affect migration by itself, but the estimated interaction terms indicate that it does influence migration flows (column 3). Mutual euro area membership intensifies migration toward countries with a relatively low unemployment rate, as suggested by the negative and significant estimated coefficient of the interaction term between the EMU dummy and the relative unemployment rate. This effect appears to have strengthened further in the crisis. This suggests that migration flows have contributed to the adjustment to asymmetric shocks more in the euro area countries than between other countries.

Table II.1.2: **Determinants of gross bilateral migration flows: Gravity equations of intra-EU15 mobility**

Dependent variable: Log gross migration flow	(1) Full sample (1992-2011)	(2) EMU period (1999-2011)	(3) Crisis period (2008-2011)
Log product of populations	1.350***	1.504***	-0.268
	(0.475)	(0.552)	(2.922)
Log weighted distance	-0.258***	-0.308***	-0.331***
	(0.042)	(0.045)	(0.068)
Log relative GDP per capita in the destination country	1.704***	1.308***	2.050**
	(0.260)	(0.387)	(1.035)
Log relative unemployment rate in the destination country (lag)	-0.143***	-0.209***	-0.197
	(0.040)	(0.048)	(0.124)
Log bilateral migrant stock in the destination country, 1990	0.407***	0.386***	0.350***
	(0.017)	(0.019)	(0.030)
Common language	0.511***	0.507***	0.604***
	(0.054)	(0.063)	(0.102)
Constant	-42.047***	-49.792***	8.303
	(13.927)	(16.874)	(103.897)
Source country effects	yes	yes	yes
Destination country effects	yes	yes	yes
Year effects	yes	yes	yes
Observations	2,217	1,751	550
R-squared	0.913	0.922	0.935

Note: OLS estimations. Asterisks indicate estimated coefficients that are statistically significant at the 1% (***), 5% (**), or 10% (*) level.
Source: Commission services, based on data from the OECD International Migration Database.

Table II.1.2 presents gravity equations of gross migration flows among the "old" Member States (EU15). Rather than using interaction terms, this exercise analyses the development of migration patterns by estimating the same relationship on three different sub-periods: the full period 1992-2011; the period following monetary unification (1999-2011); the post-crisis years (2008-2011). All specifications include origin and destination country effects as well as year effects. ([48]) The following observations can be made:

- Over the full sample period, population and relative per-capita GDP affect migration flows significantly among EU15 countries even in the presence of country effects. This indicates that there is a premium to "big-to-big" and "relatively-poor-to-rich" country

([48]) In the estimations for this restricted sample, variables controlling for past colonial relations and mutual euro area membership have been dropped for lack of variability.

migration among the "old" Member States.

- The effect of other control variables (distance, past migration and common language) is strongly significant, goes in the expected direction, and is robust to the period chosen.

- The relative unemployment rate is a significant determinant of migration flows among the EU15. Over the full sample period, the magnitude of the estimated coefficient is similar to that estimated on the global sample.

- In the post-EMU period, the effect of the relative unemployment rate is higher than over the full sample period. This indicates that post-EMU, the role of migration as a cyclical adjustment channel between Old Member States has increased.

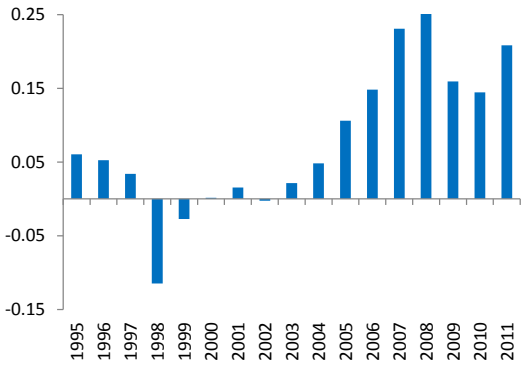
- Post-crisis, the effect of the relative unemployment rate is similarly elevated as over the post-EMU period but the coefficient is not estimated precisely enough to reach statistical significance (potentially because of the relatively low number of observations). The effect of relative per-capita GDP is estimated to be higher than over the longer sample periods, which may be related to the fact that the crisis affected the euro area 'periphery' more than the 'core'. Finally, the "big-to-big" country premium is estimated to have disappeared after 2008, while the effect of other control variables is similar to the magnitudes estimated over the whole sample period.

1.4.4. The time profile of migration among old EU member states

Synthetic information on the time profile of mobility among EU15 countries is summarised by the year effects estimated in the specification on the restricted sample. Year effects pick up changes in the mobility that are observed across the board and are not explained by other factors controlled for (e.g., convergence in GDP per capita; changing disparities in unemployment rates; changing country composition of the sample).

Graph II.1.14 presents the estimated year effects starting with 1995. The magnitude of the estimated year effects can be interpreted as a general increase or decrease of gross bilateral migration flows as compared to the baseline of 1992. A value of 0.15 in 2006 means, for example, that migration flows in that year were approximately 15% higher in general than in 1992 (after controlling for all factors included in the equation).

Graph II.1.14: **Time profile of intra-EU15 mobility: Estimated year effects**



Note: The graph shows the year effects estimated from regression (1) of Table II.1.2. The level zero is set by mobility flows in 1992.
Source: Commission services, based on data from the OECD International Migration Database.

The mobility among EU15 countries increased rapidly starting from 2003, and peaked in 2008 about 25% above the levels of the early 1990s (Graph II.1.14). After a drop in 2009 and 2010, mobility picked up in 2011. Despite these decreases, mobility in the EU15 remained overall at historically high levels throughout the crisis years.

1.4.5. Country-specific time profiles

The previous subsection has established that (i) migration flows are affected by the unemployment differential between countries; (ii) that this effect is stronger in the euro area; and (iii) may have increased in the euro area during the crisis.

This subsection presents a visual analysis of the unexplained component of inward and outward migration flows of EU countries. The unexplained component of inward or outward migration is the weighted average (respectively by country of destination or origin) of the residuals from the regressions explaining mobility flows. It represents the part of migration flow which is not explained by structural and cyclical control variables. It provides information about time-variant factors affecting the propensity to migrate beyond those captured by the above variables.

Conversely, the unexplained component of migration flows does not provide information on common trends in migration as these trends are already captured by the year dummies included in the estimated gravity equations. Also, the unexplained component of migration flows cannot be used to compare the absolute magnitude of migration flows across countries. Overall differences across countries are captured by the origin and destination country dummies and thus are part of the explained component.

The unexplained component of migration flows is calculated by countries of destination and origin. It is calculated as weighted average of the residuals from the regression on the whole sample (column (3) of Table II.1.1). ([49])

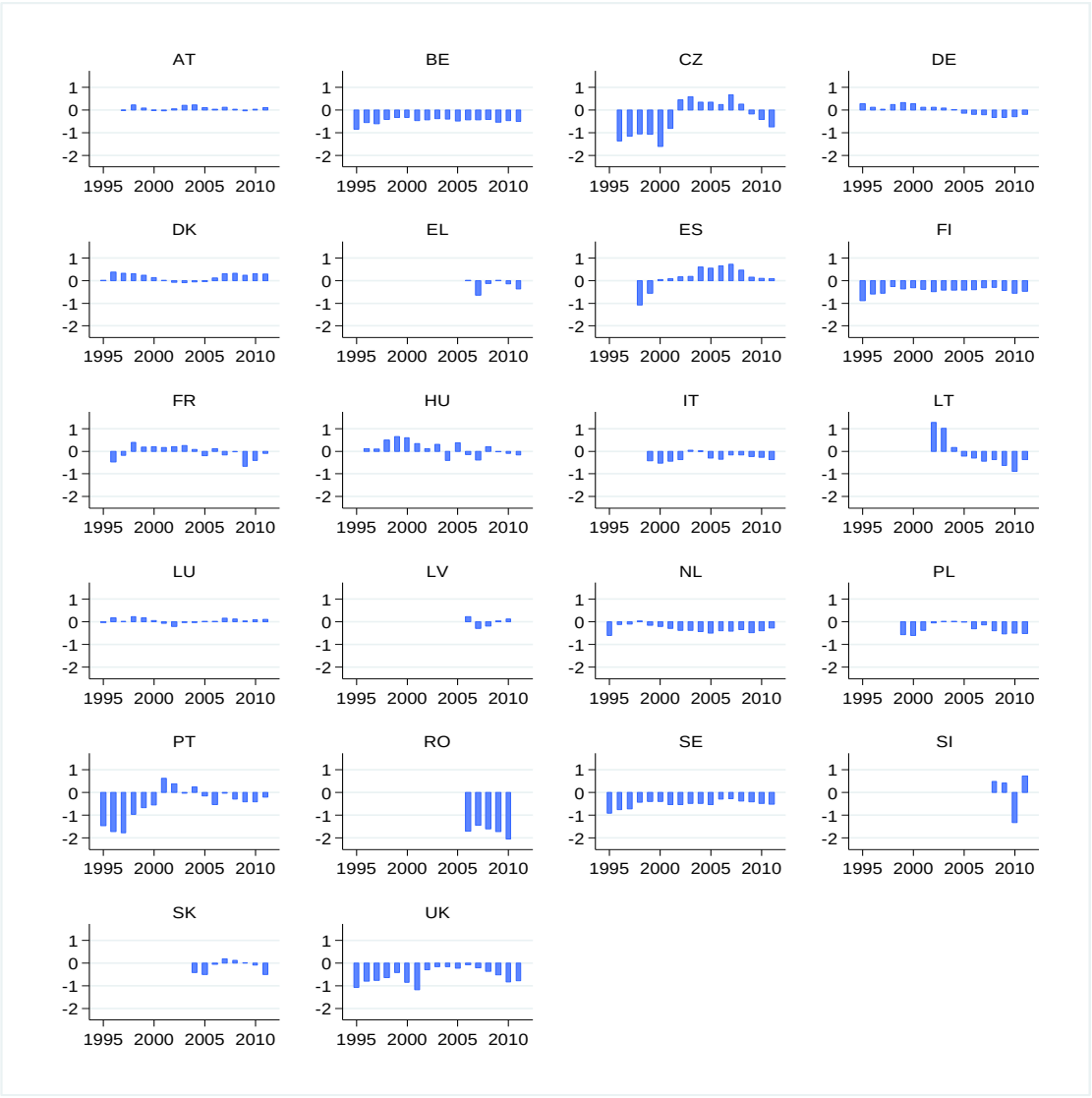
Since the gravity equation is specified in log-log terms, the unexplained component can be interpreted as follows: a value of 1 can be interpreted as implying that the actual migration flow was about double the prediction, while a value of (−1) can be interpreted as implying that the actual migration flow was about half the prediction.

Graph II.1.15 shows the unexplained component of mobility flows by destination country. Movements in the unexplained component of mobility inflows are largest in the Czech Republic, Lithuania, Portugal and Spain. In Spain, the unexplained component moves together with the cycle, suggesting that migration to this country was more pro-cyclical than in other countries. In the other three countries, the unexplained component appears to be largely pro-cyclical as well, but there appear to be idiosyncratic factors. Migration flows to the Czech Republic and Portugal were generally lower than predicted at the beginning of the sample period. Migration flows to Lithuania were higher than predicted in the first years observed in the early 2000s.

Also, there is some increase in 2010-2011 in the unexplained component of migration inflows into countries of the euro area core, i.e., Austria, France, Germany, Luxembourg and the Netherlands, while this is less clear in Belgium and Finland.

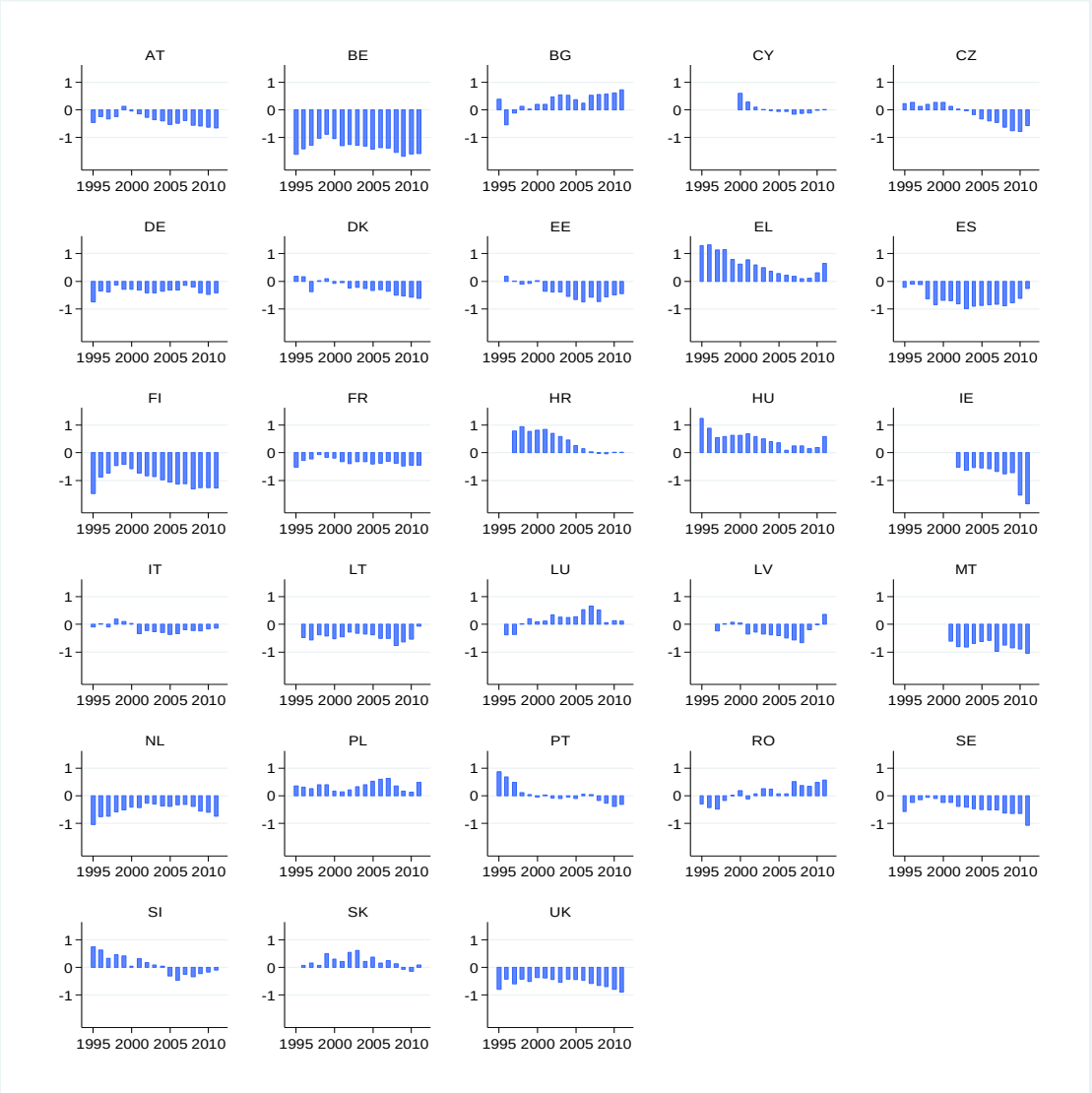
([49]) The weighting is done in proportion to the average magnitude of bilateral migration flows and to the number of observations in a given bilateral relation. The weighting ensures that the aggregate unexpected component of migration flows is not sensitive to large prediction errors in small bilateral migration flows. It is a consequence of the weighting that the unexplained component of migration flows by origin or destination country does not need to add up to zero over the sample period.

Graph II.1.15: **Unexplained mobility flows: weighted average by destination country (EU-28 countries in the sample)**



Note: The graph depicts the weighted average of estimated residuals by destination country, as obtained from regression (3) of Table II.1.1. Weights are time-invariant; they take into account the average migration flow and the number of observations for a given pair of origin and destination countries. The graph includes EU member states for which there is information in the database. Estonia and Ireland have been excluded for a low number of observations. For a documentation of the sample, see the Appendix.
Source: Commission services, based on data from the OECD International Migration Database.

Graph II.1.16: **Unexplained mobility flows: weighted average by origin country (EU-28)**



Note: The graph depicts the weighted average of estimated residuals by origin country, as obtained from regression (3) of Table II.1.1. Weights are time-invariant; they take into account the average migration flow and the number of observations for a given pair of origin and destination countries. For a documentation of the sample, see the Appendix.
Source: Commission services, based on data from the OECD International Migration Database.

Graph II.1.16 shows the unexplained component of mobility flows by country of origin. There are more countries with marked movements in the unexplained component of outward mobility than inward mobility. There are a number of distinct patterns across countries:

- A marked U-shaped pattern is observed for Greece and Spain and, to a lesser extent, Estonia, Latvia and Slovenia. This suggests that flows of outmigration are more pro-cyclical in these countries than in others. (For Spain, this could be confirmed also for immigration flows, but not for the other countries, potentially for lack of a sufficient number of observations).

- In contrast, a hump-shaped development of unexplained outward mobility can be observed in some euro area countries (Belgium, Finland, the Netherlands) and non-euro area countries (Sweden, the UK, and to a lesser extent, Denmark).

- There are different patterns observed across New Member States though the sample period: while the unexplained component of outward flows has been increasing for Bulgaria and Romania, it is decreasing for the Czech Republic and Croatia.

1.5. Cross-country labour mobility and adjustment: a general framework

The previous sections have focused on the main trends of labour mobility across EU countries, and on their determinants. This section aims instead to analyse the role of labour mobility as an adjustment mechanism to asymmetric labour demand shocks.

1.5.1. Plan of the analysis

In a first step, a number of stylised facts concerning labour market dynamics are presented, with a view to assess regularities in the co-movement of employment, the activity rate, the unemployment rate, and labour mobility. It is also assessed whether the dynamics of these variables in each country are closely linked to the dynamics observed for the whole EU. This in turn allows assessing whether labour demand shocks are mostly common or country specific.

Subsequently, the methodology of Blanchard and Katz (1992) is applied to investigate how labour mobility in a typical EU country responds to shocks. Compared with recent analyses (e.g., Dao et al, 2014, Beyer and Smets, 2014), the focus is on mobility across countries rather than regions. Such a focus permits a better identification of the role of labour mobility in response to national asymmetric shocks. Compared with previous studies taking a cross-country perspective, (e.g., l'Angevin, 2007a,b), the availability of longer time series make it possible to examine if the contribution of labour mobility to labour market adjustment for the typical country has changed over time, most notably after the 2008-2009 crisis. Moreover, the role of real wages could not be assessed in previous studies because of the lack of data on wages at regional level. Focusing on cross-country mobility allows exploring the response of real wages to labour demand shocks.

Annual data are used to estimate a VAR (Vector Auto Regression) model using the whole panel of available countries over the period 1970-2013. ([50]) The panel structure expands the sample size (and results in a gain in statistical degree of freedom) which allows the assessment of whether, on average, the response of labour mobility to shocks has changed over time, possibly as a result of evolving integration across EU Member States. Finally, the labour market adjustment mechanism is evaluated for selected individual Member States. Since the sample size becomes more limited when individual countries are analysed, this exercise is conducted on quarterly data.

1.5.2. Analytical approach and literature review

In a monetary union, asymmetric shocks are expected to initially cause differences in unemployment and activity rates, which are absorbed over time via the adjustment of real wages, and via geographical mobility. In a country hit by a positive labour demand shock, workers are initially drawn from the unemployment pool and more inactive workers start entering the labour force. Overtime, real wages grow and, if the shock persists, the labour force starts growing also thanks to the inflow of workers from other geographical locations. Similar dynamics play out in the opposite direction in case of a negative shock.

With limited data on labour mobility, the standard approach in the literature is to follow the methodology by Blanchard and Katz (1992). Blanchard and Katz (1992)

([50])VAR is an econometric model used to capture the linear interdependencies among a set of macroeconomic variables.

depart from the observation that variations in relative employment levels across US states persist over time, while relative unemployment and activity rates are stationary variables (i.e. shocks to these variables fade away after some time). The main idea is that if asymmetric shocks have permanent effect on employment but not on unemployment and activity rates, the change in employment levels must be absorbed by changes in the working age population. Assuming that labour demand shocks do not influence demographic trends, the response of relative population must reflect the response of labour mobility.

Note that the contribution of mobility is calculated as a residual: it is estimated as the change in employment that is not explained by changes in the activity rate and the unemployment rate. This implies that, as opposed to gravity equations which focus on bilateral mobility flows, this approach includes migration to and from third countries in its definition of adjustment through mobility.

Blanchard and Katz (1992) find that, in a typical US state, a 1% transitory negative labour demand shock raises the unemployment rate by 0.32 percentage points above the national average in the first year and lowers the activity rate by 0.17 percentage points. The effects on the unemployment and activity rates disappear after five to seven years; those on relative employment gradually build up, peaking at *minus* 2% after four years. This pattern implies a substantial role of inter-state mobility in the first years following the shock.

Subsequent analysis applied the same framework to other geographical areas. Table II.1.3 summarises empirical findings of these studies. In each line of the table it is reported how much of the initial labour demand shock is absorbed after 1 year by changes of the unemployment rate, the activity rate and labour mobility, as estimated by the various studies.

Table II.1.3: **Decomposition of the response of labour market variables after 1 year to an asymmetric labour demand shock**

	Unemployment	Participation	Mobility
Euro area (12 Member States 1973-2005) (1)	33	44	23
EU (51 regions 1975-87) (2)	21	74	4
EU (47 regions 1977-2011) (3)	30	40	31
EU (NUTS1 regions 1998-2009) (4)	16	60	24
United States (51 States 1978-1990) (5)	32	17	51
United States (51 States 1958-90) (2)	18	29	52
United States (51 States 1976-95) (6)	24	43	33
United States (51 States 1976-2005) (1)	22	34	44
United States (51 States 1977-2011) (3)	14	43	43
United States (51 States 1977-2009) (4)	22	24	54
Spain (1976-94) (7)	36	23	41
Italy (1969-95) (6)	23	56	22
Germany (1970-93) (6)	28	61	11
United Kingdom (1969-94) (6)	11	85	4
Canada (1976-96) (6)	46	43	11

Source: (1) L'Angevin (2007a,b); (2) Decressin and Fatás; (3) Beyer and Smets (2014); (4) Dao et al. (2014); (5) Blanchard and Katz (1992); (6) Obstfeld and Peri (1998); (7) Jimeno and Bentolila (1998).

Decressin and Fatás (1995) apply this framework to investigate regional labour mobility in the EU and compare the results to those obtained for the US states. Their sample covers the period 1975-1987 and comprises regions for France, Germany, Italy, the UK and Spain; Belgium, Denmark, Ireland, Greece, the Netherlands and Portugal are taken as single regions. They find that the labour market adjustment in the EU is characterised by a muted response of labour mobility as compared with the US, while the response of activity rates appear stronger. In Europe, it takes about four years for the effect on the activity rate and unemployment rate to disappear. In the US, net inter-state mobility accounts within the first year for 52% of the change in the relative employment and after three years for 70%. In Europe it is only after the third year that mobility accounts for a proportion similar to that reached in the US after only one year.

Bentolila and Jimeno (1998) analyse the response of the typical Spanish region to a labour demand shock and find that for the period 1976-1994 unemployment bears a significant fraction of the adjustment, accounting for about one third of the change in employment after three years.

Dao et al. (2014) reassess the adjustment of the US states extending the Blanchard and Katz sample to 20 additional years. Compared to Blanchard and Katz, they find that the role of

participation and unemployment has increased, while the contribution of inter-state mobility has decreased. Applying the methodology to European regions, they find that the short-term response of labour mobility has increased overtime.

Beyer and Smets (2014) reconsider the comparison between the US and European labour market adjustments made by Decressin and Fatás. In particular, they assess separately the adjustment to region specific shocks, to common shocks with asymmetric effects and to national shocks. They find that a significant difference between the EU and the US can be found only in the response of mobility to common shocks with asymmetric effects. In contrast, the mobility response to region specific shocks plays a relatively minor role both for the EU and the US, and appears to fall over time. Finally, inter-country mobility in response to country-specific shocks is less important than the inter-regional mobility in response to region-specific shocks.

Most studies on the EU focus on regional labour market adjustment. Only few have looked at the role of labour mobility for national labour market dynamics. In a study on the euro area covering the period 1970-2005, L'Angevin (2007b) finds that inter-state mobility plays a minor role in euro area countries and that, compared to the US, it takes more time for unemployment and participation to return to a long-run equilibrium after the shock. ([51]) Yet, restricting the sample to the period 1990-2005, the euro area labour market responds similarly to that of the US, with a larger contribution of labour mobility in the medium-term.

([51])The effect of an asymmetric shock fades away after 7-8 years in the US and only after 15- 20 years in the euro area. However, after 1990 the persistence of national unemployment rates has diminished in the euro area.

1.5.3. Data and empirical implementation

Data

The estimation of the average response to asymmetric labour demand shocks is conducted in an annual panel database that includes the 15 members of the EU before enlargement. Data are taken from the Annual Macro-economic database of DG ECFIN (AMECO). Employment and compensation per employee are from National Accounts, unemployment and the activity rate from the Labour Force Survey, compensation per employee is deflated with the GDP deflator.

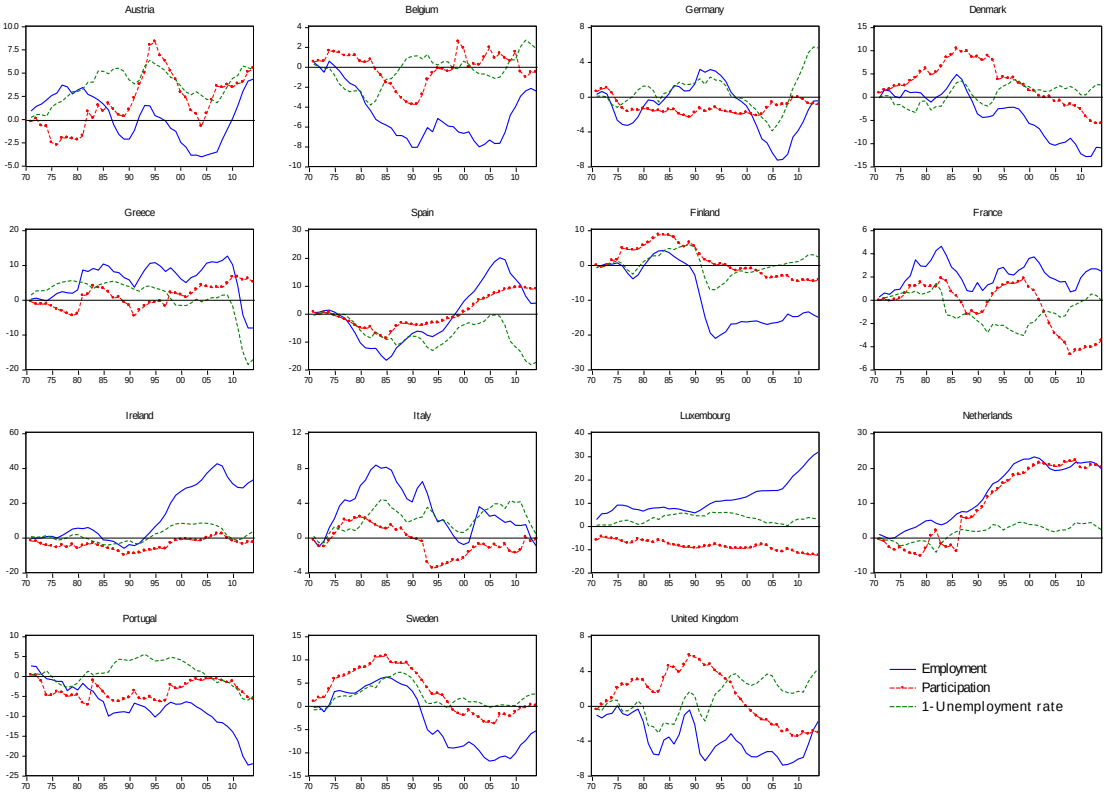
The analysis of the pooled data makes use of a panel VAR framework that imposes the same dynamics on all countries. This restriction is removed when estimating the role of labour mobility in the adjustment of selected individual countries. Since the sample size becomes limited when single countries are analysed, the single-country analysis is based on quarterly data. Countries with the longest available data are analysed (Germany, Spain, France, Ireland, Italy and the UK) over the sample period 1998Q1-2013Q4.

Labour market adjustment: some stylised facts

Before exploring the contribution of labour mobility to labour market adjustment, it is useful to review some stylised facts on the dynamics of employment, unemployment and labour market participation across EU countries.

Graph II.1.17 depicts, for all countries in the sample, the growth rate of the level of employment, the activity rate and the employment rate (defined in this methodology as 1 *minus* the unemployment rate), relative to the EU average, since early 1970s. Defining the variables as deviations from EU average allows a focus on asymmetric shocks. Changes in labour mobility are derived as a residual from changes in employment

Graph II.1.17: **Labour market dynamics in selected European countries relative to the EU average (cumulative growth since 1970)**



Note: The chart shows growth rates of national variables relative to EU15 growth rates. To focus on business cycle developments, each relative variable is expressed as a deviation from its mean over the whole period.
Source: European Commission, DG ECFIN AMECO database.

that cannot be attributed to changes in unemployment or the activity rate. In Graph II.1.17, changes in mobility can be gauged by subtracting both activity and employment rate changes from employment growth along the vertical axis. ([52])

The visual inspection of the data reveals diversity across countries, but few stylised facts stand out.

- Relative employment growth and relative changes in the activity and unemployment rates tend to oscillate around constant averages. This is consistent with the assumption of the Blanchard and Katz model (see Box II.1.3).

- For some countries (e.g. Austria, Germany and Ireland until the crisis), national developments diverge only temporarily from the EU average, which is suggestive of the importance of common shocks.

- The recessions that followed the two oil shocks of the early 70s had only a temporary effect on employment growth in several countries. This contrasts markedly with the persistent effects of the financial recession that hit Sweden and Finland in the early 1990s or with the effects of the 2008 financial crisis in Greece, Portugal and Spain. For these countries, shocks to employment growth had more persistent effects on unemployment,

([52]) Since the activity rate and the unemployment rate expressed as $a = L/P$ and $u = 1 - E/L$ respectively, where a and u are the activity rate and the unemployment rate, E is employment, L the labour force, and P is the working age population, then, denoting growth rates by a dot, it is easily shown that $\dot{E} - \dot{a} - 1 \dot{-} u = \dot{E} - (\dot{L} - \dot{P}) - (\dot{E} - \dot{L}) = \dot{P}$.

Table II.1.4: **Common labour market disturbances: 1970-2013**

	Employment growth			Unemployment rate			Participation rate		
	β- coefficient	t-statistic	R2 adj	β- coefficient	t-statistic	R2 adj	β- coefficient	t-statistic	R2 adj
Austria	0.49	4.9	0.34	0.41	11.0	0.73	1.29	13.9	0.82
Belgium	0.76	7.3	0.55	0.81	10.4	0.71	0.98	19.5	0.90
Germany	0.74	5.5	0.41	0.68	6.6	0.50	1.10	33.9	0.96
Denmark	0.59	3.3	0.19	0.61	6.7	0.50	0.26	2.3	0.09
Greece	0.57	1.6	0.04	1.62	6.1	0.46	1.34	19.5	0.90
Spain	2.43	9.5	0.68	2.43	16.9	0.87	1.95	26.2	0.94
Finland	1.40	4.9	0.35	0.98	5.7	0.41	0.20	2.1	0.07
France	0.86	9.4	0.67	1.24	21.3	0.91	0.60	14.2	0.82
Ireland	1.89	5.1	0.37	0.93	4.3	0.28	1.35	15.9	0.85
Italy	0.80	5.1	0.37	0.68	11.1	0.74	0.73	16.0	0.89
Luxembourg	0.37	2.5	0.11	0.50	7.1	0.53	0.53	10.5	0.72
Netherlands	0.85	5.7	0.43	0.46	4.8	0.34	3.06	19.4	0.90
Portugal	1.20	5.5	0.41	0.80	4.9	0.34	1.27	19.2	0.86
Sweden	1.00	5.1	0.37	0.75	5.9	0.43	0.17	1.4	0.02
United Kingdom	0.96	5.5	0.41	0.77	7.5	0.56	0.50	7.4	0.55
Average	0.99		0.38	0.91		0.55	1.02		0.69
OLS estimate	0.99	16.8	0.30	0.91	16.2	0.28	1.01	11.8	0.17
Average D&F (1995)			0.20			0.89			0.27

Note: The coefficients are from regressions of each variable on the relative EU-15 aggregate; they represent the response of a country-specific variable to the EU aggregate. Estimation over the sample period 1970-2013. D&F stands for Decressin and Fatàs (1995).
Source: Commission services, based on AMECO database of DG ECFIN.

consistent with the evidence presented by Calvo et al. (2012) that labour market adjustment is sluggish particularly in recessions induced by disruptions of the credit channel. ([53])

- Fluctuations in employment growth relative to the EU average are matched by changes in either the activity or the unemployment rate or both. For example, fluctuations in employment growth were accompanied by changes in relative unemployment in Germany, Ireland, Italy, and Finland, while in the Netherlands, France and Sweden, relative employment growth moves together with the relative activity rate.

- The difference between employment growth and the sum of the growth of activity and employment rates matches the changes in working-age population which mirrors labour mobility flows. A tendency towards greater inward mobility is visible in Spain, Ireland, Luxemburg, and the Netherlands; outward mobility is observed in Finland, Portugal, and Sweden. A sustained inflow of workers characterised the increase in the Spanish and Irish employment before the 2008 crisis. The crisis reversed only partly this trend, with the negative labour demand shock leading to huge job destruction and a limited decline in the growth of the working age population. This pattern contrasts with that of Finland following the recession of the early 1990s, when a strong increase in unemployment was accompanied by a persistent and sizeable decline in the activity rate.

The extent to which labour market disturbances are common across the EU or asymmetric can be inferred from Table II.1.4. Following standard practice in the literature, country-level variations in the variables are regressed on developments for the EU15 aggregate. The β coefficients indicate how much of the change in the EU aggregate is transferred on national variables within the same year, while the R^2 measures the strength of the relationship between national and aggregate variables. A few facts are worth mentioning.

- On average, 40% of the fluctuations in national employment growth are explained by EU15 developments, which is consistent with findings by L'Angevin (2007a,b) over the 1973-2005 period. This suggests that

([53]) Calvo et al. (2012) showed that recoveries that follow deep recessions are jobless or wage-less depending on the pattern of inflation during the recession episodes.

common shocks in the EU are more relevant at the country than at the regional level, but less relevant than in the case of US states. ([54])

- Employment growth is highly correlated with EU-level developments for the majority of countries; asymmetric shocks seem to prevail in Austria, Denmark, Greece and Luxembourg.

- Country-level unemployment rates are in general generally more strongly correlated with the EU aggregate than in the case of employment growth. The same is true for activity rates, with the notable exceptions of Denmark, Finland and Sweden.

Analytical framework

Following Blanchard and Katz (1992), a vector auto regression (VAR) with two lags has been estimated for the following variables: the change in the logarithm of national employment, the logarithm of the activity rate and the logarithm of the employment rate (defined as 1 *minus* the unemployment rate).

All variables are relative to the respective EU means. Box II.1.3 describes the methodology in details. VARs are standard tools for examining the dynamic interrelationships between variables. With a VAR each variable is regressed on its lags and the lagged values of the other variables. Each estimated equation can be used to simulate the response over time of the given dependent variable to shocks in other variables.

- The identification of the shocks is based on the assumption that unexplained changes in employment growth correspond to country-specific labour demand shocks. These shocks are assumed to influence within the year relative unemployment and activity rates, with a delayed feedback on employment growth. ([55])

- In a different specification, real wages are also included in the analysis, to gain insight on the role of relative wages in rebalancing Member States' labour markets. In the identification of the shocks, real wages are assumed to respond contemporaneously to labour demand shocks and to affect contemporaneously the labour supply through changes in the employment or in the activity rate. ([56])

([54]) The 0.4 regression coefficient is lower than the one found for the US (0.6) by Blanchard and Katz (1992), but higher than what found by Decressin and Fatás (1995) for regional data (0.2)..

([55]) Shocks are identified with Choleski decomposition of the variance-covariance matrix of reduced form residuals with the order: employment growth, employment rate, activity rate.

([56]) The identification strategy orders the variables in a way that real wages come after employment growth but before the other variables. The log of relative real wages are included in the VAR as first differences (i.e. they are assumed to be non-stationary). Panel unit roots tests confirm their non-stationarity.

Box II.1.3: **The VAR framework used to analyse the response of labour mobility to labour demand shocks:**

Blanchard and Katz's (1992) provide the standard framework to assess labour market dynamics. Each country specialises in the production of a particular good; production factors are mobile across states. The relative labour demand n depends on relative product demand z and relative wages w

$$w_{i,t} = -dn_{i,t} + z_{i,t}$$

All variables are relative to the aggregate weighted average. The relative labour demand depends on relative wages and country specific characteristics x_d that affects firms' locational decisions and do not change over time (i.e. are a source of permanent differences in employment levels)

$$z_{i,t+1} - z_{i,t} = -aw_{i,t} + x_{di} + \varepsilon^d_{i,t+1}$$

$\varepsilon^d_{i,t}$ is a country specific labour demand shock. Changes in the labour supply are driven by the relative wage differential, local labour market conditions (the unemployment rate u) and other country specific characteristics x_s that affects workers' locational preferences

$$n^s_{i,t+1} - n^s_{i,t} = bw_{i,t} - gu_{i,t} + x_{si} + \varepsilon^s_{i,t+1}$$

$\varepsilon^s_{i,t}$ is a country specific labour supply shock. The relationship between wages and unemployment is

$$w_{i,t} = -cu_{i,t}$$

The model is closed with the unemployment defined as the difference between labour supply and labour demand.

$$u_{i,t} = n^s_{i,t} - n_{i,t}$$

In the long run, relative employment growth and relative unemployment are determined by the following equations

$$\Delta n_i = \frac{cax_{si} + (cb + g)x_{di}}{ca + d(cb + g)}$$

$$u_i = -\frac{w_i}{c} = \frac{dx_{si} - x_{di}}{ca + d(cb + g)}$$

Employment growth is determined by country specific factors x_{di} and x_{si}. In countries more attractive to companies, the inflow of firms leads to higher wages and lower unemployment, which stimulates the arrival of workers that allow for employment growth to be permanently higher. In countries more attractive to individuals, the inflow of workers pushes wages down and unemployment up. Labour and firm mobility ensures that the effect of labour demand shocks on relative wages, unemployment and participation rates are transitory.

A VAR is estimated to investigate the response of employment, unemployment and participation rate to an asymmetric labour demand shock, i.e. all variables are expressed as deviations from the respective national means. For any variable, the following decomposition holds $y_{it} - y_t = (y_{it} - \beta y_t) + (\beta - 1)y_t$. The first component represents the asymmetric shock while the second common shocks with asymmetric effects. Therefore, the focus of the analysis is on country specific shocks and common shocks with asymmetric effects.

(Continued on the next page)

Box (continued)

The fact that asymmetric shocks have permanent effect on employment levels but not on unemployment and participation rates has two consequences. First, the change in employment levels must occur through labour mobility. Second, the VAR should be estimated with the relative employment in first differences and the employment rate (defined as 1–unemployment rate) and the activity rate in levels.

The following VAR with two lags has been estimated

$$z_{it} = A + A_1(L)z_{it-1} + f_i + \varepsilon_t$$

z_{it} is the following vector $(\Delta n_{it}, le_{it}, lp_{it})$; Δn_{it} is the first difference of the logarithm of employment in country *i* minus the logarithm of aggregate employment in the EU; le_{it} is the logarithm of the employment rate (*1- unemployment rate*) in country *i* minus the logarithm of the employment rate (*1- unemployment rate*) in the EU; lp_{it} is the logarithm of the participation rate in country *i* minus the logarithm of the participation rate in the EU.

A key identifying hypothesis of Blanchard and Katz (1992) framework is that innovations to the employment growth equation are exogenous labour demand shocks. This is a reasonable hypothesis when the correlation between unemployment rates and employment growth is negative, while this correlation is positive if growth derives mostly from labour supply. A panel regression of unemployment rate on employment growth gives a significant slope of -0.56, implying that the hypothesis that innovations to employment growth mostly represent demand shocks is valid also for the EU sample.

The hypothesis that innovations to the employment growth represent labour demand shocks is implemented through orthogonalised shocks, i.e. uncorrelated shocks. Since the variance covariance matrix of the estimated errors ε_t is unlikely to be diagonal (i.e. errors in the equation are correlated), the residuals of the equations have to be decomposed in such a way that they become orthogonal. The Choleski decomposition represents the standard way to do this. In practice, it consists in ordering the variables in the VAR so that shocks to the variables that comes earlier affect the following variables contemporaneously, while those that came after affect the previous variables only with a lag. Thus, it this assumed that labour demand shocks affect the unemployment rate and the participation rate contemporaneously. Supply side shocks effects are assumed to operate through uncorrelated shocks to the employment rate or the participation rate

Another identifying assumption is that country-specific characteristics create constant differences across countries that can be modelled as fixed effects f_i. Since the fixed effects are correlated with the repressors through the lagged dependent variables, fixed effects are eliminated expressing variables as deviation from their country specific means.

The availability of data on wages at the national level allows to explore how much of a labour demand shock is absorbed by changes in relative real wages. The inclusion of wages allows for a better identification of the labour demand shock, where their response should be positive, from labour supply shock, where their response should be negative.

1.5.4. Adjustment to asymmetric labour demand shocks

Evidence from panel VAR analysis

Graph II.1.18 shows the responses of employment, unemployment and the activity rate to a one- standard-deviation positive labour demand shock for the whole sample (top panel) and for the pre-crisis period (bottom panel). ([57]) Results are shown separately in the parsimonious VAR specification with no real wages (left panels) and for the specification including a wage equation (right panels).

The results suggest the following:

- As expected, labour demand shocks result mostly in a variation of unemployment and activity rates on impact. These effects dissipate very slowly over time. In contrast, the effect on mobility and real wages is smaller on impact and builds up gradually.

- Over the period 1970-2013, the average size of the labour demand shocks identified is about 1.1%. The effect on employment is persistent and reaches a maximum after about 4 years, before falling to a value permanently higher than the initial level. Within one year, the unemployment rate falls and the activity rate rises respectively by about 0.5 and 0.3 percentage points above the EU average. The effect of the shock on the unemployment and activity rate is very persistent and lasts beyond 5 years.

- Labour mobility increases by 0.3% the first year and peaks after about 10 years. Thus, in the first year, the unemployment and the activity rates and labour mobility absorb respectively 4%, 32% and 25% of the initial labour demand shock. The proportion of the initial demand shock absorbed by changes in the population rises over time.

All in all, in analogy with previous studies, results indicate that, over the medium term, the large majority of asymmetric demand shocks are absorbed via an adjustment in relative activity rates and mobility, the former being more responsive in the first years after the shock, while the latter becoming predominant after some years.

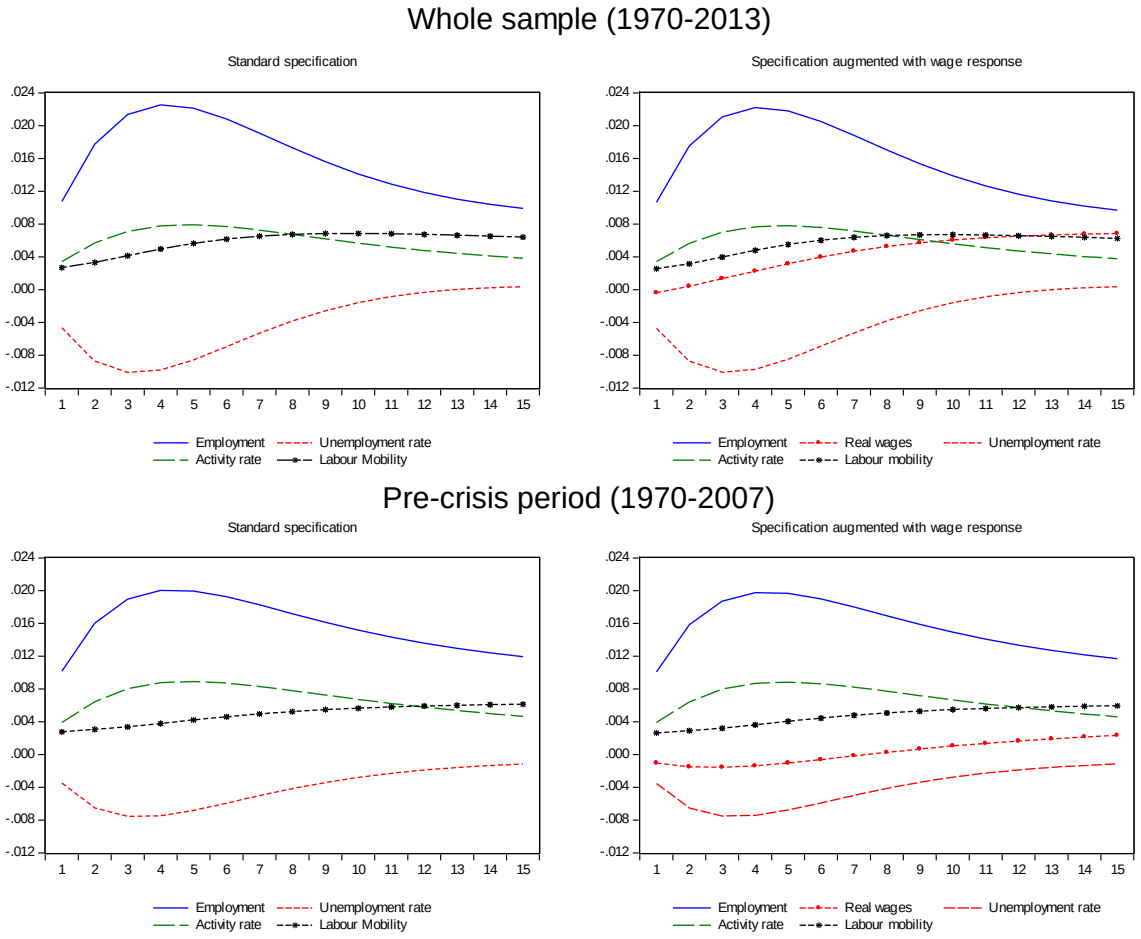
Over the pre-crisis sample (1970-2007), the average shock is estimated to be about equally sized but more persistent. In response to the shock, within the first year the unemployment rate declines by 0.3 percentage points and the activity rate increases by 0.4 percentage points. Within the first year the unemployment rate and the activity rate absorb about 34% and 38% of the labour demand shock. ([58]) Compared to the whole sample, the response of unemployment is weaker and more persistent; in contrast, the response of the activity rate larger and more persistent. A key difference across the two periods is found in the response of labour mobility, which appears less responsive to the shock in the pre-crisis period. In the whole sample, the response is about 5% after 5 years, while it is below 4% in the pre-crisis sample.

In the long-term, the increase of the labour supply through higher activity rate and greater labour mobility accounts for respectively 40% and 60% of the overall increase in employment. The figures for the pre-crisis period are 40% and 50%. It also emerges that, while for the whole sample in less than 8 years mobility

([57]) The response to a negative shock is symmetric. For presentational purposes, confidence intervals are not shown. The responses of the employment rate and the activity rate are significant at the 5% for about 10 years while the response of the employment is always significant.

([58]) The response of the unemployment rate up to 4 years after the shock stays within the standard errors computed over the whole period; after the fourth year, the dynamics of the unemployment rate does not differ over the two samples. In contrast, the response of the activity rate is always within the standard errors computed for the whole period.

Graph II.1.18: **Responses to a country specific positive labour demand shock**



Note: The horizontal axis represents years after the shock. The vertical axis represents log points. Mobility is defined as the change in employment not explained by changes in the employment rate (defined as 1 minus unemployment rate) or the activity rate.
Source: Commission services.

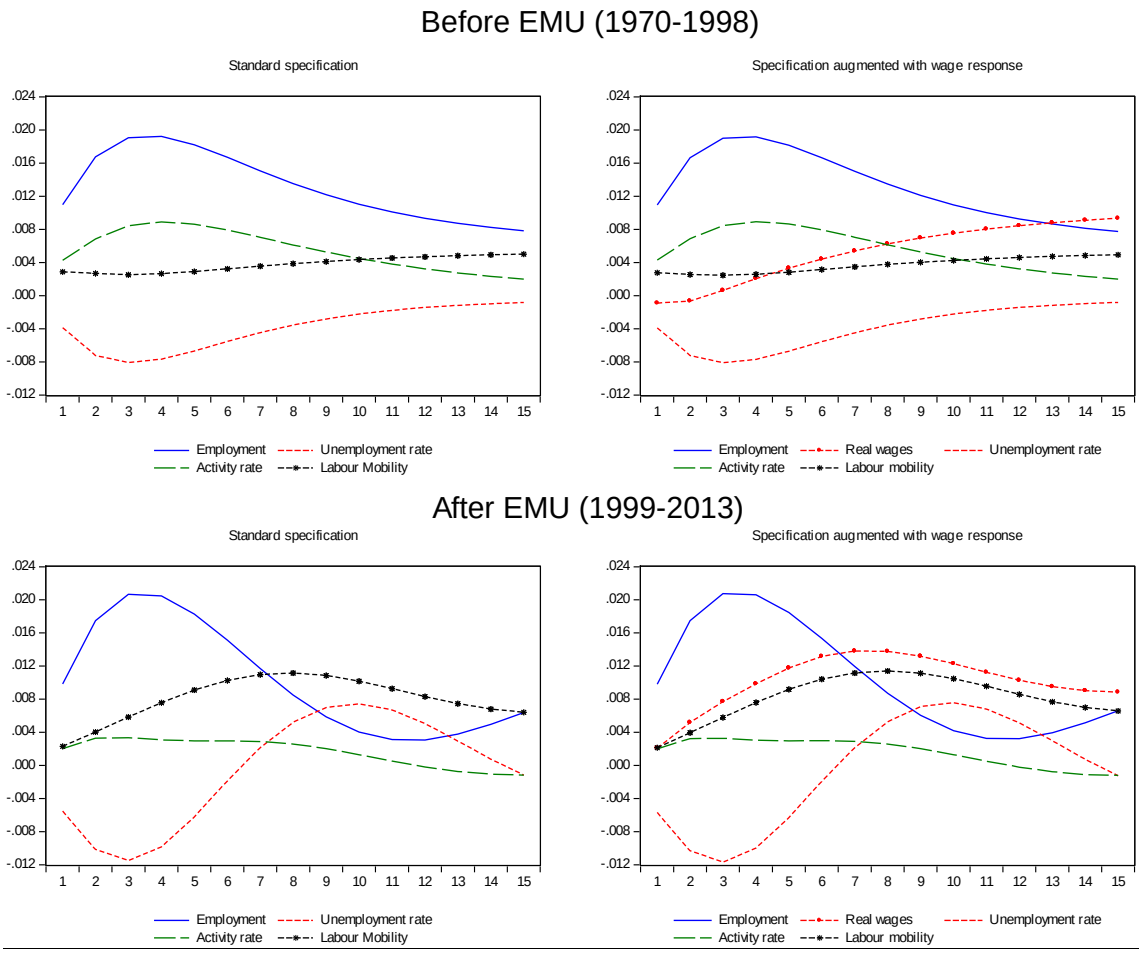
becomes the prominent form of adjustment, for the pre-crisis period it takes more than 11 years for mobility to overtake activity rates as the most relevant adjustment channel.

The evidence suggests that since the start of the 2008 crisis, mobility has played a more important role in the adjustment of labour markets than in the past; in contrast, the adjustment of unemployment and activity rates was comparatively short-lived. This is consistent with the observation that activity rates were resilient in the EU during since 2008, while the so-called discouraged-worker effect appears to have been weaker than in previous downturns. ([59])

These findings remain largely unchanged when real wages are included in the analysis. For the whole sample, relative real wages gradually increase in response to the positive labour demand shock and stabilise after about 10 years, broadly in parallel with the stabilisation of unemployment. In response to a 1% shock, relative wages change by about 0.5% after 10 years. Including wages in the model does not appear to matter greatly for the adjustment of the relative unemployment rate, consistent with the findings of Blanchard and Katz (1992) for

([59])These findings are consistent with those by Jauer et al (2014).

Graph II.1.19: **Responses to a country specific positive labour demand shock**



Note: The horizontal axis represents years after the shock. The vertical axis represents log points. Mobility is defined as the change in employment not explained by changes in the employment rate (defined as 1 minus unemployment rate) or the activity rate.
Source: Commission services.

the US states and Bayoumi et al (2006) for Canadian Provinces. ([60])

When restricting the sample to the pre-crisis period, the response of real wages appears considerably more muted. Thus, since 2008 relative wages have become more reactive to country specific cyclical conditions.

The responses to an asymmetric labour demand shock have also been computed for a different sample split: a pre-EMU and EMU period. Graph II.1.19 shows that the labour market adjustment has changed during the EMU period in a number of respects.

First, despite the fact that the estimated average labour demand shock is about equally sized over the two periods (1.1% in the first period and 0.98% in the second), the response of unemployment is quicker and less persistent in the EMU period. ([61]) Second, the activity rate exhibits a more muted and short-lived

([60])These findings are robust to a specification where wages are an exogenous variable. The results are also robust to a different identification scheme where wages respond contemporaneously to labour demand and labour supply shocks but affect the unemployment and the activity rates only with a lag. Finally, the results do not change significantly for a specification where relative wages are stationary.

([61])This may reflect the persistency of the labour demand shock itself which is lower in the post-EMU period.

reaction to the shock. Third, labour mobility appears to respond more quickly during the EMU period, absorbing a bigger fraction of the shock than the activity rate at any lag. ([62]) A possible explanation for this finding could be linked to the fact that activity rates in EU countries have been driven to larger extent by structural factors, including linked to reforms and policies facilitating labour market participation by females and the elderly, and less by cyclical factors. Moreover, the more rapid response of the working age population may reflect more the effect of enlargement than a migration of national citizens. Finally, real wages in the EMU period seem to be more reactive to country specific labour demand shocks. Before the EMU, the response of real wages to the shock is initially muted and becomes statistically significant after 5 years. In the post-EMU period, wages are significantly different from the pre-shock level after the second year. ([63])

Table II.1.5 provides a measurement of the contribution of an asymmetric labour demand shock to the cyclical fluctuations of each variable. For example, 37% of the fluctuations in the activity rate are attributed at the 5 year horizon to a labour demand shock. The decomposition of unemployment is not reported because, trivially, labour demand shocks explain at all horizons the largest proportion of unemployment fluctuations.

Before EMU, labour demand shocks account for a sizeable proportion of the variance of the activity rate, while these shocks are less relevant for wages or labour mobility. After monetary unification, there is a considerable change in the relative importance of labour demand shocks. Within one year, they still remain more important for the activity rate than for labour mobility or real wage growth; however, over the medium- to the long-run, labour demand shocks become relatively more important for the variance of labour mobility. These results underscore the increased role of wages and mobility as adjustment mechanism to asymmetric labour demand shocks.

Table II.1.5: **Variance decomposition: percentage of the variance of each variable explained by a country specific labour demand shock**

	Before EMU			After EMU		
Years after the shock	Growth of relative real wages	Activity rate	Labour mobility	Growth of relative real wages	Activity rate	Labour mobility
1	0.3	12.6	6.0	1.1	8.4	7.6
3	0.5	27.7	6.0	5.2	15.2	18.9
5	0.9	36.9	6.0	5.7	18.3	21.1
10	1.2	44.0	6.1	5.8	19.8	21.6
15	1.3	45.2	6.2	5.8	19.8	21.6

Note: FEVDs are computed estimating a VAR on relative employment growth, relative growth of real wages, relative change in the working age population and relative activity rate with 4 lags over the period 1970-2014.
Source: Commission services.

Evidence for selected country-specific VAR analysis

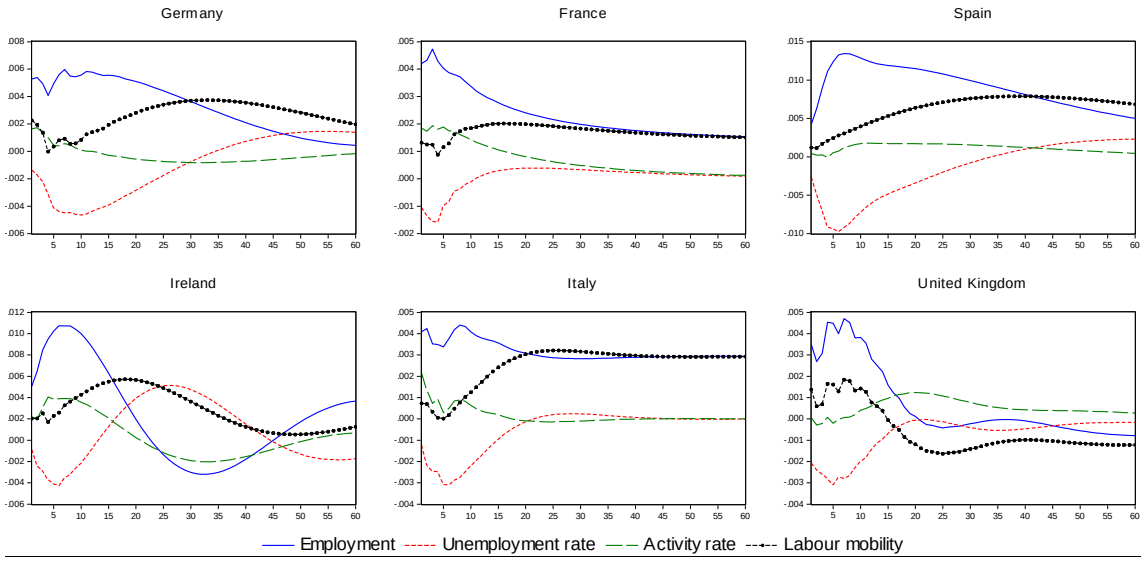
The response to an asymmetric labour demand shock has been simulated for selected member states. Quarterly data are used; employment growth is computed quarter on quarter. For each country a VAR with 4 lags has been estimated over the period 1998Q2-2013Q4.

Graph II.1.20 suggests that results are qualitatively similar to those obtained for the representative EU member states with panel VAR analysis. A number of interesting findings stand out concerning differences in labour market responses across countries. Labour demand shocks appear more persistent in continental European countries than in the UK or Ireland. The response of labour mobility is faster and more short-lived in countries such as Ireland and the United Kingdom where mobility flows are quite high. Conversely, it is more persistent in continental countries (e.g. France and Italy). Finally, labour mobility accounts

([62]) This is consistent with the results obtained by L'Angevin (2007a,b) comparing the 1990-2005 period with that over the 1970-2005 period. Results are robust to the exclusion from the sample of Denmark, Sweden and the UK.

([63]) This finding is influenced substantially by change of relative wages over 2012-2013; in fact, the dynamic adjustment of real wages is closer when the response is computed for the 1999-2011 period is closer to that of the pre- than to that of the post-EMU period.

Graph II.1.20: **Responses to a country specific positive labour demand shock for selected EU member states.**



Note: The Impulse response functions are based on estimates of VARs with 4 lags for each country over the period 1998Q2-2013Q4. The horizontal axis represents quarters after the shock. The vertical axis represents log points. Mobility is defined as the change in employment not explained by changes in the employment rate (defined as 1 minus unemployment rate) or the activity rate.
Source: Commission services.

for a large share of shocks in Spain and Ireland, which is consistent with the evidence of the post-EMU period obtained on annual data.

1.6. Conclusions

Cross-country mobility flows in the EU are still much lower than those recorded in other highly integrated economic areas, notably the United States, and well below mobility within countries. The population of migrants from within the EU is also generally much lower than the population of migrants from outside the EU. Nevertheless, an upward trend in mobility is visible in the EU, not only as a result of the enlargement.

The analysis of the determinants of bilateral migration flows by means of gravity equations shows that migration flows are affected by the unemployment rate differential between the origin and destination country, besides traditional variables like the distance between countries, existence of a common language, colonial history and the extent of past migration. EU membership is found to increase mutual migration flows positively (by about 25%). Euro area membership does not seem to increase mobility *per se*, but it is estimated to make mobility more sensitive to unemployment differentials. Evidence from gravity equations also reveals that labour mobility flows among the fifteen countries that were EU members before 2004 have increased since the mid-2000s on top of what is explained on the basis of the evolution of fundamentals. All in all, the evidence suggests that increased mobility flows within the EU are not only due to the enlargement or growing heterogeneity of EU countries, but also linked to a gradual deepening of the extent of labour market integration.

The analysis of the dynamic response of mobility flows to asymmetric shocks in the vein of Blanchard and Katz (1992) confirms the findings of the literature that in Europe unemployment and labour market participation absorb the largest fraction of asymmetric labour demand shocks in the short- to medium-term. Over the period 1970-2013, about one quarter of asymmetric labour demand shocks are absorbed by labour mobility within 1 year, while about 50% of the shock is absorbed after 5 years, an

estimate which is in line with that obtained in previous studies. In line with L'Angevin (2007a,b) and Dao et al (2014), the paper shows that the importance of mobility as an adjustment mechanism has increased in the EU. The response of real wages to demand shocks also appear to have strengthened. Beyer and Smets (2014) found that the role of labour mobility as adjustment mechanism for the EU regions has fallen over the period 1994-2011; their analysis is however not in contradiction with those of this chapter, which focuses on mobility across countries and not regions. The difference suggests that mobility adjustment within the EU are triggered more by country than by region specific shocks. Overall, the findings of this chapter suggest that, although the magnitude of mobility flows in the EU remains below what could be expected in a fully integrated monetary union, the responsiveness of labour mobility to asymmetric demand shocks has increased over time. Further analysis is needed to investigate the reasons underlying such increased responsiveness of mobility flows, notably the relative roles of enlargement (see, e.g., Jauer et al., 2014) and the loss of the exchange rate and an independent monetary policy as shock absorbers. The analysis also suggests that, in the coming years, the persistence of the large unemployment differentials observed after the crisis could entail cross-country labour mobility flows of a considerable magnitude, which could require in some cases supportive policy frameworks to ensure the effective integration of mobile workers.

APPENDIX A.1.1
Gravity equations

The appendix documents the sample composition of the gravity equations by year and destination country and it provides the list of origin countries included in the sample.

Table II.A1.1 shows that the number of observations progressively increases by year.

Table II.A1.1: **Sample composition of gravity equation by year**

Year	No of obs.
1992	183
1993	210
1994	217
1995	250
1996	521
1997	723
1998	1094
1999	1248
2000	1449
2001	1743
2002	1765
2003	1723
2004	1802
2005	1937
2006	2019
2007	2060
2008	2193
2009	2330
2010	2269
2011	2188
Total	**27924**

Source: Own calculations.

Table II.A1.2 shows the sample composition by 38 destination countries in the OECD International Migration Database. The table shows that the number of observations is very heterogeneous across countries. This has multiple reasons. First, few observations are available for some countries that were included in the database relatively recently (the Baltic countries, Greece, Slovenia). Second, few observations are available for some destination countries that report only few bilateral relationships per year (this is the case most notably for Ireland).

Table II.A1.2: **Sample composition of gravity equations by destination country**

Destination country	No of obs.
Australia	1449
Austria	1214
Belgium	678
Canada	1626
Chile	817
Czech Republic	288
Denmark	1391
Estonia	7
Finland	1266
France	1146
Germany	1596
Greece	36
Hungary	831
Iceland	791
Ireland	19
Israel	423
Italy	385
Japan	633
Korea, Rep.	904
Latvia	53
Lithuania	67
Luxembourg	1248
Mexico	330
Netherlands	758
New Zealand	1078
Norway	1525
Poland	800
Portugal	268
Romania	58
Russia	131
Slovak Republic	530
Slovenia	162
Spain	1329
Sweden	1264
Switzerland	563
Turkey	127
United Kingdom	506
United States	1627
Total	**27924**

Source: Own calculations.

Finally, the sample includes the following 163 origin countries: Afghanistan, Albania, Algeria, Antigua and Barbuda, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Cambodia, Cameroon, Canada, Chile, China, Colombia, Costa Rica, Croatia, Cuba, Cyprus, Czech Republic, Côte d'Ivoire, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Ethiopia, Fiji, Finland, France, Georgia, Germany, Ghana, Greece, Grenada, Guatemala, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Korea Rep., Kuwait, Kyrgyz Republic, Lao People's Dem. Rep., Latvia, Lebanon, Lesotho, Liberia, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Norway, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, Russia, Rwanda, Samoa, San Marino, Saudi Arabia, Senegal, Seychelles, Sierra Leone, Singapore, Slovak Republic, Slovenia, Solomon Islands, South Africa, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Sudan, Suriname, Swaziland, Sweden, Switzerland, Syrian Arab Republic, São Tomé and Principe, Tajikistan, Tanzania, Thailand, Timor-Leste, Tonga, Trinidad and Tobago, Tunisia, Turkey, Tuvalu, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Vanuatu, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe.

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