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Labour Market and Wage Developments in Europe

Annual Review 2018

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Foreword

«Policies supporting productivity growth lay the foundation of future wage growth. This report shows that the EU labour market continued to improve in 2017 and 2018, with unemployment falling faster than would be expected based on the pace of economic growth.

The report also shows that wage convergence between Central and Eastern European countries and the rest of the European Union continues. But in a number of countries, wage growth is still held back by relatively low inflation, moderate productivity growth and remaining reserves in the labour market. Since 2008, significant reforms have been implemented to improve the adjustment capacity of labour markets and extend the coverage of unemployment benefits. While the improvements in the labour market over the last five years are encouraging and reflect reform efforts, we need to make sure that the recovery benefits all. The European Pillar of Social Rights is a key initiative by the European Commission to promote convergence towards better working and living conditions».

Marianne Thyssen
Commissioner for Employment,
Social Affairs, Skills and Labour Mobility

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Comments on the report would be gratefully received at the following email address: EMPL-A3-UNIT@ec.europa.eu.

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SUMMARY AND MAIN FINDINGS

The EU labour market is in its fifth year of expansion, and the unemployment rate is closer to pre-crisis levels

From the first quarter of 2013 to the second quarter of 2018, employment in the EU rose by 14 million (almost 9 million for the euro area). The employment recovery accelerated in the course of 2014 and gained strength thereafter. In 2017, it expanded in the EU and the euro area by 1.6% − the highest rate since the start of the recovery, a development which continued throughout the first half of 2018. In August 2018, the EU unemployment rate fell to 6.8% (8.1% for the euro area), about one percentage point below the rate one year earlier. As in previous years, the fall in unemployment was stronger than would be expected based on the pace of economic growth. Employment gains were spread across countries and the dispersion in unemployment rates across countries has declined, although it remains above the level prevailing before the crisis.

Yet, labour under-utilisation is larger than suggested by the unemployment rate, and large differences across countries remain when hidden unemployment is taken into account

Although hidden unemployment also declined it remains substantial. This includes both people who work less than they want to − *involuntary part-time workers* − and people who have given up on searching for a job because they consider their chances of finding a job low − *discouraged workers*. In 2017, there were 9 million people in involuntary part-time and 8.2 million discouraged workers. As in previous years, broad measures of labour market slack have improved less swiftly than the headline unemployment rate. The decline in hidden unemployment has also been less uniform across countries. In nearly half of the Member States hidden unemployment still represents a significant share of the working age population. Finally, in spite of a modest cyclical recovery, the average number of hours worked remains on a downward trend.

The probability of finding a job has improved, and vacancies are reaching high levels, pointing to a tightening labour market

Improvements in job finding rates have been observed for all durations of unemployment. The long-term unemployment rate dropped to 3.1% in the EU (4.0% for the euro area) in the first quarter of 2018. In many Member States, these improvements were accompanied by a more effective process of matching job seekers with available jobs. The analysis shows that the broad-based recovery and the decline in long-term unemployment have also contributed to this improvement. In 2017 and in the first half of 2018, the share of companies reporting labour shortages as a reason limiting business activity increased in several countries more than the decline in unemployment, pointing to a rising mismatch between demand and supply of labour. In several Member States, skills and labour shortages have reached very high levels.

Without the increase in activity rates, the decline in the unemployment rate due to the recovery would have been even stronger

Activity rates in the EU kept rising without interruption even during the crisis period. Between the first quarter of 2013 and the fourth quarter of 2017 labour market participation rates (for the age group 15-74) in the EU rose from 63.6% to 64.7% (for the euro area from 63.6% to 64.4%). This upward trend tempered the impact of the employment recovery on the unemployment rates. This is in marked contrast with the United States, where the nearly decade-long decline in labour force participation has amplified the impact of the employment recovery on the fall of unemployment.

Wage growth has started to pick up in the EU, but remains below what would be expected at the current unemployment rate

While labour market conditions have been improving since 2013, wage growth has remained subdued until recently. From the end of 2016 throughout the second quarter of 2018, wage growth moved slowly but steadily upwards. In 2017, wages in the euro area rose at a higher rate than one year earlier (1.6% against 1.1%), with a clear acceleration in the second half of the year. In the first half of 2018, the wage recovery continued with growth rates of about 2.1% both in the EU and the euro area. Nonetheless, nominal wage growth is well below where it was before the crisis in years with comparable levels of unemployment.

Wages are rising in all Member States, and at higher rates in those with low income

In almost all EU Member States, nominal wages rose at a higher pace in 2017 than in 2016, accelerating in the second half of 2017 and the first half of 2018. As in previous years, wage growth was higher in Central and Eastern European countries. Since wages in these countries are still relatively low, this development supported convergence of their wages towards the EU average. Developments in 2017 continued to be consistent with the external rebalancing needs within the euro area. Nominal unit labour costs continued to grow faster in countries characterised by a current account surplus before the crisis ('surplus countries') than in countries with previous current account deficits ('deficit countries'). Recent real wage growth was above productivity growth in most Central and Eastern European Countries (except Croatia, Poland and Slovenia) and in line with productivity growth in Greece, Austria, Denmark, and Germany. For the euro area as a whole, real wages in 2017 expanded at a lower rate than productivity, while in the first half of 2018 they were mostly aligned.

Low inflation and low productivity growth are the main drivers of the moderate wage developments

This report provides an in-depth analysis of the short- and long-term determinants of moderate wage growth in the EU. The analysis suggests that nominal wage growth has closely followed inflation and trend productivity growth since the mid-1990s, but the link between wages and prices has weakened after the crisis in the context of weak inflationary pressures. The relationship between wage growth and unemployment continued to hold in the post-crisis period (2010-2017). After the crisis, wage growth was moderate because of low inflation, low trend productivity growth, and high unemployment. The analysis suggests that increases in collective bargaining coverage have a moderately positive effect on wage growth in the short run. In addition, in the post-crisis period, countries with more rapid falls in union density experienced somewhat lower wage growth. However, the level (as opposed to the change) of institutional characteristics (e.g. collective bargaining coverage) is not found to have an effect on wage growth.

In the post-crisis period, only a few countries experienced wage growth below what would be expected based on economic fundamentals

Only a few countries experienced nominal wage growth in the post-crisis period significantly below what would be expected on the basis of inflation, productivity growth and unemployment. This group includes countries with high (Croatia and Cyprus), intermediate (Ireland and Portugal) and low unemployment rates (the Netherlands and the UK). Countries with significant shortfalls in wage growth before the crisis include euro-area countries that developed large current account surpluses (Germany and the Netherlands) but also some Member States that were pursuing significant disinflation policies (Poland, Romania and Slovenia). The changing composition of the workforce (in terms of age, gender and education) and occupations (e.g. employment in services, temporary contracts) had a small positive effect on wages in the post-crisis period. This is contrary to evidence for the United States. In some

Member States with low or moderate wage growth, such as Germany, Italy, Luxembourg and Portugal, composition effects have been a significant component of aggregate wage growth since 2010.

Strong wage growth in Central and Eastern European countries has supported the process of wage convergence

The analysis in this report shows that there has been real wage convergence between Central and Eastern European countries and the rest of the European Union. The crisis did not put an end to this process, as wages started to grow fast again in the lower wage countries shortly after the crisis. However, there has been no convergence among the EU15 countries, reflecting both the intra-euro area rebalancing needs and low productivity growth in some Member States. Convergence to higher real wages in the EU depends on factors that influence the productivity growth in the long term. When these conditions differ across countries, convergence is only conditional, meaning that it occurs towards levels consistent with the long-term growth specific to each country.

Policies that boost productivity growth are essential for upward wage convergence

Findings in this report underline the importance for upward wage convergence of policies that boost productivity growth, in particular those that ensure efficient markets, an adaptable and skilled workforce and support the adoption of innovative work practices; collaborative social dialogue has a big role to play to support upward convergence. As taught by history, convergence requires time. The econometric analysis in the report suggests that it would take about twenty-two years to halve the wage gaps between EU countries; however, when countries have a similar economic structure, the pay gap could be closed in almost a quarter of this time. The analysis also suggests that convergence can be faster in countries with supportive labour market institutions. In particular, it occurs at a faster rate in countries with a relatively higher trade union density.

Reforms have increasingly focussed on addressing long-term challenges and building resilient economies and societies

After dealing primarily with crisis-related challenges, the focus of the reform agenda in Member States has shifted gradually from measures enhancing labour market adjustment to measures dealing with long-term challenges, including those stemming from a changing world of work and the need to build more resilient and inclusive economic and social structures. This is well reflected in the broad consensus reached on the principles of the European Pillar of Social Rights and is also visible from the policy priorities stemming from the 2018 European Semester. During 2017 and in the first half of 2018, the reforms undertaken by some Member States in the labour market, education and social sphere focussed on the provision of adequate skills, the effectiveness and adequacy of social safety nets and on fostering labour market participation. As in previous years, active labour market policies were high on the agenda, with particular attention to skills development. In addition, reforms aimed at more flexible working arrangements and a better reconciliation of work and family life, enhanced regulation of atypical forms of work and more effective social dialogue also gained in importance.

Since the onset of the crisis, significant reforms have been implemented to improve the adjustment capacity of labour markets and extend the coverage of unemployment benefits

As recognised by the European Pillar of Social Rights, well-designed employment protection legislation and unemployment benefit systems are both essential for good labour market functioning. Striking the right balance between flexibility and security may favour economic resilience, by easing adjustment to shocks, while ensuring fairness and securing transitions between different jobs. The economic and financial crisis that started in 2008 worked as a catalyst for reforms previously considered difficult or even impossible to implement. After the crisis the most severely hit countries implemented comprehensive reforms of their labour market, combining measures to ease job protection with reforms of the unemployment benefits aimed at providing wider coverage while preserving job search incentives. However, challenges remain.

Thus, convergence is observed in the tightness of employment protection legislation as well as in some parameters of the unemployment benefit systems

As described in the report, reforms loosening employment protection for permanent contracts were enacted in countries with more stringent legislation. This brought about convergence in the EU of the strictness of EPL for permanent contracts, as measured by the OECD indicator – mainly driven by the component *length of notice period* and *severance payments*. Convergence is also observed for the regulation of temporary contracts − largely driven by changes in the legislation concerning temporary work agencies. Turning to unemployment benefits, and in line with the objective of broadening their coverage, there is a visible convergence towards lower minimum contribution periods necessary to be eligible for benefits; eligibility conditions were loosened in eight Member States and tightened in only two. Convergence towards a lower maximum duration of benefits is also observed, reflecting the combined need of supporting activation, while finding resources to broaden their coverage. Conversely, differences across countries in the net replacement rates remained mainly unchanged, despite net replacement rates being increased in sixteen Member States and reduced in ten.

Reforms implemented during the crisis have started to pay off but their full effects may be visible only over time

The report includes an analysis of reforms of employment protection legislation and unemployment benefits enacted in selected Member States. It takes time for the full effects of reforms in these areas to materialise, in part because reforms are often phased in only gradually (*grandfathering*) to avert their distributional consequences and gain the political support of those that would be negatively affected in the short-term. For example, the 2012 Spanish reform of severance payments preserved for the existing contracts the rights accrued at the time of the reform. As shown in the report, *grandfathering* has alleviated the implications of lower firing costs on dismissal rates; this also implies that the full effects of the reform will become evident only in the medium to long run.

… and their effectiveness depends also on flanking measures

It is not always easy to disentangle the effects of a specific reform, in particular when these changes are combined with other measures or when they require flanking policies to be fully effective. The analysis in the report illustrates how complex the assessment of the effects of structural reforms is. For example, hiring subsidies for young employees were introduced in Italy at the time of the EPL reform in 2012. Although some of the effects may be due to the coinciding reduction of labour costs for young workers, the analysis suggests that the EPL reform had positive effects on the hiring rate. Similarly, job search requirements for older people in unemployment have been gradually tightened in Belgium; it is shown that this change was more effective when accompanied by more targeted activation measures.

Part I

Labour market and wage developments

1. GENERAL LABOUR MARKET CONDITIONS IN THE EURO AREA AND THE EU

In 2017 and in the first half of 2018, the improvements in the labour market continued at a steady pace both in the EU and the euro area. Unemployment continued to be on a declining path reaching in July 2018 the lowest rates since the start of the crisis. Employment growth picked up, supported by a small increase in labour productivity. In spite of a tightening labour market, the number of hours worked per worker remained at historical lows. This is consistent with the downward trend in hours of the last two decades, but also reflects more spare capacity in the labour market than indicated by the unemployment rate.

Both a decline in the job separation rates (job losses) and an increase in the job finding rates contributed to the observed reduction in unemployment. As the labour market recovery strengthened, the probability of finding a job improved also for the long-term unemployed.

In spite of the decline in unemployment, wage growth remained modest in 2017; however, it started to pick up at the end of the year and in the first quarter of 2018. The weak wage growth observed so far can be explained by contingent factors such as still high unused labour resources and low inflationary pressures, but also by the trend decline in labour productivity growth.

1.1. INTRODUCTION

In 2017 and early 2018, the labour market continued to improve, benefitting from economic growth, a strong global outlook and accommodative macroeconomic policies. On the back of the highest economic expansion since a decade (2.4%), employment rose in 2017 by 1.6%, the highest rate since 2008; employment growth decelerated slightly in the first half, hovering around the highest rate since the start of the recovery. The unemployment rate continued to fall, approaching the lowest level reached before 2008.

Against this background, this chapter analyses the main features of the current labour market developments in the EU and the euro area in 2017 and early 2018. It compares the EU labour market performance with that of other industrialised economies and assesses the role played by relevant variables including employment, participation, working hours and labour costs. Section 1.2 describes the recent labour market developments in the EU in an international perspective. Section 1.3 analyses the trends in employment, activity rates and hours worked. Section 1.4 reviews the latest trends in wages and labour costs. Section 1.5 focuses on aggregate movements in and out of unemployment ("labour market flows"), as well as long-term unemployment and job matching. Section 1.6 concludes. ([1])

1.2. SETTING THE SCENE: THE EU LABOUR MARKET IN AN INTERNATIONAL PERSPECTIVE

1.2.1. Recent EU-level developments

The economic expansion continued to be accompanied by sustained job creation. Spurred by strong domestic and foreign demand and high levels of confidence, the labour market delivered robust employment gains. In 2017, employment in the EU rose by 1.6%, with a stronger expansion in the first semester. In the first half of 2018, employment growth continued to expand at a solid rate (Table I.1.1). This is much higher than the average employment growth observed for the EU and the euro are before the crisis (about 1% on average over the period 2000-2007). The EU unemployment rate has fallen steadily from 11% (12% for the euro area) of 2013Q1 to 6.9% (8.3% for the euro area) in June 2018 (last available figure).

Since economic growth has turned positive in mid-2013, employment has expanded for 19 consecutive quarters. Yet, while GDP continued growing at a sustained pace throughout 2017, employment expanded at a slower rate; in the last quarter of 2017, GDP grew by 2.7% on an annual basis while employment increased by 1.5%. This coincided with a pick-up of labour productivity

([1]) The analysis of labour market outcomes for different socio-economic groups can be found in the Employment and Social Developments in Europe report (2018).

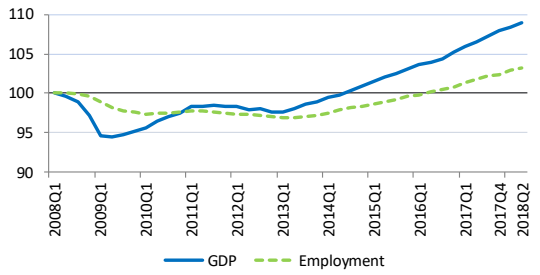
Table I.1.1: **Unemployment, compensation per employee and GDP growth in the euro area and EU**

					Quarter over same quarter of previous year, % (1)						Quarter over previous quarter, % (1)					
		2015	2016	2017	2017Q1	2017Q2	2017Q3	2017Q4	2018Q1	2018Q2	2017Q1	2017Q2	2017Q3	2017Q4	2018Q1	2018Q2
Unemployment rate	EA	10.9	10.0	9.1	-0.8	-1.0	-0.9	-1.0	-1.0	-0.9	-0.2	-0.3	-0.2	-0.3	-0.2	-0.2
	EU28	9.4	8.6	7.6	-0.8	-1.0	-1.0	-0.9	-0.9	-0.8	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2
Unemployment growth	EA	-6.4	-6.9	-9.3	-7.9	-9.8	-9.1	-9.9	-9.3	-9.3	-2.6	-3.1	-1.7	-2.9	-1.9	-3.1
	EU28	-7.8	-8.5	-10.3	-9.4	-10.7	-10.3	-10.7	-10.4	-10.6	-2.9	-3.1	-2.1	-3.1	-2.5	-3.3
Growth of nominal compensation per employee	EA	1.3	1.1	1.6	1.4	1.5	1.6	1.8	1.9	2.3	0.3	0.3	0.4	0.7	0.4	0.8
	EU28	3.1	-0.6	1.0	0.2	0.4	1.1	2.2	2.0	2.3	0.7	0.5	0.0	1.0	0.5	0.8
GDP growth	EA	2.1	1.9	2.4	2.0	2.5	2.8	2.7	2.4	2.1	0.7	0.7	0.7	0.7	0.4	0.4
	EU28	2.3	2.0	2.4	2.2	2.5	2.8	2.6	2.3	2.1	0.7	0.6	0.6	0.6	0.4	0.4
Employment growth	EA	1.0	1.4	1.6	1.6	1.6	1.7	1.6	1.5	1.5	0.5	0.4	0.4	0.3	0.4	0.4
	EU28	1.1	1.3	1.6	1.5	1.7	1.7	1.5	1.5	1.4	0.5	0.5	0.3	0.2	0.5	0.4

(1) Seasonally adjusted data.
(2) In the case of the unemployment rate, the table presents changes in percentage points, rather than percent.
Source: Eurostat.

growth, which, slightly declined in the first half of 2018 following the decline of GDP growth.

Graph I.1.1: **Employment and GDP in the EU (2008Q1=100)**



Source: Eurostat.

The current productivity developments have to be seen against the backdrop of a marked slowdown in trend labour productivity. Over the period 2008-2016 labour productivity growth dropped to an average of 0.5% from about 1.5% during period 2000-2007. As shown in Box I.1.1, productivity remains below the level projected on the basis of the pre-crisis trend. Factors that predated the financial crisis – e.g. a slowdown in technological innovation and diffusion, lower business dynamism, ageing and possibly also skill mismatches – have been identified as key determinants of the weak labour productivity growth in several countries (e.g. European Commission, 2017a; ECB, 2017; IMF, 2017a; Fernald et al 2017). ([2]) Moreover, the legacy of the crisis, together with the characteristics of the subsequent service-led recovery may have also impaired productivity growth. ([3])

It remains unclear whether the recent increase in labour productivity growth is only temporary. At the early stage of an economic recovery, productivity tends to accelerate; GDP rises in response to cyclical improvements, but it takes more time to hire more staff and install new capital. As the recovery gains strength, labour demand tends to catch up with higher levels of output, weakening productivity growth. Yet, the current EU recovery was initially suffering from low capital accumulation relative to employment growth – i.e. weak capital deepening (ECB, 2017) - including as a consequence of low investor confidence (European Commission, 2017d). Thus, the belated and gradual pick-up in investment – also boosted by the Investment Plan for Europe – may have contributed to prolonging the productivity cycle. ([4]) Moreover, as discussed in the *Policy Developments* chapter, labour market reforms enacted since the onset of the crisis might have improved job reallocation and contributed to the recent increase in labour productivity. This increase may have helped to consolidate the strong and widespread employment gains observed since the recovery.

([2]) The contribution of TFP to potential growth halved in the euro area before the financial crisis from 1% in 2000 to ½% in 2007 (ECB 2011)

([3]) Deep recessions, especially if associated to financial crises, have persistent effects on productivity, even when economic growth returns to its pre-crisis trend. Sectors as services with a low capital-labour ratio have lower productivity.

([4]) The shortfall in labour productivity growth is lower if measures on hourly basis are used - see Box I.1.1.

Box I.1.1: **The dynamics of productivity in the aftermath of the crisis**

Labour productivity is a key component driving living standards. It usually fluctuates with the business cycle along a medium-term trend which reflects the efficiency of production, technological progress and capital embodied technical change (so-called total factor productivity). These fluctuations are usually associated to labour hoarding, i.e. the attitude of firms to hoard labour during the business cycle in anticipation of a pick-up of demand, due to costs of firing and re-hiring workers when the demand recovers. In the short- to medium-term, labour productivity growth responds also to capital deepening (i.e. changes in the capital-labour ratio).

During the recession, the unemployment rate increased by 4.8 pps (from 7.3% of 2008Q1 to 12.1% of 2013Q2) and it dropped during the subsequent recovery throughout 2017 by 3.7 pps. The swift response of unemployment to the economic recovery may have affected the evolution of GDP and this has to be taken into account when measuring the trend in labour productivity. Labour productivity is adjusted for the cycle on the basis of an Okun's law relationship. In practice, the growth rate of each variable is regressed on leads and lags of the change in the unemployment rate; the residual is a measure of what the growth rate would have been, consistent with an unchanged unemployment rate (Fernald et al 2017). Productivity growth is first regressed on current and lagged values of unemployment rate changes; subsequently, the variable is corrected for the cycle filtering out the effects due to the fluctuations of unemployment (Daly et al 2017). This measure represents what the growth of productivity would have been without the changes in unemployment rate observed during the recession. Moreover, since labour productivity per person employed equals hourly productivity times hours worked per person employed – i.e. $\frac{GDP}{EMP} = \frac{GDP}{H}\frac{H}{EMP}$ where H is the total hours worked, applying the same methodology allows identifying the behaviour of these different components of the productivity per person employed. The same methodology is applied to filter out the cycle from the capital deepening and the TFP. For all variables, the correlation with the current and lagged changes of unemployment turns out to be quite high.

Chart 1 shows the evolution of labour productivity (per person employed) in the euro area since 1999. It compares the actual series (the solid line) with the one cyclically adjusted (the dotted thick line) and with a pre-crisis projected trend. The table below shows, for the pre-crisis, crisis periods and the post-crisis recovery, the yearly growth rates of the different measures. A few facts stand out.

First, labour productivity expanded during the recovery at about the same rate as before the crisis (0.86% per year against 0.84% per year). The growth of hourly labour productivity and hours worked per worker changes over the two periods, with the former dropping from 1.04% to 0.88% and the latter falling before the crisis (-0.19% per year) but remaining mainly flat during the recovery. Labour productivity (per person employed) adjusted for the cycle grew at a stable but modest rate before the crisis (0.74% per year).

Second, hourly productivity growth is not only higher than the growth of GDP per person employed, but its trend declines relatively more slowly during the recovery compared to the pre-crisis period (0.53 pps yearly against 0.73% yearly from the output trough of 2013Q2). The difference is matched by the trend decline in hours worked per person employed, without substantial difference between the cyclically adjusted and the historical values and in continuation of the evolution of hours based on pre-crisis trend (figure). Nonetheless, the current level of productivity falls short of the pre-crisis projected trend.

Third, the cyclical adjustment provides unambiguously evidence of the trend decline of productivity growth during the recovery period. Conversely, labour force participation is trending upward with no substantial influence of the cycle.

Fourth, TFP and capital deepening give a perspective of the determinants of productivity from the supply side. It clearly emerges that the decline in hourly labour productivity during the recovery is attributable both to a decline in TFP growth and in the capital deepening (i.e. the rate at which capital per worker is increasing. Statistical tests detecting a break in the mean growth rate (Perron 1989) locate both for capital deepening and TFP growth (both cyclically adjusted) a break in respectively 2011 and 2012 – i.e. in a context of high financial fragmentation and credit risks. Thus, the increase in participation rate supported GDP growth, while the decline in hours worked per worker offset the decline in hourly productivity growth due to weak TFP and modest capital accumulation.

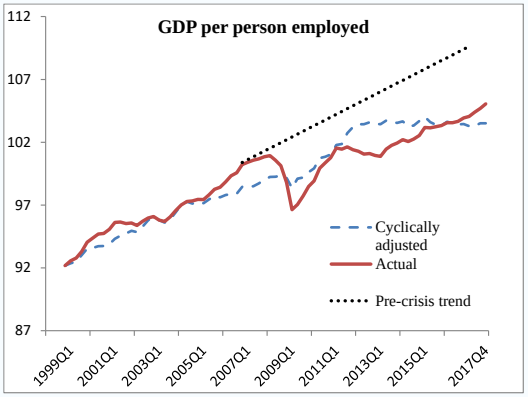
(Continued on the next page)

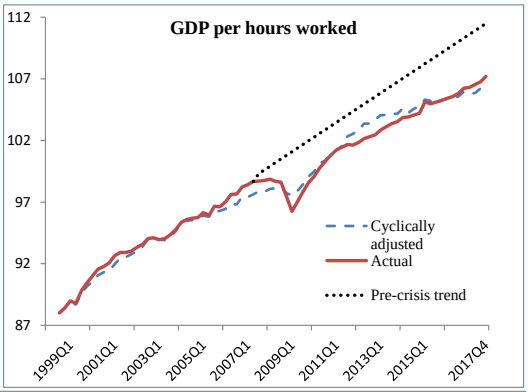
Box (continued)

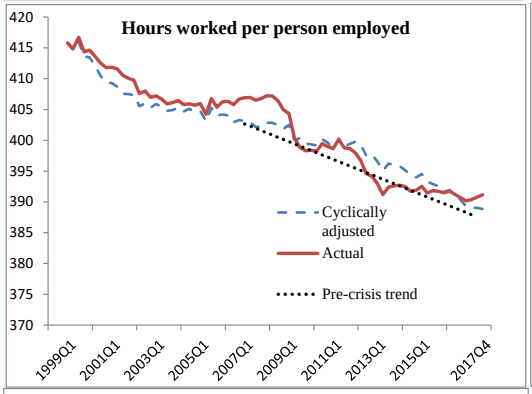
Determinants of labour productivity growth

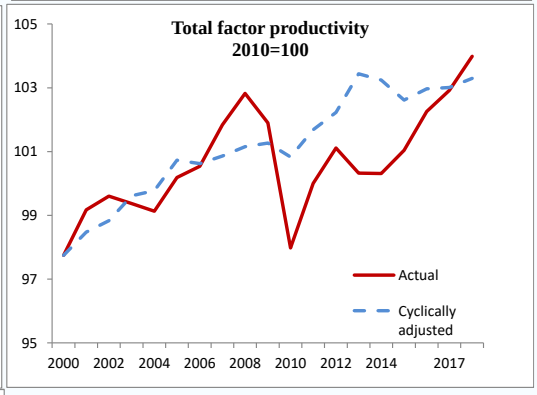
	Actual values			Cyclically adjusted		
	2000Q1-2008Q1	2008Q1-2017Q4	2013Q1-2017Q4	2000Q1-2008Q1	2008Q1-2017Q4	2013Q1-2017Q4
GDP per person employed	0.84	0.41	0.86	0.74	0.43	0.01
Hourly productivity	1.04	0.83	0.88	1.01	0.85	0.48
Hours worked per worker	-0.19	-0.42	-0.02	-0.28	-0.37	-0.35 (1)
TFP (annual)	0.53	0.11	0.92	0.39	0.21	0.01
Capital deepening	1.19	0.89	-0.41	1.42	0.72	0.36
Labour force participation (pps)	0.43	0.25	0.29	0.39	0.26	0.28

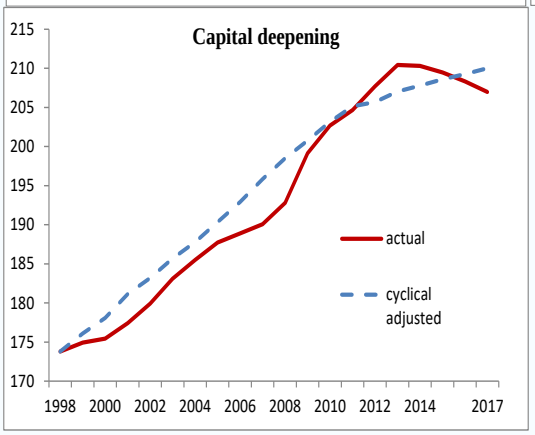
Sources: AMECO and own calculations. All variables are average annualized rates of growth. TFP and capital deepening are growth rates based on annual figures. (1) 2013Q1-2017Q3.





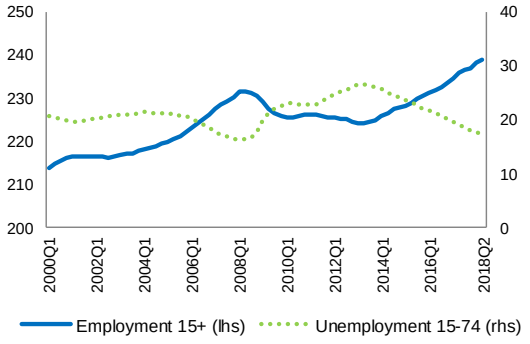






Unemployment has been steadily falling. In 2017, employment increased by 3.7 million people, outpacing the increase in the labour force, and leading to a drop in unemployment by 2.1 million people. Nonetheless, the number of unemployed remains high. While employment currently stands at about 2% above the pre-crisis level, unemployment levels in the EU remain 11% (and in the euro area 23%) above their respective pre-crisis levels (Graph I.1.2).

Graph I.1.2: **Employment and unemployment in the EU, million persons, 2001-2018, quarterly data**

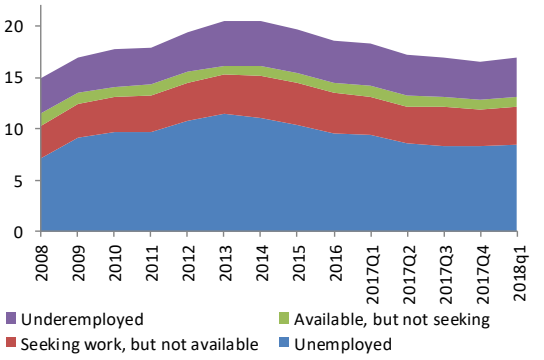


(1) Employment is from National Accounts, domestic concept, ages 15 and over, seasonally adjusted.
(2) Unemployment is from the Labour Force Survey, ages 15-74, seasonally adjusted.
Source: Eurostat.

Labour under-utilisation is larger than suggested by headline unemployment. Between 2013 and 2017, the number of unemployed in the EU fell by about 30%, while that of both the underemployed part-time workers ([5]) and discouraged workers dropped by respectively 7% and 20%. In 2017, the number of part-time workers wanting and ready to work more hours (involuntary part-timers) amounted to 9.0 million or 3.7% of the active population in the EU (6.7million or 4.1% of the active population in the euro area). Those available to work not seeking a job because they consider that no work is available for them – the so-called discouraged workers – dropped in the EU from 6.6% to 6.1% of the inactive (from 7.3% to 7.0% for the euro area). ([6]) While their proportion has started to recede (Graph I.1.3), the share of discouraged workers and involuntary part-timers remain significant in a number of countries (see also Chapter 2).

([5]) Under-employed part-time are those in work who would prefer to work longer hours.
([6]) All figures refer to the age group between 15 and 7 years.

Graph I.1.3: **Extended measures of labour utilisation (as percentage of extended labour force)**



(1) The extended labour force is the active labour force plus the involuntary part-timers plus those available, but not seeking plus those seeking but not available to work.
Source: Own calculations based on LFS.

The recovery has also led to growth in temporary jobs, reflecting the effect of a prolonged uncertainty on employers' hiring decisions. In 2017, temporary employment increased by 2.5% in the EU (4.6% in the euro area), accounting for about one fifth of total employment growth in the EU and euro area. The increase is even higher for contracts of short duration – less than 6 months − (3% for the EU and 6.2% for the euro area). ([7]) As a result, in 2017 temporary employment in the EU accounted for about 14% of the total number of employees (16% for the euro area). ([8]) In light of the comprehensive reforms of employment protection legislation enacted since the crisis ([9]), the growth of temporary employment is puzzling. A number of hypotheses can be advanced. First, as advocated by Blanchard et al (2017), lower optimism about future productivity developments may have induced firms to revise downwards their investment plans, thereby validating such expectations. Firms may have reacted to this uncertainty by adopting more flexible forms of

([7]) The high incidence of temporary employment entails significant costs. At the micro level it reduces the incentive to invest in human capital (Dolado, 2016); at the macro it increases inefficiently the flexibility of the labour market (IMF, 2010) and raises inequality between people with different skills but holding different types of contracts. However, temporary contracts provide better working conditions than non-dependent employment (European Commission, 2017c, *Labour Market and Wage Developments in Europe*).
([8]) This is about the same rate as before the 2008 crisis.
([9]) Chapter 3 provides an overview of the main characteristics of reforms of employment protection legislation enacted since the 2008 crisis.

work that shift risks onto workers (Cœuré, 2017). Second, workers dismissed during the recession were mainly those with short job tenures; thus, with the recovery employers might have preferred to re-hire them with a temporary contract.

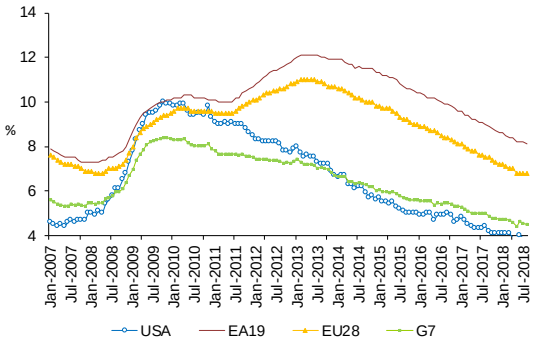
The upward trend in activity rates has softened the decline in unemployment rate due to the employment recovery. Activity rates in the EU have been trending upwards, driven by higher activity rate for women and older workers. Between 2000 and 2008 the EU activity rate for the age group 15-74 increased from 61.2% to 63.1%. Activity rates kept increasing during the crisis, particularly in countries most affected by high unemployment. From 2013Q1 to 2018Q2, the employment rate in the EU for this age group rose from 56.3% to 60.5% (for the euro area from 55.6% to 59.2%). Over the same period, the activity rate in the EU from 63.6% to 64.9% (from 63.5% to 64.4% for the euro area). Thus, this upward trend in participation tempered the impact of the employment recovery on the fall of unemployment. ([10])

1.2.2. Recent labour market developments in major world regions

Unemployment continued to decline in the main industrialised countries. Unemployment rates are back to pre-crisis levels in most industrialised countries. The gap with the EU unemployment rate has also been falling (Graph I.1.4 and Table I.1.2). In June 2018, the EU unemployment rate was only 3 pps and 2.2 pps above the rate of the US and the G7 countries, although the gap with the US would disappear if one considers the effect of the falling activity rate in the US (Graph I.1.6).

The US unemployment rate is falling and the labour market is becoming tighter. With output slightly above its potential, the labour market has been further tightening, with the unemployment rate hovering at 4% since October 2017. From the end of the recession in June 2009 to April 2018 (last available figure), the vacancy-unemployment ratio has increased from 0.15 to 1 – the highest value ever. ([11]) Extended measures of labour underutilisation all show similar patterns, fully closing the gap with their pre-recession values. Starting from 2009, *part-timers for economic reasons* (as involuntary part-time workers are called in the US) have been continuously dropping. Nonetheless, in the US this measure has declined more slowly than the unemployment rate, a feature observed only for the EU. In August 2018 (last available figure), it reached 4.6 million, slightly higher than the pre-crisis average (of about 4.4 million on monthly basis).

Graph I.1.4: **Unemployment rates in the EU the US and the 'Group of seven' advanced economies, 2000-2018, monthly data**



Source: OECD.

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

	GDP growth %			Unemployment rate %		
	2000-2007	2016	2017	2000-2007	2016	2017
EA	2.2	1.9	2.4	8.6	10.0	9.1
EU	2.5	2.0	2.4	8.7	8.6	7.6
CAN	2.8	1.4	3.0	7.0	7.0	6.3
JPN	1.5	1.0	1.7	4.7	3.1	2.8
USA	2.7	1.6	2.2	5.0	4.9	4.4
OECD	2.5	1.7	2.3	6.5	6.3	5.8
BRIC:	8.1	5.2	5.7	:	:	:
BRA	*3.6*	*-3.5*	*1.0*	*11.3*	*11.6*	*12.9*
RUS	*7.2*	*-0.2*	*1.5*	*8.1*	*5.5*	*5.3*
IND	*7.2*	*7.9*	*6.4*	*:*	*3.5*	*3.6*
CHN	*10.6*	*6.7*	*6.9*	*3.9*	*4.1*	*4.1*

Source: Eurostat and OECD.

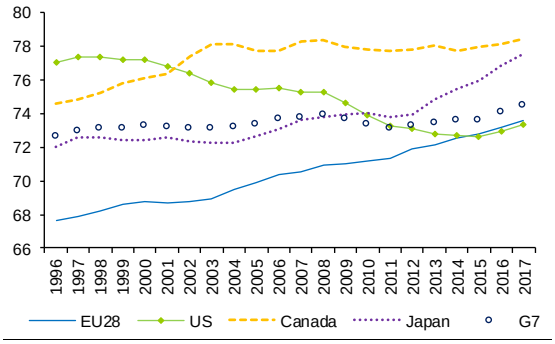
US nominal wage growth has been moderate, but it is firming more recently. Between 2011 and 2014, average hourly wages grew at an annual rate slightly below 2%. As employment continued on a path of moderate growth and labour market tightness to be spread across a broader range of

([10]) The next section provides a comparison with the US.

([11]) More than half of transitions from unemployment are into employment. The non-employment index – a measure taking into account the individual transitions to employment – was almost at its historical lows in July 2018. The average unemployment duration further dropped to 23 weeks in July 2018 (it peaked at nearly 41 weeks in July 2011).

skills and sectors, wages seemed to have gained momentum: average hourly earnings have been growing at 2.5% in 2017 and 2.7% in the first quarter of 2018. In the 2017 average, median weekly earnings grew by 2.5%, up from 2.2% in 2016 and further rising, in the period January-July 2018, at 3.0%, the largest increase since 2011. ([12])

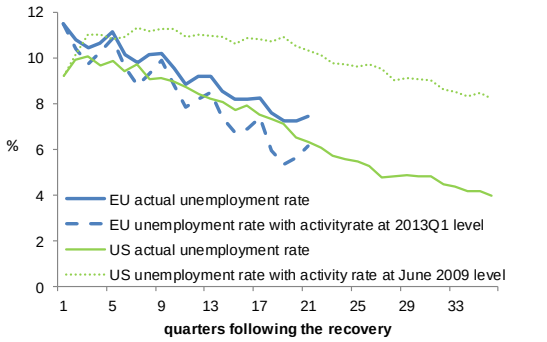
Graph I.1.5: **The activity rate in the EU and selected advanced economies, 1996-2017**



(1) The activity rate is the ratio of active to total population. Active population includes those employed and unemployed, but excludes those inactive (e.g. not seeking work).
(2) Age group: 15-64.
Source: OECD.

The current situation of the US labour market is not as positive as the unemployment rate would suggest. In 2017, the employment rate rose by 0.8 pps to 70.1%; while recovering from the 2011 through (66.5% of 2011Q2), it is still below the peak reached before the crisis (72.2% of 2006Q4), and well below the historical record of about 74.3% of early 2000s. The gap between the weak increase in the employment rate and the rapidly falling unemployment rate is closed by a falling activity rate. Graph I.1.6 shows the effect of falling activity rate on the US unemployment rate and compares it to the EU. Had the activity rate remained constant at the level prevailing at the beginning of the 2013 recovery, the EU unemployment rate would have fallen below 6% (below 8% for the euro area by the end of 2017). This is in marked contrast with the US, where the decline of the last decade in labour force participation has amplified the effects of the employment recovery on the fall of unemployment. ([13]) Without such a fall, the unemployment rate would have stood at 8.1% by March 2018 rather than the actual 4.1%. The weak increase in the US participation rate in 2017 seems insufficient to reverse the decline in participation observed since early 2000s for all age and gender groups: in 2017, the incidence of the employed or of those looking for a job (i.e. the labour supply) was slightly higher in the EU than in the US-Graph I.1.5. ([14]) Thus, with falling activity rates, subdued wage growth and still sizeable unused labour resources, the US labour market recovery remains some distance from full employment.

Graph I.1.6: **Unemployment rate in the EU and the US: the effect of divergent trajectories in activity rates**



(1) With unchanged activity rate, the change in unemployment between time t and time h equals the change in employment rate between the two periods divided the activity rate in period h. For the EU the recovery starts in 2013Q1; for the US in 2009Q2.
Source: Own calculations based on Eurostat and BLS.

In Canada, the labour market recovery has been accompanied by a gradual pick up of wage growth. Solid growth boosted by exports has been strengthening even further the labour market recovery, with employment recording the largest increase in fifteen years (2.3% year over year) and the first increase in the activity rate since 2008. Yet, similarly to the US, wage growth picked up only gradually during 2017, bringing the annual average at about 2%.

([12]) The sources of the low wage growth in the US have been widely assessed; leading factors include the slow reduction of long-term unemployment, the effect of new hires and the low-skilled workers on wage growth, both being hired at lower entry wages (Daly and Hobijn, 2016), the low inflation environment and weak productivity growth (Furman 2018).

([13]) This decline has persisted well beyond the end of the Great recession (Hall and Petrosky-Nadeau, 2016).

([14]) Ageing of the baby boom generation explains half of the decline in the participation rate during the 2007-2016 period; cyclical effects account for about one third while the rest is accounted by younger cohorts prolonging labour market entry (Balakrishnan *et al.* 2015). Compared to Europe, institutional features and policies contributes less to foster participation decisions (IMF, 2018, Richter, Chapman and Mihaylov, 2018).

In Japan, output growth in 2017 (1.6%) outpaced expectations with near-zero inflation. Strong exports coupled with supportive monetary and fiscal measures helped boost the economy. Despite the ageing labour force, the increase in labour force participation is considerable, owing mainly to contribution of women and older workers. The increase in labour supply was accompanied by a decline in the unemployment rate – in June 2018, the unemployment rate fell to 2.4%, the lowest in more than 20 years. The share of non-regular workers, albeit still hovering at 37.5%, stopped rising for the first time in seven years. ([15]) Firms have been responding to labour shortages by improving working conditions rather than increasing pay; in 2017, nominal wage growth expanded at a weak rate of 0.4%. A broad reform, enacted in June 2018, aims at improving workers` protection and combating the discrimination between regular and part-time workers. ([16]) This might contribute to pushing wage growth up.

In China, strong growth continues to support a low unemployment rate. In 2017 economic activity expanded at 6.9%, driven mainly by consumption and investment, while the contribution of net export was small. The official unemployment rate at 4.1% is low relative to that of other regions, although the trend decline in the labour force participation has also played a role (it was 76.8% in 2000 and fell below 70 in 2016). Claims that China has reached a turning point in its growth model seem to be supported by positive wage dynamics, particularly in first-tier cities, with rising rural-urban earnings inequality (Song, 2017). Moreover, in the fast growing sectors linked to the financial and digital economy, skills mismatches are reported, with inflows from more highly educated university and vocational graduates lagging behind a fast growing demand (McKinsey, 2016).

Brazil is emerging from a worse than expected recession. Unemployment is projected to further fall to 11.2% in 2018, after peaking at 13.4%, yet the youth unemployment rate is still around 26% percent (OECD, 2018b). In an attempt to boost job creation in the formal sector, the labour reform of July 2017 has introduced measures aiming at removing obstacles to hiring. ([17])

Graph I.1.7: **Real wages and productivity growth in the euro area and selected advanced economies, 2016-2017**

Note: Real wages in this graph are wages adjusted for the change of prices in economic output (the GDP deflator). This indicator is also referred to as the annual growth of "real product wages".
Source: DG ECFIN AMECO database.

In 2017, real wage growth in industrialised countries has been lagging behind productivity growth. In the euro area, real wages expanded at about the same rate as in 2016 (0.5%), while productivity increased at slightly below 1%. In the US and Canada, real wage growth was low or slightly negative while productivity expanded at above 1% (Graph I.1.7). ([18]) With the exception of Japan, where real wage growth outpaced productivity growth, these patterns have led to a fall in the share of labour in total income.

([15]) Non regular employees include part-time employment, temporary workers, dispatched employees from temporary work agencies, and contract employees.

([16]) The aim of the reform is to improve the conditions of non-regular workers providing equal pay for equal work. Irregular job contracts typically earn about 60 percent of the hourly wage of regular full-time employees, compared with 70 to 80 percent in many European economies.

([17]) The aim of the reform is to modernize Brazilian labour law to international standards, guarantee flexible working arrangements and formalize irregular workers. However, it raises some concerns, notably in terms of a potential setback to workers' rights, as it reduces workers and unions' bargaining power (de Carvalho 2017).

([18]) Real wages are wages adjusted for inflation. These calculations adjust wage growth by the change in the price of economic output, rather than consumption. This concept, called "real product wages" is relevant for determining the labour demand by firms.

1.3. EMPLOYMENT, ACTIVITY RATES, HOURS WORKED

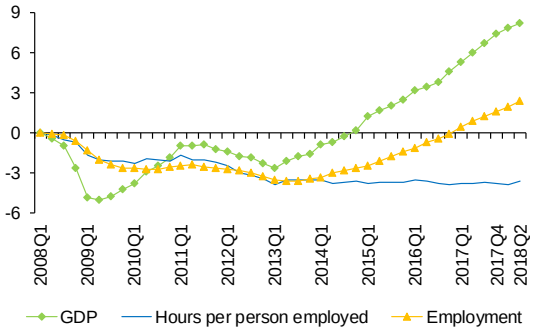
The improvement in the labour market situation has led to a strong increase in the number of jobs created; activity rates have been trending upwards. From 2016 to 2017, about 3 million jobs were created in the EU, more than half (1.8 million) in the euro area. The EU employment rate increased by more than a percentage point to 67.7% for the age group 15-64 (Graph I.1.8); in the euro area, the 2008 rate was finally exceeded reaching 66.3%. Meanwhile, the activity rate in the EU hit a new historic high at 73.4%. Higher activity rates reflect factors such as the increase in the retirement age and in female educational attainment (Fernandez and Turegano, 2018); the effect on female participation behaviour of the higher risks for men of becoming unemployed due to the recession – so-called added worker effect (Riedl and Schoiswohl, 2015) or to greater job destruction of middle skill occupations (job polarisation) usually taken by men (Verdugo and Allègre, 2017). ([19])

Graph I.1.8: **Employment, unemployment and activity rates, EU28, 2000-2017**

(1) Age group: 15-64 years old.
Source: Eurostat, Labour Force Survey.

Although employment has reverted to its pre-crisis level, the hours worked per employee remained low. In 2017 and second quarter of 2018, they remained about 3% below the pre-crisis level in the EU and about 4% in the euro area (Graph I.1.9 shows the cumulative changes for the euro area). This feature, which is discussed at greater length in the next Chapter, has allowed a steeper rise in hourly productivity during the recovery. ([20]) Accounting for the number of hours that both part-time and full-time workers would like to work provides a measure of the unutilised labour resources broader than that provided by the share of involuntary part-time. At the onset of the crisis, the desired hours of those in employment increased substantially (Box I.1.2). Before the crisis, the share of people that wanted to work more hours matched the share of workers who wanted to work fewer hours. As the crisis unravelled, EU workers declared that they wanted to work more hours. Controlling for this hidden unemployment would push the jobless rate at the peak of the crisis up by about 1 percentage point: in the first quarter of 2013, the unemployment rate in the EU and euro area would have been respectively 13% and 15% rather than the observed 12.3% and 13.7%.

Graph I.1.9: **Cumulative change in GDP, employment and average hours worked per person, euro area, 2008Q1-2018Q2**



Source: Eurostat, National Accounts.

([19]) Ageing has a positive effect on participation rate in Southern European Countries - Italy, Spain and Greece - and negative in Continental European countries – e.g. Germany, Belgium and the Netherlands – (Fernandéz and Turegano, 2018). Factors such as the decline in the birth rate may have also contributed to keep up

([20]) The availability of more flexible working arrangements and of short-time working scheme have made hours worked more responsive to the cycle (European Commission, 2017c, *Labour Market and Wage Developments in Europe*).

Box I.1.2: Underemployment in the EU28 and EA revisited

The unemployment rate is the most common measure of labour market slack. However, it provides only a partial picture of the effective utilisation of the labour resources. During the crisis, there was also a steady increase in the number of those that wanted to work longer hours (the *underemployed*). Compared to the common definition of underemployed, in this analysis this group includes both part-time and full-time workers. Building on the work for the UK by Bell and Blanchflower (2013), this box presents an alternative measure of underemployment defined as the *underemployment index*. It is obtained adding to the (*headcount*) unemployment, the number of excess supply of hours that workers would like to work at a given wage rate, transformed into unemployment equivalent. Excess supply (the net balance between over-and under-employment) is obtained comparing the desired working hours of the proportion of those that would like to work shorter hours with the proportion of those that would like to work longer hours.

Table 1: Underemployment and overemployment in the EU28

	Underemployment		Overemployment	
	Share of workers underemployed in percentage	Average hours underemployed	Share of workers overemployed in percentage	Average hours overemployed
All workers				
2007	8.8	11.7	8.8	11.3
2010	11	11.9	10	10.3
2013	12	12.0	9.9	10.0
2016	10	11.6	10	9.9
Full-time employees				
2007	6.2	8.7	8.7	10.4
2010	7.6	8.8	10	9.6
2013	8.2	8.7	10	9.4
2016	7.1	8.2	11	9.4
Part-time employees				
2007	22	14.2	5.9	8.5
2010	24	14.5	8.2	8.6
2013	26	14.9	7.9	8.1
2016	23	14.5	6.7	8.0
Self-employed				
2007	7.4	14.4	12	15.4
2010	10	14.7	12	14.2
2013	11	14.8	10	14.1
2016	9.0	14.3	11	14.0

Note. Before 2009 no data on Malta included.

***Source*.** Commission calculations based on the European Labour Force Survey.

During the crisis an increasing proportion of the workforce in the EU28 indicated that they want to work more hours (Table 1). Between 2007 and 2013, this share increased from less than 9% to 12% of all workers. ([1]) Unsurprisingly, the share of part-time employees who indicated that they wanted to extend their working time was higher than for full-time employees. In 2013, 26% of the part-time employees wanted to work more hours, against only 8.2% of the full-time employees. Part-employees were also those that wanted to work the largest number of additional hours. In 2016, the labour market started to recover and underemployment declined across all types of workers. There is no clear pattern with respect to overemployment.

([1]) A worker is considered underemployed (overemployed) when the sum of the effective hours worked in the main job and the actual hours worked in the second job (HWACTUA2) is below (above) the number of hours the worker would like to work (HWWISH). The effective hours in the main job equals the actual hours worked (HWACTUAL) except in case the worker worked less because of bad weather, labour dispute, education or training, illness, maternity or parental leave, special leave or holidays. In these case the effective hours worked are set equal to the usual hours worked (HWUSUAL).

(Continued on the next page)

Box (continued)

The underemployment index provides a measure of labour market slack that controls for differences between preferred and actual working hours. It is an alternative to the measure for underemployment that focuses only on involuntary part-time. The *index* combines underemployment at the extensive (headcount unemployment) and at the intensive margin. It is defined by expressing unemployment, underemployment and employment in hours worked and expressed by:

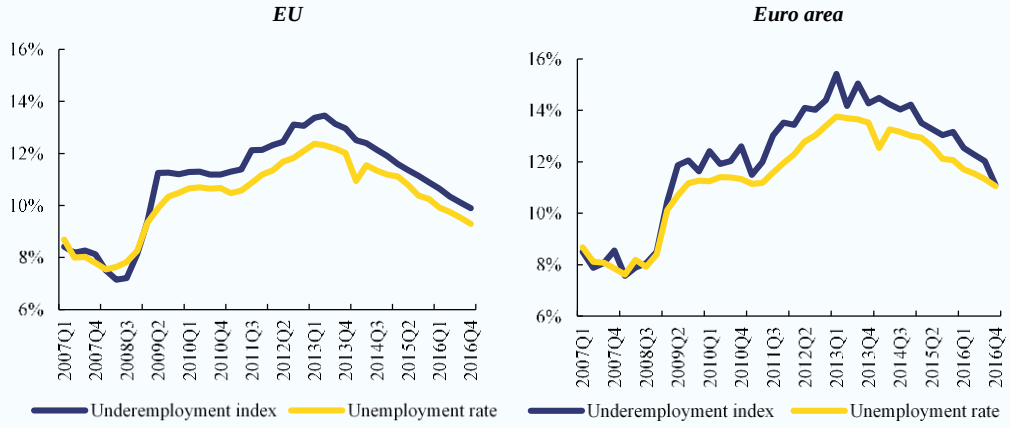
$$U^* = \frac{U\bar{h} + \widetilde{H}^m - \widetilde{H}^l}{U\bar{h} + \widetilde{H}^T}$$

where unemployment ($U\bar{h}$) is the number of unemployed (U) times the average number of hours worked by the employed ($\bar{h}$). Underemployment ($\widetilde{H}^m - \widetilde{H}^l$) is the difference between the additional hours worked for all workers who indicated that they want to work more hours ($\widetilde{H}^m$) minus the reduction in hours for all workers who indicated they want to work less hours ($\widetilde{H}^l$). It is an indicator of excess desired working hours across employees. It can be positive or negative. The volume of total hours worked ($\widetilde{H}^T$) is the sum of the actual hours worked by all workers. If the desired increase of hours equals the desired decrease of hours, the *under-employment* index equals the unemployment rate; otherwise it can be higher or lower. Data at quarterly frequency are based on microdata from the European LFS for the period 2007Q1-2016Q4.

Figure 1 presents the results for the underemployment index and the unemployment rate for the EU (panel A) and the euro area (panel B). There are several findings that are worth mentioning.

- Over almost the whole period underemployment is higher than the unemployment rate. This indicates that there were more people willing to work more hours than actually working.
- Since the onset of the crisis in 2009, the gap between the underemployment index and the unemployment rate widened. This indicates both more job destruction and reduction in working hours during the crisis. This gap may reflect labour hoarding, but also an increase in workers' willingness to work more hours in response to a decline in their hourly wage. In 2016, it started to decline again as in several Member States the labour market started tightening.
- There is more underemployment in the euro area than in the rest of the EU, with some variation across countries. The gap between the underemployment index and the unemployment rate is slightly larger for the euro area (1 pps) than for the EU since 2009 (0.8 pps), although the gap decreased substantially in the euro area in the last quarter of 2016.

Graph 1: Underemployment index and unemployment rate for the EU and Euro area (2005Q1-2016Q4)



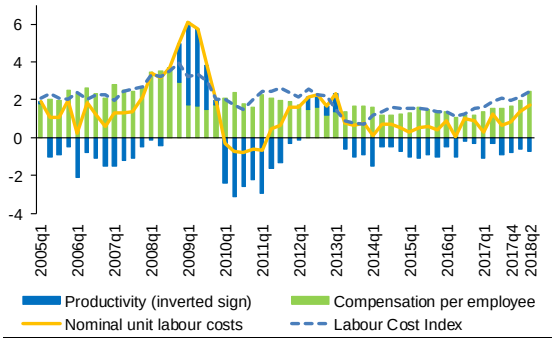
Note: The unemployment rate is calculated based on the hours worked as described above excluding the employment mismatch term $\widetilde{H}^m - \widetilde{H}^l$ to ensure the comparability across the data. For the average hours worked for all workers, we have first calculated the average hours worked by country and then worked with a simple average across countries. Before 2009 no data on Malta included.

***Source*:** Commission calculations based on the European Labour Force Survey.

1.4. WAGES AND LABOUR COSTS

Wage growth has picked up only at the end of 2017. Wage growth in the euro area started to increase at the end of 2017 and more firmly in the first quarter of 2018 - from 1.4% of 2017Q1 year over year to 2.3% in 2018Q2 year over year. Negotiated wages confirm that wage pressures did not materialise until the first half of 2018: the yearly average percentage change in 2017 was 1.5%, slightly above the growth of one year earlier (1.4%); but, negotiated wages expanded in the first half of 2018 at higher rate (1.9%). Modest wage growth, coupled with a slight increase in productivity growth, translated into moderate dynamics of unit labour costs at euro-area level, with an annual growth rate of 0.8% in 2017 - but slightly higher in the first half of 2018 (Graph I.1.10).

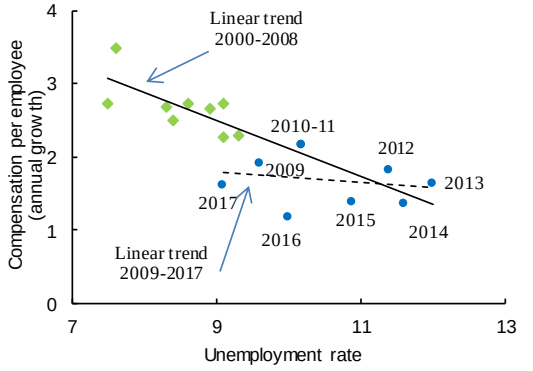
Graph I.1.10: **Compensation per employee and unit labour costs in the euro area, annualised growth rates, 2005Q1-2018Q2**



Source: Commission Services.

Wage growth remains below the pace that could be expected based on falling unemployment. Graph I.1.11 depicts the euro-area Phillips curve – the usually negative relationship between nominal wage growth and unemployment. The fact that the observations for 2016 and 2017 are well below the fitted line implies a missing nominal wage growth of at least 1 pps relative to what could be expected on the basis of the pre-crisis relationship. Of course, unemployment is just one of the determinants of wage growth; other factors may play a role in the "flattening" of the wage Phillips curve, including inflation, productivity developments and other factors. The next few passages provide a discussion of possible causes, while the analytical Chapter II.1 conducts a quantitative analysis of factors explaining recent wage moderation in the EU.

Graph I.1.11: **Phillips curve for the euro area: growth rate of compensation per employee, 2000-2017**



Source: DG ECFIN AMECO database and Eurostat, LFS.

Moderate nominal wage growth in the recovery can be explained by low inflation, low productivity growth and remaining reserves in the labour market. In the euro area, nominal gross wages and salaries grew at an average annual rate of 1.7% between 2010 and 2017, as compared to 2.5% between 2000 and 2007. Low inflation may partly explain the low growth of nominal wages. ([21]) Meanwhile, real productivity growth increased slightly (0.7% on average over 2010-2017 as compared to 0.4% pre-crisis), but coupled with a significantly higher unemployment rate (11.7% in the post-crisis period as compared to 8.7% pre-crisis). Moreover, the resistance on the side of workers and employers to nominal wage cuts during the recession may have also made wages less responsive to the economic recovery – the so-called "*pent-up*" wage deflation (Yellen, 2014 for the US and Izquierdo *et al.* 2017 for the euro area). Thus, as the labour market slack continues to diminish and inflation picks up, nominal wage dynamics would likely accelerate.

Several studies have suggested that there is no missing wage growth if one accounts for the effective spare capacity in the labour market. ([22]) Currently, there are still 9 million

([21]) Consumer price increases also slowed to an average annual pace of 1.5% in the post-crisis period (2010-2017) as compared to 2.2% in the pre-crisis period (2000-2007).

([22]) The analytical chapter discusses in depth the long- and the short-term determinants of wage growth in the EU. Early analyses include IMF 2017a, ECB, 2017; European

underemployed part-time workers, which together with the unemployed makes the labour market effectively less tight than indicated by the current unemployment rate. As discussed in the box I.1.2 and in the previous edition of this Report, accounting for the additional desired hours, provides a better measure of the utilisation of labour input. In 2016, 10% of the workers indicated they would like to work longer hours. ([23]) Controlling for the differences between the actual and desired hours worked, including for those who would like to work less hours, results in almost 900 thousand additional full-time unemployed. With more people willing to work more or more hours, the trade-off between higher wages and open-ended positions tilts in favour of the latter (Cœuré, 2017). ([24]) Similarly, workers' preference toward more flexible working arrangements has a moderating effect on the growth of nominal wages.

In addition to cyclical explanations, structural (long-term) factors may have held back the growth of wages. First, cyclical unemployment might be higher than suggested by the gap between the current and the structural unemployment rate. ([25]) As discussed in Chapter I.3 on policy developments, comprehensive labour market and pension reforms have been implemented in a number of countries since the onset of the crisis. By fostering labour reallocation and participation and by improving matching between job vacancies and job seekers, these reforms may have lowered the structural unemployment rate – i.e. the unemployment rate consistent with long-run-price and wage stability. While the level of structural unemployment is not known with certainty, estimates by various institutions suggest that it has dropped over time – according to the Commission the NAWRU for the EU28 aggregate declined by almost 2 pps from 9.4% to 7.6%. ([26]) To the extent that the effects of reforms are captured by estimates of the structural unemployment only with a lag, the effective size of the labour market slack (i.e. how far is the unemployment rate from its structural level) would be higher than the one currently observed.

Globalisation and outsourcing of labour intensive production may have strengthened the constraints on wages and prices stemming from non-domestic factors. Prices and wages may have become more reactive to foreign labour costs than to domestic conditions. This effect may have been reinforced by the increasing trend of employment in service sectors, with lower bargaining coverage as compared to the more unionised manufacturing sector. ([27]) This weaker collective bargaining capacity would manifest itself in flatter (inflation and wage) Phillips curves. ([28])

Demographic trends may slow down inflation and wage growth. Demographic shifts may affect structural inflation pressures since different age groups differ in their propensity to consume and save (see, e.g., Juselius and Takats, 2018). But demographic shifts may affect wage growth not only indirectly, through inflation, but also directly. As discussed in the analytical Chapter II.1, different mechanisms may be at work. In many Member States, older workers tend to earn more than younger workers but younger individuals' earnings grow faster. The evidence of the analytical chapter suggests that the composition effect may prevail: during the post-crisis period wage growth was somewhat faster in countries with a relatively larger share of older workers, all other factors equal. ([29]) An explanation of this finding might be that ageing has not yet had a significant effect on the structure of the labour market.

Commission, 2017c, Bell and Blanchflower, 2018; Hong et al, 2018)

([23]) This is less than the level of 12%, which was reached during the crisis, but still well above the pre-crisis level of 8.8%.

([24]) However, it may also be that during recessions or period of uncertainty, employers have stronger bargaining power; if this leads to lower wages, workers would like to work longer hours to offset the loss of income.

([25]) The structural unemployment rate is defined as the rate that cannot be further reduced by a cyclical recovery alone.

([26]) In 2017 the NAWRU was lower than it 1997 level in nineteen countries; it was 1 pp above its 1997 level in six, including Cyprus, Spain, Greece and Portugal. For the euro area estimates of the NAWRU have been continuously revised downward (Praet, 2018; Cœuré, 2018).

([27]) Digitalisation and new forms of work makes more difficult for unions to represent adequately all workers. The 2018 edition of the Employment and Social Developments in Europe report (Chapter 6) discusses at length the challenges for collective bargaining in a changing world of work.

([28]) For an analysis of sectoral price inflation Phillips curves in the US, see Seydl and Spittler (2016).

([29]) Chapter II.1 also finds that the ageing of the workforce has increased the aggregate wage level through a composition effect especially in Germany, Italy, Portugal and Spain.

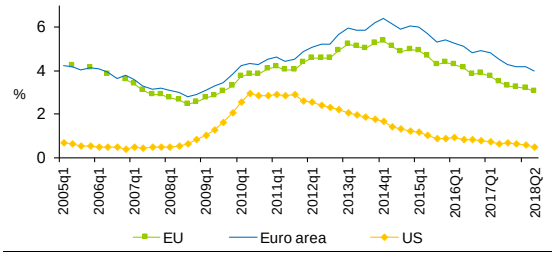
The changing nature of work has broadened opportunities, but has also made workers more uncertain about their jobs. This could exert two possible contrasting effects on wages. On the one side, it puts upward pressure on wage claims, as workers would like to be covered for the higher income risks. On the other side, it weakens workers' bargaining position and thus exerts a downward pressure on wage growth. The digital revolution may further reinforce these mechanisms as automation weakens the demand for labour and wage growth in the short-term (through a displacement effect); yet it also leads to productivity increases in the long-term, which increase demand and wages for non-routine labour (Acemoglu and Restrepo, 2018). ([30])

The findings in analytical Chapter II.1 suggest that the wages have not stopped responding to unemployment in the EU. Once inflation and productivity is taken into account, the response of wage growth to unemployment developments does not appear to be significantly different after the crisis as compared to before. There are only a few Member States with significant 'missing wage growth' in the post-crisis EU, including Ireland, the Netherlands, Portugal, and the UK. In this respect, moderate wage developments appear to involve a smaller element of surprise in the EU than in the US and some other advanced economies.

1.5. LONG-TERM UNEMPLOYMENT AND LABOUR MARKET MATCHING

The reduction of long-term unemployment continued. Since the peak reached in the first quarter 2014, the proportion of the labour force unemployed for at least 12 months dropped by 2.2 percentage points both in the EU and the euro area, (Graph I.1.12). This decline accounts for 60% of the total decline in the EU unemployment rate (50% for the euro area). In the first quarter of 2018, the long-term unemployed were at around 8 million in the EU (6.8 million for the euro area), half a million above the pre-crisis level (one million for the euro area). ([31]) The EU long-term unemployment rate, at 3.2% in the first quarter of 2018, contrasts with the US rate of only 0.6% in the same quarter (Graph I.1.12). This difference reflects the higher job finding rates in the US.

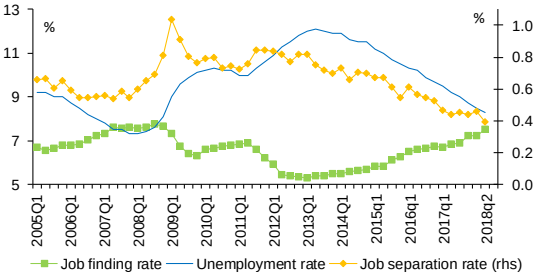
Graph I.1.12: **Long-term unemployed (for 1 year or more) in the EU, the euro area and the US (% of total labour force), 2005-2018, quarterly data**



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

Changes in unemployment reflect different dynamics of the job finding and separation rates. Job finding rates have only gradually improved, gaining momentum at the end of 2015 (Graph I.1.13). After the initial surge, separation rates declined steadily and in the second quarter of 2018 fell well below pre-crisis levels.

Graph I.1.13: **Job finding and separation rates in the euro area, 2005-2018, quarterly data**



Source: Commission Services based on Eurostat data.

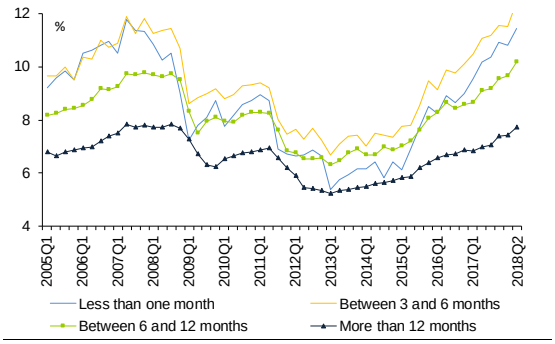
Improvements in the job finding rates have been observed across all groups of unemployed, including the long-term. Graph I.1.14 shows the job finding rates for different spells of unemployment. Improvements in employment chances have been stronger at short than at long durations. The probability of finding a job improved at a higher rate for those with spells of unemployment longer than 12 months only from the second half of 2017.

([30]) ESDE (2018) provides a discussion of the socio-economic challenges stemming from new forms of work.

([31]) This reflects both the drop in the short-term unemployed due to the revival of employment and the long-lasting effects of the crisis on the employability of specific socio-economic groups hit the most by the crisis (e.g. the low skilled).

Rising job finding rates have led to the shortening of unemployment spells. The expected duration of unemployment spells reached a peak of almost 19 months at the end of 2012, nearly twice as long as prior to the crisis. In the second quarter of 2018, the expected duration of unemployment spells had inched down to 13 months. ([32])

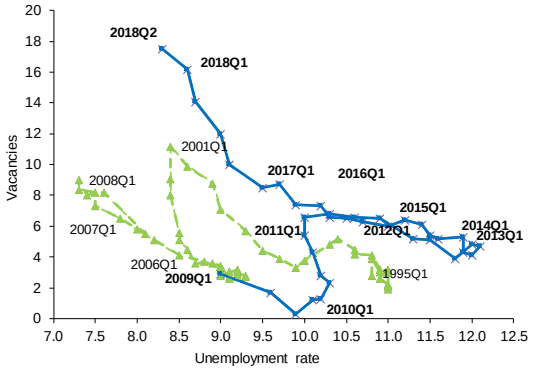
Graph I.1.14: **Job finding rate by duration of unemployment, euro area, 2005-2018, quarterly data**



Source: Commission Services based on Eurostat data.

Recent developments suggest that the jobless rate is approaching its structural rate. The evolution of job finding rates is behind the movements of the Beveridge curve, the usually negative relationship between unemployment and job vacancies (Graph I.1.15). ([33]) The outward shift of the EU Beveridge curve observed after the crisis has been linked to weak labour demand and worsened labour market matching, with significant differences across countries (see Chapter 2). Since 2013, vacancies have been growing in line with the reduction in unemployment, a pattern atypical at the early stage of the recovery. Contrary to the US (Sahin et al., 2014), the rapid rate at which the unemployed have found jobs suggests that the efficiency of the job matching process has improved in many EU countries. ([34]) In the second half of 2017, vacancies jumped abruptly by more than a half (the steepest increase since the series is available) and more than the unemployment declined, hinting to the possibility that the labour shortages and skill mismatches are constraining further the reduction of the unemployment rate. ([35]) In the first half of 2018, vacancies remained at historical high levels.

Graph I.1.15: **Beveridge curve for the euro area, 1995-2018, quarterly data**



Note: Job vacancies are approximated with a survey based indicator of labour shortages in industry (factors limiting production: labour).
Source: European Commission, based on data from the Labour Force Survey and the Business and Consumer Survey.

1.6. CONCLUSIONS

In 2017 employment in the EU expanded at a solid pace, being sustained by solid economic growth. In June 2018 (last available figure), the unemployment rate dropped in the EU and the euro area to 6.9% and 8.3%, respectively. Yet, the euro area unemployment rate remains about one percentage points slightly above the rates seen in 2007. The increasing number of those entering in the labour force among the working age population has partially delayed the drop of unemployment. Yet, with 7.4 million fewer job seekers in the EU (almost 4.5 million in the euro area) compared to the start of the recovery, the improvements remain sizeable.

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

([33]) In the standard framework, higher unemployment over the cycle is associated with a lower number of vacancies as a higher supply of job seekers and greater demand for employees will increase the likelihood of employers finding a match for their vacant posts. Movements along the curve are associated to cyclical fluctuations for unchanged matching efficiency -i.e. the efficiency of the process matching job seekers and vacant post.

([34]) However, with a large number of underemployed and of people marginally attached to the labour force looking for a job – respectively at 3.7% and 4.2% of the labour force –, the unemployment rate underestimates the degree of labour market utilisation. Taking into account the spare capacity in the labour market and the effective job search effort implies smaller declines in matching efficiency during recessions and smaller improvements during the recovery (Hornstein and Kudlyak, 2016).

([35]) Currently, Commission estimate for the euro area structural unemployment rate (NAWRU) is close to 8.4%.

Wage growth remained modest as the recovery gets on a solid path, but accelerated at the beginning of 2018. The recent small pick-up in productivity may have created the conditions for stronger wage increases, in particular in countries where the labour market has proved to be tightening – as discussed in the next chapter.

The labour market outlook is linked to medium-term economic growth prospects. These remain conditioned by the legacy of the economic and financial crisis and the underlying long-term economic trends, including the ageing of the population and the modest productivity trends**.** Risks to employment growth include a softening of economic expansion and tensions related to the external environment that might derive from trade policy and growth prospects in commodity exporting countries. Further increases in employment will crucially depend on the strengthening of productivity growth and on the support to investment.

Further reduction in unemployment would require fostering the match between vacant posts and job seekers, including by tackling skills mismatches and labour shortages. As documented in Chapter 2, the efficiency of the process matching job seekers to vacant positions has been increasing in many countries, responding, *inter alia*, to the drop in the long-term unemployment, and supportive active labour market policies; changes in the recruitment intensity – similarly to what has been observed in the US (Diamond, 2013) – may also have played a role.

2. LABOUR MARKET DEVELOPMENTS IN MEMBER STATES

In 2017 and the firsts two quarters of 2018, improvements in the labour market continued across the EU. The fall in unemployment continued to be more rapid than what the pace of economic growth would normally imply and it surpassed the pre-crisis levels in a majority of countries. While unemployment divergences across countries have declined, broader measures of labour utilisation suggest that a significant dispersion in labour market conditions remains. This dispersion reflects the decreasing but still high share of involuntary part-time employment in countries such as France, and Spain, and discouraged workers in countries such as Portugal and Italy. Meanwhile, emerging labour shortages provide evidence that the labour market is tightening in Germany, Netherlands and Bulgaria.

Consistent with the aggregate evidence of the first chapter, in a large number of countries the current hours worked per worker have continued to drop along the pre-crisis downward trend. The decline is driven mainly by the fall in the average hours worked by full-time workers; conversely, the average number of hours worked by part-time workers has increased. After a substantial deterioration during the crisis, the process matching unemployed people to vacancies - called matching efficiency - improved in most Member States in 2017. This is mainly a result of the decreasing –although still high- long-term unemployment rate, which is, however, still below the pre-crisis level in half of the countries due to the higher level of skills mismatches. Furthermore, substantial differences remain across countries.

Nominal wage growth in 2017 was positive in virtually all EU Member States except Finland and Croatia. In the second quarter of 2018 nominal wage growth was positive in all EU Member States without exceptions. Wages grew faster in Member States with lower wage levels, and in those countries that are not members of the euro area, thereby supporting convergence in the EU. The increase in nominal wages was the highest in Romania, Hungary, the Czech Republic and the Baltic countries. Nonetheless, in most countries, nominal wage growth has remained below what the decline in unemployment would have suggested. This can be attributed to the low inflation and modest productivity growth, in addition to a sizeable degree of labour market slack in some countries.

In 2017, cost competitiveness developments responded to differences across countries in demand conditions. Nominal unit labour costs continued to grow faster – although at a slower pace- in countries that had recorded current account surpluses before the crisis compared to countries that had recorded current account deficits. Countries that saw their unit labour costs rise relative to those of their competitors − such as the Baltic countries, Germany and Slovakia − were also countries with a relatively stronger cyclical position. Conversely, in countries with a relatively weak cyclical position, such as Italy, competitiveness improved.

2.1. INTRODUCTION

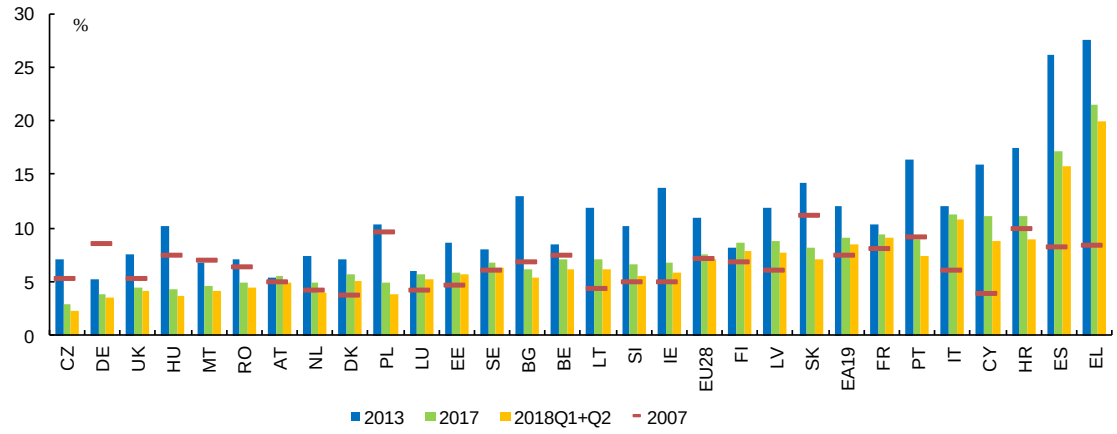
This chapter takes a closer look at labour market and wage developments in individual EU Member States. It does so in an integrated way by assessing employment, unemployment and wage developments. It also looks at developments in the labour market matching efficiency across the EU.

Sections 2.2 and 2.3 describe recent developments in unemployment, employment and activity rates, and analyse the adjustment of hours worked. Fluctuations in job creation and job destruction affecting unemployment developments are reviewed in Section 2.4, while recent wage and productivity developments are described in Section 2.5. Section 2.6 analyses the evolution of the unit labour cost and its main components, followed by Section 2.7 that focuses on external competitiveness and how labour market outcomes relate to external balances and adjustment needs. Finally, Section 2.8 concludes.

2.2. UNEMPLOYMENT RATES

The EU labour market recovery is broad-based. In 2018, unemployment rates continued to fall in all Member States, supported by the economic recovery and favourable external conditions (Graph I.2.1). In 2017, economic growth turned positive in all countries, with GDP growth well above 1%. The broadening of the economic

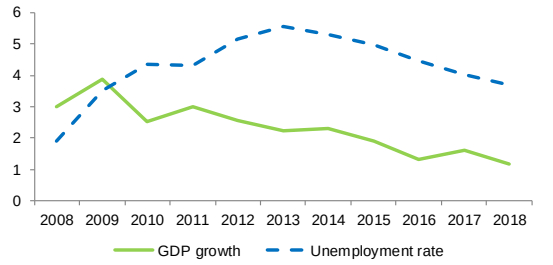
Graph I.2.1: **Unemployment rate, 2007, 2013, 2017 and first half of 2018 (countries are ranked by ascending order of unemployment rate in 2016)**



(1) Seasonally-adjusted data for 2018 Q1 and Q2.
(2) Countries are ranked by ascending order of unemployment rate in 2016.
Source: Eurostat, Labour Force Survey.

recovery coincided with a decline in the dispersion of unemployment rate, which is expected also for 2018.

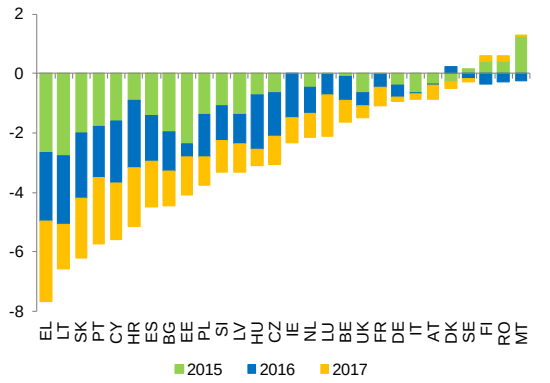
Graph I.2.2: **Dispersion in GDP growth and unemployment rates**



(1) Standard deviation; 2018 based on Commission forecast; For 2015, the Ireland is excluded due to revision in the measurement of GDP.
Source: Eurostat, National Accounts, Ameco database.

The drop of unemployment has surprised on the upside. The job-rich recovery that started in 2013 continued in 2017. By the second quarter of 2018, the unemployment rate fell below the 2007 level in 13 Member States. ([36]) Nonetheless, in 15 Member States it is still above the pre-crisis lows (on average by 3 pps), with the highest gaps relative to 2007 recorded in Greece, Spain and Cyprus. Nevertheless, unemployment fell faster than what would have been expected on the basis of economic growth, in these same countries that underwent a protracted structural adjustment during the crisis such as Greece, Portugal, Cyprus and Spain (Graph I.2.3). But the unemployment rate declines surprised on the upside also for countries emerging relatively unscathed (e.g. the Netherlands or Poland).

Graph I.2.3: **Changes in the unemployment rate unexplained by GDP growth, 2015-2017, pps**



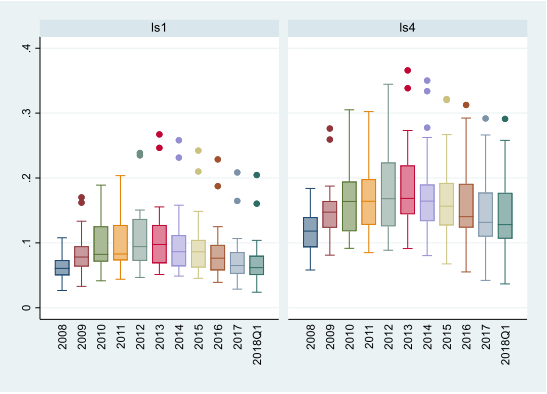
(1) The graph shows the gap between the actual change in the unemployment rate and the change predicted on the basis of the relationship with GDP growth estimated for the period 1995-2007 on a panel of EU28 countries, with country specific fixed-effects. Negative values mean that the unemployment rate declined faster (or increased by less) than predicted on the basis of GDP growth. (2) A 1 pp of GDP growth reduces the unemployment rate by 0.27 pps, based on regression estimates with country fixed effects.
Source: European Commission based on Eurostat data.

The difference between the actual fall in unemployment and its level predicted by GDP growth reached cumulatively (over the three years,

([36]) These are Poland (5.7 pps), Germany (5 pps), Slovakia (4.2 pps),Hungary (3.7 pps), the Czech Republic (3 pps), , Malta (2.9 pps), Romania (1.9 pps), Portugal (1.8 pps), Bulgaria(1.8 pps), Belgium(1.5 pps), the UK (1.1 pps), and Croatia (0.6 pps) and the Netherlands (0.2 pps)

2015-2017) 5 pps or more in Greece, Lithuania, Slovakia, Portugal, Cyprus and Croatia. In a few countries, the change in unemployment was very close to what would have been expected based on economic growth. ([37])

Graph I.2.4: **Dispersion in labour slack measures for EU28:**



(1)LS1 is unemployment as percentage of the extended labour force; LS4 adds to the unemployed those available to work but not seeking, those seeking work but not immediately available, as well as the involuntary part-time workers; LS4 is in percentage of the extended labour force (i.e. the sum of the labour force and all previous components). (2) Boxes represent the middle half of the distribution; the mark inside the box is the median. Dots are outliers. The upper and lower whiskers around the boxes show the minimum and maximum values excluding outliers.
Source: European Commission based on Eurostat LFS.

Differences across countries in the utilisation of labour remain significant. One feature of the recent labour market recovery is that divergences across countries in unemployment rates have been falling relatively faster than divergences in broader measures of the utilisation of labour. Graph I.2.4 shows the dispersion in labour underutilisation in the EU according to two different measures, namely the unemployment rate (left panel, LS1) and a measure of labour market slack which includes, *inter alia*, the involuntary part-time workers (right panel, LS4). The dispersion in involuntary part-time employment and those willing but not seeking work is significantly higher than the one in unemployment rates, indicating that the divergences among countries stem mainly from the involuntary part-time employment and those marginally attached to the labour market.

Discouraged workers and involuntary part-timers represent a sizeable share of the working age population in nearly half of the countries. The share of marginally attached workers was above 10 percent of the inactive in 14 Member States in the first quarter of 2018, while the share of discouraged workers remained higher than in 2007 in 16 countries in 2017. ([38]) Nonetheless, for almost all countries both shares declined since 2013. The most significant declines in the share of marginally attached workers since the start of the recovery were observed in Bulgaria, Romania and Latvia, while the greatest decline in the share of discouraged workers were recorded in Bulgaria, Cyprus, Latvia and Slovakia (Table I.2.1).

2.3. EMPLOYMENT AND ACTIVITY RATES AND HOURS WORKED

2.3.1. Employment and activity rates

Employment and activity rates have surpassed pre-crisis levels in the majority of the EU countries. ([39]) Since the start of the 2013 recovery, the employment rate increased in all countries, with increases over 6 pps in in the Czech Republic, Lithuania, Malta, Croatia, Spain, Slovenia, Luxembourg, Slovakia, Ireland, Poland, Cyprus, (Table I.2.1) and in Slovakia and Hungary, employment rate gains surpassed 8 pps. In turn, activity rates increased nearly everywhere but on average about by half of the increase in the employment rates, thereby accompanying the absorption of unemployment. In the first quarter of 2018, activity rates increased by more than 3 pps in the Czech Republic, Estonia, Lithuania, Latvia, Malta and by more than 6 pps in Hungary, and Luxembourg, as compared to 2013. The activity rate declined only in Spain.

([37]) For example, 2017 economic growth predicts the decline in unemployment in Germany, Finland, Malta, Romania and Italy.

([38]) Marginally attached workers are those available to work but not actively searching for a job; discouraged workers are those that do not search for a job because they believe that no jobs are available.

([39]) Employment/activity rates represent employed/active persons as a percentage of same age total population.

Table I.2.1: **Employment and activity rates and shares of marginally attached and discouraged workers over inactive, 2013, 2017 and 2018Q2, %**

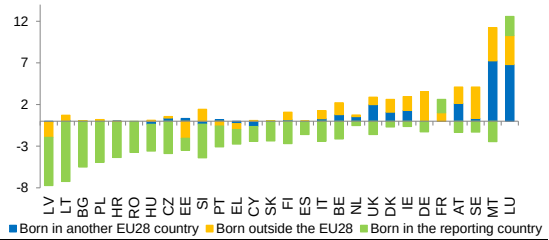
	Employment rate			Activity rate			Share of marginally attached workers			Share of discouraged workers	
	2013	2017	2018Q2	2013	2017	2018Q2	2013	2017	2018Q2	2013	2017
SE	74.4	76.9	77.8	81.1	82.5	83.7	10.4	7.7	6.6	2.7	1.9
NL	73.6	75.8	77.0	79.4	79.7	80.1	15.5	12.9	11.7	5.5	4.0
DE	73.5	75.2	75.4	77.6	78.2	78.2	8.3	9.6	8.9	1.8	1.5
DK	72.5	74.2	75.7	78.1	78.8	79.6	12.4	18.1	15.0	0.5	0.6
UK	70.5	74.1	74.6	76.4	77.6	77.6	14.6	12.5	11.6	0.5	0.3
EE	68.5	74.1	74.8	75.1	78.8	78.8	15.5	18.4	19.5	3.9	3.5
CZ	67.7	73.6	74.7	72.9	75.9	76.4	5.0	4.4	3.9	0.6	0.4
AT	71.4	72.2	73.0	75.5	76.4	76.6	20.4	20.5	18.0	0.7	0.4
LT	63.7	70.4	72.1	72.4	75.9	76.8	4.7	5.4	4.1	2.4	2.3
LV	65.0	70.1	71.7	74.0	77.0	77.9	20.1	15.9	15.4	8.4	5.5
FI	68.9	70.0	73.0	75.2	76.7	79.7	12.0	14.1	13.6	5.7	4.3
SI	63.3	69.3	71.1	70.5	74.2	75.1	13.1	8.8	10.8	3.7	1.6
MT	62.2	69.2	70.6	66.3	72.2	73.5	14.3	13.3	12.3	1.4	0.4
HU	58.1	68.2	69.3	64.7	71.2	71.9	11.7	8.9	8.2	6.6	3.6
PT	60.6	67.8	69.8	73.0	74.7	75.0	14.7	12.8	11.6	12.4	9.8
IE	61.7	67.7	68.5	71.8	72.6	73.1	11.1	13.9	24.6	4.3	2.2
BG	59.5	66.9	67.9	68.4	71.3	71.8	12.2	8.1	7.3	13.8	8.9
LU	65.7	66.3	66.2	69.9	70.2	70.0	18.4	17.4	17.3	1.1	0.5
SK	59.9	66.2	67.1	69.9	72.1	72.0	5.9	5.8	5.3	0.9	2.0
PL	60.0	66.1	67.7	67.0	69.6	70.2	15.3	12.9	11.6	6.1	4.3
CY	61.7	65.6	69.4	73.6	73.9	75.0	13.3	7.9	6.5	6.2	3.3
FR	64.0	64.7	65.5	71.1	71.5	71.8	6.0	7.0	6.6	2.6	2.6
RO	60.1	63.9	65.5	64.9	67.3	68.4	12.0	7.8	4.7	9.1	5.9
BE	61.8	63.1	63.7	67.5	68.0	67.9	7.3	8.1	9.5	4.7	3.4
ES	54.8	61.1	62.5	74.3	73.9	73.9	13.8	10.8	9.9	7.2	4.6
HR	52.5	58.9	61.1	63.7	66.4	66.1	14.0	10.7	9.5	7.4	6.3
IT	55.5	58.0	59.1	63.4	65.4	66.3	19.5	19.6	18.8	12.4	12.3
EL	48.8	53.5	55.3	67.5	68.3	68.5	4.6	5.5	5.2	1.8	1.8
EU28	64.1	67.7	68.6	72.0	73.3	73.7	12.3	11.5	10.7	5.4	4.4
EA19	63.5	66.4	67.3	72.2	73.1	73.4	11.9	11.8	11.3	5.8	5.1

(1) Marginally attached workers are defined as inactive persons (aged 15-74) who are available to work but are not actively searching for a job, expressed as a share of the total inactive population. Discouraged workers are marginally attached workers who are not seeking employment because they think no work is available Employment is based on the resident concept. Employment and activity rates refer to age group 15-64.
(2) Countries are ranked by descending order of the employment rate in 2017.
(3) Break in time series: IE in 2016, BE, DK, IE in 2017.
Source: Eurostat, Labour Force Survey.

Employment rates have been pushed up by falling unemployment and increasing participation. In almost all countries, the fall in the number of unemployed and the increase of the activity rates was accompanied by an increase of employment rates (Table I.2.2).

The strongest contributions stemming from unemployment declines are observed for Spain, Portugal and Ireland. The increase in the activity rate contributed the most in Romania, Malta and Sweden. The same applies to the employment rate, which in 2018Q2 increased in all countries with the exception of Luxembourg. Countries such as Malta, Sweden, Germany and Austria have seen increases in working age population due to mainly an increase in their foreign-born population (EU28 and non-EU28) over the 2013-2017 period.

Graph I.2.5: **Contribution of foreign born and native population to growth of total working age population: 2013-2017**



(1) Disaggregated data for born in another EU28 country and born outside EU28 are not available for Bulgaria, Romania and Germany. Foreign-born population was calculated for these countries. (2) Countries are ranked by ascending order of growth in working age population, 15-64.
Source: European Commission based on Eurostat.

Table I.2.2: **Contributions to employment rate changes, 2013-2018Q2 (cumulative changes)**

	Change in employment rate (pps)	*Contributions explained by change in:* Change in activity rate (pps)	Contribution of unemployment growth (inverted sign)	Contribution of population growth
BE	2.0	0.4	1.6	0.0
BG	7.6	3.4	5.2	-0.6
CZ	6.3	3.5	3.5	-0.2
DK	3.4	1.5	1.5	0.1
DE	2.2	0.6	1.3	0.1
EE	5.6	3.7	2.8	-0.2
IE	7.0	1.2	5.4	0.4
EL	6.2	1.0	6.0	-0.7
ES	7.2	-0.4	8.3	-0.2
FR	3.2	0.7	0.6	0.2
HR	8.2	2.4	6.4	-0.6
IT	3.5	2.9	0.7	-0.1
CY	7.0	1.5	6.3	-0.3
LV	4.9	3.9	3.3	-0.8
LT	7.7	4.4	4.4	-0.7
LU	1.4	0.2	-0.3	0.6
HU	10.7	7.2	4.1	-0.3
MT	9.5	7.2	0.9	0.4
NL	3.2	0.7	2.7	0.0
AT	2.0	1.1	0.4	0.1
PL	7.1	3.2	4.6	-0.5
PT	8.6	2.0	7.3	-0.4
RO	5.1	3.5	2.0	-0.2
SI	7.6	4.6	3.4	-0.3
SK	7.0	2.1	5.3	-0.3
FI	3.8	4.5	-0.3	-0.1
SE	3.6	2.6	0.5	0.2
UK	4.2	1.2	2.8	0.1

(1) The table decomposes the changes in the employment rate into the contribution stemming from changes in the activity rate, the growth rate of unemployed people and of the working age population. A positive sign means a positive contribution.
Source: European Commission based on Eurostat.

2.3.2. The adjustment of hours worked

The recovery of hours worked has remained sluggish. In almost all Member States, the employment recovery was accompanied by sluggish or even falling hours worked per employed. While employment surpassed its pre-crisis level almost everywhere, developments in hours worked per employed continued to be flat, remaining well below pre-crisis levels in several countries (Graph I.2.6). This reflects both the slack in the labour market and a general trend to work less hours.

The weak growth of hours worked hides a cyclical recovery around a declining trend. Graph I.2.A1.1 in Annex 1 shows the gap between the current hours worked per person employed and its trend, i.e. the cyclical component of the average hours worked (a measure of labour market slack). During the recession, the average hours worked dropped in all countries, and in some of them well below its trend. In the first quarter of 2018, they were below trend in six Member States (Austria, Greece, Spain, Portugal, the Netherlands and Italy), while, for the remaining countries, hours stood either above or at their trend value. Yet, with notable exceptions (i.e. Bulgaria, Czech Republic, Estonia, Croatia and Slovakia, all having average hours worked about more than 1% above trend), differences with the long-term trends remain usually negligible. In fact, a dominant factor is the long-term decline in the hours worked per worker. Different factors may explain the declining trend in average hours worked per worker, including the rising importance of services, a sector where part-time workers are over-represented, and the effect of technological change. ([40]) These factors are briefly discussed in the rest of this section.

The rise of part-time employment contributes to the overall decline in the average hours worked. The increase in part-time employment goes hand-in-hand with a decline in the total weekly hours worked. As a percentage of total employment, part-time in the EU increased from 17.5% in 2007 to 19.4% in 2018 Q2. ([41]) This was accompanied by a reduction in the average number of hours worked per worker from 37.9 to 36.9 hours between 2007 and 2018 Q2.

The decline in the average hours worked by full-time workers is partly offset by the increase in the average hours by part-time workers. Graph I.2.7 shows the contribution of full-time and part-time employment to the change in average hours worked over the period 2007-2018Q2. In 2008, part-time workers in the EU worked on average 19.9 hours, with a large diversity across countries: 18.4 hours in Germany against 24.4 in Romania. In the second quarter of 2018, the hours worked by part-time workers reached 20.3 hours on average, varying between 17.2 hours for

([40]) The Employment and Social Developments Report 2018 devotes an entire chapter to the future of work and concludes that digitalisation and capital deepening, in combination with the process of globalisation, have brought about the disappearance of many traditional jobs in Europe. At the same time, these are often accompanied by the creation of new ones.

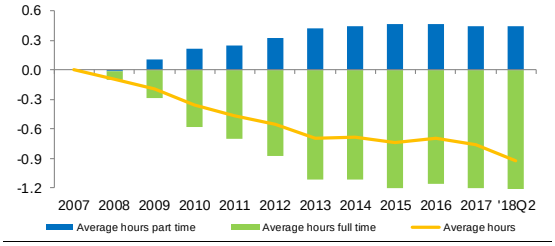
([41]) Countries with the largest increase include Austria, Cyprus, Italy and Greece, with an increase in their share between 4 and 6 pps, followed by Netherlands, Spain, and Slovakia with an increase above 3 pps.

Graph I.2.6: **Change in number of employees and hours worked per employee, cumulative % change since the first quarter of 2009**

(1) Countries are ranked by ascending order of % change in the number of employees between 2009q1 and 2018q2. Values for number of employees for Malta are out of scale (+41%). Due to break in the series of hours worked data from HU are shown relative to 2010Q1
Source: Eurostat, National Accounts.

Portugal and almost 26 hours for Belgium. ([42]) Table I.2.A1.1 in Annex 1 shows that for all countries the increase in the volume of hours worked by part-time employed mitigates the effect on total hours of the decline in the volume of hours worked by full-time employed. This effect is stronger after the crisis, in particular for a few countries, such as the Netherlands, Germany and Belgium. One possible explanation of the increase in the maximum hours worked by part-time workers in these countries is that the good economic conditions may have led to a rebalancing of hours worked within the family between part-time and full-time workers. ([43]) Stronger preference for lower hours worked as income rises may also lead to decline in average hours worked (Bick et al, AER 2018).

Graph I.2.7: **Average hours worked in the EU: contribution of part-time and full-time employment, 2008-2018Q2**



(1) The chart shows the cumulated change in the contribution of full-time and part-time hours to the change in the total hours worked.
Source: European Commission based on Eurostat.

([42]) Between 2008 and 2017, the hours worked by part-time workers increased by 2.1 hours in Belgium, 1.3 Germany and by less than one hour in Italy, Netherlands, Latvia and Estonia; they dropped by more than one hour in Bulgaria (-1.3), Czech Republic (-1.2), Denmark (1.5), Croatia (-2), Lithuania (-1.7), Hungary (-1.9), Portugal (-1.4) and Romania (-3.7) and Slovakia (-2.4).

([43]) In Germany this change in the composition of hours worked within the family has been anticipated the 2018 metalworker agreement that allowed for choosing between more flexible working time and higher wages.

Box I.2.1: Impact of total factor productivity on hours worked

Over the long term, total factor productivity growth is neutral at the extensive margin (number of employees) but not at the intensive margin (hours worked). In order to identify the overall effect on hours, Table 1 shows the effect of total factor productivity growth (or TFP, a catch-all measure of technological progress) on both the volume of hours (columns 1-2) and the hours worked per person employed (columns 3-4). ([1]) The constant represents the growth rate of total hours worked unexplained by technological innovations; as expected, the volume of worked hours dropped during the 2008-2009 crisis. The first column implies that a one percent increase in TFP leads to an increase in the volume of hours worked by 0.16%. If one excludes the 2008-2009 recession (column 2), the effect almost halves and is also imprecisely estimated. In contrast, the value of the constant triples; this suggests that other factors explain employment growth in the long term. ([2]) Column 3 shows the effect of productivity growth on the hours worked per person employed: a rise in TFP growth unequivocally raises the hours worked on average by employees (by 0.07%) with no difference between the crisis and post-crisis periods. It is also worth noting that this increase only partially offsets the decline (of about 0.3% yearly) in the hours worked per person employed explained by other factors (the value of the constant).

Table 1. Technological progress doesn't reduce hours worked: effect of TFP growth on hours worked

	1995-2017	Exlcuded 2008-2009	1995-2017	Exlcuded 2008-2009
Dependent variable:	Total hours worked growth	Total hours worked growth	Average hours worked per person employed growth	Average hours worked per person employed growth
	(1)	(2)	(3)	(4)
Total hours worked growth lagged	0.33 ***	0.32 ***		
	(0.04)	(0.04)		
Average hours worked per person employed growth lagged			-0.15***	-0.16***
			(0.04)	(0.04)
Total factor productivity growth	0.16***	0.07	0.07***	0.07**
	(0.04)	(0.04)	(0.02)	(0.02)
Constant	0.14***	0.45***	-0.34***	-0.35***
	(0.095)	(0.10)	(0.05)	(0.06)
Observations	583	527	583	527
R-squared adjusted	0.42	0.37	0.10	0.06
Number of countries	28	28	28	19

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The sample includes euro-area countries except EE, CY, LV, MT, SI, SK. Wage growth is measure by the rate of change of nominal compensation per employee.
Source: DG ECFIN AMECO database and Eurostat LFS.

([1]) Volume of work and total hours worked are used interchangeably. The volume of work equals the hours worked per person employed times the number or employed people. Estimates exploit the relationship between the variables within each country and represent the average effect.

([2]) TFP rises the hours worked per employee but not the total hours worked. This implies that there can be an offsetting effect on employment. However, this effect is imprecisely estimated. Large and positive effects on employment stem from other factors not taken into account in the estimate.

Technological progress has small but positive effects on hours worked. Historical evidence suggests that despite the unlimited possibilities of labour-saving technologies, automation does not replace fully labour. ([44]) The effect of technological progress on hours worked stems from *two offsetting effects*. On the one side, automation reduces the hours needed by each worker to do specific tasks, in particular in sectors undergoing rapid innovations; on the other side it raises productivity and, thus, may increase the demand for labour, thereby partly or fully offsetting the negative effect on total hours worked. ([45]) The analysis in Box I.2.1 suggests that technological progress would increase the overall number of hours worked. This may be due to a demand effect whereby, technical improvements

([44]) For more details please see European Commission 2018d, available at http://ec.europa.eu/social/BlobServlet?docId=19719&langId=en

([45]) It does so directly by increasing the demand in non-automated tasks in industries where automation takes place − so-called *Uber-effect*- − or indirectly through the effect of higher productivity on consumer incomes – a *Walmart* effect − or through lower costs for downstream customer industries − a *Costco* effect − (Autor et al, 2018).

lead to higher productivity and wage, which triggers the demand for new products and services. Nonetheless, the effect of technical change does not fully offset the downward trend in average hours worked observed over the last decade.

2.3.3. Employment developments at sectoral level

Job creation is particularly strong in services. In most countries the strongest growth in employment over the past years has been observed in services, reflecting the strong cyclical recovery (Table I.2.3).

Table I.2.3: **Employment growth in different sectors, cumulative % change over the years 2013-2018Q2**

	Industry	Construction	Market services	Public admin, health, education
MT	2.6	17.6	21.1	20.7
IE	11.0	71.0	13.3	14.4
LU	4.5	13.4	13.5	16.2
HU	9.3	19.1	13.8	10.8
CY	9.8	18.3	14.2	3.6
ES	9.5	16.7	12.4	7.0
SK	14.0	4.8	9.1	6.7
PT	14.2	7.5	16.8	3.8
SI	11.3	5.0	9.6	8.0
HR	8.6	8.0	19.0	17.6
SE	-3.9	17.2	7.2	12.0
EE	7.1	18.2	19.4	-1.3
UK	2.9	11.2	8.6	1.8
DK	5.6	16.6	8.3	2.3
CZ	10.6	-7.5	5.3	11.0
PL	10.5	3.2	9.1	5.5
EU28	4.7	4.5	7.2	5.6
NL	2.2	-1.1	7.0	0.6
AT	5.2	7.7	6.0	8.6
EA19	3.1	2.0	6.3	5.9
EL	1.6	0.2	9.8	7.3
DE	3.7	4.3	3.7	9.9
LT	9.5	-1.2	3.9	3.7
BE	-2.7	0.9	1.9	5.6
IT	0.1	-9.6	5.1	3.3
FR	-3.7	-3.9	4.1	2.9
FI	-3.0	13.1	1.9	2.9
BG	5.6	4.0	7.2	0.7
RO	9.2	9.1	17.3	8.9
LV	-5.8	5.0	5.3	0.3

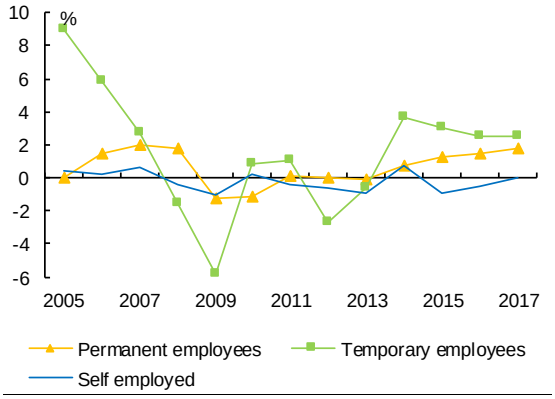
(1) Countries are ranked by descending order of cumulative employment growth over the period 2013-2018q2.
Source: Eurostat, National Accounts.

During the period 2013-2018Q2 the strongest growth of employment in market services comprising accommodation, food service activities and information and communication sectors was recorded in Malta, Estonia, Croatia, Portugal and Romania. Fuelled by domestic demand but also public investments, a large increase in the construction sector is noticeable in Ireland, while a consistent increase is noticeable in Hungary, Cyprus, Sweden and Malta. Public administration, health and education expanded with the strongest growth of employment observed in Malta, Luxembourg, Croatia, Sweden and the Czech Republic. Finally, also industry saw a sizeable employment growth specifically in Ireland, Portugal, Slovakia, Estonia, Poland and Slovenia.

2.3.4. Employment developments by contract type

Permanent employment expanded at a stronger rate in 2017. As the output gap is closing, permanent hiring in the EU further strengthened in 2017 (with a growth rate of 1.8%, compared to 0.7% in 2014), while the growth of temporary contracts weakened to 2.5% in 2017 from above 3.5% in 2014 (Graphs I.2.8 and Graph I.2.9). As a consequence of these developments, the stock of permanent contracts increased in almost all countries, in particular in Croatia, Poland and Romania with a share of permanent contracts below the median. Moreover, declines in the share of permanent contracts in countries with low share imply divergence across countries.

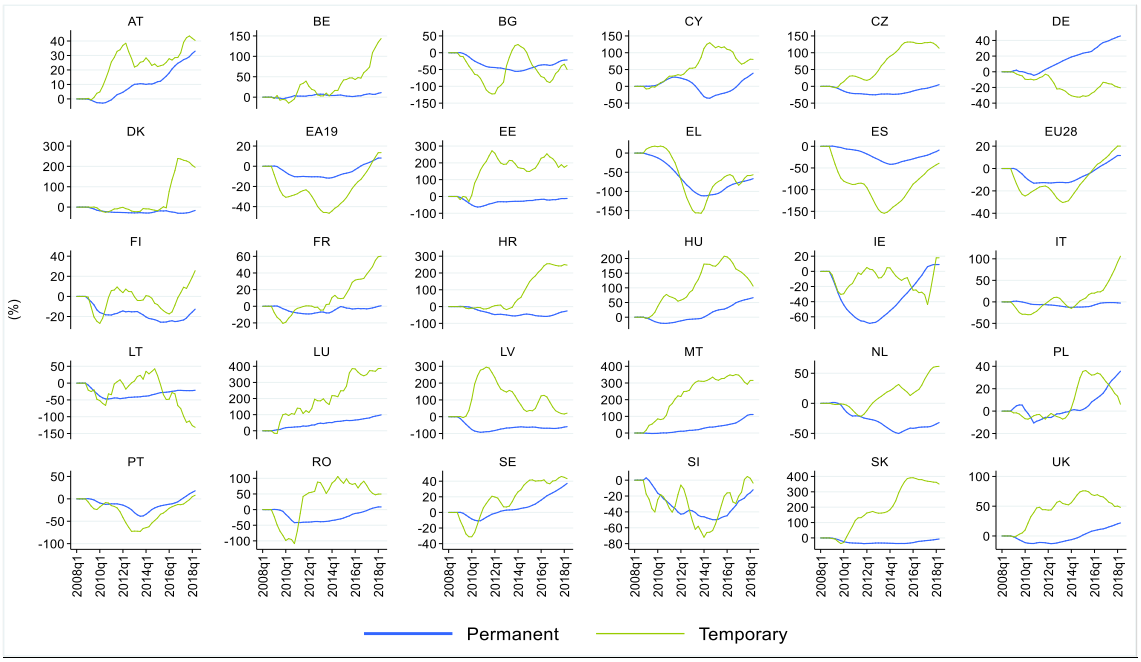
Graph I.2.8: **Employment growth by contract type, EU 28, 2004-2017, %**



(1) Age group: 15-64.
Source: Eurostat, Labour Force Survey.

The shift to permanent contracts is consistent with a recovery gaining strength and with the effects of reforms reducing firing costs of permanent workers.

Graph I.2.9: **Employment growth by contract type, 2008-2018Q2, cumulative % change since the 2008Q1**



(1) Age group: 15-64.
Source: European Commission based on Eurostat data, Labour Force Survey.

Table I.2.4: **Distribution of contract types among the employed, 2017, % and pps**

	Open-ended contracts		Temporary contracts		Self employed	
	2017	chg	2017	chg	2017	chg
LU	88.9	*-0.1*	5.1	*0.1*	6.1	*-0.1*
EE	87.0	*-0.2*	2.7	*-0.6*	10.3	*0.8*
LT	86.6	*0.6*	1.4	*-0.2*	12.0	*-0.3*
LV	84.1	*0.3*	2.5	*-0.6*	12.7	*-0.3*
MT	83.9	*1.7*	4.4	*-1.6*	11.7	*-0.1*
HU	83.3	*0.8*	7.7	*-0.8*	9.0	*0.0*
DK	82.7	*0.9*	11.1	*-0.7*	6.1	*-0.2*
SE	81.7	*0.2*	14.2	*0.0*	4.1	*-0.2*
UK	80.1	*0.3*	4.6	*-0.2*	15.3	*-0.1*
AT	79.7	*0.0*	7.7	*0.1*	12.6	*-0.1*
DE	79.6	*0.5*	10.7	*-0.3*	9.7	*-0.2*
CZ	78.1	*0.3*	7.6	*-0.1*	14.3	*-0.2*
SK	78.0	*0.9*	8.4	*-0.5*	13.6	*-0.3*
IE	75.9	*0.2*	7.9	*0.3*	16.2	*-0.5*
FR	75.6	*-0.5*	14.2	*0.6*	10.2	*-0.1*
FI	75.6	*0.5*	13.2	*0.3*	11.3	*-0.8*
CY	75.3	*0.7*	12.7	*-0.7*	12.1	*0.0*
BE	74.6	*-1.1*	8.7	*1.1*	16.7	*0.0*
RO	74.0	*0.4*	0.9	*-0.1*	25.1	*-0.3*
EU28	73.5	*0.1*	11.5	*0.1*	15.0	*-0.2*
EA19	72.9	*-0.1*	12.8	*0.4*	14.3	*-0.3*
BG	69.9	*-1.4*	3.4	*0.3*	26.7	*1.1*
HR	69.3	*2.5*	17.9	*-1.0*	12.9	*-1.5*
PT	67.4	*0.2*	17.8	*-0.1*	14.8	*-0.1*
NL	66.9	*-0.5*	16.7	*0.8*	16.4	*-0.3*
SI	66.4	*-0.5*	14.5	*0.8*	19.1	*-0.3*
ES	65.5	*-0.4*	21.5	*0.6*	13.0	*-0.3*
IT	65.1	*-0.3*	10.8	*1.1*	24.1	*-0.7*
EL	60.2	*-0.1*	6.8	*0.1*	33.0	*0.0*
PL	59.0	*1.4*	20.7	*-1.0*	20.4	*-0.3*

(1) Countries are ranked by descending share of open-ended contracts in 2017.
(2) "Change" refers to the change in the share compared with the previous year (in pps).
Source: European Commission based on Eurostat LFS data.

Nonetheless, temporary employment remained quite dynamic in some countries, e.g. Belgium, Ireland and Italy, while it decreased by more than 10% in the Baltic States, Malta and Romania. In spite of the recent dynamics of temporary employment, open-ended contracts are the predominant type in all Member States (Table I.2.4), with a share in total employment going from about 89% in Luxembourg to 59% in Poland. ([46])

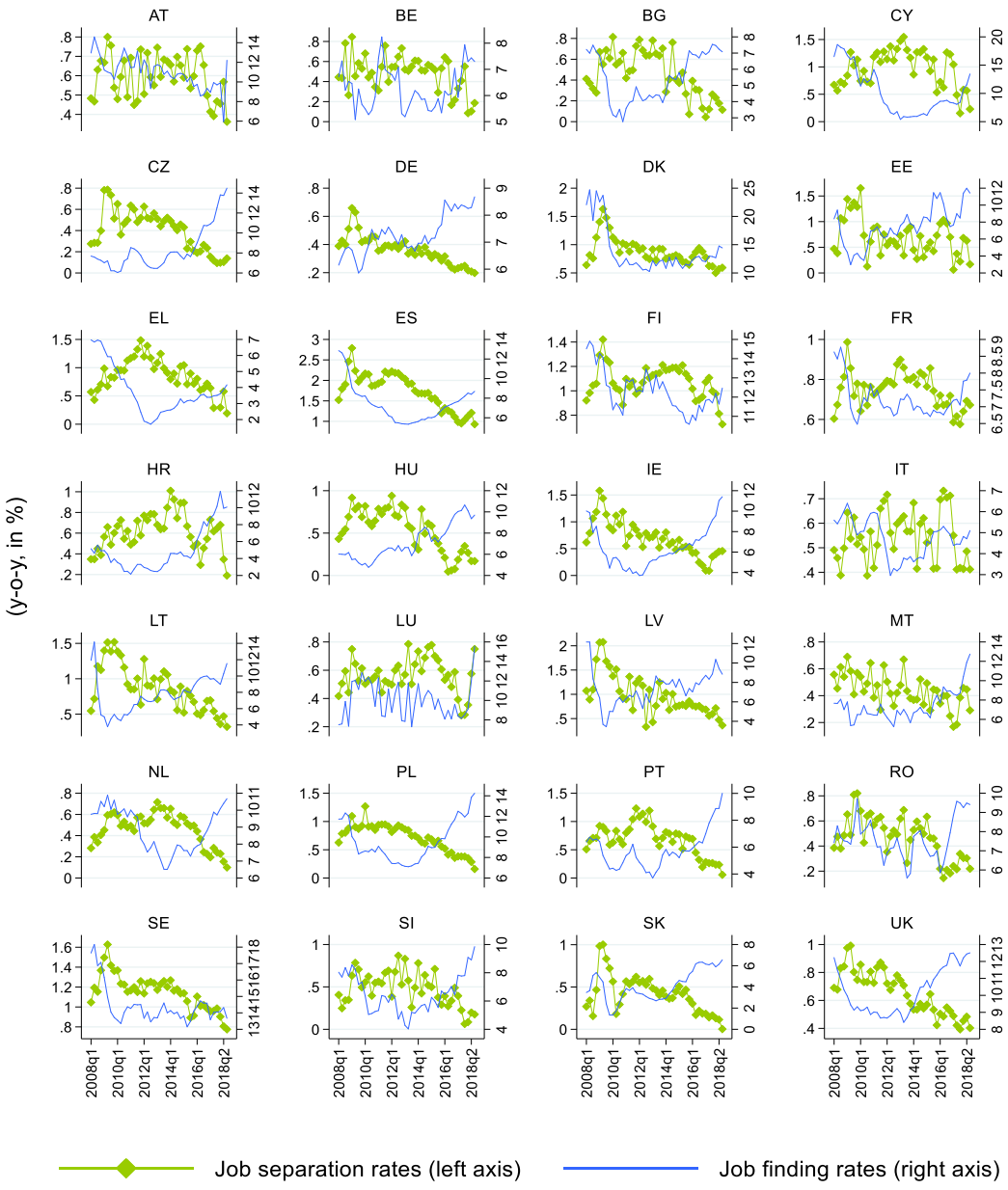
2.4. JOB MARKET FLOWS

2.4.1. Job finding and separation rates

In 2017, half of the Member States job finding rates have been improving or hovering around high levels. This trend continued also in the second quarter of 2018 (Graph I.2.10). In some countries (e.g. in Germany, Sweden, Denmark, Slovenia, Slovakia and Lithuania), the job finding rates - a measure of the probability that an unemployed person finds a job within the next month - remained unchanged at high levels, this also being an indication of a tightening labour market.

([46]) Chapter 3 reviews the EPL reforms implemented after the crisis in the EU Member States.

Graph I.2.10: **Job finding and job separation rates, 2008-2017, quarterly data**



Source: European Commission based on Eurostat data.

Job separation rates remain low and are in most cases returning to their pre-crisis levels. In 2017 and the second quarter of 2018, the overall job separation rates - a measure of the probability that an employed person becomes unemployed in the next month - reached very low levels. Although more volatile than job finding rates, in most Member States (e.g. Lithuania, Latvia, Portugal, Ireland, Malta) job separations decreased in 2017 compared to 2016 (Graph I.2.10).

2.4.2. The Beveridge curve and matching efficiency

Movements along the Beveridge curve suggest that the labour market is becoming tighter. The Beveridge curve is the standard tool to assess whether the process of matching vacant posts with unemployed people reflects cyclical changes or structural shifts. ([47]) In good times firms post many vacancies, while unemployment is low, and *vice versa* in bad times. For the majority of Member States, in line with an expansionary phase of the business cycle, movement along the Beveridge curve continued in the second quarter of 2018. Some countries exhibit a steeper slope, with the number of vacancies increasing more than the decline in unemployment. ([48]) This could indicate that the labour market is getting tighter in Bulgaria, the Czech Republic, Germany, Estonia, Finland, Hungary, Croatia, Malta, the Netherlands, Poland, Sweden, Slovenia and Slovakia.

For some countries, shifts in the Beveridge curve hint at structural improvements in the labour market. A shift toward the origin of the curve may signal an improvement in labour market matching; it means that in order to keep unemployment unchanged fewer vacancies are posted than before, at the same unemployment rate. In several countries (Cyprus, Spain, France, Italy, Portugal, and Romania), the drop in unemployment is not accompanied (or preceded) by large movements in vacancies – reflected by the slope of the Beveridge curve becoming flatter −, which hints at a decline in the structural unemployment, possibly related to labour market reforms implemented after the crisis.

The observed shifts may also reflect cyclical fluctuations in the matching efficiency. Shifts in the Beveridge curve can be traced back to changes in the *efficiency* of labour market matching, i.e. the capacity of the labour market to match unemployed people to vacant jobs. For many countries, estimated matching efficiency follows the evolution of job finding rates, which are highly pro-cyclical. At the onset of the financial crisis, the matching process deteriorated in many Member States, including Cyprus, Greece, Croatia, the Netherlands, and Slovenia (see Chart in Box I.2.2); in contrast, it improved in Germany and, after a transitory decline, in the Czech Republic and Poland. Since the start of the recovery, improvements have been recorded, in half of the Member States with the matching efficiency close to its pre-crisis levels in 6 countries (Estonia, France, Hungary, Romania, Poland and the United Kingdom) ([49]). Yet, in the remaining countries the matching efficiency is below its pre-crisis level.

The unemployment duration and the dispersion of labour market conditions across sectors and skill groups affect the process matching unemployed people with vacant jobs. The effectiveness of this process may change over the cycle because of a *composition* or a *dispersion effect*. The former refers to less employable groups becoming more or less represented among the unemployed during a recession or a recovery, respectively; the share of long-term unemployment is a proxy of this effect ([50]) and depends, *inter alia*, on the probability of finding a job. The latter *effect* represents how matching efficiency is influenced by the labour market conditions across different sectors when displaced workers are not easily employable in a sector different from that of their last occupation. Consistent with results for the US (Barnichon and Figura, 2015), Box I.2.2 shows that in recessions the employability of unemployed workers worsens, leading to an increase in long-term unemployment and to a deterioration of the process matching unemployed people with vacant jobs.

([47]) The Beveridge curve is the relationship between vacancies and unemployment consistent with inflows into unemployment equals to outflows out of unemployment (i.e. no change in the unemployment rate). It is typically shown with vacancies on the vertical axis and unemployment on the horizontal axis.

([48]) In response to higher productivity or in anticipation of greater sales, firms post more vacancies; these open positions eventually are filled by job seekers, many of them previously unemployed. Thus the rise in vacancy postings goes hand in hand with a decline in unemployment. Filling vacancies become more difficult when unemployment is low, and the Beveridge curve becomes steeper.

([49]) A deterioration in the matching efficiency in the recovery period has been observed in Austria, Belgium, Slovenia and Luxembourg. For Latvia, the drop at the end of 2015 is related to a break in the data.

([50]) In recessions, the share of long-term unemployed rises and the matching efficiency falls, as there is a larger share of workers with lower employability (Barnichon and Figura, 2015). The average job finding probability falls even without any change in the job finding probability of any singe worker.

Box I.2.2: **The determinants of matching efficiency in the EU**

Matching efficiency is a key concept in understanding the turnover in the labour market; it measures how efficient the process of matching job-seekers with available jobs is. If unemployment falls while the number of vacancies is unchanged, the Beveridge curve shifts 'inwards', and matching efficiency is said to improve. ([1]) It is a concept based on the theory of job-search and matching (Mortensen and Pissarides, 1994; Petrongolo and Pissarides, 2001), which provides insights into the dynamics of hiring, and in fact describes the productivity of the matching function. Changes in the number of new matches that cannot be accounted for by changes in inputs are attributed to the residual - matching efficiency.

In the post crisis period, the matching efficiency is increasing overall in the EU with substantial differences across countries. This box updates estimates of the determinants of matching efficiency produced in the 2013 (European Commission, 2013b). Estimates of the matching efficiency throughout 2016 were obtained in 2017. (For more details, see European Commission 2013b, 2017c; and Arpaia, Kiss and Turrini, 2014).

Several studies have argued that mismatches in the labour market constitute important determinants of the matching efficiency (Hall and Wohl, 2018). Sahin et al. (2012) show that the misallocation of workers across sectors may have shifted the US matching function, reducing the aggregate job finding rate. Barnichon and Figura (2013) find that the matching efficiency is positively correlated with the dispersion of labour market tightness across regions.

Two types of mismatches are considered: skills and sectoral mismatches, i.e. imbalances between labour demand and labour supply across skills and industries/sectors, respectively. Information on unemployment by industry of last employment is available at the sectoral level by Eurostat. The sectoral mismatch indicator is the unemployment dispersion (coefficient of variation) across sectors. A higher level of the indicator denotes a higher disparity between the sectors that offer many vacant jobs and the sectors that dismiss many workers. The skills mismatch indicator is defined as the dispersion between employment and working-age population shares by education groups (Estevao and Tsounta, 2011).

Table 1. Determinants of matching efficiency: evidence from regression analysis

Dependent variable: matching efficiency	Whole sample (2004-2016)		Pre-crisis 2004-2007		Crisis 2008-2012		Recovery 2013-2016	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unemployment rate dispersion across sectors	-0.541*** [-6.79]	-0.399*** [-4.25]	-0.178 [-0.66]	0.208 [1]	-0.473* [-1.89]	-0.446* [-1.90]	-0.605* [-2.09]	-0.372* [-2.16]
Skills mismatch indicator	-0.996** [-2.4]	-0.686* [-1.83]	-3.599* [-2.31]	-2.222* [-2.19]	-1.456 [-1.11]	-1.198 [-1.02]	-0.477 [0.33]	0.544 [-0.75]
Dependent variable 1 lag	0.974*** [8.86]	0.767*** [7.94]	0.724*** [5.74]	0.413*** [-4.34]	0.607*** [6.84]	0.484*** [3.67]	0.406 [1.71]	0.225 [0.8]
Dependent variable 2 lags	-0.255*** [-3.45]	-0.268*** [-4.16]	-0.338 [-2]	-0.244* [-2.22]	-0.244** [-2.67]	-0.265** [-2.90]	-0.249 [-1.60]	-0.129 [-0.86]
Average expenditure on ALMPs per unemployed / GDP per capita	4.602 [1.6]	3.721 [1.17]	16.16** [3.07]	8.738* [1.95]	17.10** [3.01]	15.22* [2.23]	13.62** [3.05]	6.37* [1.99]
Long-term unemployment ratio		-2.961* [-2.2]		-6.579*** [-5.54]		-2.816 [-1.17]		-5.924*** [-3.55]
Constant	1.465*** [4.55]	2.516*** [6.05]	3.272** [3.64]	4.274*** [6.77]	2.815*** [3.96]	3.624*** [4.25]	3.806*** [5.66]	4.180*** [4.71]
Observations	229	228	78	77	92	92	63	63
R-squared	0.753	0.678	0.35	0.39	0.14	0.11	0.15	0.5
Number of countries	20	20	20	20	20	20	20	20

Note: Robust t-statistics in brackets. *** p<0.01. ** p<0.05. * p<0.1. All regressions include country effects.

Table 1 presents the results from panel fixed effects regressions of matching efficiency on these two mismatch indicators, the change in the expenditure on ALMPs per unemployed (divided by GDP per-capita), the change in the ratio of long-term unemployment in the total population in addition to two lags of the dependent variable to account for persistency. ([2]) The analysis is conducted for the period 2004-2016 as

([1]) Although changes in the measured matching efficiency are usually considered to reflect changes in structural unemployment, caution is warranted. For example, shifts in the composition of labour demand from high to low labour turnover industries (i.e. from construction to engineering) or reduced recruitment intensity may lead to a decline in the measured matching efficiency, but not in the actual efficiency of matching.

([2]) Countries include: AT, BE, BG, CZ, DE, DK, EE, EL, ES, FI, FR, HU, NL, PL, PT, RO, SE, SI, SK, UK.

(Continued on the next page)

Box (continued)

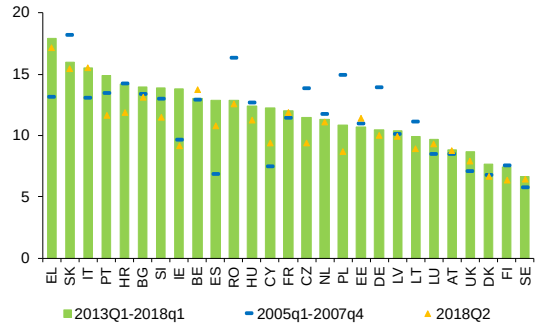
well as for three sub-samples separately: the pre-crisis period (2004-2007), the crisis period (2008-2012) and the recovery (2013-2016). The results for the three sub-samples should be interpreted with caution due to the low number of observations.

Across the whole sample, all variables have the expected sign and are statistically significant. Both skills and sectoral mismatches reduce the matching efficiency, and this effect remains statistically significant after the inclusion of the long-term unemployment ratio. The latter reduces as well the matching efficiency, while expenditure on ALMPs per unemployed has a large, positive effect on matching efficiency.

When splitting the sample in periods, it appears that sectoral mismatches affect the matching efficiency more in the crisis and the recovery periods, whereas skills mismatches have an impact more on normal periods. ALMPs have a higher impact on efficiency during the crisis whereas the long-term unemployment has a higher impact in the pre-crisis and the recovery periods. The higher effect of ALMPs during the crisis is in line with previous evidence suggesting that ALMPs will be more effective in periods of high unemployment, negative economic growth and weak labour demand (Kluve, 2010; Lechner and Wunsch 2009). The effect of long-term unemployment could be attributed to the large increase of long-term unemployment inherited from the crisis. During the crisis, there is an immediate impact on short-term unemployment, whereas the impact on long-term unemployment takes time and is also visible in the recovery, in light of the unprecedented increase in the average duration of unemployment spells.

An increase in the unemployment dispersion across sectors or skill levels lowers the effectiveness of this process. Finally, an increase in the expenditure on active labour market policies (ALMPs) per unemployed (relative to GDP per capita) improves aggregate matching efficiency, particularly during recessions. These findings are consistent with a typical cyclical pattern observed for a large number of countries. At the early stage of the recession, the higher dispersion in labour market conditions leads to a deterioration of the matching process. ([51]) In the following years, skill mismatches and higher long-term unemployment (i.e. due to the persistently low job finding rates) become additional sources of matching inefficiency. The increase in the matching efficiency in 2016 and 2017 was mainly a result of the decreasing (although still high) long-term unemployment rate (i.e. falling unemployment duration). Thus, matching efficiency could improve through up-skilling/re-skilling policies as well as ALMPs([52]) and policies targeting the long-term unemployment.

Graph I.2.11: **Length of unemployment spells, 2005-2018Q2, quarterly data, months**



(1) Data for Malta are not available.
Source: European Commission based on Eurostat data.

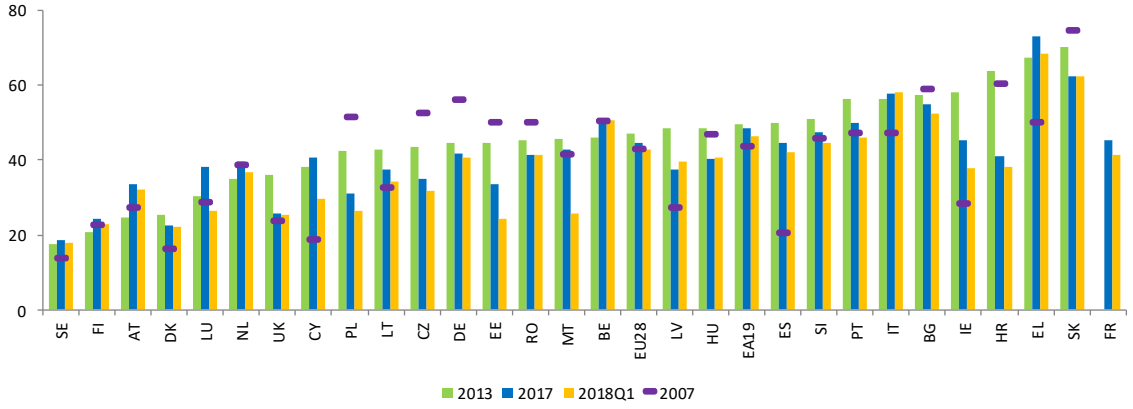
The average duration of unemployment has fallen, but remains high. The length of unemployment spells is inversely related to job finding rates. In the second quarter of 2018, the average duration of unemployment ([53]) decreased relative to the pre-crisis period in more than half of the Member States (Graph I.2.11). In some (i.e Croatia, the Czech Republic, Poland, Romania, Slovakia, Lithuania and Germany) it stood well below the 2005-2007 average.

([51]) Construction was the first sector hit by the 2008 recession; it was difficult to quickly replace workers in different sectors. For the median country, the sectoral dispersion reached a peak in 2009 but receded quickly thereafter. In contrast, the long-term unemployment as a share of active population increased continuously until 2013.

([52]) The 2018 European Semester process emphasised the importance of ALMPs for a 13 countries, including Belgium, Bulgaria, the Czech Republic, Italy, Cyprus and Slovakia. The European Social Fund 2014-2020 has allocated a sizeable amount to the delivery of ALMPs in Member states as well as to the capacity building of institutions delivering these.

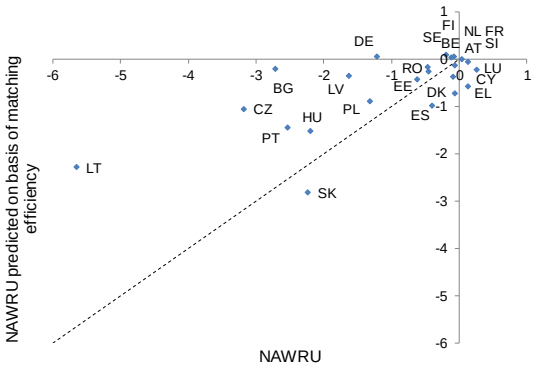
([53]) On average in the EU as a whole the duration of unemployment spells in 2017 stood at 7.5 months, i.e. slightly above the pre-crisis level of 7.1 months.

Graph I.2.12: **The long-term unemployment ratio in the EU**



(1) Long-term unemployment ratio represents long-term unemployment as a proportion of total unemployment.
(2) Long-term unemployment is defined as unemployment lasting at least 12 months.
(3) Countries are ranked by ascending order of long-term unemployment in 2016.
Source: Eurostat.

Graph I.2.13: **Change in the NAWRU since the recovery: 2013-2016**

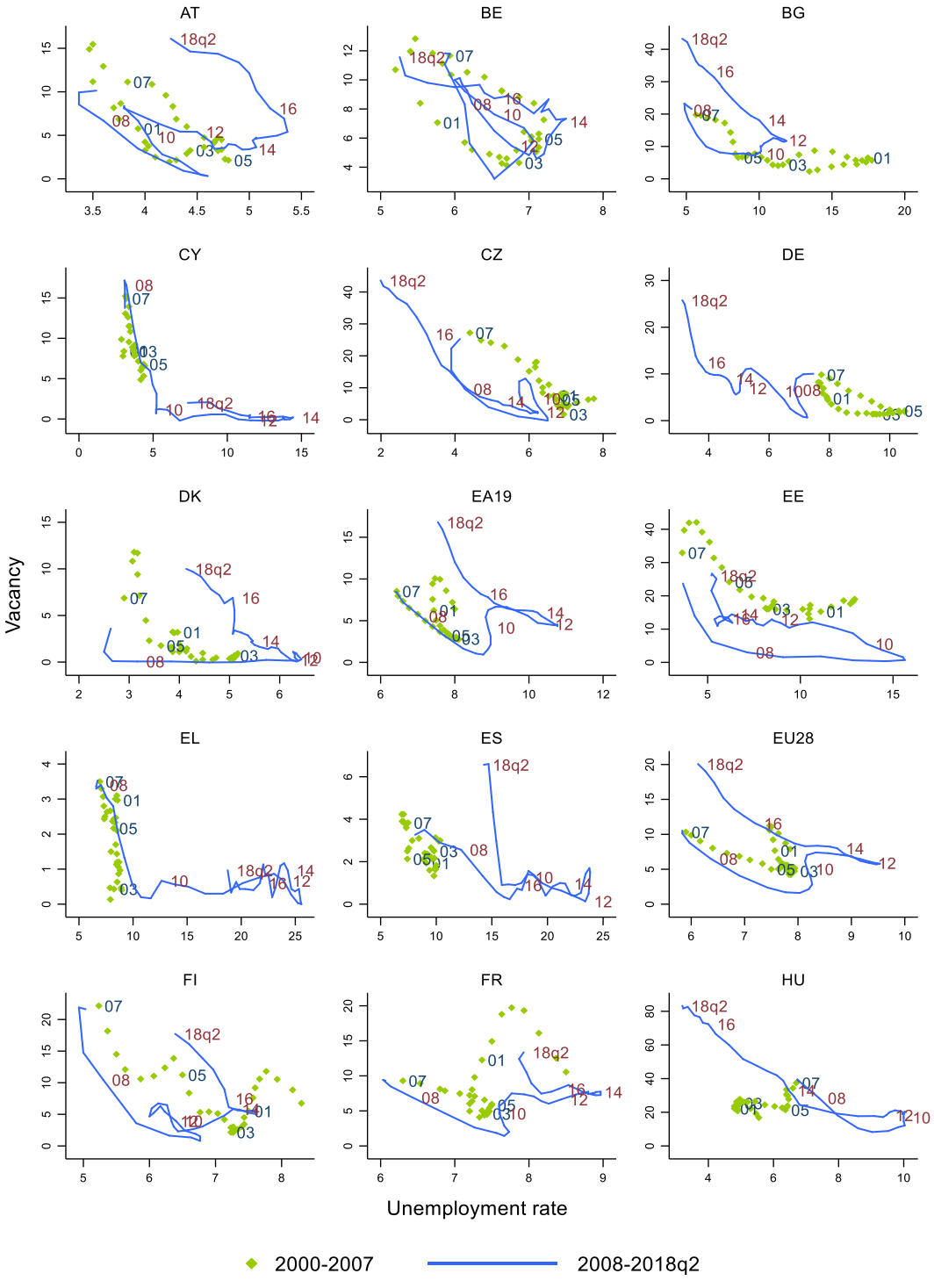


(1) The Graph reports changes since 2013 in the NAWU and in the values predicted based on steady state matching efficiency (based on the fixed effect regression of column 8 in the Box).
Source: Own calculations based on Eurostat data.

In a few cases, this decrease was significant, namely Slovakia, Croatia, Portugal, Romania, the Czech Republic, Germany, and Poland. The long-term unemployment ratio (the share of unemployed that are looking for a job for more than a year) in the second quarter of 2018 remained above pre-crisis levels (Graph I.2.12), in only eight countries.

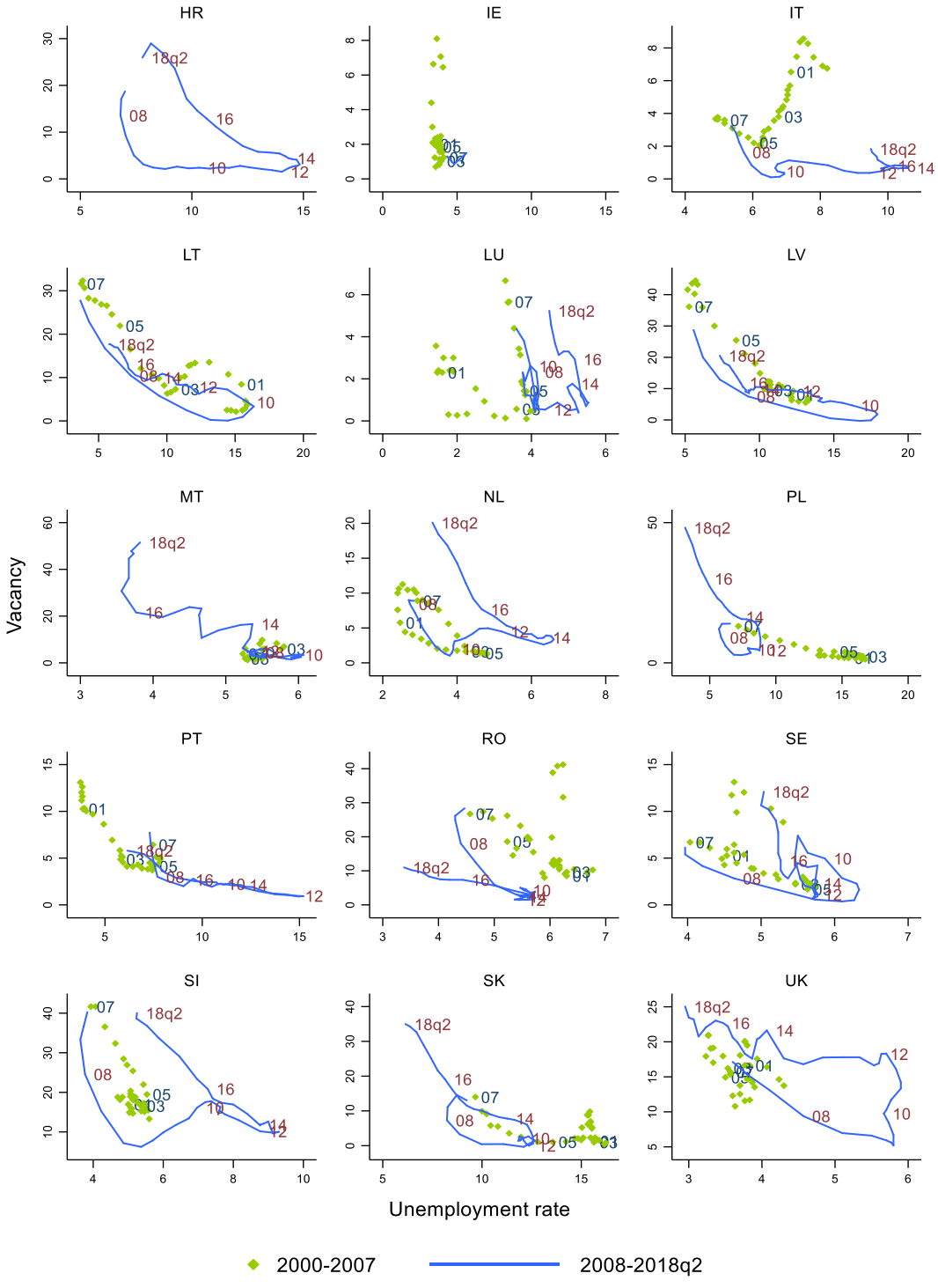
The drop in structural unemployment is partly driven by improvements in the matching efficiency. Graph I.2.13 compares the change during the recovery in the structural unemployment (NAWRU) with the change predicted on the basis of key determinants of the matching efficiency (Box I.2.2). The results suggest that better matching of vacant jobs with unemployed people explains part of the decline in the structural unemployment in a large number of countries. The largest contributions from these factors are observed for Slovakia, Hungary, Poland, and Portugal. For Denmark, Spain and Greece, the drop in the actual NAWRU is higher than the one predicted by the change in the variables driving the matching efficiency - i.e. the structural unemployment may have fallen for other factors such as the effects reforms increasing real wage flexibility in Greece and Spain or of technological changes and automation in Denmark.

Graph I.2.14: **The Beveridge curve in EU Member States, 2000q1-2018q2, quarterly data**



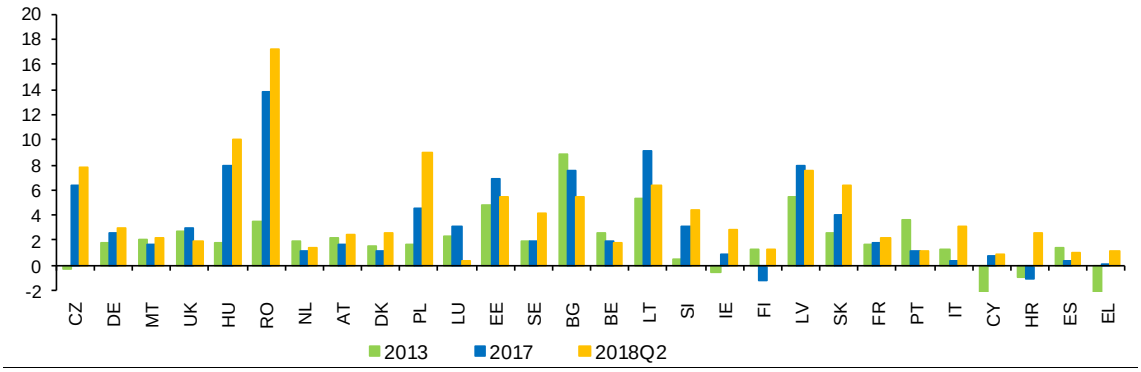
Source: European Commission based on Eurostat data.

Graph I.2.15: **The Beveridge curve in EU Member States, 2000-2018q2, quarterly data, cont.**



Source: European Commission based on Eurostat data.

Graph I.2.16: **Nominal compensation per employee, 2013, 2017 and 2018Q2, annual % change**



(1) Wages are measured by the indicator "Nominal compensation per employee", which is calculated as a total compensation of employees divided by total number of employees. The total compensation is defined as the total remuneration, in cash or in kind, payable by an employer to an employee in return for work done by the latter during the accounting period and it has two components: i) Wages and salaries payable in cash or in kind; and ii) Social contributions payable by employers. (2) All the data used are national accounts data. The indicators are based on national currency values. Aggregates are weighted averages. (3) Countries are ranked in ascending order of the unemployment rate in 2016. (4) For LU 2018q1.
Source: European Commission, AMECO database.

2.5. TRENDS IN WAGES AND LABOUR COSTS

2.5.1. Nominal wage developments

Nominal wage growth was positive in almost all Member States in 2017 and the first half of 2018. ([54]) Wage developments in Greece and Cyprus turned positive after years of negative wage growth (Graph I.2.16). The highest increases in wage growth were recorded in Romania, Hungary, Poland and Slovakia while in general wages grew faster in Member States with lower wage levels, and in those that are not members of the euro area.

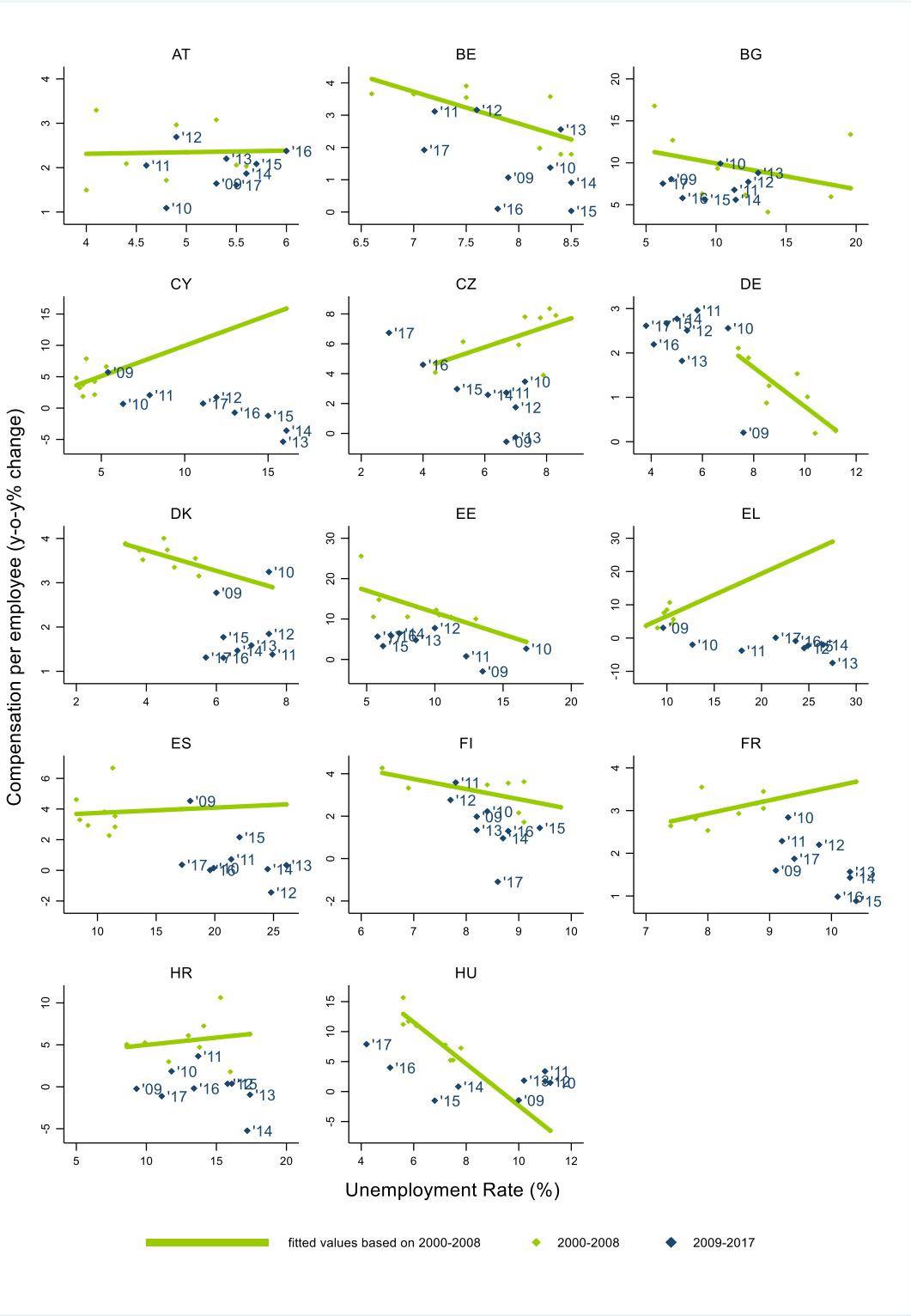
The strong wage growth in Central and Eastern European countries has supported the process of wage convergence in the EU. In 2017, wage growth has been the highest (above 7%) in the Baltics, Romania and Bulgaria, reflecting both a rapid catching-up of GDP per capita to the EU average and, especially for the Baltics, the recovery of domestic demand after the contraction that followed the 2008 crisis. ([55])

On the contrary, wage growth has been moderate in the rest of the EU In 2017, wage growth below 1% prevailed in countries with past current account deficits and pervasive adjustment needs (Portugal and Greece) and those with a current account surplus but which have been experiencing a deterioration of their external position and a loss of cost competitiveness after the crisis (Finland and Italy). The largest euro area countries exhibited comparatively low wage growth: nominal compensation per employee grew by 2.6% in Germany and by 1.8% in France in 2017.

Wage growth is lower than it was in the past at similar levels of unemployment. In spite of these differentiated patterns across countries, wages expanded in 2017 below the rate that one would have expected on the basis of their pre-crisis relationship with unemployment. The Phillips curve, the negative relationship between wage growth and unemployment, is the standard tool to assess how wages respond to unemployment. A steeper curve means that wage growth reacts more to changes in unemployment. In 2017, in most EU Member States decreases in unemployment were accompanied by higher wage growth (Graphs I.2.17-I.2.18). ([56])

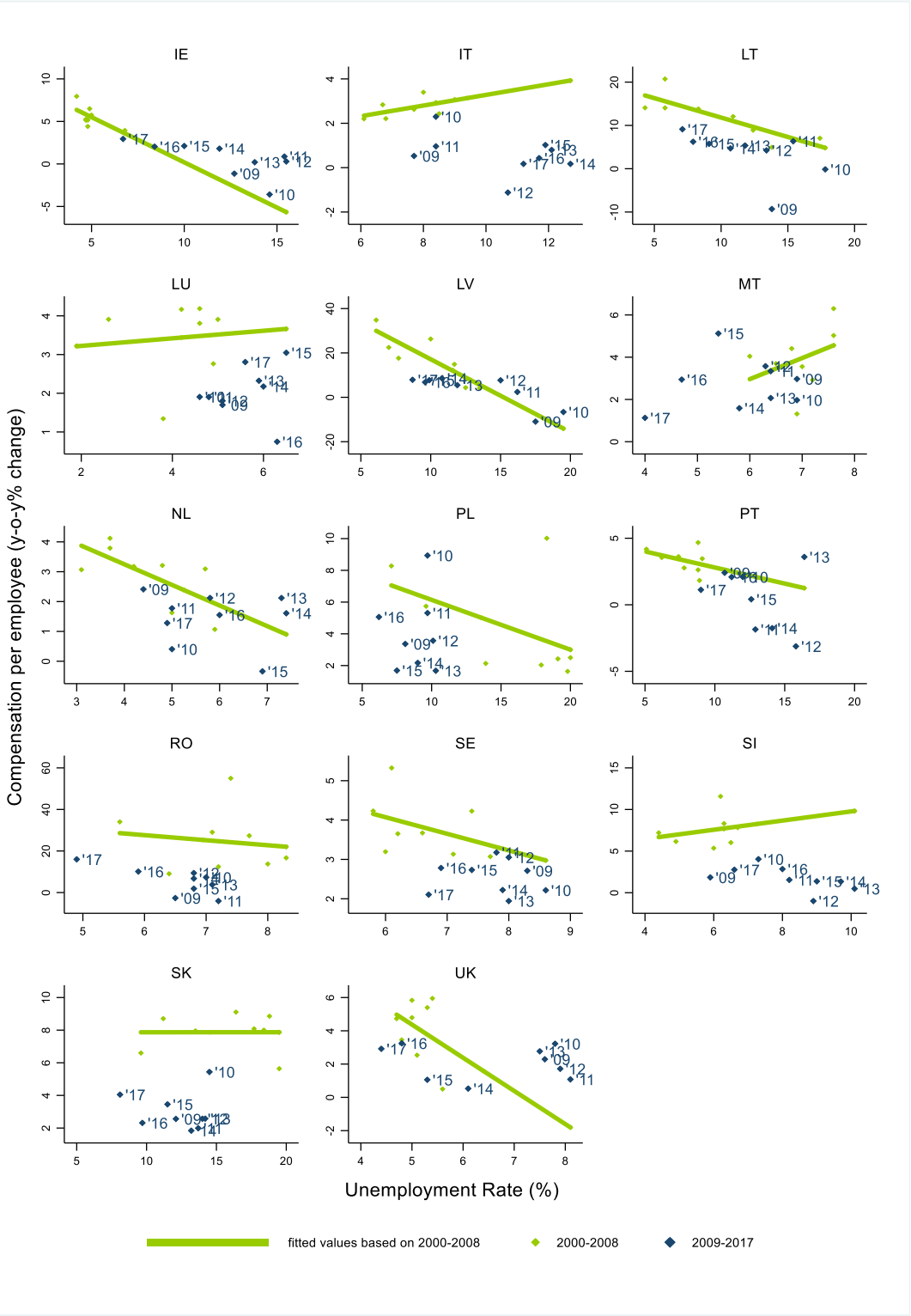
([54]) In this section the terms compensation per employee and wages are used inter-changeably.
([55]) The analytical Chapter on wage convergence discusses more in detail the factors driving wage convergence.
([56]) The analytical Chapter 1 provides an analysis by country of the gap between current wage growth and wage growth expected on the basis of the underlying fundamentals.

Graph I.2.17: **Phillips curve for EU countries: compensation per employee growth and unemployment rate, 2000-2008 and 2009-2017**



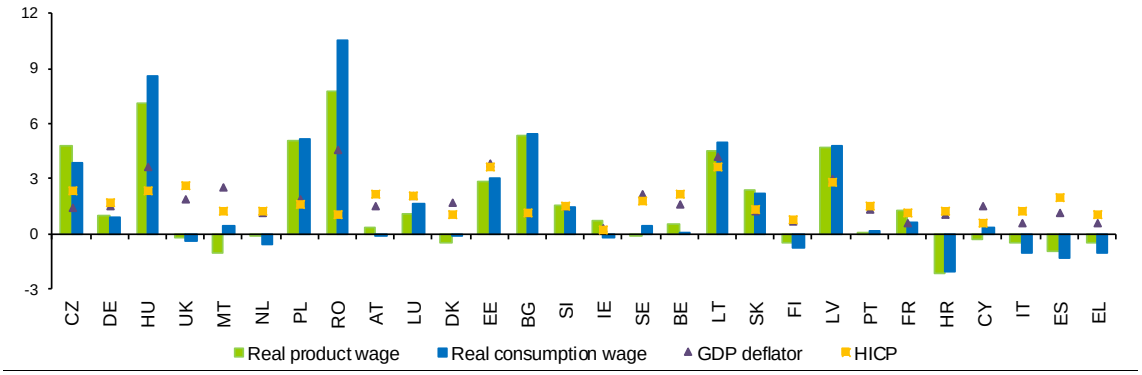
Fitted values over the whole sample period.
Source: European Commission based on Eurostat data.

Graph I.2.18: **Phillips curve for EU countries: compensation per employee growth and unemployment rate, 2000-2008 and 2009-2017, cont.**



Fitted values for the whole sample period.
Source: European Commission based on Eurostat data.

Graph I.2.19: **Real product and consumption wages, HICP and GDP deflator, 2017, annual % change**



(1) Countries are ranked by ascending order of the unemployment rate in 2017.
Source: European Commission, AMECO database.

Yet, except for the Czech Republic, wage growth in 2017 remained below the level of past years with similar levels of unemployment. Countries in which wage growth remained below the historical relationship with unemployment include Belgium, Cyprus, Germany, Denmark, Finland, Slovakia, and Sweden.

Relatively low nominal wage growth can be explained by low inflation and modest productivity growth, besides unemployment developments. Analytical chapter II.1 extends the analysis of wages based on Phillips curves by taking into account all relevant economic fundamentals, including inflation and productivity. The chapter shows that nominal wage growth has not stopped responding to unemployment developments in the post-crisis period. Rather, it has remained slower than it had been at similar levels of unemployment because of the slow pace of inflation and productivity growth. The analytical chapter also shows that there are only a few Member States in which a significant measure of 'missing wage growth' can be identified after controlling for inflation, productivity and unemployment. These include, for the period 2010-2017, Croatia, Cyprus, Ireland, the Netherlands, Portugal, and the UK. Countries with the highest measure of 'missing wage growth' in the pre-crisis period of 2000-2007 include Austria, Germany, Ireland, the Netherlands, Poland and Slovenia.

2.5.2. Real wage developments

In 2017, real wages increased in most Member States but were less supportive of workers' purchasing power (Graph I.2.19). The increase in real consumption wages (i.e. wages adjusted for the change in consumer prices) helped sustain aggregate demand. At the same time, due to an overall increase in consumer prices, real wage growth in 2017 remained below that in 2016 in most countries and even fell in seven countries (Austria, Croatia, Italy, Finland, Greece, the Netherlands and Spain), as a result of stagnant (decreasing in the case of Finland) nominal wages and low but positive consumer price inflation.

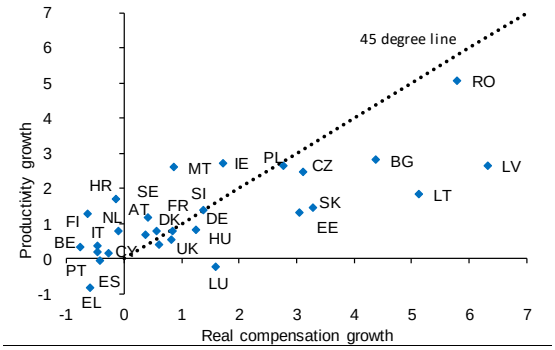
In 2017, real wages were also less supportive of firms' profits in most Member States. Real product wages - (i.e. wages adjusted for the GDP deflator, a proxy at the aggregate level of price of the output produced in one country - are the relevant labour cost indicator for firms. Compared to 2016, where consumer prices increased less than GDP price deflator in all countries, thereby sustaining both workers' purchasing power and firms' profits, in 2017 the GDP price deflator increased less than the consumer prices in about half of the Member States, resulting in real product wages increasing more than real consumption wages. With the exception of Cyprus, Croatia, Italy, Greece, Denmark, Spain, Malta and Finland, where real product wages decreased and Belgium, the Netherlands, Sweden and Portugal where real product wages remained mainly unchanged, in all other countries they increased.

2.5.3. Real compensation per employee, productivity and unemployment

In 2017, real wage growth stood above productivity growth in catching-up countries.

Over the last three years, and consistent with the pattern observed since the recovery, real wage growth (deflated with output prices) exceeded productivity growth in the majority of the EU13 Member States, – i.e. the countries below the 45 degree line in Graph I.2.20 – partially as a result of the catching-up process towards higher income countries. In 2017, the largest gaps between real wage growth and productivity growth were observed in the Baltic States, Bulgaria, and Slovakia. In eight countries, real wage growth was negative, reflecting weak or negative productivity growth. In contrast, real wage growth was below productivity growth in countries with a relatively higher level of income (Austria, Denmark, Finland, Ireland, the Netherlands, and Poland).

Graph I.2.20: **Real compensation per employee and productivity, average growth rates 2015-2017**

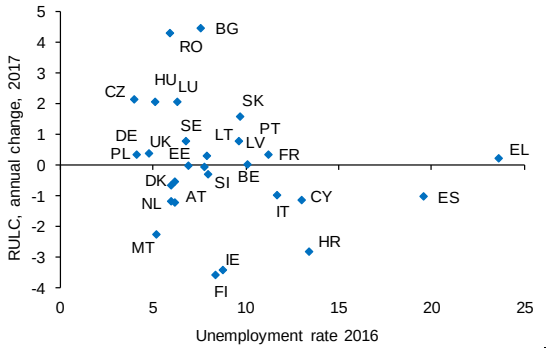


(1) Real compensation is nominal compensation per employee deflated with the GDP deflator.
(2) On the 45 degree line, real wage growth equals productivity growth. Point above the line represent countries where productivity growth is above real wage growth; the opposite for points below the line.
Source: European Commission based on Eurostat data.

As a consequence, the wage share has increased in countries where it was low. Since the onset of the 2013 recovery, the share of labour income in total GDP has been rapidly increasing, in particular in Bulgaria Latvia, Lithuania, Estonia and Slovakia. Within the EU13, it has dropped in Croatia, Cyprus, Malta and Slovenia, where it was relatively higher than the EU13 average. Among the EU15, it has decreased more in countries where the wage share was relatively high (i.e. Belgium, the Netherlands, and Finland).

Differences in real unit labour costs across countries are only weakly related to differences in unemployment rates. The real unit labour costs are the relevant metric to assess whether real wages are consistent with the absorption of unemployment in *excess* of its structural level. ([57]) As in 2016, the correlation across countries between the unemployment rate in 2016 and the change of the real unit labour costs in 2017 remained weak (Graph I.2.21). While real unit labour costs in high-unemployment countries declined (Croatia, Cyprus, Spain and Italy), wage compression in Greece bottomed out after the sizeable adjustment observed during previous years. At the other end of the spectrum, while most of the countries with high real labour cost growth have comparatively low unemployment rates (the Czech Republic, Romania, Hungary, and to a lesser extent Bulgaria), other countries with the lowest unemployment rates have also falling real unit labour costs (Austria, Malta, the Netherlands and Estonia). The highest decreases in real labour costs in 2017 were recorded in Finland and Croatia (more than 3 pps) and Ireland and Malta (more than 2 pps), whereas the highest increases were recorded in Romania (6 pps) and Bulgaria (4 pps).

Graph I.2.21: **Unemployment rate (2016) and change in real unit labour costs (RULC, 2017)**



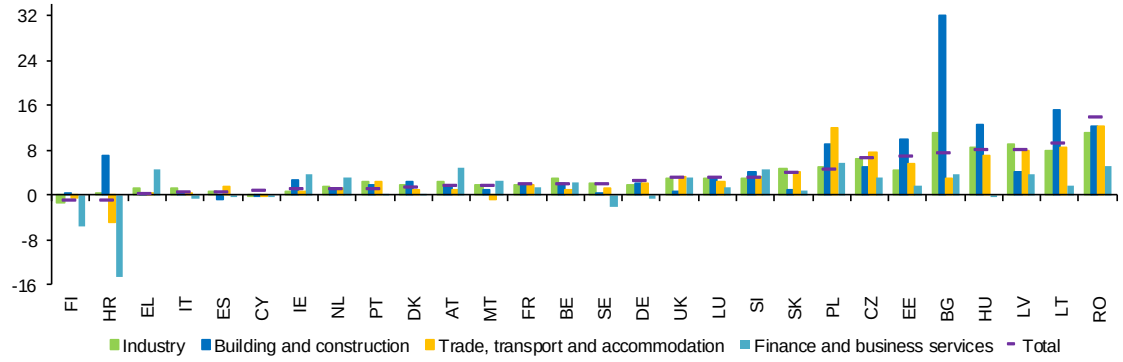
Source: European Commission based on Eurostat data.

2.5.4. Wage developments by sector

Wage growth in the public and private sectors was similar in most countries in 2017. Exceptions to this were countries where public wages increased after having been frozen (Bulgaria, Cyprus, Estonia, Romania, and the United Kingdom) or countries where public wages decreased compared to wages in the private sector which increased (Poland and Finland) (Graph I.2.23). The largest difference between the two

([57]) Real unit labour costs, i.e. real wages adjusted for productivity, is a measure that mimics the labour share,

Graph I.2.22: **Compensation per employee by sector, 2017, annual % change**



(1) Countries are ranked by ascending order of changes in average compensation per employee (total economy) in 2017.
Source: Eurostat.

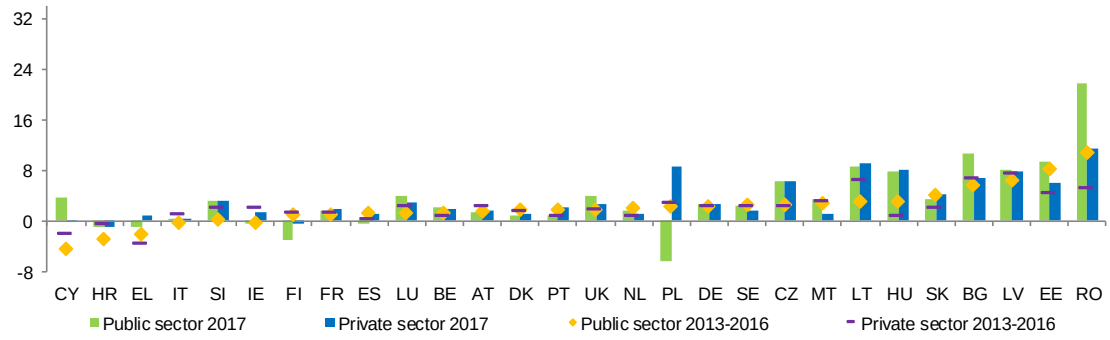
sectors was observed in Romania, where public sector wages increased by a record high of more than 30%, leading to a gap of more than 20 pps with the private sector wage growth, and Poland where public sector wages decreased by 6.4 pps whereas private sector wages increased by 7.3 pps. The analysis in the Box I.2.3 shows that pay gaps have been reduced significantly, including in countries under fiscal stress.

In the private sector, in 2017 the largest increase in wages was recorded in *Building and Construction* (Graph I.2.22), Which is similar to 2016**.** For Member States with the highest aggregate wage expansion wages in *Building and Construction* grew the fastest (except in Latvia and the Czech Republic). With the exception of Poland and Bulgaria wage growth in *Trade, Transport and Accommodation* and *Industry* was consistent with growth of overall wages. In most of the countries (except for Austria, Greece, France, the Netherlands and Slovenia) wages in *Finance and Business Services* increased less compared to all the other sectors; and they even declined in several countries (Finland, Croatia, Cyprus, Hungary, Italy, Spain, and Sweden).

2.5.5. Nominal Unit labour costs

In 2017, nominal unit labour costs picked up in the EU, driven by wage growth and modest productivity gains. Nominal unit labour costs (NULC) adjust nominal wages with labour productivity, providing information on cost competitiveness. The increase was the highest in Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania and Romania. Most of these countries faced relatively rapid wage growth due to both rapid convergence and tightening labour markets (Table I.2.5). In 2017, nominal unit labour costs decreased in Finland, Ireland and Croatia.

Graph I.2.23: **Compensation per employee in public and private sectors, 2013-2017, % change**



(1) The public sector is defined as public administration and defence, education, health and social work, personal service activities. (2) Countries are ranked by ascending order of growth of compensation per employee in the public sector in the period 2013-2016.
Source: Eurostat.

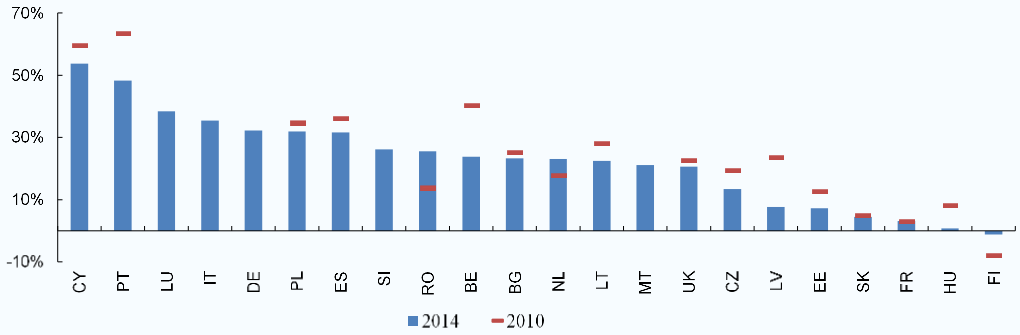
Box I.2.3: **Public-private wage gap**

There is a lot of attention on how public sector wages compare to those in the private sector. On the one hand, adequate public wages are needed to attract and retain individuals with the required qualifications and skills. On the other hand, high wage levels in the public sector could distort the incentives to look for a job in the private sector. A high public-private wage gap may "crowd-out" private sector employment, increase labour costs and lead to competitiveness losses. Moreover, for those Member States required to make large fiscal consolidation efforts, reducing the public wages is one potential way to reduce the public wage bill.

This box quantifies the public-private wage gap in 2010 and 2014 based on the microdata files of the Structure of Earnings Survey (SES), which are compiled by Eurostat and provide harmonised information on various individual and job characteristics. ([1]) The wage gap between private and public employees is calculated as a simple difference between the average wage in the private sector and the average wage in the public sector. Firms that fall under public (private) control are those where the public (private) sector holds more than 50% of economic and financial control of the firm. Balanced public and private ownership (50/50 'shared control') is very rare in practice. Therefore, such cases will not be coded separately and should, if they occur, be treated as being under "private control".

On average, public employees in the EU earn more per hour than private employees (Graph 1), with large differences across countries. The public-private wage gap is the largest in Cyprus and Portugal, where employees in the public sector earn on average 45% or more per hour than employees in the private sector. In contrast, in Finland public employees earn slightly less than private employees. Compared to 2010, the wage gap has fallen in most countries. In some countries (e.g. Cyprus, Portugal and Spain), the fiscal consolidations enacted during the crisis have triggered (through wage freezes or cuts) an adjustment of public wages from the unsustainable levels prevailing before the crisis.

Graph 1: Average wage difference between private and public employees (% of the hourly wage in the private sector), 2010 and 2014



Source: Own calculations based on the SES 2014.

([1]) The countries included in the analysis are Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Hungary, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania Slovenia, Slovakia, Spain and United Kingdom. There is no data on Austria, Croatia, Denmark, Greece, Ireland and Sweden because the data was (not yet) available or information on some key variables was missing which limits the comparability with other countries (e.g. no information on the type of contract for Sweden). For Belgium, Portugal and Luxembourg figures may not be representative and comparable as the SES does not include information on the sector "Public administration, defence and compulsory social security".

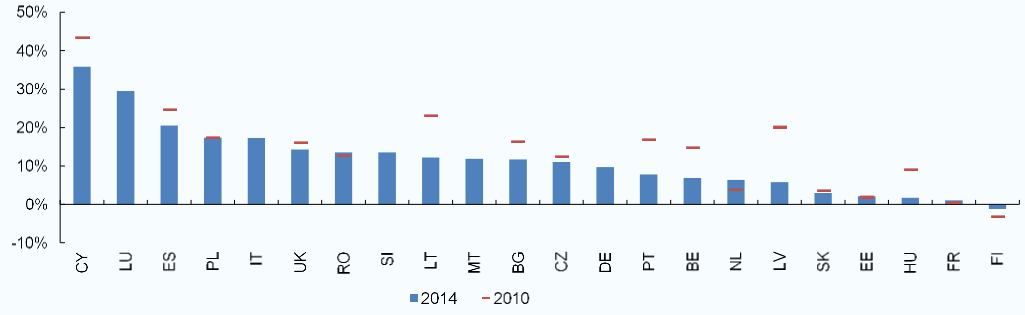
(Continued on the next page)

Box (continued)

The average (i.e. unadjusted) wage gap between private and public employees provides some first insights. However, it may also reflect specific individual and job characteristics rather than *pure* differences between public and private sector wages. For example, public employees are on average older and higher educated than private employees, which may explain why they earn more than their private counterparts. It is standard to adjust the wage gap controlling for differences in individual and job characteristics with the so-called *Mincer* equation - estimated using an Ordinary Least Squares (OLS) regression. ([2]) Graph 2 shows the adjusted wage gap between public and private employees. A series of observations can be made.

First, the highest gap is found for Cyprus and Luxembourg, (although data for Luxembourg do not include "Public administration, defence and compulsory social security"). At about 20%, the wage gap is also high in Spain, Italy and Poland. Second, the wage gap drops when individual and job characteristics are taken into account, which hints at the importance of composition effects. Third, there is a high correlation between the adjusted and unadjusted wage gap (the standard correlation coefficient is 0.80; the correlation between ranks is 0.77). This means that the distribution of countries does not change substantially once composition effects are taken into account. Nonetheless, there are important changes in country rankings based on the adjusted measure. For example, Portugal with a 48% gap has the second highest unadjusted gap, but shifts well below the median once the different characteristics of private and public employees are duly taken into account in the measurement of the gap; with an adjusted gap of 10% against an unadjusted one of 32%, the importance of skills and age composition is also evident for Germany. In contrast, after controlling for observable differences in individual and job characteristics, there seems to be no significant difference between public and private wages in Finland, France and Estonia (with no major changes between adjusted and unadjusted measures). Finally, the adjusted wage gap has declined in most countries, in particular in Cyprus, Latvia, Lithuania, Portugal and Hungary.

Graph 2: Adjusted wage gap between public and private employees – Mincer equation (% of the hourly earnings of private employees)



Source: Own calculations based on the SES 2010 and 2014.

These results do not change when the wage gap is adjusted to control for sector composition or based on alternative method (i.e. Oaxaca-Blinder decomposition).

([2]) All control variables are categorical variables. Age is grouped in six age classes. Gender distinguishes between men and women. Educational attainment refers the highest level of educational attainment achieved by the individual and distinguishes between four categories based on the ISCED classification. Sector of employment is grouped in three categories: Industry and construction (Nace B-F); Market services (Nace G-L) and Non-Market services (Nace M-U). Occupation is grouped in nine categories based on the ISCO-08 classification. Contract type distinguishes between permanent and temporary contracts. Finally, a distinction is made between part-time and full-time employees.

Table I.2.5: **Decomposition of nominal unit labour costs (NULC), annual % change, 2017**

	NULC	Compensation per employee	Labour productivity	GDP deflator	RULC
RO	9.1	13.8	4.2	4.6	4.3
HU	5.8	7.9	2.0	3.7	2.1
BG	5.7	7.5	1.7	1.2	4.5
EE	4.7	6.9	2.1	3.9	0.8
LT	4.6	9.1	4.4	4.3	0.3
LU	4.2	3.2	-1.0	2.1	2.1
LV	3.8	7.9	3.9	3.1	0.8
CZ	3.6	6.4	2.7	1.5	2.1
SK	2.8	4.1	1.2	1.3	1.6
UK	2.3	2.9	0.6	1.9	0.4
SE	2.2	2.0	-0.2	2.2	0.0
DE	1.8	2.6	0.7	1.5	0.3
PT	1.7	1.1	-0.6	1.4	0.3
BE	1.6	1.9	0.3	1.7	-0.1
PL	1.3	4.6	3.2	1.9	-0.6
SI	1.3	3.2	1.9	1.6	-0.3
EL	0.9	0.1	-0.8	0.7	0.2
FR	0.6	1.9	1.2	0.7	0.0
DK	0.5	1.1	0.7	1.7	-1.2
NL	0.5	1.1	0.6	1.2	-0.7
CY	0.4	0.7	0.4	1.5	-1.2
AT	0.3	1.6	1.3	1.6	-1.2
MT	0.2	1.7	1.4	2.6	-2.3
ES	0.2	0.3	0.1	1.2	-1.0
IT	-0.4	0.3	0.7	0.6	-1.0
HR	-1.8	-1.1	0.7	1.1	-2.8
FI	-2.7	-1.2	1.6	0.8	-3.5
IE	-3.2	0.9	4.2	0.4	-3.6

(1) Countries are ranked by descending order of change in nominal ULC in 2017. (2) The annual change in nominal ULC (NULC) is calculated as the difference between the change in compensation per employee and the change in (real) labour productivity. The annual change in real unit labour costs (RULC) is calculated as the difference between the change in NULC and the GDP deflator.
Source: European Commission, AMECO database.

2.5.6. Contribution to inflation

Wages did not create inflationary pressures in 2017. The contribution of nominal unit labour costs to inflation was positive in almost all Member States, except Finland, Ireland and Croatia (Table I.2.6). In eighteen Member States, their contribution remained below 1%, while it stood above 1% in Lithuania, Latvia and the Czech Republic as well as in three countries outside the euro area (Bulgaria, Hungary and Romania). But even in countries where wages did exert some push on inflation, this was counterbalanced by a fall in the price of imported goods and, in some cases, by lower profitability (gross operating surplus).

Table I.2.6: **Contributions to the final demand deflator, 2017, annual % change**

	Import prices	NULC	Indirect taxes	Gross oper. surplus	Final demand deflator
IE	0.8	-0.6	-0.1	0.9	0.5
CY	-0.3	0.1	0.8	0.0	0.6
FR	0.5	0.3	0.2	0.0	1.0
CZ	0.2	1.0	0.2	-0.4	1.0
IT	0.6	-0.2	0.4	0.3	1.2
HR	0.7	-0.7	0.3	1.1	1.5
FI	0.9	-1.1	-0.1	1.7	1.5
DK	0.4	0.2	0.0	1.0	1.6
EL	1.1	0.3	0.1	0.1	1.7
ES	0.8	0.1	0.1	0.8	1.8
PL	0.5	0.4	0.6	0.2	1.8
DE	0.7	0.8	0.1	0.3	1.8
AT	0.9	0.1	0.0	0.9	1.9
SK	1.3	0.7	0.1	-0.1	2.0
BE	1.1	0.5	0.1	0.3	2.0
PT	1.1	0.6	0.6	-0.2	2.0
NL	1.4	0.2	0.1	0.5	2.1
SI	1.2	0.5	-0.1	0.5	2.2
MT	1.4	0.1	0.2	0.9	2.5
SE	1.1	0.8	0.4	0.5	2.7
HU	0.8	1.5	0.3	0.3	2.8
UK	1.3	1.0	0.1	0.4	2.8
LV	1.0	1.3	0.1	0.5	3.0
BG	2.3	2.0	0.4	-1.7	3.1
LU	3.1	0.8	0.0	-0.1	3.8
EE	1.2	1.4	0.0	0.8	3.8
LT	1.7	1.3	0.2	0.9	4.1
RO	1.3	3.0	-0.4	0.7	4.5

(1) Countries are ranked by ascending order the final demand deflator.
Source: European Commission.

2.5.7. The tax wedge

In 2017, only a few Member States reduced labour costs by cutting the tax wedge (Table I.2.7**). The tax wedge is defined as the ratio between the amount of taxes paid for an average single worker and the corresponding total labour cost for the employer. Tax wedges increased in half of the Member States and decreased in the other half. The largest fall in tax wedges was recorded in Hungary** (decrease of 2.1 pps), Luxembourg (decrease of 1.3 pps), and Finland (decrease of 1.2 pps). The tax cuts concerned mainly employers' social contributions in Hungary and mainly income taxes in Luxembourg. The largest increase in tax wedges was recorded in Bulgaria (0.7 pps) and the Czech Republic (0.4 pps). The tax increase in Bulgaria concerned mainly employers' social contributions while the in the Czech Republic concerned solely personal income tax.

Table I.2.7: **Decomposition of tax wedge**

	Total Tax Wedge 2017	Of which			Difference 2016 - 2017				Difference 2008 - 2017			
		Personal Income Tax	Social Contributions Employee	Social Contribution Employer	Total Tax Wedge	Personal Income Tax	Social Contribution Employee	Social Contribution Employer	Total Tax Wedge	Personal Income Tax	Social Contribution Employee	Social Contribution Employer
MT	25.4	12.0	6.7	6.7	0.3	0.3	0.0	0.0	2.7	3.3	-0.3	-0.3
IE	27.2	13.9	3.6	9.7	0.2	0.2	0.0	0.0	4.9	4.2	0.7	0.0
UK	30.9	12.6	8.5	9.8	0.0	-0.1	0.0	0.1	-1.9	-2.2	0.2	0.1
BG	34.3	7.3	11.2	15.7	0.7	-0.1	0.3	0.4	-0.8	0.1	0.5	-1.4
PL	35.6	6.2	15.3	14.1	0.1	0.1	0.0	0.0	0.9	-0.1	-0.2	1.2
DK	36.3	35.5	0.0	0.8	-0.1	0.0	0.0	0.0	-2.6	-2.8	0.0	0.2
LU	36.7	14.9	11.0	10.8	-1.8	-1.3	-0.4	0.0	2.1	1.1	0.1	0.8
NL	37.5	15.5	11.8	10.1	0.2	0.6	-0.5	0.1	-1.7	1.5	-3.9	0.7
HR	38.6	6.9	17.1	14.7	-0.2	-0.2	0.0	0.0	:	:	:	:
EE	39.0	12.5	1.2	25.3	0.0	0.0	0.0	0.0	0.6	-0.4	0.7	0.3
ES	39.3	11.3	4.9	23.0	-0.1	-0.1	0.0	0.0	1.3	1.4	0.0	-0.2
RO	39.5	11.5	9.3	18.7	0.2	0.2	0.0	0.0	-2.9	2.1	-3.0	-1.9
EL	40.8	8.0	12.8	20.0	0.3	0.0	0.1	0.1	-0.7	0.9	0.3	-1.9
LT	40.8	10.3	6.9	23.7	-0.4	-0.4	0.0	0.0	-0.8	-5.2	4.6	-0.1
PT	41.4	13.3	8.9	19.2	-0.2	-0.2	0.0	0.0	4.5	4.5	0.0	0.0
SK	41.6	7.7	10.2	23.6	0.1	0.2	0.0	-0.2	2.8	0.3	-0.4	2.9
LV	42.9	15.3	8.5	19.1	0.3	0.3	0.0	0.0	1.6	0.6	1.2	-0.3
FI	42.9	17.1	7.6	18.2	-1.2	-0.7	0.5	-1.0	-0.9	-2.4	2.6	-1.1
SE	42.9	13.7	5.3	23.9	0.1	0.1	0.0	0.0	-1.9	-1.3	0.0	-0.6
SI	42.9	10.0	19.0	13.9	0.3	0.2	0.0	0.0	0.1	0.7	0.2	-0.8
CZ	43.4	9.8	8.2	25.4	0.4	0.4	0.0	0.0	-0.1	1.5	-1.0	-0.6
HU	46.2	12.1	15.0	19.0	-2.1	0.5	0.6	-3.2	-8.0	-3.7	2.3	-6.6
AT	47.4	11.2	14.0	22.2	0.1	0.3	0.0	-0.2	-1.6	-1.3	0.0	-0.3
FR	47.6	11.0	10.6	26.0	-0.4	0.2	0.1	-0.8	-2.2	1.2	1.1	-4.4
IT	47.7	16.5	7.2	24.0	-0.1	0.1	0.0	-0.2	1.1	1.3	0.0	-0.3
DE	49.7	16.0	17.4	16.3	0.1	0.0	0.1	0.1	-1.7	-1.7	0.1	-0.1
BE	53.7	20.7	10.9	22.2	-0.3	-0.1	0.0	-0.1	-2.2	-1.2	0.1	-1.1

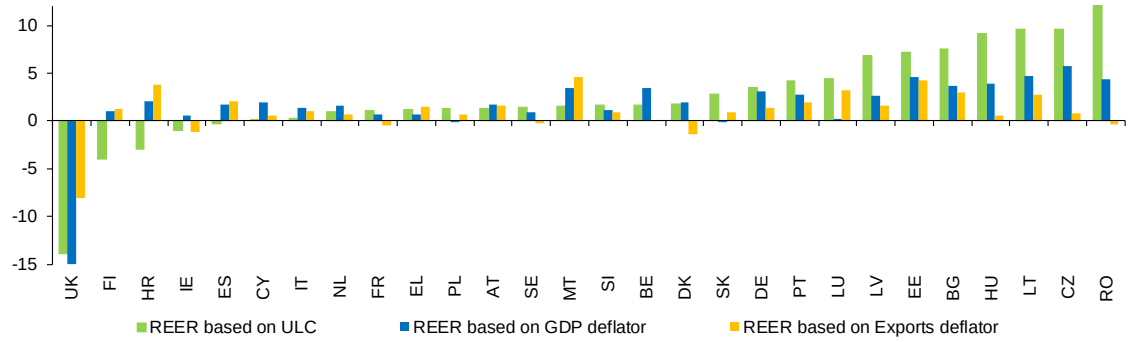
(1) The tax wedge data refer to a single person, without children, earning the average wage.
(2) Countries are ranked by ascending order of the tax wedge in 2017.
(3) Data for Cyprus not available; data for Croatia not available before 2013.
Source: European Commission based on OECD tax-benefit models.

2.6. COST COMPETITIVENESS AND EXTERNAL ADJUSTMENT DEVELOPMENTS

2.6.1. Real effective exchange rate developments

Competitive developments have reflected the catching-up process in low-wage countries. Cost competitiveness (as measured by the Real Effective Exchange Rate, REER, based on unit labour costs, ULC) deteriorated in several Eastern European Member States with a comparatively rapid wage growth over the period 2015-2017 (Graph I.2.24). The apparent degree of real appreciation is sensitive to the deflator used. In the Baltic Member States, real appreciation is milder with the export deflator than with unit labour costs. This suggests that firms in these countries are not able to pass on all labour cost increases into their export prices, which may compress profit margins (relative to their main trading partners).

Graph I.2.24: **REERs based on various deflators, cumulative % change over the period 2015-2017**



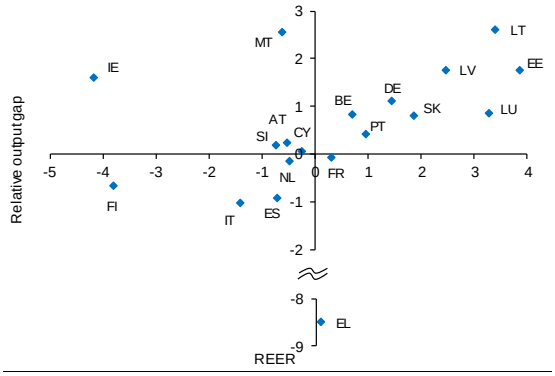
(1) Countries are ranked by ascending order of the variation in the ULC-based REER in 2015-2017.
Source: European Commission based on Eurostat data.

Among the Eastern European Member States, real appreciation in export prices has been also observed in Bulgaria and Croatia besides the Baltic countries, while it has not yet been recorded in the Czech Republic, Hungary, or Romania despite fast appreciation based on unit labour costs.

2.6.2. Competitiveness and adjustment in the euro area

Cost competitiveness has continued to respond to domestic economic conditions. Except for Malta, Ireland, and Austria, all countries with a cyclical position stronger than the euro area average in 2016 experienced an appreciation of their REER in 2017 (Graph I.2.25). In contrast, a depreciation of the real effective exchange rate (i.e. competitiveness gains) can be observed for countries in which the output gap was below the euro area average (i.e. Spain, Italy and Finland).

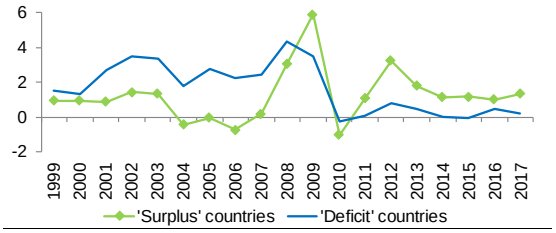
Graph I.2.25: **ULC-based REER (2017, % change) and relative output gap (2016, % of GDP)**



(1) REER relative to the rest of the euro area. Relative output gap is the difference between the output gap of the country and the one of the euro area.
Source: European Commission based on Eurostat data.

Developments in 2017 continued to be consistent with the external rebalancing needs within the euro area. In the post-crisis period, nominal ULC have continued to grow faster in countries characterised by a current account surplus before the crisis ('surplus countries') than in countries with previous current account deficits ('deficit countries'); but the gap has started to narrow, reflecting the ongoing labour market recovery in 'deficit countries' and the weak wage growth in 'surplus countries' (Graph I.2.26). In 2017, nominal ULC growth decreased slightly in deficit countries (to 0.2% from 0.4% in 2016) and increased (from 1.0% in 2016 to 1.3% in 2017) in 'surplus countries'. The increased gap (from 0.6% in 2016 to 1.1% in 2017) means that the pace of rebalancing picked up again.

Graph I.2.26: **ULC in deficit and surplus countries within the euro area, weighted average, 1999-2017, annual % change**



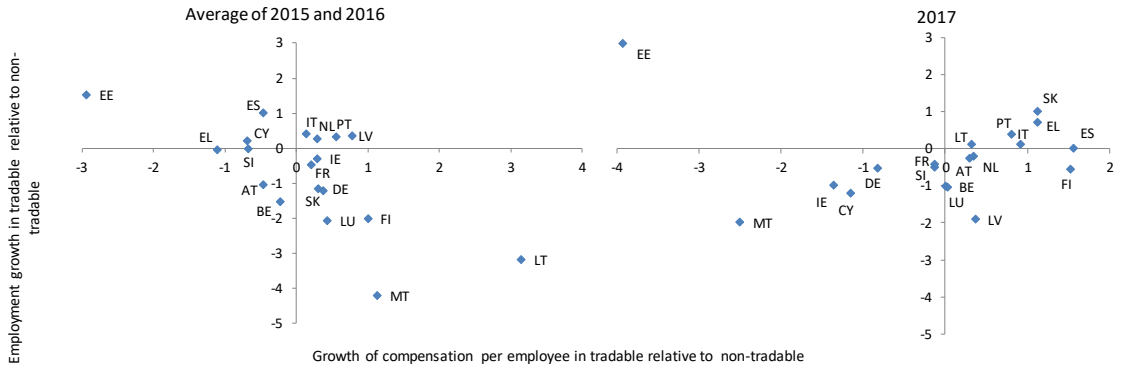
(1) Surplus countries are Belgium, Germany, Luxembourg, the Netherlands, Austria and Finland. 'Deficit' countries are all other euro area Member States. This classification is based on the current account situation around 2008.
Source: European Commission based on Eurostat data.

The economic rebalancing of 'deficit countries' has entailed a shift of employment from non-tradable towards tradable sectors. ([58]) Wage restraint was more pronounced in the non-tradable sectors of 'deficit countries', supporting a reallocation of labour into the tradable sectors (Graph I.2.28).

This process has slowed down recently, as the recovery that had started in 2013 was driven by domestic demand. Contrary to 2016 when tradable and non-tradable sectors developed similarly in most countries, in 2017 both wages and employment grew comparatively faster in the tradable sectors in most countries (left panel top-right quadrant in Graph I.2.27). Notable exceptions are Cyprus, Germany and Malta, where both relative wages and employment in the non-tradable sectors expanded more.

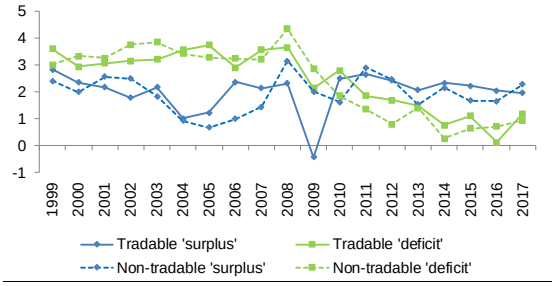
([58]) Tradable sectors include: Agriculture, forestry and fishing; Industry (except construction); Wholesale and retail trade, transport, accommodation and food service activities. Non-tradable sectors include: Construction; Information and communication; Financial and insurance activities; Real estate activities; Professional, scientific and technical activities; Administrative and support service activities; Public administration, defence, education, human health and social work activities; Arts, entertainment and recreation; Other service activities; Activities of household and extra-territorial organizations and bodies.

Graph I.2.27: **Compensation per employee and employment growth differential between tradable and non-tradable, 2015-2016, average annual % change, and 2017, annual % change**



Source: European Commission based on Eurostat data.

Graph I.2.28: **Compensation per employee, tradable and non-tradable sectors, in 'deficit' and 'surplus' countries: 1999-2017, annual % change**



(1) Surplus countries are Belgium, Germany, Luxembourg, the Netherlands, Austria and Finland. Deficit countries are all other euro area Member States. This classification is based on the current account situation around 2008.
(2) Data for some deficit countries (Greece, Italy) for 2016 are not available.
Source: European Commission based on Eurostat data.

2.7. CONCLUSIONS

The labour market recovery that started in 2013 continued in 2017 and the first half of 2018. Supported by the broadening of the economic recovery and favourable external conditions, unemployment rates kept falling in the first half of 2018. Employment and activity rates continued to improve, surpassing pre-crisis levels in a majority of countries. In most countries, the fall in unemployment continued to be faster than what would had been expected on the basis of economic growth, in particular in countries that underwent structural adjustment during the crisis such as Greece, Portugal, Cyprus and Spain, but also in countries, such as the Netherlands and Poland.

While divergences in unemployment across countries have declined, larger differences remain when hidden unemployment is taken into account. This includes people who work less than they want to ('involuntary part-time workers'), or people who have given up the search for a job because they consider their chances of finding a job low ('discouraged workers'). Discouraged workers and involuntary part-time workers still represent a significant proportion of the population in almost half of the EU countries.

Recent improvements in employment were accompanied by sluggish or falling hours worked per employee. This reflects the slack in the labour market, the rising importance of services that employ a lot of part-time workers, the effect of technical change as well as a general trend to work fewer hours.

Job creation has been positive both in permanent and temporary contracts since the start of the recovery. In the last two years, the growth in permanent contracts increased and the growth in temporary contracts slowed, consistent with increasing confidence in the recovery.

The efficiency of the process matching unemployed people with vacant jobs improved in most Member States. This improvement can be attributed mainly to the decrease in the long-term unemployment rate, while differences in efficiency

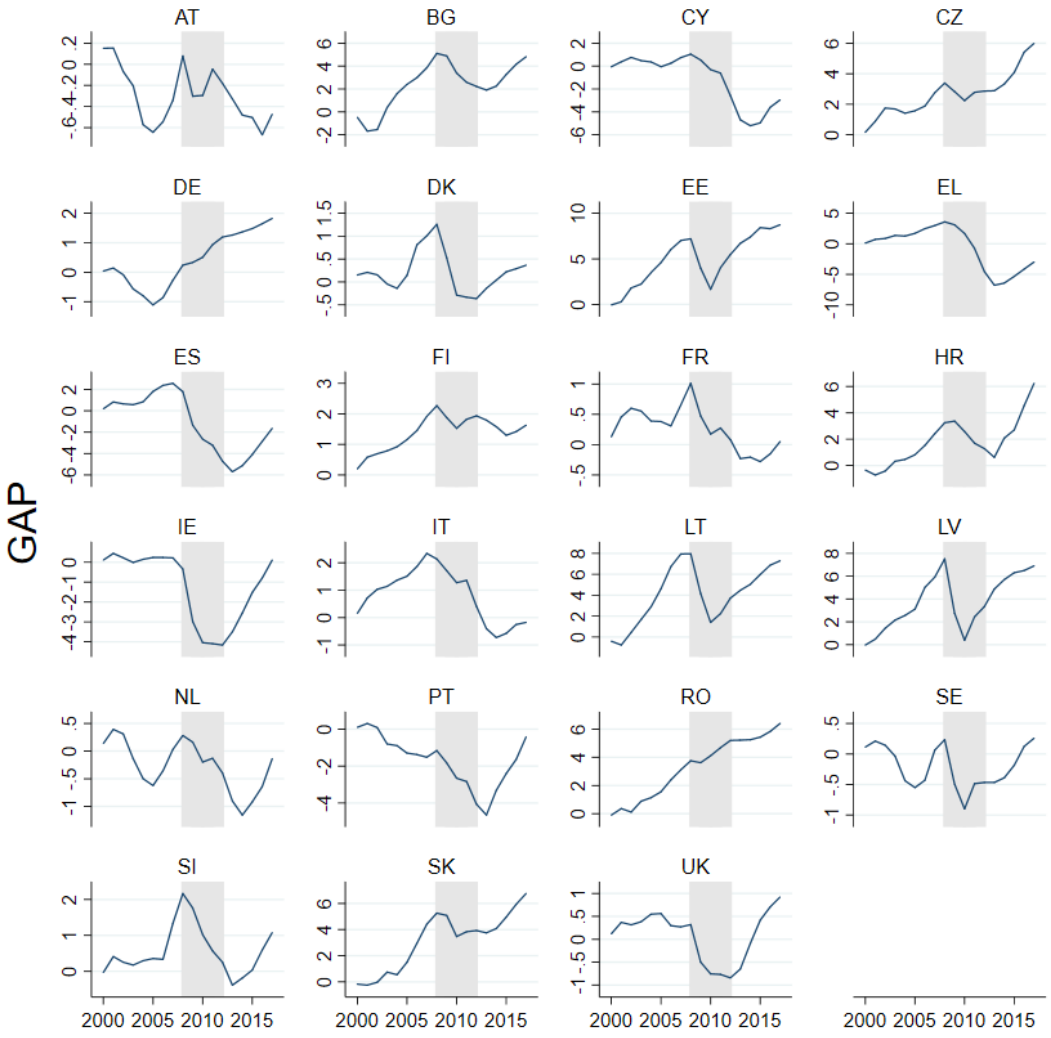
among countries can be explained by differences in skills mismatches, sectoral mismatches, ALMPs and unemployment durations.

Nominal wage expanded in most countries, but growth remains moderate in many. In 2017, nominal wages increased in all Member States but Croatia and Finland. Wage growth was the fastest in Central and Eastern European countries characterised by comparatively high economic growth, while it was the lowest in countries with high unemployment or external adjustment needs. In spite of the recent increase, wage growth continued to be moderate in euro area countries with low unemployment.

Cost competitiveness has been overall consistent with the external rebalancing needs within the euro area. In 2017, nominal ULC continued to grow faster in countries characterised by a current account surplus before the crisis (‘surplus countries’) compared to countries with previous current account deficits (‘deficit countries’)..

APPENDIX 1

Graph I.2.A1.1: **Hours worked per person employed adjusted for the trend**



Source: European Commission based on Eurostat data.

Table I.2.A1.1: **Contribution of full-time and part-time employment to the change in average hours worked over the period 2008-2017**

	Contribution of part-time employment to change in average hours worked	Contribution of hours worked in part-time to change in average hours worked	Contribution of full-time employment and hours worked in full-time employment to change in average hours worked	Total	Contribution of part-time employment to change in average hours worked	Contribution of hours worked in part-time to change in average hours worked	Contribution of full-time employment and hours worked in full-time employment to change in average hours worked	Total
	2000-2008				2008-2017			
BE	1.15	0.64	3.32	-0.81	1.3	1.3	-1.5	1.9
BG					0.1	-0.1	-2.3	-1.9
CZ	-0.29	-0.34	-3.86	-4.36	1.0	-0.1	-4.2	-3.6
DK	1.31	-0.24	-6.49	-5.54	0.9	-1.0	-1.9	-2.6
DE	2.87	0.05	-6.94	-4.04	0.9	0.8	-3.1	-1.7
EE	-0.26	-0.07	-1.57	-1.99	1.6	0.1	-4.1	-2.3
IE	1.18	0.00	-7.10	-5.79	0.7	0.1	0.0	1.1
EL	0.50	-0.13	-2.33	-1.85	2.1	0.0	-2.9	-0.9
ES	1.63	0.18	-4.43	-2.74	1.6	0.0	-5.3	-3.6
FR	0.00	0.05	1.78	2.42	0.9	-0.2	-2.6	-2.4
HR					-0.9	-0.1	-1.3	-2.2
IT	3.31	-0.58	-4.72	-2.30	2.5	0.1	-5.4	-2.6
CY	-0.41	-0.11	-0.76	-1.47	2.8	-0.1	-5.5	-2.5
LV	-2.67	-0.80	-1.01	-4.75	0.9	0.0	-4.1	-3.2
LT	-1.46	-0.37	2.49	1.03	0.6	-0.3	-1.8	-1.8
LU	3.70	0.26	-8.57	-4.43	1.0	0.0	0.1	1.6
HU	0.51	0.04	-3.46	-2.67	0.0	-0.2	-0.5	-0.7
MT	2.70	-0.01	-6.68	-3.94	1.2	0.3	-1.8	-0.5
NL	3.40	1.03	-7.80	-3.14	1.9	0.9	-4.0	-1.6
AT	3.43	-0.74	-2.10	0.00	2.7	0.2	-8.4	-5.2
PL					-0.6	0.0	-0.7	-1.2
PT	0.36	-0.22	-1.64	-1.76	0.0	-0.5	0.8	1.3
RO	-3.87	-1.35	5.42	-0.49	-1.1	-0.3	0.0	-2.0
SI	1.32	0.03	-4.20	-2.88	1.1	0.0	-4.7	-3.5
SK	0.40	-0.12	-2.34	-3.76	1.7	-0.1	-4.0	-2.9
FI	0.43	-0.25	-2.21	-2.34	1.3	-0.2	-2.8	-2.4
SE	2.34	0.94	-4.94	-0.55	-1.6	-0.2	2.3	0.0
UK	-0.10	0.45	-2.17	-1.86	0.4	0.4	-1.6	-0.8

Source:

3. POLICY DEVELOPMENTS

After dealing primarily with crisis-related challenges, reform activity in the field of employment and social policies has increasingly turned to responding to long-term structural challenges, including those stemming from a changing world of work, and to addressing the need for more resilient economic and social structures, able to smoothly withstand shocks in the short term and to promote higher growth and better social outcomes in the longer term. This appears to be aligned with the structural reform agenda set at EU level, and the policy recommendations issued to Members States in that context, as shown in previous editions of this report.

Reforms implemented in EU Member States since 2017 are in line with this trend. During 2017 and in the first half of 2018, Member States focused on combining improvements in the adequacy and coverage of welfare benefits with measures aimed at fostering labour market participation. Active labour market policies kept being high on the policy agenda, with particular attention to skills development. Reforms aimed at more flexible working time arrangements and a better reconciliation between work and family life, enhanced protection of atypical forms of employment and more effective social dialogue also gained in importance.

These priorities are likely to remain high on the policy agenda in the years to come, both at national and European level. This is reflected in the consensus built around the European Pillar of Social Rights and its focus on better balancing economic and social policy considerations for sustainable growth to take shape. The Country-Specific Recommendations addressed to Member States within the 2018 European Semester and National Reform Plans looking forward confirm the growing prominence of reform efforts aimed at human capital investment and efficiently designed social protection systems to support innovation, productivity and well-being in a changing world of work and society.

In the post-crisis period, significant reforms were also implemented in the area of employment protection legislation (EPL) and unemployment benefits (UB), often combined in comprehensive reform packages. Building on findings from previous editions of this report on general reform trends in the post-crisis period, this chapter focuses specifically on reforms passed in these two policy areas and their possible effects. As a result of these reforms, the policy settings regulating the strictness of EPL for regular contracts appear to have become less diverse across the EU over the last decade. This has been mainly driven by a loosening of regulations in countries that had been previously characterised by more stringent ones, notably through reductions in severance payments and notice periods. Differences between Member States in the strictness of regulation regarding temporary contracts have also declined, but to a lesser extent.

A general reform trend can also be distinguished in the field of unemployment benefit systems, towards better coverage and reinforced activation requirements. This has resulted in some convergence towards lower minimum contribution periods necessary to be eligible for benefits. Convergence towards a lower maximum duration of benefits is also visible. In terms of UB generosity the pattern is more mixed, with reforms going in both directions.

Reform activity in the fields of EPL and UB was particularly intense in 2012 and 2013. Taking account of the time lag for reforms to produce their effects, the chapter analyses the effects of measures implemented in 2012 in Italy, Spain and Belgium. Italy reduced employment protection for permanent contracts and made it slightly more stringent for temporary contracts. The analysis shows a positive effect of this reform on hiring rates and a small negative effect on labour costs. Spain reduced severance pay in case of unfair dismissals. The reform resulted in a small increase in employment outflows in the short term. The design of the reform, which ensured that rights already accrued before the adoption of the new rules were largely preserved ('grandfathering'), dampened this effect. The analysis of the UB reform in Belgium shows that more stringent job-search requirements for older unemployed in combination with targeted activation measures have led to improved employment prospects for older workers.

3.1. INTRODUCTION

This chapter provides an overview of recent developments and reform priorities in the area of employment and social policies.

Section 3.2 presents the overall reform trends in the EU in the post-crisis period up to mid-2018. Special attention is devoted to two areas, employment protection legislation (EPL) and unemployment benefits (UB), which have witnessed significant reforms during the period under consideration. The significance of reform activity in these two areas can be explained in light of their macro-economic relevance, and of the impact that any change introduced in their design can have on employment and social outcomes. An analysis of the possible impact of selected EPL and UB reforms on labour market outcomes is provided. For the description of reform trends, the chapter makes ample use of the LABREF database, an inventory of labour market measures adopted in the EU Member States since 2000. ([59])

Section 3.3 looks at reform plans, with a focus on the priorities emerging from the European Pillar of Social Rights and the European Semester, the EU annual cycle of economic policy coordination. Section 3.4 concludes.

3.2. POLICY TRENDS

3.2.1. Broad reform trends in the post-crisis period

The last decade has been characterised by relatively high reform intensity in the field of employment and social policies. The crisis resulted in a marked increase in the total number of policy measures across the EU. Reform activity remained above the pre-crisis period also in most recent years (Graph I.3.1).

As highlighted in previous editions of this report, a shift in the focus of reforms can be observed over time. ([60]) At the onset of the crisis, Member States were primarily dealing with crisis-related challenges, mainly through short-term fiscal stimulus measures. In a second phase, notably in 2011 and 2012, significant reforms were implemented to improve the adjustment capacity of the labour market, notably in the fields of employment protection legislation, unemployment benefits and wage setting, especially in vulnerable countries. Reform activity continued to be intense in these three policy areas after 2013, involving also countries that had been less heavily hit by the crisis but needed to modernise their policy settings. Finally, once the second dip of the recession was over in 2013, reform activity turned to responding to longer-term structural challenges related to the need to build more resilient economic and social structures and to the emergence of new forms of work.

A new phase in the reform activity can thus be identified starting from 2013/2014. Starting from this period, the focus progressively turned towards reinforcing the national welfare system, cutting the tax wedge on labour to support job creation, and enhancing the effectiveness of employment services, vocational training and active labour market policies more in general. More recently, from 2015-2016 onwards, an increasing number of interventions can be observed to provide protection for more flexible forms of employment and ensure social protection coverage for non-standard workers. Reforms in the field of wage settings have mainly gone in the direction of improving the effectiveness and inclusiveness of industrial relation structures. Making work arrangements more flexible for a better reconciliation between work and family life has also gained momentum in the reform agenda.

This is confirmed when looking at policy action in 2017 and in the first half of 2018. It is especially in this period that Member States started to implement reforms to better respond to the challenges emerging from digitalisation and new forms of work. In this context, several measures were adopted in the direction of more generous welfare benefits and a broader coverage, combined with strengthened incentives to work and measure to enhance the effectiveness of active labour market policies. In particular, measures were implemented to improve the adequacy of unemployment benefits, extend their duration, relax eligibility criteria and enhance activation measures. A number of other countries increased

([59]) The LABREF database is maintained by the European Commission and is available online under the link: http://ec.europa.eu/social/main.jsp?catId=1143&intPageId=3193&. See Turrini et al. (2015).
([60]) See: European Commission, 2016b and 2017c.

Graph I.3.1: **Average number of labour market reform measures per country per year by direction of reform measures, selected policy domains, EU28**

(1) Information for Croatia starts in 2012. Reform measures are classified as "increasing" ("decreasing") if they lead to an increase (decrease) in the underlying policy settings. This simple criterion needs to be interpreted seperately in the different policy areas. An "increasing" direction should be interpreted as increasing the stringency of regulations in the domains of employment protection legislation and working time, as increasing the generosity in the domains of unemployment and other welfare-related benefits and early withdrawal, and as increasing the tax burden on labour. In the area of wage-setting an increasing direction refers to measures tightening framework conditions for wage setting on the part of employers, including increases in minimum or public wages. The reverse applies for the "decreasing" direction. The graph excludes the LABREF policy domains ALMPs and Immigration and mobility.
Source: European Commission, LABREF database.

the level or broadened the coverage of other welfare-related benefits. In this period, emphasis was put in several countries on policies aimed at skills development and at a better matching between demand and supply, notably through vocational education and training, and adult learning. Increased attention was also paid to the regulation of atypical forms of employment and to improving the effectiveness of dispute resolution mechanisms, while several measures were taken to modernise collective bargaining frameworks. A general trend towards more flexible working arrangements and towards facilitating the reconciliation between work and family life, including through a better sharing of caring responsibilities between women and men, is also clearly visible.

The shift in the reform strategies of several countries since the recovery can be seen in light of the need to tackle longer-term structural challenges and improve socio-economic resilience across the EU. In this context, reform packaging has become an increasingly prominent feature of policy making in the employment and social field. Comprehensive reform packages have been implemented in countries such as Italy, Spain and most recently Lithuania, the Netherlands and France, as well as in countries under Economic Adjustment Programmes, such as Greece and Portugal. Reform plans are broad and multi-faceted; they often cover simultaneously the two key aspects of flexibility and security, with encompassing measures in the areas of EPL and UB.

As recognised by the European Pillar of Social Rights, well-designed EPL and UB are both crucial for a good labour market functioning. Hiring and firing rules and the design of income support during periods of involuntary unemployment are strongly interrelated and complementary. They jointly respond to the need of striking a balance between security and flexibility. As such, EPL and UB are among the key policies that can favour resilience by easing adjustment to shocks while ensuring social fairness. ([61]) The next section of this chapter focuses on reforms trends in the areas of EPL and UB from 2008 to the first half of 2018 (for an overview see Table I in annex). Reform activity in these areas was especially intensive in 2012 and 2013 (Graph I.3.1).

Besides a description of reform trends in the areas of EPL and UB, this chapter provides a short literature review and tries to disentangle the effects of selected measures. It does so while

([61]) Cost-effective ALMPs, coordinated collective bargaining frameworks and working-time adjustment are other policies that promote resilience (Hijzen, A., A. Kappeler, M. Pak and C. Schwellnus, 2017).

bearing in mind that the impact of reforms in these areas requires time to be fully captured by the data for a number of reasons, linked to the time lag necessary for their effects to materialise. First, with a view to minimising the effect of reforms loosening dismissal rules, grandfathering existing rights is likely to delay the impact of EPL reforms. Second, it may take time for workers and businesses to learn about the new rules. Finally, microdata, which have the advantage of better identifying the effects of selected reforms, are available only with lags. ([62])

3.2.2. Trends in employment protection legislation since 2008

Employment protection legislation consists of rules and procedures governing the hiring and firing of workers. It includes conditions and restrictions for hiring and for the use of specific types of contracts, procedural requirements employers have to adhere to when starting a dismissal procedure, regulations defining the lawfulness of dismissal and consequences of unfair dismissal, and provisions regarding payments to workers in case of (early) termination of a contract. ([63])

A key challenge for employment protection legislation is to strike a balance between workers' protection and the possibility to respond swiftly to economic shocks. ([64]) EPL addresses the risks for workers associated with the dismissal process. It ensures that firms internalise the social costs of dismissals, and protects workers from arbitrary decisions of the employer. At the same time, strict dismissal rules may reduce both job separation and hiring rates. Although the effect on overall unemployment is ambiguous, economic theory predicts that overly strict EPL reduces job mobility and is likely to increase unemployment spells and possibly hinder labour market access for vulnerable groups. Adequate employment protection can foster investment in firm-specific human capital and has positive effects on productivity, but when overly strict it can impede an efficient reallocation of labour, with negative effects on productivity.

This is reflected in the European Pillar of Social Rights. ([65]) Balanced EPL contributes to well-functioning labour markets and economic resilience by allowing for an efficient allocation of labour, while fostering human capital investment and protecting workers. In 2018, four Member States received a Country-Specific Recommendation (CSR) to revise specific features of their EPL (Spain, the Netherlands, Portugal and Poland). In line with Principle 5, these CSRs aim at addressing labour market segmentation, by reducing the gap between the protection and costs associated with respectively permanent and temporary contracts, thus reducing the risk for workers to be locked in a succession of temporary contracts with limited protection, facilitating transitions and promoting hiring on permanent contracts (see also section 3.4).

The OECD indicators of strictness of EPL for permanent and temporary contracts allow for observing over time and across countries the changes in policy settings resulting from the reforms introduced. The OECD EPL strictness indicators cover two main dimensions: 1) protection against individual and collective dismissals for workers with regular (i.e. open-ended full-time) contracts; and 2) regulation of temporary forms of employment (Box I.3.1 for details on the construction of the OECD EPL strictness indicators). The LABREF database

([62]) For example, the EU LFS micro data for 2016 were available only in the last quarter of 2017, which is a time lag of almost two years.

([63]) The available OECD indicators of EPL cover only permanent, temporary and temporary work agent contracts.

([64]) See e.g. Pissarides, 2010; Bertola, 1990; Mortensen and Pissarides, 1994; European Commission, 2012; Belot et al. 2007; Hopenhayn and Rogerson, 1993.

([65]) See in particular Social Pillar Principle 5 on 'Secure and adaptable employment', which states among other things that 'the transition towards open-ended forms of employment shall be fostered', that 'in accordance with legislation and collective agreements, the necessary flexibility for employers to adapt swiftly to changes in the economic context shall be ensured' and that 'employment relationships that lead to precarious working conditions shall be prevented, including by prohibiting abuse of atypical contracts'. In addition, Principle 7 on 'Information about employment conditions and protection in case of dismissals' states that 'workers have the right to be informed in writing at the start of employment about their rights and obligations resulting from the employment relationship, including on probation period' and that 'prior to any dismissal, workers have the right to be informed of the reasons and be granted a reasonable period of notice'. In addition, this Principle states that 'they have the right to access to effective and impartial dispute resolution and, in case of unjustified dismissal, a right to redress, including adequate compensation'.

Box I.3.1: The construction of the OECD EPL indicators

Since the early 1990s, the OECD has measured the strictness of EPL. The OECD uses EPL indicators covering two main dimensions: 1) protection against individual and collective dismissals for workers with regular contracts; and 2) regulation of temporary forms of employment.

The OECD indicators are based on a codification of 21 elements of employment protection legislation. Two summary indicators specify the strictness of EPL regarding *individual and collective dismissals for workers with regular contracts (EPRC)* and *temporary contracts (EPT)* on a scale from 0-6, with higher values representing stricter regulations (Graph 1). The two summary indicators are made up of four sub-indicators, which are in turn decomposed into 21 sub-components.

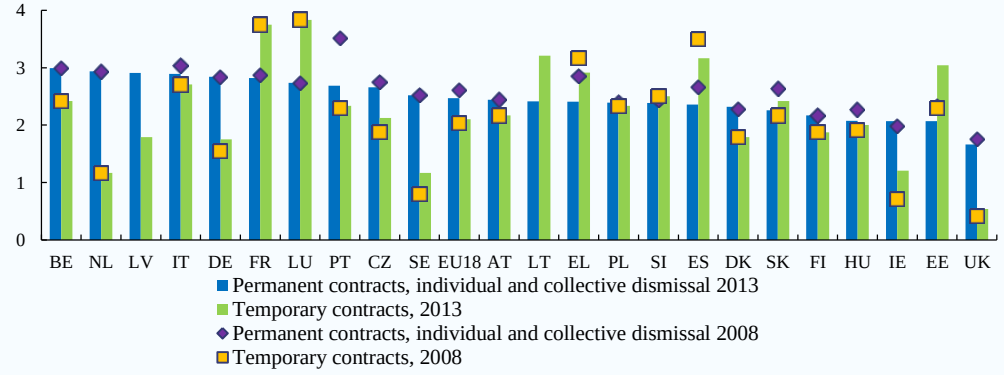
Individual and collective dismissal for regular workers (EPRC) is composed of the following two sub-indicators:

- *Regulation of individual dismissals of workers with regular contracts* (EPR) incorporates three main aspects of EPL: 1) procedural inconveniences that employers face when starting a dismissal process, such as notification and consultation requirements; 2) notice periods and severance payments; and 3) difficulty of dismissal determined by the definition of justified or unfair dismissal, the length of the trial period, the consequences of unfair dismissal and the maximum period to make a claim of unfair dismissal.
- *Additional provisions for collective dismissals* (EPC) includes additional procedures, costs and restrictions applicable when an employer dismisses a large number of employees at the same time. Only those regulations that go beyond the ones that apply for individual dismissals are taken into consideration.

Temporary contracts (EPT) is also made up of two sub-indicators:

- *Regulation of standard fixed-term contracts* (EPFTC) includes regulations regarding valid reasons for use and the maximum successive number and cumulative duration of standard fixed-term contracts.
- *Regulation of temporary work agency employment* (EPTWA) includes regulations and restrictions regarding temporary work agency employment.

Graph 1: Strictness of EPL regarding individual and collective dismissals for workers with permanent contracts (EPRC) and temporary contracts (EPT), 2008-2013



allows for identifying the characteristics of the policy interventions that are behind the change of OECD EPL indicators. ([66])

([66]) LABREF covers some aspects of EPL not captured by the OECD indicators (e.g. changes in the dispute resolution mechanisms and reforms regarding atypical contracts and self-employment).

Individual and collective dismissals of workers on regular contracts

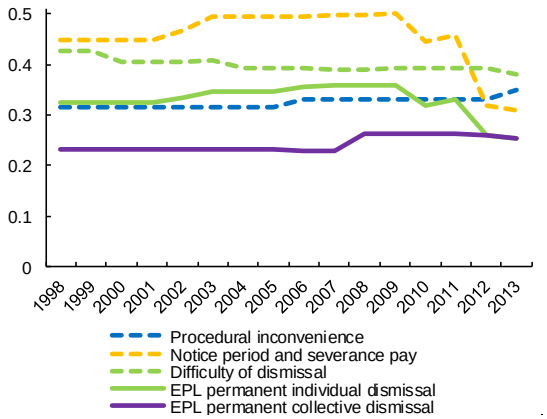
The post-crisis period has been characterised by broad convergence in the indicator measuring the *strictness of EPL for regular contracts*. In the period before the crisis, differences in the strictness of EPL regarding individual and

collective dismissals of workers on regular (open-ended) contracts were large and broadly stable across the EU. Although substantial differences persist in the post-crisis period, there is evidence of convergence in the underlying institutional settings having occurred between Member States over the last ten years. This is mainly due to a relaxation of EPL regarding *individual* dismissal for workers on regular contracts in countries with overall stringent regulation beforehand, in particular Portugal, Greece and Spain, and to a lesser extent Italy (Graph 1 in Box I.3.1).

The OECD indicator regarding individual dismissals of workers with open-ended contracts covers three main dimensions: 1) procedural aspects of dismissal such as the obligation to provide a written notification or ensure prior consultation/authorisation by a third party; 2) notice periods and severance payments; and 3) difficulty of dismissal. The third dimension is in turn determined by: a) the definition of justified or unfair dismissal; b) the length of the trial period; c) the consequences of unfair dismissal (reinstatement or compensation requirements); and d) the maximum period to make a claim of unfair dismissal.

Convergence in EPL strictness has been mainly driven by reforms of notice periods and severance payments. Graph I.3.2 shows the evolution of a measure of dispersion across 18 EU countries in the EPL strictness for individual and collective dismissals of workers with regular contracts and its components. The graph shows a clear convergence regarding individual dismissal of regular workers since 2009, mainly driven by sharply declining differences in the level of strictness of the regulations on notice periods and severance payments. The convergence pattern is mixed regarding procedural inconveniences and difficulty of dismissal, reflecting, *inter alia*, different legal traditions and practices. While there is some convergence with respect to the regulations determining the difficulty of dismissal, there is divergence in the strictness of the procedural inconveniences faced by employers.

Graph I.3.2: **Convergence in EPL for individual and collective dismissal for workers with regular contracts measured by the coefficient of variation**



(1) Based on a sample of 18 countries for which information before 2008 was available, including Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Ireland, the Netherlands, Poland, Portugal, Spain, Slovakia, Sweden and the United Kingdom. For the calculation of the indicators, version 2 weights are used to ensure the comparability of the data over time (three versions of the indicators are available, reflecting changes over time in the scope of information incorporated).
Source: Commission calculations based on OECD data.

A review of labour market reforms in LABREF reveals that many countries have modified *notice periods and severance payments*. Estonia (2009), Slovenia (2013) and Lithuania (2016) combined the shortening of the notice period with a reduction in severance payments. The notice period was also shortened in Spain (2010) and Italy (2010). Moreover, severance payments were reduced in Slovakia (2011, but reversed in 2012), and Hungary (2012) and both reduced and capped in Portugal (2011-2013) and the Netherlands (2015). In addition, a few countries reduced notice periods and severance payments for specific categories of workers, or for specific job tenures. Greece reduced the notice period and severance payments for white-collar workers in 2010 and shortened and capped it for employees with job tenure of 15 years and longer in 2012. The Czech Republic linked severance payments to job tenure in 2012, which resulted in a decrease of severance payments for workers with job tenure below three

years. Spain broadened in 2011 the group of workers who can be hired on a specific type of permanent contract characterised by reduced severance payments. The only countries that passed reforms in the opposite direction were France and Belgium. In France, severance payments for workers with job tenure of up to ten years were increased in 2017. In Belgium, the reform in 2014 aimed at closing the gap between the length of notice given to different categories of workers by increasing it for blue-collar and decreasing it for white-collar workers.

Since 2008, a few Member States have also implemented changes in the *procedures employers have to adhere to when starting a dismissal*. Slovenia and Croatia simplified procedures and reduced administrative barriers in 2013 and 2014. France also eased the procedure in 2017, by allowing employers to clarify or supplement reasons of dismissal after notification. Italy clarified the dismissal notification requirements in 2012. In the Netherlands, the dismissal route involving prior authorisation of the Public Employment Service (UWV), was restricted in 2015 to cases of dismissal for economic reasons or long-term incapacity to work. Belgium extended the right to be informed about the reasons for dismissal to blue-collar workers in 2014. In Greece, an obligation to electronically declare the termination of a work contract was introduced in 2017.

Several countries clarified and broadened the scope of *justified dismissals*. The difficulty of dismissal is amongst others determined by the scope for justified (or unfair) dismissal. Since 2008 the definition of justified dismissal has been broadened by adding additional reasons for fair dismissal in Spain (2010, and further specified in 2012), the Czech Republic (2012), Portugal (2013), Croatia (2014), France (2016) and Lithuania (2016). Spain included for instance organisational reasons as valid grounds for dismissal and Portugal added worker's 'unsuitability'. France specified that the selling of business activities and the reorganisation of the company should be regarded as justified reasons for dismissal. In contrast, in the Netherlands more stringent rules on reasonable causes for dismissal were introduced in 2015.

In addition, a number of countries increased the length of the *trial period*. The difficulty of dismissal is also determined by the length of the trial period, as during this period the employment relationship can usually be ended at no cost. Since 2008 the trial period has been increased in France (2008), Greece (2010), Romania (2011) and Finland (2017). Moreover, Slovakia increased the maximum probation period for executive employees in 2011, and the Czech Republic for managerial positions in 2012. In 2012, Spain introduced a new type of permanent contract for SMEs characterised by an extended probation period of 1 year. ([67])

Several countries implemented reforms, which eased the *consequences of unfair dismissal*. The consequences of unfair dismissal also have an impact on the difficulty of dismissal. Italy reduced the scope for reinstatement in 2012 and further in 2015. The obligation to reinstate employees was replaced by a monetary compensation in most cases of unfair dismissal and remained in place only in the most serious cases (e.g. discriminatory unfair dismissal). Similarly, Hungary abolished the obligation to reinstate an employee after unfair dismissal in 2012, except in a few specific cases related for instance to equal treatment. In addition, since 2008 several countries have reduced compensation payments for unfair dismissal payments. Spain did so in 2012 (see Box I.3.4 for the effects of this reform) and Croatia in 2014, while Slovakia (2011), the UK (2014) and the Netherlands (2015) put a cap on their maximum amount. France introduced an indicative scale of compensations to be awarded by labour tribunals in 2015, and turned this into compulsory ceilings in 2018.

Finally, several countries reformed their *dispute resolution mechanisms*, aimed at shorter or more flexible procedures and lower uncertainty. This dimension is not fully captured by the OECD indicators, which monitor only changes in the maximum time to introduce a claim for unfair dismissal. As widely recognised, other elements related to the design of the dispute resolution system also play an important role for determining the cost of dismissal for both employers and

([67]) This contract which comes with sizeable hiring subsidies will be in force until the unemployment rate is above 15%.

employees. ([68]) As concerns the time for an employee to file a claim of unfair dismissal, it was shortened in Portugal (2009), Italy (2012) and France (2017). The UK doubled the qualifying period of employment required before an employee can make a claim of unfair dismissal from one to two years and introduced a fee for bringing a case to a tribunal in 2012. ([69]) In 2012, back-payments of wages lost during a labour trial were capped in Italy and abolished for those cases in which no reinstatement takes place in Spain. Reforms of the dispute resolution system were implemented in several countries. With a view to speeding up dispute settlement, Italy (2012) and France (2015) introduced alternative dispute resolution mechanisms. Ireland (2015) streamlined existing procedures, Estonia (2017) made them more flexible and Lithuania (2016) reformed and strengthened its dispute resolution mechanisms.

EPL usually prescribes *additional requirements for employers in case of collective dismissals*. The OECD indicators cover the definition of collective dismissal in legislation: the minimum number of workers that have to be dismissed in a given period for the dismissal to be regarded as collective, additional notification requirements (i.e. in addition to those foreseen for individual dismissals), the specific delays involved before notice can start, and other special costs to employers, such as additional severance payments or mandatory social compensation plans. Differences between countries as concerns the additional regulations on collective dismissals increased somewhat between 2007 and 2008, but remained stable in the post-crisis period (Graph 1 in Box I.3.1).

Since 2008, only a few countries have changed the *definition of collective dismissals*. Greece increased the threshold number of employees in 2010 and Slovakia made the threshold dependent on firm size and reduced the reference period from 90 to 30 days. In contrast, in the Netherlands (2012) the application of collective dismissal rules was broadened by including contracts dissolved by court and terminated by mutual agreement in the computation of the threshold number of dismissals.

Several other countries *eased existing regulations* on collective dismissals. Reforms to shorten or simplify the procedure for collective dismissals were implemented in Spain (2012), Croatia (2013) and France (2013). Latvia (2010 and 2015) and Croatia (2014) shortened the notice period for collective dismissals. In the United Kingdom, the 90-day minimum period before the first redundancy can take effect was reduced to 45 days in case of 100 or more redundancies 2013). In France, the period during which a social plan can be contested before the judge was cut from 12 to 3 months. In Romania, the ban on employers to hire new people on positions previously held by collectively dismissed employees was reduced from 9 months to 45 days following the dismissal. In Italy, the reduction of the scope for reinstatement (2012 and 2015) applies to most cases of collective dismissal. Greece abolished the ministerial veto on collective redundancies in 2017, along with the pre-approval by the State.

At the same time, *additional requirements* to protect workers involved in collective dismissals or support them during job transitions were introduced in a number of countries. Spain (2012) introduced a compulsory training and reallocation programme in case the collective dismissal affects more than 50 workers, and in the Czech Republic (2016) certain employers became obliged to prepare a social plan. In Luxembourg (2010), employers are now obliged to focus on older workers in retention plans and in Belgium, an obligation to respect the age pyramid within the company was introduced in 2011. In France (2013), the involvement of social partners and work councils was strengthened.

Temporary forms of employment

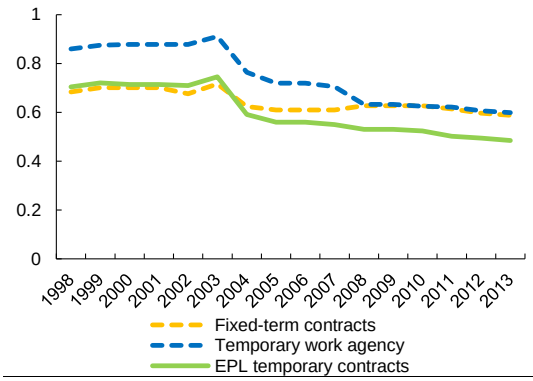
Convergence can also be observed in the evolution of the strictness of regulation of temporary employment. The relevant OECD indicator consists of two sub-indicators: 1) regulations regarding standard fixed-term contracts, including valid reasons for use and the maximum successive number and cumulative duration of contracts, and 2) regulation of temporary work agency employment. As illustrated by Graph I.3.3, dispersion between

([68]) E.g. European Commission, Economic and Social Developments in Europe, 2016a; OECD, 2013.

([69]) However, in 2017 the Supreme Court has ruled that fees introduced by the government for workers to lodge new employment tribunal cases are illegal.

Member States started to fall in 2003, mainly driven by a decline in the differences regarding the strictness of temporary agency work. Graph 1 in Box I.3.1 shows that convergence since 2008 has been driven by reforms in both directions: countries previously characterised by relatively strict EPL for temporary workers have reduced protection (Greece and Spain), while countries with previously relatively low levels of EPL for temporary workers have increased it (Sweden, the Czech Republic, Slovakia and Germany). At the same time, convergence has been dampened by reforms which relaxed protection for temporary workers in countries with already low levels of EPL (Slovakia, Estonia and Ireland).

Graph I.3.3: **Convergence in EPL for temporary contracts measured by the coefficient of variation**



(1) Based on a sample of 18 countries for which information before 2008 was available, including Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Ireland, Netherlands, Poland, Portugal, Spain, Slovakia, Sweden and United Kingdom. To ensure cross-country comparability, version 2 weights are used to calculate the indicators.
Source: Commission calculations based on OECD data.

Evidence from LABREF also shows a mixed picture regarding EPL reforms for temporary contracts. Since the onset of the crisis, measures have been taken to both ease and restrict regulations for temporary contracts, sometimes even in the same country. This illustrates the difficulty to find the right balance between 1) the need for flexibility for firms and the need for security of temporary workers, 2) costs (and protection) associated with the different types of temporary contracts, and 3) costs (and protection) of temporary versus open-ended contracts.

EPL legislation can constrain the use of fixed-term contracts by prescribing *conditions or valid reasons for their use*. Valid reasons for the use of temporary contracts that are often mentioned in the legislation are for instance: coping with unexpected fluctuations of demand, replacing permanent staff on holiday, maternity leave or sick leave, hiring workers with specialised skills to carry out specific projects; and start-up ventures implying risky and uncertain returns.

Several countries have loosened the conditions or valid reasons for the use of fixed-term contracts, while others have introduced stricter conditions. Romania (2011) and Lithuania (between 2010 and 2015) expanded the valid reasons for use of temporary contracts. Spain (2013) made an exemption to the general rules for employing young people without work experience, and Finland (2017) for long-term unemployed. Existing conditions for use of fixed-term contracts were abolished in Estonia (2009) and replaced by a fixed maximum share of temporary contracts in Italy (2014) and Lithuania (2016). In contrast, Cyprus adopted in 2016 a new law on fixed-term contracts in the public service, which introduced specific conditions for their use.

Different reform patterns coexisted in the case of Italy. Stricter conditions for the use of fixed-term contracts were introduced in 2012. However, the country introduced simultaneously the possibility to deviate from the requirement to specify valid reasons for use in specific cases for contracts with duration below one year. In 2014, a legislative decree reversed the 2012 reform by allowing temporary contracts to be signed without any specific reason. ([70]) In 2018, the new government reintroduced restrictions to the use of temporary contracts allowing the extension of their duration to 24 months only with a specific reason.

Since 2008 several countries have implemented *stricter rules on the maximum number of successive contracts or the cumulative duration of fixed-term contracts*. The Czech Republic (2011), Italy (2012), Latvia (2015) and the Netherlands (2016) increased the minimum interval between two temporary contracts necessary to consider them as non-successive. Sweden (2016) limited the possibility to hire staff

([70]) According to the Italian Constitution, a Legislative Decree is an act taken by the government usually in exceptional circumstances. It has a temporary validity; if not translated within 60 days of issues in a Legal Act by the Parliament, its validity expires.

on successive fixed-term contracts by limiting the maximum cumulative duration of temporary contracts with the same employer to two years within a five year timeframe. A maximum cumulative duration of fixed-term contracts was (re)introduced in Spain (2012) and Slovenia (2013). Moreover, the maximum cumulative duration was reduced in the Netherlands (2014) and capped in Cyprus (2016) and Poland (2013). Most recently, Italy (2018) reduced the maximum duration of temporary contracts from 36 to 24 months and the maximum number of extensions from 5 to 4.

However, several other countries implemented reforms aimed at allowing for *additional renewals of fixed-term contracts or a longer maximum cumulative duration*. Portugal introduced in 2012 a temporary rule allowing for additional renewals and France introduced the possibility of two renewals instead of one. Finland (2010) abolished the rule to provide justified reasons for use of temporary labour in case of a contract renewal. The maximum (cumulative) duration of fixed-term contracts was raised in Greece (2011), Romania (2011), Slovakia (2011), the Czech Republic (2011), Italy (2014) and Latvia (2015). In addition, Croatia introduced in 2013 the possibility of duration beyond the maximum of three years if justified by objective reasons. Similarly, the Czech Republic stipulated in 2015 that the rules on maximum duration and maximum number of renewals no longer applied if there are serious operational reasons to justify the use of a fixed-term contract. In the Netherlands, the maximum cumulative duration of fixed-term contracts for employees who have reached the statutory pension age was increased from two to four years in 2016. In 2017 France introduced the possibility for an extended industry-wide agreement to deviate from rules regarding the maximum cumulative duration, the maximum number of renewals and the waiting period between two successive contracts.

Many countries implemented reforms in the regulation of *temporary work agency employment* to extend its scope, while restricting conditions for use of these contracts. Spain broadened in 2011 the sectors in which temporary work agencies are allowed to operate, and Austria (2008), Romania (2011) and Belgium (2013) eased the conditions for the use of temporary agency work. Greece extended the maximum work period under a temporary work agency from one to three years in 2010. ([71]) Similarly, Croatia increased the maximum duration of a temporary agency assignment from one to three years in 2014. However, most reforms were aimed at restricting the use of temporary work agency employment. The maximum (cumulative) duration of assignments was capped in Estonia (2012) and Germany (2017). Moreover, Slovakia (2015) limited the possibility for successive placements of an employee at the same user company. The Czech Republic (2016) adopted rules which prohibit the assignment of a temporary agency worker at the same user company by different temporary work agencies simultaneously or in the same month. Slovenia decided in 2013 that the share of temporary agency workers may not exceed 25% of the total workforce. Poland (2017) specified conditions for use, a maximum duration and a maximum number of renewals. Protection for temporary agency workers was increased in Hungary (2011), France (2014), Croatia (2014), Belgium (2016), Denmark (2016) and Germany (2017).

Several countries also introduced reforms regarding *atypical contracts and self-employment*. Yet, this dimension is not covered by the OECD indicators on EPL strictness. New types of fixed-term contracts were introduced in a number of countries. France created a new fixed-term contract for project work with a flexible duration in 2008. In 2009, Italy introduced a voucher scheme for occasional job opportunities. Bulgaria introduced a new type of contract for seasonal short-term work in agriculture in 2015. In 2016, Lithuania introduced several new types of temporary employment contracts including apprenticeship contracts, project-based work contracts, job sharing contracts and multiple-employer contracts. In contrast, Poland and Italy restricted the number of temporary contract types by abolishing several atypical contracts in 2016. Moreover, Austria (2016) increased the protection for freelance workers and Denmark (2015) for au-pairs. Slovakia (2016) introduced a maximum duration of one year for student work. The United

([71]) At the same time the use of temporary agency work was restricted by stipulating that it may be used only for specific reasons justified by exceptional, temporary or seasonal needs and is not allowed in the construction sector, but these restrictions were lifted in 2014.

Kingdom increased the protection for workers on zero-hours contracts in 2015. Belgium extended the possibility of using flexi-jobs to more sectors in 2017. Measures to fight bogus self-employment, undeclared work or precarious work were taken by Malta (2012), Belgium (2013), Romania (2015 and 2017), Portugal (2017), Slovenia (2017) and Spain (2018).

Conclusions

Since 2008, there has been convergence in the strictness of EPL for individual dismissals of workers under open-ended contracts. Convergence has been mainly driven by reforms loosening the employment protection legislation for regular contracts in countries previously characterised by more stringent regulations. Reforms involved reductions in severance payments and notice periods. As concerns the other aspects of EPL, reform activity was less intense, but important changes have also been implemented. In particular, Member States broadened the definition of fair dismissal, extended trial periods, reduced the scope of reinstatement, decreased compensation payments, simplified dismissal procedures and made their dispute resolution mechanisms quicker or more effective.

When looking at regulations on collective dismissal and temporary contracts, the picture is more mixed. In the post-crisis period, no convergence in EPL regarding collective dismissals can be observed. Several reforms were aimed at easing existing regulations on collective dismissals, while at the same time additional requirements for collective dismissals were introduced in line with the EU Directive on collective redundancies (98/59/EC). ([72]) Some convergence is visible in the regulation of temporary contracts, resulting from reduced protection for temporary workers in countries with previously relatively strict regulations and increased protection in a number of countries, in which protection used to be relatively low (in line with the EU Directive on fixed-term work (1999/70/EC)). ([73])

3.2.3. The effects of EPL reforms

Theoretical and empirical evidence

Assessing empirically the impact of EPL reforms is quite complex. Measuring the strictness of EPL is not straightforward (most studies rely on the OECD indicators) and it can be challenging to control for business cycle effects and take into account the interactions with other relevant labour market institutions (e.g. the wage-setting system and unemployment benefit schemes). As concerns EPL reforms, it can be difficult or even impossible to isolate the effects of specific changes in the design of hiring and dismissal rules from other measures implemented at the same time. This is notably the case when changes in the employment protection legislation are embedded in a broader reform package. As an example, the 2012 EPL reform in Italy was part of the broader 'Fornero' reform, which included the introduction of a more comprehensive, insurance-based unemployment benefit system and changes in the coverage and scope of short-time working arrangements. ([74]) Similarly, the 2012 EPL reform in Spain involved a change both in the EPL and in the collective bargaining framework. ([75]) Finally, it is important to note that the effect of reforms can differ substantially across sectors and occupations.

Empirical work on the impact of EPL has delivered mixed results so far. ([76]) A number of studies find evidence of a negative relationship between employment protection and job market flows (e.g. Garibaldi, Konings and Pissarides, 1997; Gomez-Salvador et al, 2004). Most studies find small or no significant effects on employment and unemployment (e.g. Bertola, 1990; Nickel et al, 2005; Kanbur and Ronconi, 2016). There is

([72]) The EU Directive 98/59/EC provides that an employer which envisages collective redundancies must provide workers' representatives with specified information concerning the proposed redundancies and must consult with the workers' representatives in good time with a view to reaching an agreement.

([73]) The EU Directive 1999/70/EC is based on the framework agreement on fixed-term work concluded by the EU representation of social partners (ETUC, UNICE, CEEP) and sets EU-wide principles to prevent the discrimination of fixed-term workers and the abuse of fixed-term contracts.

([74]) Law 28 June 2012 n.92.

([75]) To enhance wage adjustment, the law established that the conditions set in the firm-level collective agreements prevail over higher level agreements.

([76]) The macroeconomic implications of EPL are analysed extensively in European Commission (2012).

some evidence that strict EPL may have a negative impact on productivity. Bassanini et al. (2008) show for instance that TFP growth is lower in sectors where dismissal restrictions are more likely to be binding (i.e. those with higher reallocation needs, such as ICTs). Strict EPL for regular contracts is also associated with a higher share of temporary jobs (European Commission, 2015a).

Recent empirical studies have assessed the effect of EPL reforms through cross-country analyses. Bouis et al. (2012) analyse the short-term effects of EPL reforms implemented by OECD countries since the 1980s; they find that reducing job protection on regular contracts does not have a significant effect on aggregate employment but reduces unemployment in the short run, especially for young people and women. A study by the IMF (2016) on reforms since the early 1970s suggests that when economic conditions are strong, EPL reforms have a positive effect on employment, but they can become contractionary in bad times. Cournède et al (2016), based on a sample of 26 advanced countries between 1994 and 2012, find that the effect of easing employment protection on workers' probabilities to move in or out of employment depends on the stance of other policies and institutions. For example, reducing employment protection for regular workers increases the chances of the unemployed to find a job in countries with high expenditures in active labour market programmes.

A few studies have looked at EPL reforms enacted after the crisis in specific countries. For Spain and Portugal, the OECD (2014, 2017a) finds evidence of higher hiring rates following the reforms enacted respectively in 2012 and between 2011 and 2015. For Italy, Berton et al (2017) conclude that the 2012 reform enhanced matching between workers and firms and increased labour reallocation, with small positive effects on productivity. Several studies also find a small effect of the 2015 reform (the so-called *Jobs Act*) on the creation of new permanent contracts (Cirillo et al, 2017; Sestito and Viviano, 2018) and reduced segmentation (Pinelli et al., 2017). For Slovenia, the 2013 EPL reform is shown to have increased the probability of obtaining a permanent contract and improved access to permanent jobs for young and older workers (Vodopivec, Laporšek and Vodopivec, 2016). ([77])

The rest of this section provides an in-depth analysis of the effects of the Spanish and Italian 2012 reforms based on microdata.

The 2012 reform of EPL in Italy

In 2012, the Italian government adopted a comprehensive reform of the labour market. The reform eased employment protection for permanent employment and made atypical and temporary contracts slightly more stringent. ([78]) As concerns the employment protection, the reform simplified the administrative procedure for individual dismissals by clarifying the notification requirements, introducing a new, faster and compulsory out-of-court settlement procedure in case of dismissal for economic or other objective reasons and shortening the time for the employee to file a claim of unfair dismissal in court. In addition, the scope for reinstatement in case of unfair dismissals was reduced and back-payments of wages lost during the period of a labour trial were capped.

To discourage temporary and semi-dependent work contracts, the conditions for use of these types of contracts were tightened. The maximum cumulative duration of temporary contracts was kept at 36 months, but their chaining was limited. ([79]) At the same time, the possibility to extend a temporary contract after expiration was prolonged from 20-30 days to 30-50 days (depending on the initial duration).

([77]) See also the 2012 Labour Market Developments in Europe Report (European Commission, 2012) for an ex-ante assessment of the reforms in Greece, Spain, Italy and Portugal.

([78]) The reform, which started a long-awaited reform of passive labour market policies strengthened unemployment insurance and reduced the scope of wage supplementation schemes. In addition, hiring incentives were introduced for older workers and long-term unemployed women. In 2013, incentives for hiring young workers (18-29) on permanent contracts were introduced. The incentive consisted of a tax benefit equivalent to one-third of the gross monthly earnings that are taxable for social security purposes for each eligible new employee, capped at a monthly value of EUR 650 and granted for a one-year period per worker.

([79]) The compulsory time break between two successive contracts with the same employer was extended from 10 to 60 days for contracts up to 6 months and from 20 to 90 days for contracts with duration longer than 6 months

Box I.3.2: **Effects of the 2012 labour market reform in Italy on hiring and separation**

The effect of labour market reform on the hiring and separation rate has been evaluated using a regression-discontinuity model. This model compares the labour market performance before and after the reform. The key identification assumption is that, conditional on the control variables included in the model, the labour market performance evolves smoothly and in a continuous way and any discontinuity ("jump") in the labour market performance can be attributed to the reform (and potentially also other institutional changes that happen simultaneously).

Based on the individual quarterly data from the Labour Force Survey for the period from the first quarter of 2011 to the fourth quarter of 2013, the following regression-discontinuity model is estimated using a probit estimation:

$$LP_{it} = \alpha + \beta \log u_t + \gamma X_{it} + \delta I_{t>R} + \sum_{s=1}^{3} \tau_s (t-R)^s + D_t + \varepsilon_{it}$$

where in case of the hiring rate, *LP* is the probability of finding a job measured by a dummy variable that takes a value of one if an individual *i* in time period *t* has a job tenure lower or equal to three months and a value of zero otherwise. ([1]) In case of the separation rate, *LP* is the probability of being unemployed measured by a dummy variable that takes a value of one if an individual *i* in time period *t* is unemployed for less than six months and zero otherwise. The control variables included in the model are: the quarterly unemployment rate *u* and several individual and job characteristics included in the vector *X*. ([2]) *R* is the date of the reform, while *I* is an indicator function which takes a value of zero before the date of the reform and a value of one from the reform onwards ("post-reform dummy"). The model also includes a polynomial time trend up to the third order to control for economic fluctuations. ([3]) *D* is a vector of seasonal dummy variables and ε is the standard error term. All estimations include clustered standard errors on the time period.

The sample covers the period from the first quarter of 2011 to the last quarter of 2013. ([4]) By restricting the sample until the last quarter of 2013, the impact of the 2012 reform is disentangled from the 2014 and 2015 EPL reforms. For the analysis of the impact of the reform on the job hiring rate, the sample is restricted to all employees and salary workers, while for the job separation rate the sample is restricted to all employed and those unemployed for less than six months.

Hiring rate

The 2012 reform is found to have increased the hiring rate – measured by the proportion of employees with job tenure of three months or less – by 14% (or a marginal effect at the means of 0.62 percentage points). ([5]) The impact is found to be somewhat higher for those hired on permanent contracts, namely 24 % (or a marginal effect at the means of 0.36 percentage points). In contrast, there is no significant effect found for those hired on temporary contracts (Table 1, Panel A).

However, it is unclear whether these effects can be fully attributed to the EPL reform, as the reform almost coincided with the introduction of an employment subsidy for hiring on permanent contracts. However, this subsidy was restricted to employees younger than 29 years and therefore in order to disentangle the effects of the EPL reform from the employment subsidy, the sample is restricted to those employees older than 30

([1]) The job tenure is calculated based on the variable STARTIME, which reflects the number of months an employee is employed with the current employer.
([2]) The individual characteristics included are the age of the individual (in years), gender and three education categories. In case of job hiring rate also 9 occupational categories and 21 industry categories are included as control variables.
([3]) To the extent that there are only 6 quarters in the pre- and post-reform sample, the parameters of the polynomial trends are not assumed to change over time. This methodology is similar to the specification used by OECD to assess the labour market reforms in Spain (OECD, 2013).
([4]) As the 2012 reform is implemented on July 1st, 2012, R is set at the third quarter of 2012.
([5]) The impact on the hiring rate is calculated as the marginal effect of the reform at the means divided by the probability of being hired minus the marginal effect of the reform at the means. The latter term represents the likelihood of being hired without the reform.

(Continued on the next page)

Box (continued)

years (Table 1, Panel B). In line with expectations, the effect becomes smaller, but remains significant for those hired on permanent contracts. ([6])

Table 1: The effect of the 2012 reform on the probability of having job tenure of three months or less (marginal effects)

Dependent variable	(1) Hired	(2) Hired, permanent	(3) Hired, permanent	(4) Hired, temporary
Panel A. All employees				
Post-reform dummy	0.0062**	0.0036***	0.0042***	0.0029
	(0.0028)	(0.0004)	(0.0005)	(0.0025)
Sample restricted to perm. workers	No	No	Yes	No
Observations	469712	469712	404783	469712
Pseudo R-squared	0.092	0.065	0.082	0.105
Panel B. Employees older than 29				
Post-reform dummy	0.0005	0.0014**	0.0015**	-0.0008
	(0.0024)	(0.0007)	(0.0007)	(0.0023)
Sample restricted to perm. workers	No	No	Yes	No
Observations	407081	407081	366048	407081
Pseudo R-squared	0.070	0.061	0.067	0.083

Note: The value for the post-reform dummy refers to the marginal effect. Standard errors are clustered based on the time period.

Source: European Commission estimations based on the quarterly Labour Force Survey microdata.

Placebo tests are then run for all specifications by "anticipating" the date of the reform by up to two quarters. These findings, which are available on request, suggest that the results of the reform on the overall hiring rate may have to be treated with caution, but that the findings on the permanent hiring rate are robust.

Separation rate

The 2012 reform is found to have a very small negative effect on the separation rate (Table 2). However, the effect is not robust and disappears when the sample is restricted to those older than 29 years. Moreover, also the placebo tests, which are available on request, suggest that the findings are not reliable. ([7])

Table 2: The effect of the 2012 reform on the probability of becoming unemployed in the past six months (marginal effects)

Dependent variable	(1) Separations, All	(2) Separations, Those older than 29
Post-reform dummy	-0.0017*	-0.0010
	(0.0009)	(0.0011)
Observations	663182	577540
Pseudo R-squared	0.076	0.032

***Note*:** The value for the post-reform dummy refers to the marginal effect. Standard errors are clustered based on the time period.

***Source*:** European Commission estimations based on the quarterly Labour Force Survey microdata.

([6]) Note there may be a negative spill-over effects of the employment subsidy for young employees on the relative labour cost of employees older than 29 years, which would lead to a downward bias in the estimated effect of the reform in this specification.

([7]) This may be due to the fact that separations are measured imperfectly (observed over a six month period).

Moreover, a new type of temporary contract with a maximum duration of one year was introduced, which was exempted from the requirement to specify valid reasons for the use of temporary labour.

The reform has had positive effects on the hiring rate. While the net impact on unemployment may be ambiguous, economic theory suggests that the reform is likely to increase the transitions from and to unemployment.

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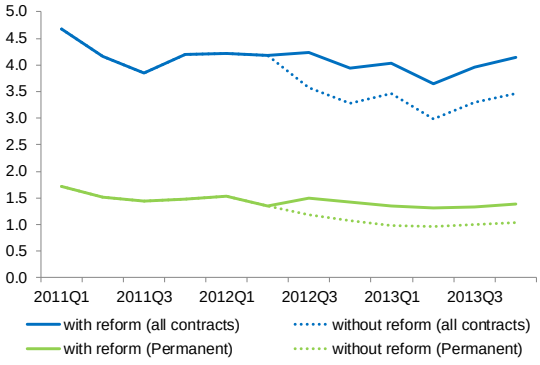
theory suggests that the reform is likely to increase the transitions from and to unemployment.

Indeed, the analysis in Box I.3.2 shows that the 2012 reform has increased the proportion of employees with job tenure of three months or less (Graph I.3.4). The impact is higher for those hired on permanent contracts. In contrast, no significant effect is detected for those hired with temporary contracts. These findings are in line with expectations, as the reform made the legislation less stringent for permanent contracts only. ([80]) No robust effects are found for the separation rate.

Graph I.3.4: **Job hiring rates in total employment, 2011-2013 (seasonally adjusted)**



(1) The figure presents the ratio of workers with no more than three months of job tenure on total employment in the reference week. The series "without" reform indicates the hiring rate in the absence of the reform based on empirical estimates of the baseline model for the individual probability of having a tenure more than three months or less.
Source: European Commission estimations based on the quarterly Labour Force Survey microdata

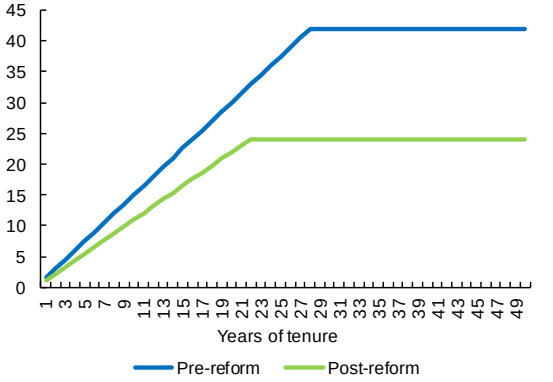
The reform had a small effect on labour costs. EPL reforms may have broader implications for employment relationships than simply affecting labour market flows. A decrease in employment protection may encourage workers to ask for higher wages as they factor in a risk premium because they are more likely to become unemployed. However, a decrease in employment protection may also keep a lid on wage growth as it may weaken the position of protected workers (the "insiders") in wage bargaining. Conditional on unemployment, productivity and the other control variables, the analysis in Box I.3.3 finds a negative but small impact on the labour costs.

However, these effects cannot be attributed only to the reform of the employment protection legislation. It is not possible to disentangle these effects from other measures which have been taken in the same time period. Indeed, the reform also included a number of measures which favoured hiring of specific workers. For example, the reform envisaged hiring incentives for older workers and long-term unemployed women. In addition, in 2013 the government introduced a bonus for hiring young workers on permanent contracts.

The 2012 reform of EPL in Spain

In 2012, a comprehensive reform of the labour code was enacted in Spain. As concerns individual dismissal rules, the reform specified the conditions for justified dismissal, reduced the severance payment in case of unfair dismissals and abolished the right of workers to receive back payments between the effective date of dismissal and the final court ruling (except when the court decides that the worker has to be reinstated). The reform also introduced a new type of permanent contract for SMEs and allowed for higher internal flexibility. Moreover, the objective reasons for collective dismissal were specified more precisely and the requirement of prior administrative authorisation was abolished.

Graph I.3.5: **Severance payment (in multiples of the individual's monthly wage) in case of unfair dismissal before and after the 2012 reform in Spain**



Source: European Commission, LABREF database.

([80]) The tightening of the conditions for the use of temporary contracts led to a sizeable reduction in the share of temporary contracts, which reached a level well below the demand explained by seasonal patterns (Colonna and Giupponi, 2015).

Box I.3.3: Effects of the 2012 labour market reform in Italy on labour cost developments ([1])

The effects on the labour costs have been evaluated using a fixed effects regression model. Labour costs by sector are expressed per hour worked and defined as the ratio of the total compensation of employees and the total number of hours worked.

Based on the sectoral quarterly data from the national accounts and the Labour Force Survey for the period from the first quarter of 2008 to the fourth quarter of 2013, the following model is estimated using a fixed effects regression: ([2])

$$logLC_{it} = \alpha + \beta \log u_t + \varphi log\, \pi_{it} + \mu log\, CPI_t + \gamma X_{it} + \delta I_{t>R} + \sum_{s=1}^{3} \tau_s (t-R)^s + D_t + \varepsilon_{it}$$

where LC is the labour cost per hour worked in sector *i* and time *t*. The control variables included in the model are: the quarterly unemployment rate *u*, the harmonised consumer price index *CPI*, the hourly productivity π and several sector specific characteristics included in the vector *X*. ([3]) *R* is the date of the reform, while *I* is an indicator function which takes a value of zero before the date of the reform and a value of one from the reform onwards ("post-reform dummy"). The model also includes a polynomial time trend up to the third order to control for economic fluctuations. *D* is a vector of seasonal dummy variables and ε is the standard error term. All estimations include clustered standard errors on the time period.

Table 1 presents the key findings. The impact of the reform on the labour costs, conditional on unemployment, productivity and the other control variables, is negative, but small. The reform is estimated to reduce the labour costs between 0.96% (baseline model) and 1.06% (baseline model including sector-specific time trend). Placebo tests are implemented by replacing the post-reform dummy with dummies taking a value of one in the second and the first quarter of 2012. For all placebo tests, the estimates were found to be insignificant. This holds also for the model specifications in which a sector-specific time trend is included.

Table 1: The effect of the 2012 reform on the labour costs

Dependent variable	Post-reform dummy		Placebo tests	
	(1) Baseline	(2) Including sector-specific time trend	(2) One quarter before	(3) Two quarters before
Post-reform dummy	-0.0096**	-0.0106**	-0.0087	-0.0039
	(0.0046)	(0.00462)	(0.0064)	(0.0103)
Observations	238	238	238	238
Pseudo R-squared	0.988	0.989	0.989	0.989

Note: Standard errors are clustered based on the time period.

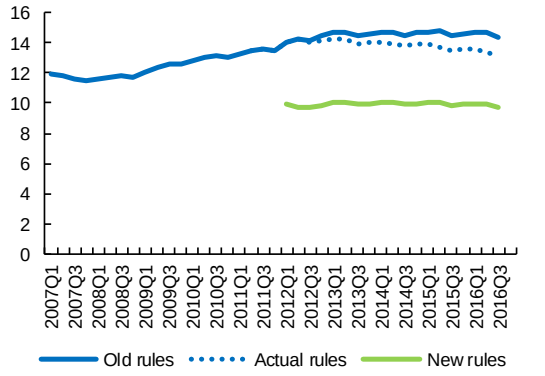
Source: European Commission estimations based on the national accounts and European Labour Force Survey.

([1]) The labour market reform known as Fornero labour market reform was enacted in June 2012, Law 28 June 2012 n.92.
([2]) The regression includes sectoral data at the one-digit of the NACE rev. 2 classification, excluding the agricultural sector.
([3]) The sectoral characteristics included the share of temporary workers, the share of three age groups, the share of three education groups and the share of women in the sector.

The reform reduced severance payments in case of unfair dismissal but protected existing entitlements. Severance payments were reduced from 45 days of salary per year of service (with a maximum of 42 months) to 33 days per year of service (with a maximum of 24 months). Graph I.3.5 illustrates how the pre-reform and post-reform severance payments in case of unfair dismissal differ over 50 months of tenure. For existing contracts, the rights already accrued before the adoption of the new rules, were largely preserved. Hence, for employees with a tenure starting before 12 February 2012, the severance payment must be calculated in two phases: 1) 45 days of wages per year of service for the period between the start of the employment contract and 11 February 2012; 2) 33 days of salary per year of service for the period between 12 February 2012 and the contract termination date. The maximum severance payment under the new rules is 24 months. However, for the employees for whom the calculation of the severance payments for unfair

dismissal before 12 February 2012 resulted in a number of months greater than 24, the maximum remained 42 months.

Graph I.3.6: **Average severance payments (in multiples of the individual's monthly wage) in case of unfair dismissal under the old, new and actual rules**



(1) "Old rules" represent the severance pay on basis of the legislation before the introduction of the 2012 reform; 'Actual rules' refer to the 2012 reform with grandfathering; "New rules" to the 2012 reform without grandfathering.
Source: Own calculations based on individual quarterly data from LFS.

Due to 'grandfathering', it may take time for the reform to produce its full effects. There is a broad agreement (e.g. Dias Da Silva, Givone and Sondermann, 2017) that it can take time for reforms to produce their full effects. This may be due to the practice of protecting acquired rights to reduce the social costs of reforms and increase their political sustainability. In order to analyse the relevance of grandfathering, severance payments are computed with the rules valid before the reform ("old rules") and with the rules established by the 2012 reform ("actual rules"), assuming full implementation (i.e. no grandfathering) of the new rules ("new rules"). Graph I.3.6 shows the severance pay in the three cases. The comparison between the new and the actual severance pay provides an indication of the speed at which the reform is entering into force. ([81])

Under the *old rules*, in the last quarter of 2016 the average severance pay would have been 14.1 months of salary. In contrast, based on the *new rules*, it would have been equivalent to 9.6 months. However, the actual severance payments converge slowly towards the new rules, as workers kept the entitlements acquired before the reform. The resulting actual severance payment was 13.0 months. A simple linear projection based on the trend since 2012 suggests that the new rules would start to be fully applied by the beginning of 2030.

Even so, the reform has increased the employment outflows. Box I.3.4 illustrates the effects on employment outflows of lower severance payments in case of unfair dismissal. In line with theoretical expectations, the decrease in the severance payment has led to an increase in the employment outflow rate. ([82]) Overall, the small estimates on the employment outflow rate suggest that 'grandfathering' may have somewhat alleviated the implications of lower severance payments on employment outflows in the short-term. Once grandfathering has expired, the effect of lower severance payments on employment outflows is expected to play a greater role.

3.2.4. Reforms of unemployment benefits after the crisis

Unemployment benefit systems insure individual incomes against the risk of unemployment. As such, they act as automatic stabilisers to sustain demand in case of economic shocks. Moreover, if well-designed and combined with efficient and effective activation strategies, unemployment benefits contribute to a better matching between unemployed people and vacant jobs.

This is well reflected in the European Pillar of Social Rights and in the policy guidance provided to Member States in the framework of the European Semester. ([83]) In 2018, Hungary received a Country-Specific Recommendation (CSR) from the Council, to improve the adequacy and coverage of unemployment benefits.

([81]) Calculations are based on individual quarterly data from the Labour Force Survey. The calculation of the severance payment is based on the job tenure determined by the variable STARTIME, which reflects the number of months an employee is employed with the current employer.

([82]) The impact on the hiring rate could not be estimated as this would have required information on the expected tenure of newly hired employees, which is a priori unknown and moreover endogenous to the reform.

([83]) Principle 13 of the European Pillar of Social Rights calls for adequate unemployment benefits of reasonable duration, which do not constitute a disincentive for a quick return to employment and are combined with adequate activation support.

Box I.3.4: **Effect of a reduction of the severance pay entitlement in case of unfair dismissal in Spain**

In order to analyse the impact of the changes in the severance pay entitlement after unfair dismissal on job separations, an econometrical model is estimated based on the model used by OECD (2017a) to analyse the impact of a change in the severance payment in Portugal. In this analysis, the variation in the depth of the reform, as measured by the percentage difference between the severance pay entitlement under the old rules and under actual rules is exploited to analyse the impact of the reform on job separation rates across different occupations. Employers are more likely to fire employees for whom the reform led to the largest reduction in severance pay entitlements based on the difference between the old rules and the actual rules.

To econometrically estimate the impact of a reduction in the severance pay entitlement after unfair dismissal, the following model is estimated based on quarterly Labour Force Survey data for the period from the first quarter of 2012 up to the last quarter of 2016:

$$EO_{iqt} = \alpha_0 + \alpha_1(\Delta \log(SP_{iqt}) * I_{t>R}) + \sum \alpha_c X_{ciqt} + \theta_{qt} + \mu_i + \varepsilon_{iqt}$$

with as an outcome variable the employment outflows (*EO*) for occupation *i* in year *t* and quarter *q*. ([1]) The main variable of interest ($\Delta \log(SP_{it})$) is defined as the percentage difference between the severance payment for unfair dismissal under the old rules and the actual rules. *R* is the date of the reform and *I* is an indicator function, which takes a value of zero before the date of the reform and a value of one from the reform onwards ("post-reform dummy"). In addition, the regression controls for individual characteristics (X_{cit}), including gender, the share of employees for three age groups and educational categories, 19 sectors of occupation and the type of contract. Finally, the regression controls for year (γ_t) and seasonal (quarterly) fixed effects (θ_q) as well as occupational fixed effects (μ_i). Occupations are defined at the three-digit ISCO level and in a robustness check at the two-digit level. The occupation of a non-employed person is defined as the occupation of his/her last job.

The results for the estimated coefficient on the difference in the severance payment entitlement, α_1, are reported in Table 1. The coefficient can be interpreted as the percentage point change in the employment outflow rate following an increase of 1% increase in the difference in the average severance pay entitlement for unfair dismissal under the old rules and the actual rules. A 10% increase in the difference in the severance pay entitlement under the old and under the actual rules leads to a small increase between 0.25 and 0.33 percentage points in the overall employment outflow rate. These findings are robust in case the sample is restricted to outflows to unemployment. Note, however, that despite controlling for certain characteristics the results could be upward biased by differences in the composition of the workforce across occupations.

Table 1: The effect of the change in the severance payment after unfair dismissal in 2012 in Spain

	Occupations defined at the three-digit level		Occupations defined at the two-digit level	
	All	To unempl	All	To unempl
$\Delta \log(SP_{it})$: Old vs. actual rules	0.0331**	0.0249**	0.0132***	0.0138*
	(0.0138)	(0.0101)	(0.00475)	(0.00727)
Observations	2,815	2,813	1,008	956
Within R-squared	0.157	0.128	0.381	0.302

Note: Standard errors are clustered based on occupations. All estimates include year, quarter and occupation fixed effects and control for age (three categories), educational attainment (three categories), sector (19 categories, agriculture and public administration are excluded), type of employment (temporary vs. permanent) and gender.

Source: European Commission estimations based on the quarterly Labour Force Survey microdata.

([1]) Employment outflows are defined as the share of individuals who have been at left their job as an employee in the past three months in the total number of employees. The time since an individual has last worked is calculated based on the variable LEAVTIME.

Recommendations to improve social protection (spending) were issued to Croatia, Italy and the Netherlands (in the latter case for the self-employed). In addition, 13 Member States received a CSR to enhance their active labour market policies (see also Section 3.3). Given the relevance

of this policy field for resilience and convergence, a benchmarking framework has been developed within the European Semester to support structural reforms in the field of unemployment benefits and activation policies. The benchmarking framework was used for the first time in the 2018 European Semester, and allowed for comparative analysis of specific design features and performance of unemployment benefits, notably as concerns eligibility and adequacy aspects. EU policy initiatives such as the Council Recommendation on Long-Term Unemployment have also helped steer reform efforts in this domain. ([84])

There is a wide diversity in unemployment benefit systems in the EU. This heterogeneity reflects the variety of labour market settings, their complex relationships, and the diversity of social preferences across countries. Unemployment benefits are relatively more generous in Nordic and Continental Europe than in Southern, Central and Eastern Europe. Similarly, activation policies aimed at preserving job-search incentives for unemployment benefits' recipients tend to be more structured and developed in countries with more generous unemployment benefits. In spite of this, reforms enacted in several countries after the crisis share all the objective of providing adequate income protection to the unemployed, while reinforcing the cost-effectiveness of activation policies (see European Commission, 2016b and 2017c). ([85])

This section identifies the common features of the reforms of unemployment benefit enacted since 2008. The description of reforms is structured along the following dimensions: 1) eligibility conditions and coverage; 2) benefit duration and net replacement rates; and 3) activation requirements (see also Table II in annex). The analysis makes use of quantitative indicators on the net replacement rates, eligibility and duration of benefits, and on the job-search and availability-to-work requirements, partly drawing from the above mentioned benchmarking exercise of Unemployment Benefits and Active Labour Market Policies developed since 2016 and integrated in the 2018 Joint Employment Report (European Commission, 2018e).

Eligibility conditions and coverage

Eligibility conditions for unemployment insurance benefits were eased in several countries in the post crisis period. Entitlement to unemployment insurance benefits depends on previous work and/or contribution records. As illustrated in Graph I.3.7, in recent years several Member States reduced the minimum years of experience or contribution period necessary to be entitled to unemployment benefits. This includes countries with previously long qualifying periods, such as Slovakia (2011), Lithuania (2017) and Portugal (2012), but also countries that were already below or close to the EU average, such as Italy, France, Austria and, most recently, Finland (2018). Latvia had already introduced in 2009 a temporary reduction of the qualifying period as a crisis-response measure. As a result of these measures, there has been some convergence towards lower minimum contribution periods necessary to be eligible for benefits (Graph I.3.8). In addition to changes observed in the length of the required qualifying periods, some countries eased the eligibility conditions by introducing the recognition of parental and long-term sickness leave (Estonia in 2009 and Latvia in 2015) or military and civilian service (Austria in 2015) as contribution periods. In contrast, the qualifying period was raised in Bulgaria (2018) and Latvia (2017).

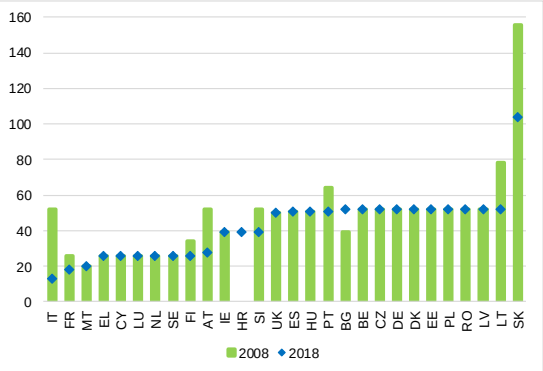
The coverage of unemployment benefits was also extended to previously excluded groups, such as self-employed, freelancers, non-regular workers and temporary agent workers**.** In particular, extending the right to unemployment benefits to self-employed is common to several countries (e.g. Croatia in 2014, Greece in 2013, Portugal in 2012, and Sweden in 2010). In the Czech Republic (2012), students with a work record became eligible for unemployment benefits. Italy introduced in 2009 one-off payments for unemployed in crisis sectors or regions, who were previously employed as project workers or temporary agency workers for at least 3 months. In contrast, eligibility conditions for a special

([84]) Council recommendation of 15 February 2016 on the integration of the long-term unemployed into the labour market OJ C 67, 20.2.2016, p. 1–5.

([85]) This section is confined to the design of unemployment benefit systems and the role of job-search and job-availability requirements. The part of activation policies related to Active Labour Market Policies in support of jobseekers, such as upskilling, training and support services by Public Employment Services, are outside the scope of this section.

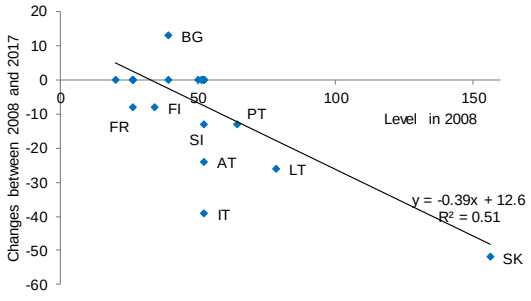
unemployment allowance for young people were tightened in Belgium (2015). Latvia (2017) implemented a reform that made seasonally unemployed workers no longer eligible for benefits and tightened conditions for long-term unemployed.

Graph I.3.7: **Length of the required qualifying period in weeks**



(1) In Malta (2008 and 2018), at least 50 weekly contributions must have been paid since the person first started work; in Ireland (2008 and 2018), at least 104 weekly contributions must have been paid since the person first started work; in Austria (2018), at least 53 weekly contributions must have been paid since the person first started work; in Italy (2008) a minimum of 104 weeks of insurance since the person first started working were required to become entitled to unemployment benefits. In Slovakia (2008) the length of the required qualifying period was 104 weeks for people on temporary contracts.
Source: MISSOC database (January 2008 and January 2018).

Graph I.3.8: **Convergence unemployment benefits - minimum qualifying period in weeks**

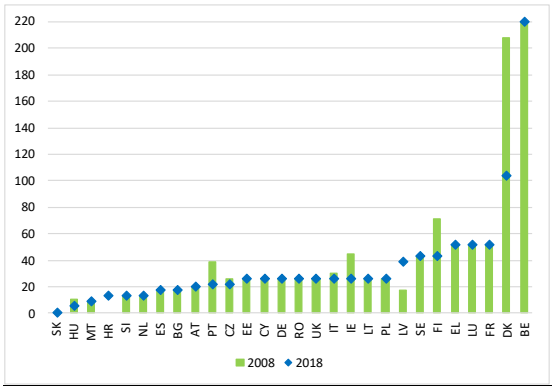


Source: Commission calculations based on MISSOC database

Duration and net replacement rates of benefits

Since 2008, several countries have reduced the duration of unemployment benefits. As illustrated by Graph I.3.9, the maximum duration of benefits for people with a one-year work record varies considerably between countries.

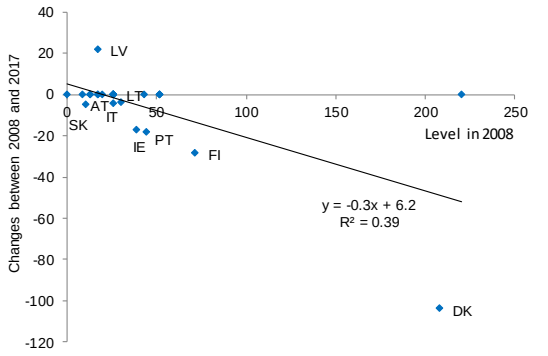
Graph I.3.9: **Maximum duration of benefits for a one-year work record**



(1) In Belgium there is no limit on the duration of benefits. For Member States where duration also depends on age, the chart shows the duration for the youngest age group, corresponding to the shortest possible one. In Slovakia, a person with a one-year work record cannot qualify for unemployment benefits (at least 2 years of unemployment insurance contributions during the last 3 years are necessary in 2018 and 3 years of contributions within the last 4 years in 2008). In Poland, duration varies depending on the level of the unemployment rate of the region relative to the national average. In Ireland duration is longer (52 weeks in 2008 and 39 weeks in 2018) if the applicant has paid 260 or more weekly contributions since first entering insurance. In Cyprus calculations are based on a 6 days working week.
Source: MISSOC database (January 2008 and January 2018) and national legislation.

At the higher end there is Belgium with its unlimited benefit duration. The maximum unemployment benefit duration is also quite high in Denmark, although it was reduced to two years in 2010 as part of the "Recovery Package". On the opposite side are Slovakia, Hungary and Malta. As visible in the graph, the maximum duration of benefits was reduced in Hungary (2011), Finland (2017), Ireland (2009 and 2013), Portugal (2012), Italy (2013) and the Czech Republic (2009). In addition, for people with longer work records (not visible in the graph), the maximum duration was reduced in Greece (2014), the Netherlands (2016), and France (2017) (in the latter country only for people in the age group 50-55). In contrast, the duration of unemployment benefits was raised in Latvia (2009), Lithuania (2017) and Romania (2009, but only temporarily). These policy reforms have resulted in some convergence towards a lower maximum duration of benefits (Graph I.3.10).

Graph I.3.10: **Convergence unemployment benefits – maximum duration**

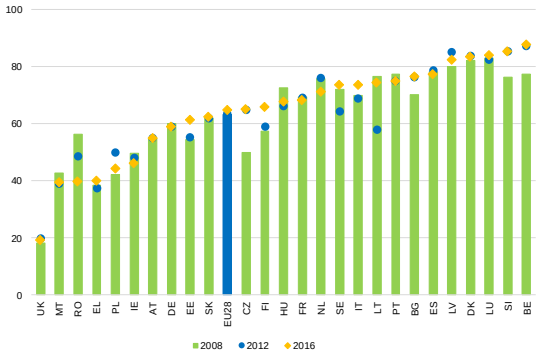


Source: Commission calculations based on MISSOC database

Since 2008, the net replacement rate has been increased in several Member States, but decreased in others. As illustrated by Graph I.3.11, the net replacement rate after 2 months of unemployment increased between 2008 and 2016 in 15 countries and most notably in the Czech Republic, Belgium, Estonia and Finland. The replacement rate after 2 months of unemployment decreased over time in 10 countries, with the sharpest declines being visible in Romania, Hungary and the Netherlands. In Lithuania and Sweden the replacement rate declined substantially between 2012 and 2016, but increased again afterwards. This reflects reforms implemented in a number of countries. Belgium (2009 and 2012) and the Czech Republic (2008) raised the benefit for initial periods of unemployment. In Estonia unemployment benefits were increased in 2013 and 2014. Finland increased unemployment benefit levels through a series of reforms between 2010 and 2014 while in Sweden unemployment benefits were made more generous in 2015. In Poland the benefit level was raised by around 30% in 2010. In 2017, the (minimum) unemployment benefits were increased in Ireland, Portugal and Bulgaria. The ceiling of unemployment benefits was raised in Sweden (2012), Lithuania (2014) and Estonia (2014 and 2018). In addition, Lithuania raised unemployment benefits in 2016.

Reforms reducing net replacement rates were adopted in several other countries. Maximum benefits were capped in Belgium (2012). In Portugal, rates were limited to 75% of reference pay (2010), and the maximum benefit was reduced (2012). In Greece, the basic benefit was decreased by 22% in 2012, though increasable according to the number of the recipients' children. Spain (2012) reduced benefits from 70% to 50% of the reference wage for unemployed registered for more than 180 days in the system. Other countries have introduced a phased reduction of replacement rates. Ireland lowered the weekly benefit by 4% in 2009 and 2010. Lithuania implemented a reform which reduced the average and maximum benefit in 2010. In 2013, Slovenia decreased rates to 60% between the fourth and twelfth month of benefits, and to 50% thereafter. In addition, Finland cut unemployment benefits for high earners in 2014.

Graph I.3.11: **Net replacement rates after 2 months of unemployment (67% of AW), 2008, 2012 and 2016**



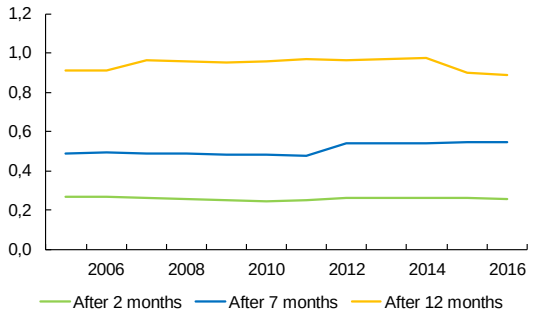
(1) Data computed for a single, low-wage earner without children at 67% of average wage and one year of contribution. No time-series available for Cyprus and Croatia.
Source: DG EMPL elaborations based on OECD tax-benefit indicators.

Yet, these reforms resulted in limited convergence of net replacement rates for different unemployment spells. Graph I.3.12 shows the dispersion across countries of the net replacement rates for different unemployment spells. Low and stable levels observed for periods after 2 and 7 months of unemployment indicate weak convergence across the EU in the net replacement rates at short durations. Conversely, for spells of unemployment longer than 12 months, there has been a mild decline in the dispersion after 2014.

Adjustments in net replacement rates and reductions in maximum duration of benefits were combined with larger unemployment assistance. Unemployment assistance usually consists of a flat subsidy provided to individuals who are not eligible for unemployment insurance.

In the post-crisis period, unemployment assistance was increasingly used also to cover those unemployed who had exhausted their rights to unemployment insurance benefits. For instance, in 2009, France started granting one-off payments of EUR 500 for young jobseekers who do not meet the qualifying period for unemployment insurance benefits. In 2009 and 2010, Spain granted temporary payments of EUR 420 up to 180 days to individuals who have lost their unemployment rights, as long as they attended a training programme. On another stance, between 2010 and 2013, Sweden guaranteed unemployment benefits to individuals on long-term sickness leaves who have exhausted their rights.

Graph I.3.12: **Dispersion within the EU in the net replacement rates by unemployment spells**



(1) Coefficient of variation. Data computed for a single, low-wage earner without children.
Source: Commission calculations based on OECD tax-benefit model.

Activation requirements

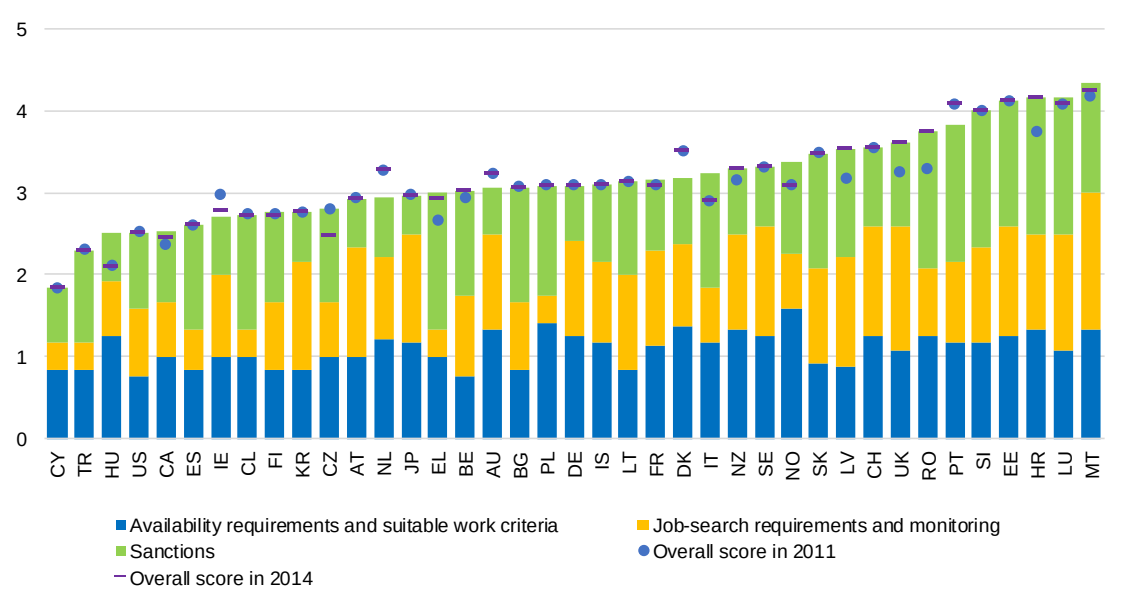
Job-search and work availability requirements have been slightly tightened in a number of countries. The OECD indicator of strictness of eligibility criteria comprises three components and eleven sub-items to characterise different aspects of availability requirements, job-search conditions and sanctions. ([86]) Graph I.3.13 shows the scores across countries in 2011, 2014 and 2017. The index varies between 1 (least strict) and 5 (most strict); Malta, Luxembourg, Croatia, Estonia and Slovenia are the countries with the strictest eligibility condition. Between 2011 and 2017, the overall indicator has increased in several Member States (Hungary, Greece, Belgium, France, Italy, Latvia, United Kingdom, Romania, Croatia, Luxembourg and Malta), with a large contribution of sanctions on refusal of job offers, failure to participate in counselling sessions or ALMPs, and voluntary unemployment. The eligibility conditions have become less strict in Ireland, the Netherlands, Denmark and Portugal. There is little convergence across countries.

The way these strengthening requirements were enacted varied across countries. A number of countries reduced the number of valid criteria for refusal of a job offer (Luxembourg and Portugal in 2010 and Romania in 2011). In 2008, France limited the number of suitable employment offer refusals allowed. In the Netherlands (2016) the timeframe to reject a suitable job offer without punishment was lowered from 12 to 6 months after registry in the system. In 2011 Belgium shortened the time allowed to refuse jobs not related to previous experience. Stricter conditions regarding job availability were introduced in several countries, notably by enlarging the geographical area for suitable job offers (France, 2008; Finland, 2010; Belgium, 2011; Croatia, 2017). The Czech Republic (2012) strengthened work availability conditions by introducing more strict reporting requirements.

Several measures were particularly targeted at youth and older people. In 2009, Denmark restricted rules on compulsory activation for young unemployed under 30. Since 2015, Finland has defined that unemployed under 25 must seek vocational training to be eligible for unemployment insurance and must accept study placements if applied and invited to a study programme. Between 2011 and 2014 Belgium tightened activation requirements for older people through a series of reforms which extended labour market availability and job search requirements to all unemployed below the pensionable age. A notable exception is France, where the age requirement to be exempt from active job search was reduced between 2011 and 2012.

([86]) OECD has long studied the role of job-search availability criteria. Details of the index construction and discussion of 2011 data are available in Venn (2012), with following updates and improvements in Langenbucher (2015) and OECD (2018b) for data from 2014 and 2017, respectively. However, note that the OECD makes a terminology distinction between entitlement conditions – requirements for having the right to receive unemployment benefits – and eligibility criteria – requirements for the *continued* receipt of benefits.

Graph I.3.13: **Overall strictness indicator in 2011, 2014 and 2017**



Source: OECD

Sanctions on lack of compliance with job-search and availability-to-work requirements were introduced or strengthened in a number of countries. Ireland introduced penalties for beneficiaries not in compliance with job-search requirements in 2011. Italy stipulated in 2015 that beneficiaries who refuse to accept a suitable job offer or participate in active labour market policies are no longer eligible for benefits. Payment of unemployment benefits has also become conditional on participation in job-search assistance and support or training activities in Slovakia (2016) and Finland (2018). In 2012 the United Kingdom extended the maximum period during which a jobseeker would lose unemployment benefits in case of the refusal to accept a suitable job offer from a maximum of 3 months to 3 years. The Czech Republic (2012) specified that missed appointments at public employment services can lead to losing entitlements to unemployment benefits if they cannot be justified.

In a few countries registration requirements for beneficiaries of unemployment benefits became stricter. Luxembourg made registration at the public employment service compulsory in 2010. Bulgaria made payment of unemployment benefits conditional to registration requirements in 2010. Similarly, Estonia introduced a reform in 2017 which stipulates that unemployment benefits can be reduced if unemployed workers fail to register within 3 days after being given notice.

With a view to enhancing activation, the possibility to remain entitled to unemployment benefits while working or studying was recently introduced in a few countries. Since 2017, Slovenia has allowed primary or secondary educated unemployment benefits recipients to continue receiving 20% of their benefit until the end of the period for which the benefit was originally awarded (but no longer than 12 months after the start of employment). In Finland (2018) the possibility to remain entitled to unemployment benefits while studying was introduced with a view to improving skills and employability. Moreover, measures were taken to lower disincentives to entrepreneurship, by not taking into account income from business activities in the first four months after startup. In contrast, Slovakia (2017) limited to 40 days per year the possibility to work while receiving benefits.

Conclusions

Some convergence can be observed in the evolution of key design characteristics of unemployment benefits. Reforms have aimed at improving the coverage of unemployment benefits

by easing eligibility conditions. As a result, some convergence towards lower minimum contribution periods necessary to be eligible for benefits is visible. In addition, several Member States have implemented reforms aimed at improving access to unemployment benefits for self-employed and non-standard workers. To improve the cost-effectiveness of unemployment benefits, reinforced activation requirements, combined in some cases with reductions in the duration and net replacement rates, have been implemented in a large number of countries. Some convergence towards a lower maximum duration of benefits is visible. At the same time, several Member States have attempted to improve the adequacy of unemployment benefits by increasing the levels of unemployment insurance or extending unemployment assistance to people not previously eligible for it. In other countries, net replacement rates have dropped as a result of reforms.

3.2.5. Impact of unemployment benefit reforms

Theoretical and empirical evidence

The impact of unemployment benefit reforms has been widely analysed in the literature. There is a trade-off between the insurance function and the incentives to work. On the one hand, unemployment benefits help smooth the consumption patterns of displaced workers; on the other hand, they may reduce their incentive to look for a job, thus lengthening the duration of unemployment spells. The relevance of this effect is evidenced by the rise in job-search intensity of unemployment benefit recipients when getting closer to the date at which they exhaust their benefits. ([87]) Stricter job-search requirements may help to overcome the risk of benefit dependency (e.g. Fredkisson and Holmlund, 2006).

Assessing empirically the impact of comprehensive unemployment reforms is not straightforward. As for EPL reforms, unemployment benefit reforms are often implemented together with other reforms. For example, in Italy, the 2012 unemployment benefit reform was embedded in a comprehensive package (the so-called *Fornero reform*) which included also a far-reaching reform of EPL (see Section 3.2.2). In Germany, unemployment benefits have been reformed under the *Hartz* reforms, which in addition also modified the minimum income support. Because of these interactions between different reform areas, analyses are often country-specific and it is difficult to draw general policy conclusions.

Most studies have analysed the impact of changes in the generosity of unemployment benefits on the unemployment spells. In general, an increase in the benefit duration or net replacement rate increases the duration of unemployment and reduces the transitions from unemployment to employment. ([88]) An important limitation is that some of these studies do not take into account the aforementioned interaction with other labour market institutions, such as the social assistance system. Accounting for these effects might yield more nuanced findings – i.e. a reduction in the unemployment duration may also increase the transitions of individuals between the unemployment benefit and the social assistance system. ([89])

The effect of the generosity of the unemployment benefit system on job match quality is mixed. In general, the job match quality is measured by the net earnings in the new job, which, based on the theoretical literature, are expected to be lower in case of a less generous unemployment benefit system. However, most of the existing studies do not find an effect, either positive or negative, on the job quality of those who find employment after being unemployed. For example, Lalive (2007) shows for Austria that more generous unemployment benefits increase the unemployment duration, but do not affect the average wage**.**

([87]) Thus, there is a spike in the transition rate from unemployment to employment at the date of expiration of the benefits; see Card and Levine, 2000 and Card et al. 2015.

([88]) E.g. Lalive et al., 2006 for Austria; Kyyrä and Ollikainen, 2008, for Finland; Lichter, 2016, for Germany.

([89]) E.g. Fremigacci (2010) for France and Petrunyk and Pfeifer (2017). Another important limit is that the majority of studies have analysed the impact on the short-term outcomes. One notable exception is Schmieder et al. (2012) who finds that the long-term effects of more generous benefits on overall non-employment is smaller.

Box I.3.5: **Effect of more stringent job search requirements and targeted activation measures for older unemployed in Flanders**

In June 2012 the public employment in Flanders increased the upper age limit defining the group of unemployed for which systematic activation efforts are undertaken from 55 to 58 years. In this box, the effect of this policy has been estimated using a difference-in-differences logit regression model. In addition, the same estimations are provided for Wallonia and Brussels, where the public employment services did not increase their efforts to provide more targeted activation measures for older unemployed. Based on the individual quarterly data from the Labour Force Survey for the period from the first quarter of 2011 to the fourth quarter of 2013, the following model has been estimated:

$$H_{it} = \alpha + \delta I_{t>R} + \gamma Treat_{it} + \theta(Treat_{it} * I_{t>R}) + \tau X_{it} + D_q + \varepsilon_{it} \quad (1)$$

where *H* is defined as the probability of finding a job measured by a dummy variable that takes a value of one if an individual *i* in time period *t* has a job tenure lower or equal to three months and a value of zero otherwise. ([1]) The sample includes all employed. *R* is the date of the reform and *I* is an indicator function which takes a value of zero before the date of the reform and a value of one from the reform onwards ("post-reform dummy"). *Treat* is a dummy variable that takes a value of one if an individual is in the treatment group (i.e. when the individual is 57 years old) and zero when the individual is in the control group (i.e. when the individual is 52 years old). The variable of interest is the interaction term between the indicator function *I* and the variable *Treat.* The vector *X* includes several controls related to individual and job characteristics. ([2]) *D* is a vector of seasonal dummy variables and ε is the standard error term. All estimations include clustered standard errors on the time period. The sample is limited to all employed between 52 and 57 years old to ensure that individuals in both groups only differ in terms of job search requirements before the reform.

The results of the difference-in-differences estimation are summarised in Table 1. The increase in the age limit for the mandatory participation in targeted activation measures offered by the public employment service from 55 to 58 years is found to significantly increase the hiring rate for older workers in Flanders between 0.7 and 0.8 percentage points. There is no significant impact found for the combined region of Brussels and Wallonia. This is in line with the expectations as Flanders was more active in providing targeted activation measures to older unemployed. A shortcoming of the data used is that they only allow analysing newly employed workers without distinguishing whether these are workers who make the transition out of unemployment or workers who switch between jobs.

Table 1: The effect of the 2012 policy reform on the probability of having job tenure of three months or less using a difference-in-differences estimation (marginal effects)

	Flanders		Brussels and Wallonia	
Dependent variable	(1) All employed	(2) Only employees	(3) All employed	(4) Only employees
$Treat_{it} * I_{t>R}$	0.0074**	0.0081**	-0.0034	-0.0049
	(0.0031)	(0.0034)	(0.0032)	(0.0048)
Observations	15.743	13.208	12.261	10.031
Pseudo R-squared	0.037	0.046	0.058	0.064

Note: The value for the interaction term between $Treat_{it}$ and $I_{t>R}$ refers to the marginal effect. Standard errors are clustered based on the time period.

***Source*:** European Commission estimations based on the quarterly Labour Force Survey microdata.

In order to test for the robustness of the results, two robustness tests have been performed. First, a difference-in-difference matching estimation has been performed (Heckman et al. 1997). Second, in an alternative specification the sample has been restricted to the newly hired (i.e. those with tenure of less than three months) and those who are unemployed or inactive. The results (available upon request) are in line with the baseline results.

([1]) The job tenure is calculated based on the variable STARTIME, which reflects the number of months an employee is employed with the current employer.

([2]) The individual characteristics included gender and three education categories. The job characteristics include 9 occupational categories and 21 industry categories are included as control variables.

Similarly, no effects on wages for previously unemployed people is found for Slovenia, where a change in the system entailed substantial reductions in benefit duration for selected groups of workers (van Ours and Vodopivec, 2006 and 2008). In a few cases, significant wage effects as a result of unemployment benefit reforms have been identified. Based on German data, Schmieder et al. (2016) find that an increase in the unemployment duration has a negative impact on wages. Conversely, Nekoei and Weber (2017) show for Austria that extensions of relatively short unemployment benefits lead to higher wages at re-employment, which is consistent with the view that unemployment benefits subsidise productive job search and promote good job matches.

Few studies have analysed the impact of tightening job search requirements. In general, an increase in the job search requirements raises the transitions from unemployment to employment. ([90]) However, it may also increase the transitions from unemployment to inactivity. Box I.3.5 adds a piece of evidence to this limited empirical literature by exploring for Belgium the effects of strengthening job search requirements on the employment prospects of older unemployed. In particular, it focuses on the impact of the June 2012 increase in the age limit for mandatory activation measures from 55 to 58. The characteristics of this reform and the main effects on hiring are discussed in the next sub-section.

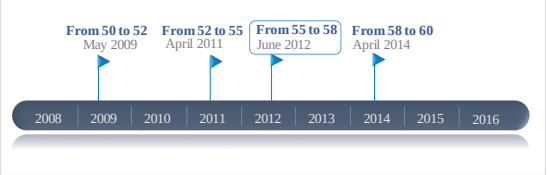
Effects of tightening job-search requirements in Belgium

Belgium has gradually tightened the job search requirements for older unemployed. Until the early 2000s, unemployed older than 50 years were exempted from registering at the regional public employment service and from actively looking for a job. This changed in 2005, when the age threshold was gradually increased up to 60 years in 2015, to reach 65 by 2020. Moreover, the reforms introduced the obligation to participate actively in the activation measure offered by the regional public employment service and to accept appropriate job offers. The definition of an appropriate job offer has itself been gradually tightened. ([91])

The effectiveness of the reform depends on the provision by the regional public employment services of targeted activation measures. In practice, the regional public employment services focussed on unemployed younger than 50 years old, implying that it was *de facto* not possible to impose unemployment benefit sanctions.

Starting from May 2009, Flanders gradually increased the upper age limit defining the group of unemployed for which systematic activation efforts are undertaken. It was increased from 50 to 52 years in May 2009 and further raised to 55 years in April 2011, 58 years in June 2012 and, finally, 60 years in April 2014 (Graph I.3.14). Participation in targeted activation measures became mandatory for older unemployed while specialised counsellors were tasked to monitor and counsel them. The public employment services in Wallonia and Brussels increased their activation efforts for older unemployed much later.

Graph I.3.14: **Age limit for systematic offer of targeted measures in Flanders**



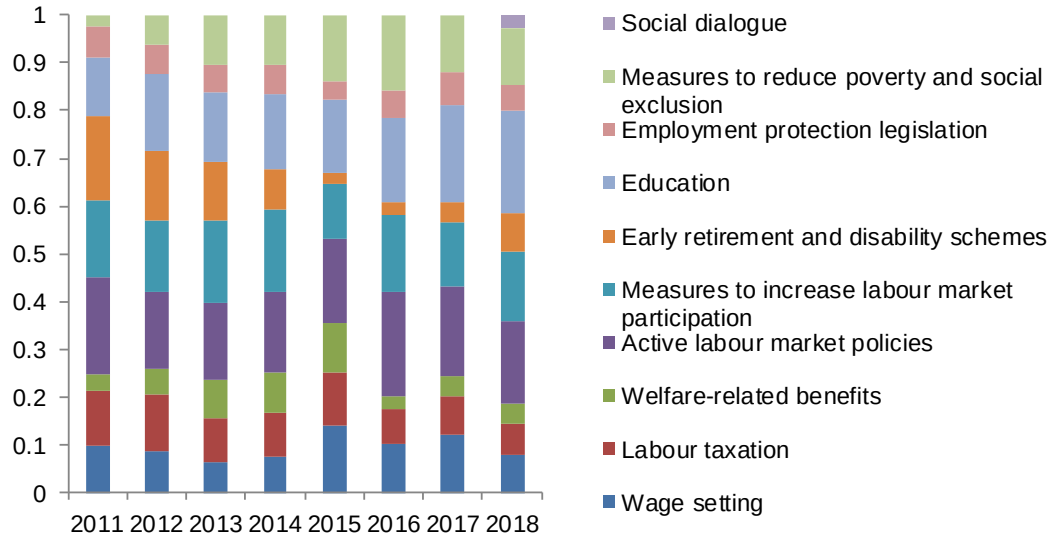
Source: Commission based on Labref.

Stringent job-search requirements for older unemployed in combination with targeted activation measures can improve older workers' job prospects. Box I.3.5 provides an assessment of the changes introduced in the eligibility conditions in Belgium. The fact that an increase in the age limit (from 55 to 58 years) above which workers were exempted from targeted activation was implemented in different time periods and in one part of the country allows to use statistical techniques (so-called difference-in-difference estimation) that identify the effects on the hiring rate of older workers by looking at the variation over time of the variable of interest (the hiring

([90]) E.g. Manning (2009) for the UK, Heyma and van Ours (2005) and Lammers et al. (2013) for the Netherlands, and Bollens (2011) for Belgium.

([91]) A change in the aptitude vis-a-vis older worker was also observed in other Member States. For example in the Netherlands and France, the exemptions for older unemployed were repealed respectively in 2004 and 2012.

Graph I.3.15: **Country-specific recommendations, distribution of CSRs by policy areas**



Source: Council Recommendations 2011-2018

rate), while controlling the change relative to a counterfactual group. The results suggest that the reform led to an increase of approximately 0.7 percentage points on the hiring rate of older employed. It is likely that part of the recent increase in the older workers' employment rate in Belgium can be attributed to the increase in job search requirements and targeted activation measures for older unemployed.

3.3. POLICY PRIORITIES AND PLANS LOOKING FORWARD

While addressing the legacy of the crisis remains a priority, the favourable economic outlook allows for a more forward-looking approach to policy making. The economic crisis has shown that building resilient economies and societies, which are less vulnerable and better able to withstand shocks, is important to achieve sustainable and inclusive growth. In addition, all Member States are affected by the long-term challenges posed by new forms of work and digitalisation, which call for a modernisation of existing social protection systems and labour market institutions.

The European Pillar of Social Rights is the overarching response that the EU has given to tackle these challenges and promote convergence towards better working and living conditions. It sets out 20 key principles and rights to support fair and well-functioning labour market and social protection systems, in light of the changing realities of Europe's societies and world of work. The 2018 *Annual Growth Survey* called upon Member States to use the Social Pillar as a framework to catalyse reforms that improve labour market and social outcomes (European Commission, 2018e). The *2018 Country Reports* outlined the nature of the challenges at national level. The ensuing *Country-Specific Recommendations* (CSRs) encouraged EU Member State to make progress, as needed, on the three dimensions of the Social Pillar: equal opportunities and access to the labour market, fair working conditions, and social protection and inclusion. Similar recommendations were addressed to the euro area as a whole. Benchmarking of design characteristics of national policy settings has started to be used in this context, to underpin country-specific analysis, and to raise awareness about the quality of institutions and reform needs in the Member States. ([92])

The number and share of CSRs related to employment and social issues have remained broadly stable in recent years, although some changes in focus are visible. Graph I.3.15 illustrates the evolution in the distribution of CSRs

([92]) See also Joint Employment Report 2018 (European Commission, 2018e).

by policy area over the period 2011-2018. ([93]) Since 2011, the weight of CSRs related to poverty reduction and education has overall increased. Active labour market policies, in particular measures to enhance labour market participation and skills, were the areas with the highest share of CSRs in the two preceding years, and this remained the case in 2018. An important novelty this year was the introduction of two CSRs related to improving social dialogue.

A closer look at labour market and social policy-related CSRs in 2018 gives a good overview of national policy priorities from an EU perspective. In line with the Social Pillar, a particular focus has been put in 2018 on the provision of adequate skills, on the effectiveness and adequacy of social safety nets and on improving social dialogue.

Recommendations to support *labour market participation* were addressed to 11 Member States. In line with the Social Pillar, which calls for equal opportunities to be ensured to under-represented groups and for active support to employment, the CSRs for 2018 encourage Member States to foster employment of specific groups (France, Luxembourg, the Czech Republic), reduce financial disincentives to work (Belgium and Germany), reduce the gender pay gap (Estonia) and increase female activity rates, with for some Member States a focus on access to quality childcare (Ireland, Italy, Austria, Poland and Slovakia).

In addition, 13 Member States were recommended to enhance the *effectiveness of ALMPs*. In line with the Social Pillar, which states that everyone has the right to receive timely and effective support for job search, a number of Member States were recommended to enhance the quality and effectiveness of public employment services and of ALMPs more in general (Belgium, the Czech Republic, Cyprus, Hungary, and Spain), often with a focus on disadvantaged groups such as the low-skilled, people with a migrant background, older workers, long-term unemployed or young people not in employment education or training (NEETs). As stressed by the Social Pillar and the European Skills Agenda adopted in 2016, education and training are crucial to foster access to the labour market and avoid skills mismatches. Equipping people with the right skills through upskilling measures, adult learning or better cooperation between education and businesses received attention in the CSRs addressed to Bulgaria, Latvia, Poland, Spain, Slovenia, Slovakia, and the United Kingdom, with a special focus on digital skills in the case of Ireland.

In 2018, particular emphasis was put on *education*. CSRs in this area were addressed to 16 Member States (excluding the CSRs related to adult learning, which are part of ALMPs). Several CSRs focused on increasing the quality and/or inclusiveness of education (Bulgaria, the Czech Republic, Slovakia, Romania, Hungary, Lithuania, and Croatia); reducing inequalities in educational outcomes (Belgium, Germany and Spain); improving vocational education and training (France, Italy, Cyprus and Latvia); strengthening the labour market relevance of education (France, Belgium, Croatia, Latvia, and Lithuania) and improving basic skills for disadvantaged groups (Austria). The importance of upskilling and adult learning was also recognised in several recommendations, notably to Latvia, Croatia, Romania, Portugal, Lithuania and France. ([94])

Improving the design of *welfare-related benefits* and *measures to reduce poverty and social exclusion* remains a priority for 10 Member States. According to the Social Pillar, everyone has a right to adequate social protection, including unemployment and minimum income schemes that also preserve the incentives to work, as well as a right to quality childcare, healthcare and long-term care, to social housing and essential services. Recommendations to improve the adequacy and/or coverage of minimum income schemes were issued to 6 Member States (Bulgaria, Hungary, Romania, Estonia, Latvia and Spain). Hungary received the recommendation to improve the adequacy and coverage of unemployment benefits. Croatia is encouraged to consolidate social benefits

([93]) The classification of CSRs is done by policy instrument (e.g. active labour market policies), rather than by expected outcomes (e.g. increasing employability). This is not a simple task as CSRs can refer to objectives/expected outcomes and required policy actions.

([94]) Subparts referring to upskilling and adult learning are classified under 'education' when they are part of a broader recommendation referring to the need for educational reform, whereas they are classified under 'ALMPs' when they are part of a broader CSR related to active labour market policies.

and improve their poverty reduction capacity. Italy received a CSR to reduce the share of old-age pensions in public spending to create space for other social spending. The important role of the design of tax and benefit systems to reduce poverty and inequality is recognised in the CSR addressed to Lithuania. The Social Pillar and the Recommendation on access to social protection adopted in 2018 stress the importance of adequate social protection for all workers (regardless of their employment status) and the self-employed. In line with this, the CSR addressed to the Netherlands focusses on promoting adequate social protection for the self-employed.

CSRs on *wage setting and minimum wage frameworks* were addressed to 6 Member States. The Social Pillar calls for fair wages and adequate minimum wages that provide for a decent standard of living for all workers, while promoting employment and taking into account national economic and social conditions. In addition, the Pillar requires all wages to be set in a transparent and predictable way, in full respect of national practices and autonomy of social partners. In line with this principle, recommendations were issued to ensure that minimum wage developments are consistent with job creation and competitiveness (France) and that minimum wage setting is based on objective criteria (Romania). Moreover, Estonia received a CSR to improve wage transparency in the private sector and Croatia to introduce harmonised wage-setting frameworks across the public sector. In view of their weak real wage growth and sizeable current account surpluses, Germany and the Netherlands were recommended to create the conditions to promote higher wage growth.

Recommendations on *early retirement* were addressed to 6 Member States. When taking into consideration the broader area of pensions, a total of 12 Member States received a CSR. ([95]) In line with the Social Pillar, which stresses the right to an adequate income for all retired people, the recommendations issued in 2018 aim at improving the long-term sustainability of pension systems (Luxembourg, Malta, Austria, Belgium, and Ireland), the adequacy of pensions (Latvia) or both (Poland, Slovenia, and Lithuania). France, Croatia and Poland were recommended to align different pension regimes. The Netherlands received the recommendation to increase the inter-generational fairness and resilience of the pension system.

CSRs to address the high *tax wedge on labour* were addressed to 5 Member States. France, Italy and Lithuania were recommended to shift the tax wedge away from labour. Germany, Latvia and Austria received the recommendation to reduce the tax burden on low-wage or secondary earners.

After the high reform intensity witnessed in the post-crisis period, 4 Member States received a CSR in the area of *employment protection legislation*. In line with the Social Pillar, recommendations favour measures that tackle labour market segmentation and promote open-ended employment. Poland and Portugal were recommended to remove obstacles to permanent hiring and Spain to facilitate transitions to open-ended employment. The Netherlands was recommended to reduce incentives to use temporary contracts and self-employed without employees.

Two Member States received a CSR on *social dialogue*. The Social Pillar stresses the importance of social dialogue and advocates the involvement of social partners in the design and implementation of economic, employment and social policies according to national practices. In line with this, Romania and Hungary were recommended to improve the quality and effectiveness of social dialogue.

Reform plans currently under discussion are largely aligned with the reform needs identified at the EU level and with the patterns emerging from policy action so far. This can be seen in light of the growing consensus on the role and effects of the different policy settings and structural reforms on socio-economic outcomes. At the same time, the unavoidably multiannual nature of many of the challenges and of the recommendations addressed to Member States involves a certain degree of continuity between policy guidance in the framework of the European Semester, the measures recently passed and those being discussed in Member States.

([95]) In previous years only CSRs in the area of early retirement (and disability systems) were taken into consideration. To ensure comparability with previous years, the graph only includes those CSRs for 2018, although the text also mentions broader CSRs in the area of pensions.

Overall, reinforcing the welfare system continues to be at the centre of policy action, together with improving the quality of skills provision. A proposal for a Universal Social Card is being tested in Spain. Measures to improve the adequacy of social benefits are planned in Croatia, Latvia and Malta. France unveiled in September 2018 a vast action plan against poverty, which focuses on child poverty and on the support and activation of those further away from the labour market, including through the introduction of a universal activation income to replace existing schemes. Comprehensive reforms aimed at enhancing the activation component of the unemployment benefit system, enlarging its coverage and increasing the effectiveness of support services to job-seekers have been put on the table in Austria, Finland and France. Discussions are ongoing in countries such as Austria, the Czech Republic, Estonia, Ireland and Romania to enhance parental leave, family allowances and childcare schemes. Specific action to reduce skills mismatches has been proposed in Germany, while a broad reform is being pursued in France to improve the labour-market relevance of initial VET. Education and training policies are also subject to reform proposals in Croatia, Poland, Romania and Slovakia.

Reforming EPL to improve the labour market functioning also occupies an important part of the reform agenda. Finland, the Netherlands and Portugal are the countries where the most far reaching reform plans have been put on the table so far in this policy domain. In particular, more flexibility is being injected in Finland and the Netherlands, while restrictions to the use of temporary contracts are planned in Portugal to reduce the excessive use of atypical employment. Work has started in Poland with a view to a comprehensive reform of the labour code.

3.4. CONCLUSIONS

A clear reform pattern has progressively emerged in the post-crisis period towards measures aimed at improving the resilience of European economies and societies. The short-term adjustment needs which had prevailed during the sovereign debt crisis of 2011-2012 have given way, from 2013-2014 onwards, to multi-faceted reform packages balancing economic and social fairness considerations. Most recent reform trends and plans looking forward confirm this overall shift in policy making.

This trend is also reflected in the increased prominence of social considerations in EU policy guidance and initiatives. In line with the European Pillar of Pillar Rights, equal opportunities, human capital investment and social welfare are now explicitly recognised as founding elements of sustainable growth. This is largely reflected in the CSRs adopted in the framework of the 2018 European Semester.

Also the reforms passed in the areas of EPL and UB over the post-crisis period have allowed for some policy convergence with a view to enhanced adjustment capacity and better socio-economic outcomes in the longer term. Common reform trends can be seen in these two areas, resulting in some convergence in underlying policy settings. For EPL, convergence was mainly driven by reforms to loosen the employment protection legislation for regular contracts in countries previously characterised by stringent regulations, and related counter-balancing action on fixed-term contracts. Since most of EPL measures appear to have been implemented in difficult times, it can be assumed that heavy budget constraints and adjustment needs may have helped set the direction for reform efforts in this field. As concerns the design of unemployment benefit systems, general reform trends can be distinguished towards enhanced coverage and reinforced activation requirements. Some convergence towards lower minimum contribution periods necessary to be eligible for benefits and a lower maximum duration of benefits is visible. The analysis shows the positive effects of such reforms, with EPL reforms in Italy and Spain having improved labour market flows, and the UB reform in Belgium having had a positive impact on the employment prospects of older workers.

Reform efforts in both areas reflect a growing recognition of the importance of quality institutions for structural reforms to be successful. Examples of the sort are the several measures passed in recent years to revise EPL dispute resolution mechanisms, to reinforce labour inspectorates or to optimise the support offered to job-seekers by public employment services. Together with reform packaging, policy measures

aimed at improving the quality of institutions are relevant not only for an effective implementation of passed reforms, but also for containing their short-term costs and increasing their long-term benefits, thereby for social fairness considerations. As recognised in the European Pillar of Social Rights, these are necessary conditions for achieving resilient economies and societies. The EU can play an important role in this respect, through institutions, policy guidance and conditionality attached to financial support.

APPENDIX 1

Table I.3.A1.1: **Reform measures in the employment protection legislation domain in the EU by direction, since 2008**

		REGULATION PERMANENT CONTRACTS					REGULATION FIXED-TERM CONTRACTS			
		Procedural requirements, probation period	Notice periods, severance payment	Definition fair dismissal; consequences unfair dismissal	Dispute resolution mechanisms	Regulation collective dismissal	Valid reasons/conditions for use fixed-term contracts	Maximum number renewals/ duration, early termination	Regulation temporary agency work	New forms of work
BE	Increasing	2014		2014		2011			2016, 2017	2013
	Decreasing		2014				2013			2013, 2017
BG	Increasing									
	Decreasing		2009	2015						2015
CZ	Increasing					2016		2011	2016, 2017	
	Decreasing	2012	2012	2012				2011, 2015		
DK	Increasing								2016	2015
	Decreasing									
DE	Increasing								2017	
	Decreasing									
EE	Increasing	2009						2009	2012	
	Decreasing		2012		2017		2009			
IE	Increasing			2014		2012				
	Decreasing				2017					
EL	Increasing			2017						
	Decreasing	2010, 2017	2010, 2012	2012		2010, 2017		2011	2014	
ES	Increasing					2012		2010, 2012		2018
	Decreasing	2012	2010-2012	2010, 2012		2012	2013		2011	
FR	Increasing		2017			2013, 2017				2017
	Decreasing	2008, 2017		2015, 2018	2015, 2017	2013, 2016		2015, 2017	2013	2008
HR	Increasing								2014	
	Decreasing	2013, 2014		2014	2017	2013, 2014		2013	2014	
IT	Increasing						2014	2012		2016
	Decreasing	2012		2012, 2015	2012	2012, 2015	2012, 2014	2012, 2014		2009
CY	Increasing						2016	2016		
	Decreasing									
LV	Increasing							2015		
	Decreasing					2010, 2015		2015		
LT	Increasing		2016							
	Decreasing		2016	2016	2013	2011	2010, 2016			2016
LU	Increasing					2010				
	Decreasing			2015						
HU	Increasing								2011	
	Decreasing	2013	2012	2012				2012		
MT	Increasing									2012-13, 2015
	Decreasing									
NL	Increasing			2015				2014		2014
	Decreasing	2015	2015	2015		2012		2016		
AT	Increasing		2013							2016
	Decreasing	2016		2010, 2017					2008	
PL	Increasing							2016	2017	2016
	Decreasing									
PT	Increasing					2013				2017
	Decreasing		2011, 2013	2013	2009	2012		2012		
RO	Increasing			2011						2015, 2017
	Decreasing	2011				2011	2011	2011	2011	
SI	Increasing							2013	2013	2017
	Decreasing	2013	2013							
SK	Increasing		2012					2012	2015	2014
	Decreasing	2011	2011	2011		2011		2011		
FI	Increasing									
	Decreasing	2017					2017	2010		
SE	Increasing							2016		
	Decreasing									
UK	Increasing					2009				2015
	Decreasing	2012		2014		2010, 2013				

Source: European Commission based on the LABREF database.

APPENDIX 1

Table I.3.A1.1: **Reform measures in the unemployment benefit domain in the EU by direction, since 2008**

		Net replacement rate	Duration	Eligibility	Search and job availability requirements
AT	Increasing	(2013)		(2011, 2015)	
	Decreasing				
BE	Increasing	(2009, 2013)			
	Decreasing	(2011, 2012)	(2011)	(2011, 2012, 2013, 2014, 2015)	(2011, 2012, 2013, 2014)
BG	Increasing	(2009)			
	Decreasing	(2010)	(2010)	(2010)	(2010)
HR	Increasing			(2013)	
	Decreasing				(2014, 2017)
CY	Increasing				
	Decreasing				
CZ	Increasing	(2008)		(2012)	(2012)
	Decreasing	(2010)	(2008)	(2008, 2010, 2012, 2015)	(2008, 2012)
DK	Increasing		(2011, 2015)		
	Decreasing	(2015)	(2008, 2010, 2013)	(2010)	(2008, 2009, 2015)
EE	Increasing	(2008, 2012, 2014, 2017, 2018)	(2008)	(2008, 2013)	(2011, 2017)
	Decreasing			(2014)	(2010)
FI	Increasing	(2010, 2012, 2015, 2016)		(2009, 2010)	
	Decreasing	(2014, 2015)	(2016)		(2009, 2010, 2014, 2016)
FR	Increasing			(2009, 2011)	
	Decreasing	(2014)			(2008)
DE	Increasing			(2016)	
	Decreasing				
GR	Increasing	(2008, 2009, 2012)		(2008, 2013, 2014)	
	Decreasing	(2011, 2012)	(2011)		
HU	Increasing				
	Decreasing	(2011)	(2011)	(2011)	
IE	Increasing	(2017)			
	Decreasing	(2009, 2010, 2013)	(2008, 2012, 2013)		(2011)
IT	Increasing	(2012, 2015)	(2012, 2015)	(2008, 2012, 2013, 2015, 2016)	
	Decreasing				(2009, 2015, 2016)
LV	Increasing		(2009, 2012)	(2009)	
	Decreasing	(2012)	(2014)	(2016)	(2013)
LT	Increasing	(2014, 2016)	(2009)	(2016)	
	Decreasing	(2009, 2011)	2016, 2017	(2009, 2014)	
LU	Increasing	(2009)	(2015)		
	Decreasing				(2010, 2016)
MT	Increasing			(2010)	
	Decreasing				(2014)
NL	Increasing				
	Decreasing		(2014)		(2014)
PL	Increasing	(2009)	-		
	Decreasing				(2010)
PT	Increasing	(2016)	(2016)	(2009, 2012)	(2016)
	Decreasing	(2010, 2012, 2013)	(2012)		(2010)
RO	Increasing		(2009)	(2017)	(2016)
	Decreasing	(2010)		(2010)	(2011)
SK	Increasing	(2012)		(2013, 2017)	
	Decreasing				(2015)
SI	Increasing	(2010, 2013)	(2010)	(2010, 2013)	
	Decreasing	(2013)			
ES	Increasing	(2008, 2012)	(2012, 2013)	(2009, 2013, 2015)	
	Decreasing	(2012)	(2012)	(2012)	(2012)
SE	Increasing	(2015)		(2009, 2010)	
	Decreasing				
UK	Increasing				
	Decreasing			(2009, 2015)	(2008, 2012, 2013, 2015, 2017)

Source: European Commission based on the LABREF database.

Part II

Analytical Chapters

1. SHORT-TERM AND LONG-TERM DETERMINANTS OF MODERATE WAGE GROWTH IN THE EU

This chapter analyses the factors explaining moderate wage growth in the EU in the post-crisis period. It investigates whether the historical relationship between wages and unemployment has broken down or weakened. It estimates a benchmark for wage growth based on economic fundamentals and a residual 'surprise component' in wage growth. Finally, it assesses whether the changing composition of the workforce, and of the jobs available, has contributed to moderate wage growth.

Results show that EU wages have not stopped reacting to unemployment developments after the 2008 crisis. Wage growth was moderate because of low inflation, low trend productivity growth, and high unemployment. There are only a few Member States with a significant 'shortfall' in wage growth, including both low and high-unemployment countries. Even in these cases, most of the shortfall occurred before the recovery took hold in 2013. Migration, ageing and collective bargaining institutions appear to have mostly transitory effects on wage growth.

During the last decade, changes in the composition of the workforce had a small but positive impact on wage growth in most of the EU. In some Member States such as Germany, Italy, Luxembourg and Portugal, composition effects were a main driver of wage growth. This also means that the underlying wage dynamics in these countries were more restrained than headline wage growth would suggest. Education, age and non-standard employment appear to be the most important factors affecting wage growth through composition effects.

1.1. INTRODUCTION

This chapter analyses the determinants of moderate wage growth in the EU in the period 1995-2017. There is a growing consensus that low inflation, low trend productivity growth, as well as remaining reserves in the labour market explain much of the recent wage moderation in industrialised countries. At the same time, many questions remain. Has wage growth stopped responding to unemployment? What is the magnitude of the 'shortfall' in wage growth in the post-crisis period? What is the relative importance of the headline unemployment rate and versus additional, latent, labour market reserves? Is the composition of the workforce, or the jobs available in the economy, affecting aggregate wage growth? Finally, are the causes of low wage growth temporary or at least partly durable?

Wage growth remains moderate in the EU, especially in light of the steady decline of unemployment over recent years. The first two chapters of this report show that in the euro area (see Graph I.1.11), and in most individual countries (see Graphs I.2.17 and I.2.18), wage growth remains below what could be expected based on the pre-crisis relationship between nominal wage growth and the unemployment rate. It also appears that the wage Phillips curve, reflecting the relationship between unemployment and wage growth, ([96]) may have 'flattened': wages appear to react less to unemployment than before the crisis. But a visual inspection of such bi-variate 'Phillips curves' only provides partial insights. Unemployment is just one among the determinants of wage growth.

Many explanations have been put forward to explain moderate wage developments in advanced economies during the recovery. Moderate inflation and productivity growth have been noted as important contributors. Many observers have also pointed out that apparent low unemployment rates may mask significant labour market reserves (or 'slack'), including discouraged job-seekers and underemployed part-time workers (see e.g. Bell and Blanchflower, 2018, for a discussion on the UK). Finally, long-term structural factors, including ageing, sectoral shifts, globalisation and changing industrial relations have also been suggested as contributors to wage moderation (as presented above in Chapter I.1). ([97])

([96]) In this chapter, the (wage) Phillips curve refers to the relationship between unemployment and nominal wage growth. Note that the term 'Phillips curve' is also used in the literature to refer a similar relationship between unemployment and price inflation.

([97]) A related literature explaining trends in the labour income share is discussed in Box II.1.3 at the end of this Chapter.

This chapter deepens the analysis of wage developments in the EU focusing first on the relationship between wage growth and relevant economic variables. To this end, the chapter estimates variants of the 'wage Phillips curve': the statistical relationship linking wage growth to fundamentals including inflation, productivity growth and the unemployment rate. Based on these estimations, it calculates a benchmark for wage growth in all EU Member States for the period of 1995-2017. The estimations allow for an investigation of the short- and long-term determinants of wage growth and whether these have changed in the post-crisis period. The benchmarks, in turn, allow for an assessment of possible 'shortfalls' in wage growth in the EU both before and after the crisis.

Subsequently, the chapter estimates the extent to which composition effects played a role in EU wage growth in the post-crisis period. How the composition of the workforce affects aggregate wage growth is especially relevant in an environment of low nominal wage growth. In such cases, small composition effects may significantly affect aggregate wage dynamics. A clear understanding of underlying wage developments is especially relevant in countries in which downward wage adjustment was necessary for the external adjustment in the aftermath of the euro-area crises.

The rest of the Chapter is organised as follows. Section 1.2 presents an estimation of determinants of EU nominal wage dynamics since the mid-1990s and wage benchmarks based on these. Section 1.3 focuses on the composition effects. Section 1.4 offers some conclusions.

1.2. DETERMINANTS OF MODERATE WAGE GROWTH IN THE EU: A QUANTITATIVE ASSESSMENT

1.2.1. Introduction

This section first estimates the statistical relationship between wage growth and the most relevant economic fundamentals. These fundamentals include inflation and productivity growth, besides unemployment. Only when controlling for all relevant factors is it possible to assess whether the effect of unemployment on wage growth has weakened or even disappeared since 2008.

In a second step, the estimated relationships are used to assess the extent of the possible 'shortfall' in wage growth in the EU. This is done by calculating rates of wage growth that could be expected (or predicted) given developments in fundamentals. The gap between actual and predicted wage growth is then interpreted as the 'surprise' component in wage growth, the part not explained by economic fundamentals. This can be interpreted as a 'shortfall' (or 'missing' wage growth) if this gap (surprise component) is negative. The extent of the shortfall is assessed both for the post-crisis period (2010-2017) and, as a comparison, for the pre-crisis period (2000-2007).

In a third step it is assessed how latent labour market developments, both short- and long-term, affect wage growth. Some of these issues have been in the focus of recent analyses, most notably the effects of alternative measures of labour market reserves (or 'slack') on wage developments. Other factors, including ageing, migration, job quality, and institutions of collective bargaining, have been less studied.

The approach used follows the existing literature on estimating 'wage Phillips curves'. It builds on methodologies that have been developed at the European Commission to benchmark wage developments in Member States (see, e.g., European Commission, 2011 and 2013a; Arpaia and Kiss, 2015), and on recent analyses focusing on the determinants of wage growth in advanced economies (e.g. IMF, 2017a; Hong et al., 2018; Bell and Blanchflower, 2018; European Commission, 2017b,c). All these studies build on Blanchard and Katz (1999) who argued for the inclusion of labour productivity (besides inflation and unemployment) in empirical models explaining wage growth. Models of this kind have also been justified by a link to the New-Keynesian model of the macro-economy, a model widely used in monetary policy analysis (Gali, 2011).

The present analysis contributes to the recent literature on estimating 'wage Phillips curves' in two ways. First, unlike other recent contributions, it extends the analysis to all EU Member States. Second, it presents some results

for each Member State separately, in particular a comparison of actual and predicted wage growth. The focus on the EU, and each Member State separately, allows for a more nuanced understanding of issues specific to this group of countries, as differentiated from issues facing other advanced economies. (For a detailed explanation of the methods used in the analysis, see Box II.1.1).

1.2.2. Data and methodology

Determinants of wage growth in 28 EU Member States are estimated for the period 1995-2017. The analysis is conducted on data taken from the AMECO Annual Macro-Economic Database of the European Commission.

In the baseline model, nominal wage growth is explained by inflation, trend labour productivity growth, as well as the level and change of the unemployment rate. Along a 'balanced growth path' (i.e. when all variables growth at a constant rate) as described by the theory of economic growth, nominal wage growth fully reflects inflation and real productivity growth. If real wage growth fully reflects productivity growth, the wage share (the share of national income that is paid in wages, also known as the labour income share) remains constant. ([98])

The unemployment rate is included to explain the effect of economic fluctuations on wage growth in the short run. Wage growth is expected to be slower when unemployment is high, and vice versa, as is suggested by the Phillips curves. This also means that the wage share may not be constant over the business cycle. The inclusion of both the level and the change of the unemployment rate is justified by recent analyses as a way to control for expected future developments in unemployment (IMF, 2017a). Further variables are included in later subsections to check whether demographic or institutional developments affect wage growth in a systematic way in the EU. In some specifications, country and year effects are included to control for country specificities and unexplained common trends across countries. **(**For a discussion of methodological issues, see Box II.1.1).

([98]) Long-term developments in the wage share, and the recent literature on factors explaining these developments are surveyed in Box II.1.3, at the end of this Chapter.

1.2.3. Main determinants of EU wage dynamics since the mid-1990s

Table II.1.1 presents estimations of the relationship between wage growth and economic fundamentals for the 28 Member States over the period 1995-2017. Columns (1) to (3) show results for the whole sample period, columns (4) to (6) for the pre-crisis period 1995-2007, and columns (7) to (9) for the post-crisis period 2010-2017. Results from three specifications are shown: without country or year effects, with country effects, and with both. The specifications without country effects are based on a pooling of country-year observations. These identify relationship on the basis of cross-country comparisons. For instance: was wage growth faster in countries and years in which inflation was faster (other factors being equal)? When country effects are included, results are based on a comparison of various years within the same country: was wage growth faster in years in which inflation was faster in the same country (other factors being equal)? Finally, year effects pick up common movements across countries over time, e.g., if wage growth was surprisingly low in a given year in all countries.

Over the whole period, wage growth closely reflects inflation and trend productivity growth. The point estimates suggest that about 93% of price changes and about 104% of trend productivity growth was translated into wage growth between 1995 and 2017 (column 1 in Table II.1.1). When country and year effects are included, these relationships become somewhat looser (between 80% and 90%), but the hypothesis that the relationship is one-to-one cannot be rejected at conventional levels of statistical significance (columns 2 and 3).

Wage growth was thus responsive to productivity developments in the EU over the last two decades. This nuances, but does not contradict, previous findings that real wages have somewhat lagged real productivity in cumulated terms over the last two decades. This apparent 'decoupling' of wages from productivity developments was analysed for instance by Schwellnus et al. (2017), who noted that, over the

Table II.1.1: **Determinants of wage growth in the EU28, various time periods**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sample period:	1995-2017	1995-2017	1995-2017	1995-2007	1995-2007	1995-2007	2010-2017	2010-2017	2010-2017
Dependent variable: Growth rate of gross wages and salaries per employee									
Unemployment rate	-0.169***	-0.350***	-0.371***	-0.182***	-0.475***	-0.563***	-0.224***	-0.376***	-0.391**
	(0.038)	(0.063)	(0.077)	(0.065)	(0.166)	(0.144)	(0.042)	(0.130)	(0.162)
Change in the unemployment rate	-0.557**	-0.468**	-0.424**	-0.434***	-0.189	-0.163	-0.305*	-0.181	-0.305*
	(0.202)	(0.206)	(0.202)	(0.148)	(0.181)	(0.195)	(0.162)	(0.193)	(0.168)
Inflation rate	0.933***	0.826***	0.906***	1.137***	0.961***	0.949***	0.383***	0.223	0.278
	(0.147)	(0.140)	(0.135)	(0.179)	(0.147)	(0.180)	(0.127)	(0.135)	(0.320)
Trend productivity growth	1.036***	0.841***	0.836**	1.061***	0.495	0.565	1.151***	0.696**	0.960**
	(0.164)	(0.247)	(0.346)	(0.180)	(0.371)	(0.419)	(0.250)	(0.318)	(0.443)
Constant (presented if no country effects)	0.013***	.	.	0.006	.	.	0.028***	.	.
	(0.003)	(.)	(.)	(0.005)	(.)	(.)	(0.004)	(.)	(.)
Country fixed effects	no	yes	yes	no	yes	yes	no	yes	yes
Year fixed effects	no	no	yes	no	no	yes	no	no	yes
Observations	582	582	582	302	302	302	224	224	224
R-squared	0.619	0.664	0.685	0.689	0.773	0.788	0.444	0.622	0.643

(1) Ordinary least squares estimations with appropriate dummy variables. Annual data for a panel of 28 EU Member States.
(2) Trend productivity growth is defined as the five-year trailing average of labour productivity growth rate.
(3) Clustered standard errors in parentheses. Asterisks mark estimated coefficients which are statistically significant at the 10% (*), 5% (**) or the 1% level (***).
Source: European Commission calculations based on Eurostat data.

two decades after 1995, the labour share fell by an average of 0.6 to 2.5 percentage points (depending on the sectoral coverage) across 31 countries of the OECD, with large cross-country variation. ([99])

Unemployment is an important determinant of wage growth over the whole period. Overall, a one percentage point increase in the unemployment rate is estimated to shave off about 0.7 to 0.8 percentage points from wage growth (sum of the estimated coefficients of unemployment level and change). Both the level and the change of unemployment affect wage growth, justifying the inclusion of both. There are differences across specifications as to the relative importance of both variables. The level of unemployment becomes more closely related to wage growth when country effects are included, reflecting the fact that the average unemployment rate differed across countries over the sample period. The negative effect of unemployment on nominal wages, together with the finding that inflation and trend productivity growth affect nominal wage growth almost one-to-one, imply that unemployment has a negative effect on the wage share.

Results for the pre- and post-crisis periods are broadly similar to those obtained for the whole period, but there are some differences. First, it appears that wage growth did not closely follow trend productivity growth within the same country in the pre-crisis period. In turn, the link between wage growth and inflation appears to have been weaker in the post-crisis period. Finally, the relation between wage growth and unemployment appears somewhat weaker in the post-crisis period, although the difference is not statistically significant. ([100])

In the pre-crisis period, the relationship between wages and productivity growth was strong between countries, but weaker within the same country over time. The specification without country effects suggests that wage growth was indeed faster in countries with faster productivity growth, with a relationship close to one-to-one (column 4 in Table II.1.1). At the same time, the specifications with country effects show that wage growth within the same country did not closely follow trend productivity growth (the coefficient is close to 50% and is not statistically significant; see columns 5 and 6).

([99]) See Table 1 in Schwellnus (2017). Somewhat larger decreases, for a narrower country sample, are reported in OECD (2018a, Figure 2.4) based on the same research.

([100]) Results for the sub-periods need to be interpreted with caution, because they are based on relatively short time periods. This matters especially in specifications with country effects. These may account for temporary phenomena such as country specificities. See also the discussion in Box II.1.1.

Box II.1.1: **Estimating the relationship between wage growth and its determinants**

Determinants of nominal wage growth are estimated by versions of the following baseline specification:

$$WAGEGR_{i,t} = \alpha_i + \beta_1 U_{i,t} + \beta_2 \Delta U_{i,t} + \theta INFL_{i,t} + \gamma PRODTR_{i,t} + \mu_t + \varepsilon_{i,t}.$$

Here, $WAGEGR_{i,t}$ denotes the growth rate of gross wages and salaries in country i and year t; $U_{i,t}$ denotes the unemployment rate and $\Delta U_{i,t}$ its change; $INFL_{i,t}$ denotes inflation; $PRODTR$ denotes trend productivity growth, calculated as the five year trailing average of the growth rate of real GDP per person employed; α_i are country fixed effects and μ_t are year fixed effects; while $\varepsilon_{i,t}$ is the error term.

The analysis follows IMF (2017a) in including both the level and change of the unemployment rate and trend (instead of simple) productivity growth. In contrast, it follows past work by the European Commission (2011, 2013) by including contemporaneous inflation as opposed to lagged inflation as is done by IMF (2017a). While this raises simultaneity concerns, it is done for two main reasons. First, simultaneity issues are not solved by lagging the inflation term (see, e.g., Reed 2015). Second, contemporaneous inflation is better suited to construct a 'benchmark' (or conditional prediction) for wage developments as it is more closely correlated with it. Even if the estimated relationship cannot be interpreted as causal because of simultaneity, the estimated OLS regression remains the 'best linear predictor' of wage growth, conditional on the covariates.

The inclusion of country or year effects comes with advantages and disadvantages, therefore results are shown both with and without them. Estimations without country or year effects answer the question how various determinants affect wage growth in an average EU Member State in an average year. Therefore, predictions based on them provide a simple and transparent benchmark for wage growth.

Country effects take account of the fact that wage growth can be faster in some countries than in others, even with the same fundamentals. The advantage of including country effects is that it accommodates the possibility that the 'equilibrium' unemployment rate may be different across countries. In such a case, a certain level of unemployment may call for wage restraint in one country but not the other. The disadvantage is that, specifications with country effects erroneously register periods of surprisingly fast (or slow) wage growth as reflections of country specificity, even if those surprising wage developments involved accumulating imbalances and were unsustainable. Thus in some cases, wage benchmarks based on specifications with country effects may lend false justification to the continuation of unsustainable wage developments. For this reason, specifications without country effects are preferred for the purpose of 'benchmarking' wage developments, while all specifications are analysed to assess the relationship between wage growth and its determinants.

Finally, year effects allow for the possibility that, in some years, wage growth is faster (or slower) than expected in all countries than it would be in an average year. While including year effects improves the fit of a statistical model, it comes with significant disadvantages. Most importantly, it is not clear why wage growth should be different, with the same fundamentals, in some years than others. Indeed, one of the aims of the present analysis is to find out whether there is 'missing wage growth' in the post-crisis years. Year effects would pick up any missing wage growth without providing a substantive explanation. In any case, results are also shown with year effects, as they have been included by some past studies.

The resulting regressions appear to be well-specified and robust. In particular, lagged wage growth is not statistically significant when included in regressions. Results are also robust to the inclusion of the estimated gap between labour productivity and wages (in levels), as done by European Commission (2011, 2013) and Arpaia and Kiss (2015).

The link between wage growth and inflation was weak in the post-crisis period. The point estimates suggest that just between 20% and 40% of inflation translated into wage growth in the period 2010-2017 (columns 7 to 9 in Table II.1.1), and the effect is not statistically significantly different from zero when country effects are included. This is likely due to the fact that inflation was historically low in this period, and its fluctuations were partly driven by external factors like energy prices that are not easy to predict (see, e.g., ECB 2017). In contrast, the relationship between wages and trend productivity remained strong.

Unemployment remains an important determinant of EU wage developments after the 2008 crisis. Quantitatively, a one-percentage point increase in the unemployment rate is estimated to shave off about 0.4 to 0.7 percentage points from wage growth in most specifications both before and after the crisis (sum of the estimated coefficients of unemployment level and change). The estimated relationship between unemployment and wage growth is similar in the pre- and post-crisis periods. The estimated effects are slightly lower in the post-crisis period, but the difference is not statistically significant. Note that the effect of unemployment on wage growth is weaker when estimated for either of the sub-periods than for the whole sample period. This could be caused by the shortness of the sub-periods, which goes together with less variation in unemployment. Overall, this evidence means that the wage Phillips curve relationship continued to operate in the post-crisis period.

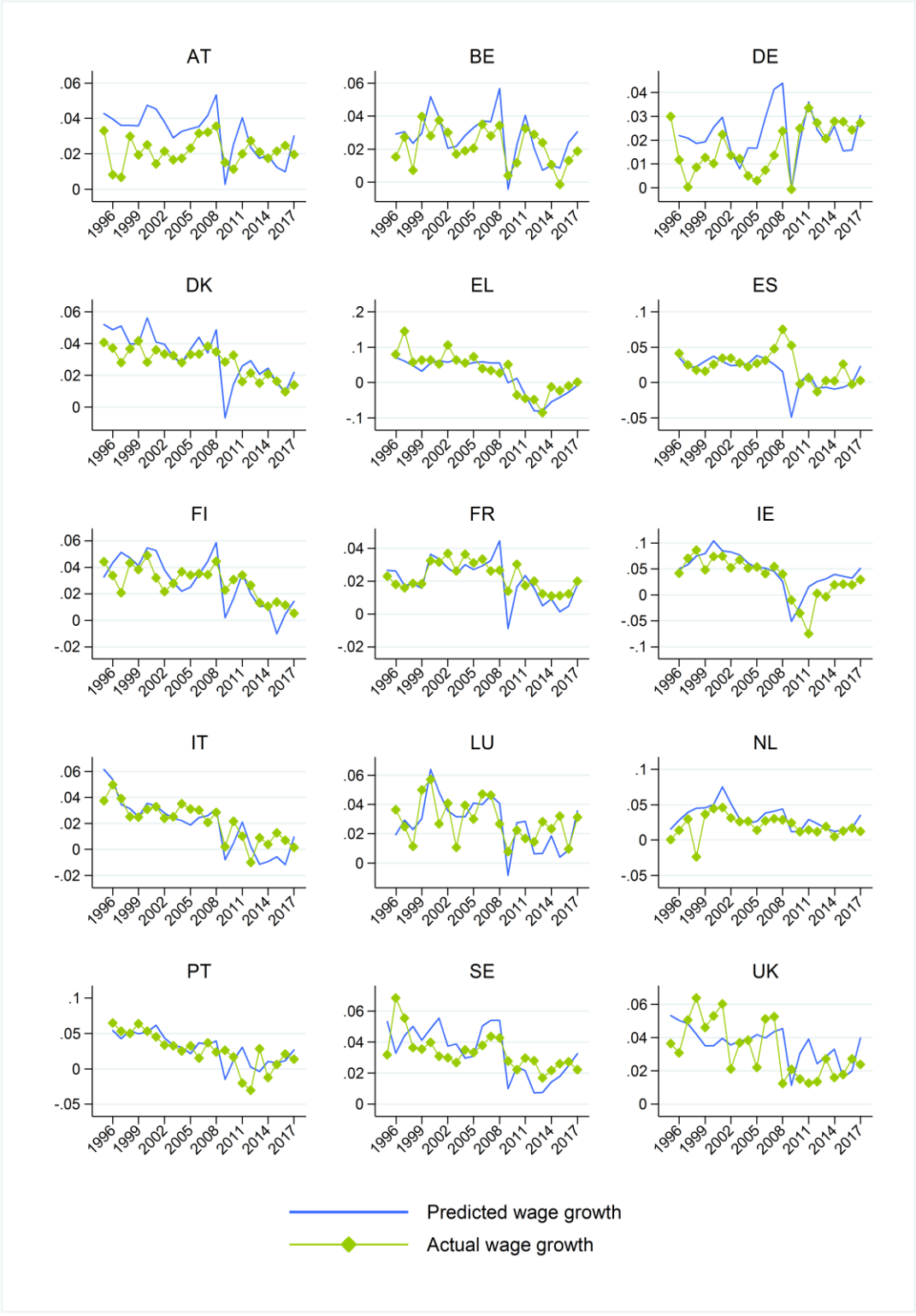
Results are qualitatively similar for sub-groups of EU Member States. Table II.1.A1.1 in the Annex of this Chapter presents results for three country groups: the current 19 Member States of the euro area (EA19), the first 12 members of the euro area (EA12), and 11 Eastern and Central European Member States (EU11). Results for the EA19 are close to the EU28 results with two slight differences, which are not statistically significant. First, the effect of productivity growth on wage growth appears to be somewhat weaker in the euro area than in the whole EU, especially when country effects are included. Second, wage growth appears to be somewhat more sensitive to changes of the unemployment rate, and somewhat less sensitive to differences in levels. Results for the EA12 show a weaker link between inflation and wage growth than in the baseline results, especially when country effects are included. Also, wage growth is less sensitive to unemployment changes in the EA12 sample, the estimated effect not being statistically significant in any of the specifications. In contrast, wage growth appears to be more sensitive to both the level and the change of the unemployment rate in the EU11 than in the EU28. Both inflation and trend productivity growth is very closely linked to wage growth in these countries, suggesting that productivity convergence is likely to lead to wage convergence over the long run. (For a detailed analysis of wage convergence, see the next Chapter).

Results are also in line with previous analyses. In particular, they are close to IMF (2017a, Annex Table 2.3.1) and Hong et al. (2018, Table 3), especially regarding the magnitude of the effect of the unemployment rate and the high coefficient of trend productivity growth. Both the estimated coefficient of inflation and that of the change of unemployment is larger than that found by the IMF, although the results get closer when the estimation is restricted to the EA12 sample. The effect of inflation is likely also larger because contemporaneous inflation is included in the regressions (as opposed to lagged inflation in the IMF work). Despite differences in methodology, the results are also similar to those found in the previous edition of this Report (European Commission, 2017c, p.17). The analysis of this chapter includes labour productivity, rather than total factor productivity, as a measure of productivity, which explains the closer relationship with wage developments found here.

1.2.4. Identifying the possible shortfall in wage growth

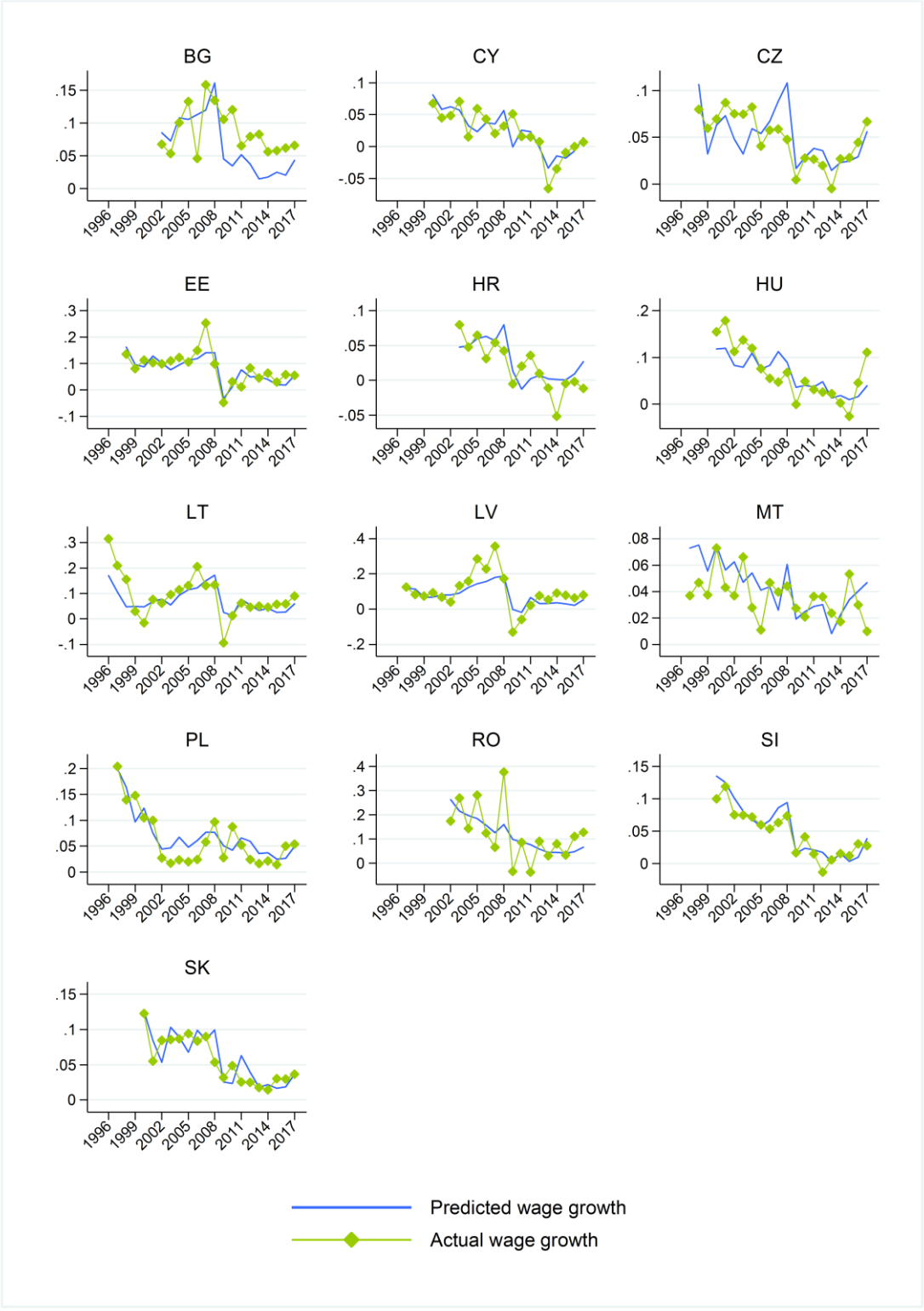
Is there a shortfall in wage growth in the EU in the post-crisis period, and if so what is its magnitude? To answer this question, predicted wage growth is computed for each country and year based on the wage Phillips curves estimated above. This predicted wage growth serves as a 'benchmark' for wage developments. The gap between actual wage growth and this benchmark is a measure of the surprise component of wage growth. When this is negative, one can speak of a 'shortfall' in wage growth.

Graph II.1.1: **Actual and predicted wage growth, EU13, 1995-2017**



(1) Prediction based on specification without country effects over the period of 1995-2017, column (1) of Table II.1.1 above.
Source: European Commission calculations

Graph II.1.2: **Actual and predicted wage growth, EU13, 1995-2017, cont.**



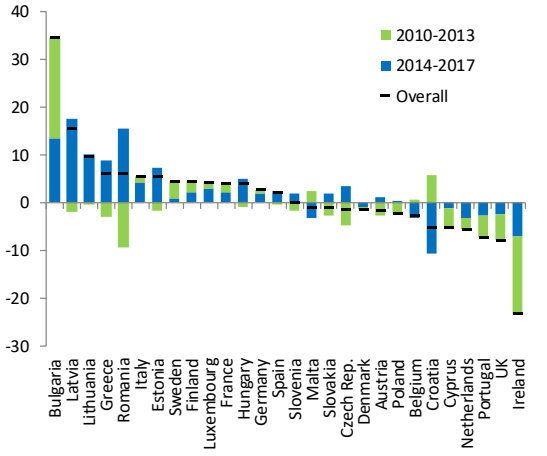
(1) Prediction based on specification without country effects over the period of 1995-2017, column (1) of Table II.1.1 above.
Source: European Commission calculations.

The wage 'benchmark' represents the wage growth that would be expected given developments in inflation, productivity and unemployment, in an average EU country in an average year. This benchmark is obtained by calculating predicted wage growth based on the estimated wage Phillips curve without country or year effects over the whole sample period (column 1 in Table II.1.1). As discussed in Box II.1.1, this specification is most suitable for benchmarking wage developments as it makes country comparisons simple and transparent. At the same time, the 'benchmark' is not normative: it does not represent the 'correct' or 'equilibrium' pace of wage growth. It simply reflects how wages moved together with economic fundamentals in 28 EU countries over the 23 years studied. Graphs II.1.1 and II.1.2 compare actual wage growth to the benchmark of wage growth predicted based on economic fundamentals, for each Member State over the period 1995-2017. Graph II.1.1 includes the 15 countries which were EU members before 2004, while Graph II.1.2 includes the 13 countries which became members in 2004 or later.

For most countries and years, predicted wage growth is quite close to actual developments. There are a number of trends and events that are clearly visible in the graphs, of which two are highlighted here. First, the recession of 2009 becomes visible by a sudden fall in both actual and predicted wage growth, the latter particularly driven by falling labour productivity. Second, a trend of disinflation is observable in a number of countries over the whole period, especially in some Eastern-European Member States: actual and predicted nominal wage growth was close to a rate of 30% in Lithuania and Romania and close to 20% in Hungary and Poland, reflecting rapid inflation, at the beginning of the sample period. Comparatively fast wage growth is also observed in Greece, Ireland, Italy and Portugal in the late 1990s.

A shortfall in wage growth can be identified only for few Member States since 2010. Actual wage growth does not appear to be systematically below prediction in the post-crisis period. Graph II.1.3 shows, for each country, the cumulated gap between actual and predicted wage growth in the post-crisis period. The graph divides this period into two equal parts: the first part (2010-2013) includes the second euro-area recession, while the second part (2014-2017) covers years of the recovery. There is a similar number of countries in which wage growth was faster than predicted based on economic fundamentals as those in which it was slower. Only six countries experienced a shortfall in wage growth that cumulated to more than 3 percentage points overall (or, roughly, more than 1/3 percentage points per year): these are, in descending order of the absolute gap, Ireland, the UK, Portugal, the Netherlands, Cyprus and Croatia. Most of the shortfall was accumulated in the crisis years of 2010 to 2013; only Croatia and Ireland experienced very a significant shortfall in wage growth between 2014 and 2017.

Graph II.1.3: **Cumulated gap between actual and predicted wage growth, EU28, 2010-2017, ppts**



(1) Prediction based on specification without country effects over the period of 1995-2017, column (1) of Table II.1.1.
Source: European Commission calculations.

There is significant heterogeneity among the Member States that exhibit surprisingly low wage growth. Among the six countries identified above with the highest degree of shortfall in wage growth in the post-crisis period, the UK and the Netherlands appear closest to the US case that received much attention in the economic discussions. In 2017, the unemployment rate was below 5% (and below pre-crisis levels) in both countries. Here, like in the US, missing wage growth can be regarded as a genuine puzzle. In Ireland and Portugal, the unemployment rate is somewhat higher but came down steeply from very high levels. ([101]) In these countries there was also a

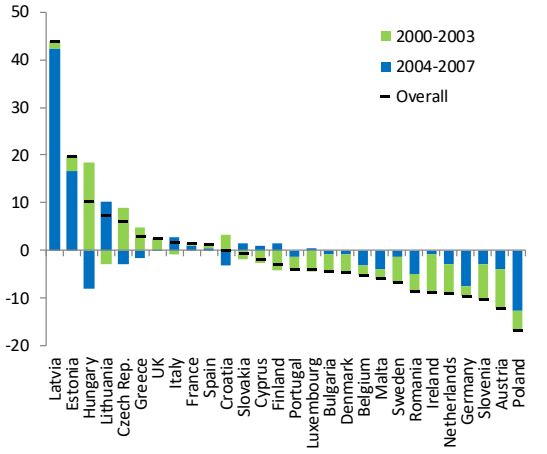
([101]) In Ireland, the shortfall in wage growth is not caused by the 2015 revision of GDP, which increases labour productivity. The effect was neutralised by replacing productivity growth in 2015 with the average of 2014 and 2016. At the

need to undergo significant external adjustment to balance their current accounts and reduce the stock of foreign liabilities. Finally, in Croatia and Cyprus, the unemployment rate was still above 10% in 2017. Both countries have also experienced negative public sector wage growth as part of significant fiscal consolidation efforts since 2013 (see also Graph I.2.22 in Chapter I.2 above, as well as European Commission 2017a, Graph I.2.21).

The group of countries with 'excess wage growth' in the post-crisis period is quite heterogeneous. The majority are catching-up economies of Central and Eastern European countries experiencing comparatively fast nominal wage growth (including Bulgaria, Estonia, Latvia, Lithuania, Romania). Yet, this group includes also countries with very low, or even negative, nominal wage growth (namely Greece and Italy) for which the benchmark wage growth is negative. In these countries, wage adjustment may be constrained by downward rigidities. As shown in the next section, in some of the countries with the most moderate wage developments (including Italy), composition effects may mask part of the underlying wage adjustment.

In some countries, there was a shortfall in wage growth in the pre-crisis period. Graph II.1.4 shows, for each country, the cumulated gap between actual and predicted wage growth in the pre-crisis period 2000-2007. A shortfall in wage growth can be identified in more countries, and to a greater extent before the crisis than after. Countries with the greatest downward surprise in wage growth include euro area countries which developed large current account surpluses (e.g., Germany, the Netherlands and, to a lesser degree, Austria) but also some Member States outside the euro area which were pursuing significant disinflation policies (e.g., Poland, Romania and, joining the euro area in 2007, Slovenia; see also Graph II.1.2).

Graph II.1.4: **Cumulated gap between actual and predicted wage growth, EU28, 2000-2007, ppts**



(1) Prediction based on specification without country effects over the period of 1995-2017, column (1) of Table II.1.1.
(2) The sample period starts in 2002 for Bulgaria and Romania and 2003 for Croatia.
Source: European Commission calculations.

The observation that there is no widespread shortfall in wage growth in the post-crisis period is robust to alternative wage benchmarks. In particular, if the specification with country fixed effects is chosen as the basis for benchmarking, the countries with apparent shortfalls in wage growth in the post-crisis period remain a minority, while the countries with shortfalls in the pre-crisis period remain a majority.

1.2.5. Results with alternative measures of labour market slack

The relative importance of latent and overt labour market reserves differs across countries. Given the low headline unemployment rate in the UK and the Netherlands, it has been suggested that latent labour market reserves have played a role in the surprisingly low wage growth in these countries (European Commission, 2018b,c). In the case of the Netherlands, it has also been suggested, that an expansion of temporary contracts may also have contributed to modest wage increases (European Commission, 2018b; calculations in the next Section confirm this effect). Heterogeneity in the significance of labour market reserves also finds support in the studies of IMF (2017a) and Hong et al. (2018).

same time, it is possible that statistical processes similar to those that led to the 2015 revision also affect other years. These effects are not neutralised by the methodology and may raise predicted wage growth as a statistical artefact.

For a more systematic analysis of the role of latent labour market reserves, wage Phillips curve regressions have been re-estimated including indicators of these. Table II.1.A1.2 in the Annex to this Chapter presents regression results with alternative measures of labour market reserves ('slack'). The focus is on two groups in particular: underemployed part-time workers (those who would like to work full time but do not find a full-time job) and individuals available for work but not seeking a job. In columns (1) to (4), the share of these workers in the labour force is introduced, as an additional variable, to baseline wage Phillips curve regressions without country effects. In columns (5) to (8), the regressions are repeated in a way that 'broad unemployment' (including these additional groups) is included instead of the standard unemployment rate. Odd-numbered columns refer to the whole sample period (whereby information about those available but not seeking a job starts only in 2005), while even-numbered columns refer to the post-crisis period.

Latent labour market reserves matter, but unemployment matters more. The regression results show that additional labour market reserves do not greatly affect wage growth when included in addition to the standard unemployment rate, but measures of broad unemployment have a similar effect on wages than standard unemployment alone. This is consistent with the finding by IMF (2017a) and Hong et al. (2018) that involuntary part-time employment is a significant determinant of wage growth (even after controlling for headline unemployment) in countries where unemployment has fallen close to pre-crisis levels, or even below, but not in those where unemployment was still comparatively high in 2016. In many EU Member States, unemployment stayed high for longer than in other advanced economies analysed by the IMF study. This finding is also consistent with the analysis in last year's edition of this report (European Commission 2017a, Table I.1.3 and p. 44).

1.2.6. The effect of demographic developments on wage growth

Have demographic developments affected wage growth in the EU? It has been suggested that ageing and migration may have had a negative effect on recent wage growth. To gain some insights into these issues, indicators of ageing and migration have been incorporated into the baseline wage Phillips curve estimations that were presented above. Table II.1.A1.3 in the Annex of this Chapter presents the results. The additional variables included are:

- The "crude rate of net migration", i.e., the balance of immigration and out-migration flows, positive in case of net immigration (columns 1 and 2);
- In other specifications, the trend of the crude rate of net migration is included, calculated as a five-year trailing average (columns 3 and 4);
- The difference between the share of older (ages 55-64) and younger (aged 20-29) individuals in total active population (ages 15-64; columns 5 and 6);
- To explore the robustness of results, the effect of each variable is explored both with country effects (in even-numbered columns), and without (in odd-numbered columns).

Expected effects are ambiguous, according to theory. In the simplest labour market models in which there is a single type of labour and the capital stock is fixed, immigration is a 'labour supply shock' restraining wage growth. However, in models with more complexity, a different result may emerge. For instance, Dustmann et al. (2013) show that, in a model with many skill types, "whenever the immigrant skill composition differs from that of the native labour force, and if capital is elastic in supply, the effect on the average wages of native workers should be zero or even slightly positive". This average effect masks heterogeneities along the wage distribution: wages might be moderated for workers who are in segments in which the density of immigrant workers is higher. ([102]) Dustmann et al. (2013) estimate that U.K. average wages have increased as a result of immigration between 1997 and 2005;

([102]) This is consistent in logic with an earlier analysis by Borjas (1999) who noted in a simpler framework that "natives in the host country benefit from immigration as long as immigrants and natives differ in their productive endowments; […] and that […] natives who have productive endowments that complement those of immigrants gain, while natives who have endowments that compete with those of immigrants lose."

they found negative effects on wages in the lowest quintile of the wage distribution, mirroring the location of immigrants in the wage distribution. Previous empirical studies are also not unequivocal on the effect of immigration on the wages of native workers, with results seeming to "cluster around zero" (Borjas, 2003).

The theoretical arguments are similarly ambiguous for the effect of the labour market participation of younger and older workers on general wages. In the simplistic framework of homogenous labour and a fixed capital stock, higher participation of older or younger workers is a 'labour supply shock' which may hold back overall wage growth. However, this may not be the case if the capital stock can expand as a response to a higher labour supply, and if there are complementarities between different groups of labour. The ageing of the workforce may also affect aggregate wage growth through a composition effect. Since older workers tend to earn a higher wage than younger workers, the ageing of the workforce may have a small positive effect on aggregate wages.

- **Wage growth is slightly higher in years when the trend of net migration is higher, other factors being equal.** The rate of net migration in a single year does not appear to be correlated with wage growth (Table II.1.A1.3, columns 1 and 2). At the same time, the trend of net migration is positively related to wage growth when country effects are included in the model (column 4), but not when country effects are excluded (column 3). This suggests that wage growth in a given country appears to be somewhat higher in times when trend net migration is relatively high (although the effect is only weakly statistically significant). According to the point estimate, an increase in net (im)migration by one person per 1000 inhabitants is statistically related to an increased wage growth of about one tenth of a percentage point.

- **The results are consistent with a small but positive effect of immigration on wages.** At the same time, the methodology of aggregate cross-country regressions does not assure that these results can be interpreted as causal. The positive relation could also be caused by reverse causation (higher wage growth may spur immigration) or a common third factor, for instance if both increased immigration and higher wages may be related with a country experiencing "good times" economically. ([103]) In these cases, however, one would expect the contemporaneous effect to be strong and the lagged effect of migratory trends on wages to be weaker. The results show the opposite which hints at the possibility that the estimated effect could be causal.

- **Wage growth appears to be slightly faster in countries in which the share of older workers is larger as compared to younger workers.** A one percentage point increase in the difference between the shares of older and younger workers is statistically related to increased wage growth by about half of a tenth of a percentage point when country effects are not included (Table II.1.A1.3, column 5). The effect is weaker and statistically not significant when country effects are included (column 6). The results are consistent with the notion that the ageing of the workforce affects aggregate wage growth through a composition effect. This hypothesis is supported by the fact that, when entered separately in the regression, the shares of older and younger workers have the opposite effect on aggregate wage growth, although the coefficient of the share of younger workers is not statistically significant (not shown in the table). Composition effects are investigated in detail in Section II.1.4 below.

- **Overall, demographic developments do not appear to have significantly affected wage growth, when economic fundamentals are taken into account.** Neither ageing nor migration appear to have held back EU wage growth over the period of study and, given the signs of the estimated effects, in the post-crisis period. This does not mean that these trends have not affected wage growth. Ageing, for instance, has been proposed as a possible factor contributing to low inflation. Such possible effects are outside the scope of this Chapter, but are briefly discussed in the Conclusions.

([103]) The 2015 edition of this Report (European Commission, 2015b) presented evidence that migration flows in the EU react to changes in unemployment to an increasing degree.

1.2.7. The effect of institutional settings on wage growth

How is wage growth affected by institutions related to collective bargaining? This subsection focuses on two aspects in particular: trade union density (the ratio of employees who are members of a trade union to all employees) and the coverage of collective bargaining (employees covered by the collective agreement as a share of all employees). Theoretically, union density and collective bargaining are expected to have a positive effect on wages, although models of wage bargaining vary in many respects, including what exactly unions and employer organisations are bargaining over and what effect this has on employment. ([104])

Past studies are not unanimous on the relationships between collective bargaining institutions and macro-economic outcomes. ([105]) In one of the few studies with significant macro-level estimates, OECD (1997) found a positive effect of collective bargaining on real wage growth across 19 OECD countries and three years (1980, 1990 and 1994). The same study also found that, between 1980 and 1990, increases in collective bargaining coverage were associated with higher real wage growth, while increases in union density with lower real wage growth across 19 countries. In contrast, on a larger panel data set covering EU and OECD members over the period 1980-2007, the European Commission (2011, pp. 96-97) found that union density and bargaining coverage had no effect on wage levels or short-term wage dynamics when economic fundamentals were controlled for. Most recently, OECD (2018a) found that collective bargaining coverage does not strongly affect economic outcomes in itself; its effects depend on the level of centralisation and coordination of the collective bargaining system. ([106])

([104]) For an overview of the theoretical literature, see Aidt and Tzannatos (2002) and Boeri and Van Ours (2013, Chapter 3).

([105]) An empirical relationship that seems robust across different samples and time periods is that stronger collective bargaining is associated with a lower earnings inequality. For an overview of the empirical literature, see Aidt and Tzannatos (2002) and Boeri and Van Ours (2013, Chapter 3), as well as OECD (1997 and 2004).

([106]) The importance of coordination in collective bargaining is also emphasised by Eurofound (2015).

Table II.1.A1.4 shows results from regressions including the change in union density and collective bargaining coverage. Regressions including the change in union density are shown in columns (1) to (4) while those including the change in collective bargaining coverage are shown in columns (5) to (8). To explore the robustness of the results, as well as possible changes of the effects over time, results are shown for the whole period (1995-2017) as well as the post-crisis period (2010-2017), and both with and without country effects.

Changes in collective bargaining coverage are estimated to have a small but immediate effect on wage growth. The point estimate over the whole period suggests that when bargaining coverage increases by one percentage point, wage growth tends to be higher by about one tenth of a percentage point (Table II.1.A1.4, columns 1 and 2). To put this into context, collective bargaining coverage in the EU15 fell by about 4 percentage points (from 78% to 74%, unweighted average) between 2000 and 2013. This would imply a cumulative one-time reduction in wage growth of about 0.4%. The reduction was faster in Central Eastern European Member States: collective bargaining coverage in the EU10 (excluding Croatia for data availability) fell by about 9% (from 40% to 31%, unweighted average) from 2005 to 2012, which would imply a cumulative one-time reduction of almost a full percentage point. The estimated effects are robust to the inclusion of country effects and appear to be about 50% larger in the post-crisis period than in the whole period (columns 3 and 4). ([107])

In the post-crisis period, wage growth appears to be lower in countries in which union density decreases more rapidly. Union density shows a downward trend in most Member States, with the falls especially significant in Eastern European Member States before 2000. Since 1995, union density has decreased annually by nearly a percentage point in an average Member State, while since 2010 the decrease has been about half a percentage point on average, annually. The estimations reported in Table II.1.A1.4 suggest

([107]) Results are similar when 'excess coverage' (the difference between collective bargaining coverage and union density) is included in the regressions instead of bargaining coverage.

that changes in union density are not related to wage growth over the whole sample period (columns 5 and 6), but are positively related to wage growth in the post-crisis period. The effect is larger and statistically significant when wage growth is compared between countries (column 7), while smaller and not statistically significant when wage growth is compared within the same country over time (column 8). The point estimate in column 7 suggests that, after 2010, if a country saw union density drop by one percentage point more than its peers with similar fundamentals, it also tended to have slower wage growth, by about half a percentage point, than its peers. Since the post-crisis period is relatively short, and the result is not very robust (as opposed to the results on bargaining coverage), it is possible that it is only due to the experience of a few countries.

Short-term effects of institutional changes related to collective bargaining contrast with the lack of long-term effects of the levels of institutional indicators. Despite the immediate effect of the changes in especially bargaining coverage discussed above, the levels of bargaining coverage and union density do not appear to have an effect on wage growth over any of the time periods with or without country effects. (These results, small and not statistically significant, are not presented.) The coexistence of these results suggests that changes in these institutional variables have a short-term, transitory, effect on wage growth.

1.3. HAS THE COMPOSITION OF EMPLOYMENT CONTRIBUTED TO MODERATE WAGE GROWTH IN THE EU?

1.3.1. Introduction

This section analyses the impact of changes in the composition of the workforce on wages. The composition of the workforce includes two types of aspects: composition in terms of individual characteristics (such as age in the example above) but also in terms of job characteristics (e.g. increasing share of the services sector or of temporary contracts). Because of data availability issues, the analysis of the post-crisis period is divided into two parts. The first part of the analysis focuses on wage growth between 2010 and 2014. Besides looking at developments of the average wage, this section also explores the impact of compositional changes on wages across the whole wage distribution and thus their possible implications for wage inequality. The second part of the analysis provides more recent estimates on the impact of composition effects on wage growth between 2014 and 2017.

Compositional effects in specific Member States have been studied, but few studies analyse them across Member States. A notable exception is the study by Christopoulou et al. (2010) who analysed changes in the wage structures in nine EU countries over 1995-2002. Unlike studies that focused on individual Member states, they find that composition effects derived from changes in age, gender or education of the labour force, largely exogenous to economic developments, had a minor contribution to the observed wage dynamics. In contrast they find that effects from job characteristics, likely driven by economic developments such as changes in the sector of employment, are more relevant. Recent analyses of how composition effects contributed to average wage growth in a single country include Abel et al. (2016) who estimate that composition effects had a slightly negative effect on wage growth in the UK in 2014 and, to a decreasing extent, in 2015.

There is also an expanding literature on the compositional effects on the wage structure. The majority of the studies have focused on the determinants of wage growth in the US or the United Kingdom (e.g. Bound and Johnson, 1992; Acemoglu, 2002; Belfield et al., 2017), but more recently an increasing number of studies focused on other Member States. Based on changes in the Portuguese wage distribution between 1986 and 1995, Machado and Mata (2005) find that an increase in educational attainment contributed decisively towards greater wage inequality. These findings are confirmed with more recent data (1988-2013) by Portugal et al. (2018). Using individual wage data for Germany, Beiwen et al. (2017) show that changes in the composition of the workforce explain more than half of the changes in wage inequality between 1985 and 2010. They find a strong impact of changes in age, educational attainment (especially in the upper part of the distribution) and employment history (especially in the lower part of the distribution).

Box II.1.2: **Methodology used to decompose wage growth**

Average wage growth between 2010 and 2014 is decomposed based on individual-level data from the 2010 and 2014 Structure of Earnings Survey (SES). This survey contains information on hourly wages for employees working in firms with more than ten employees. ([1]) In addition, it includes detailed information on several individual (age, gender educational attainment) and job characteristics (occupation, sector, type of contract, working hours).

The average wage (W_T) in time period T is found to be dependent of a number individual and job characteristics (X_T) and can be estimated by a Mincer equation or wage equation: ($\ln W_T = X_T\beta_T + \varepsilon_T$). Wage growth ($\ln W_T - \ln W_{T-1}$) is then decomposed using an Oaxaca-Blinder decomposition into a composition, price and interaction effect:

$$\ln W_T - \ln W_{T-1} = \underbrace{(X_T - X_{T-1})\beta_{T-1}}_{Composition\ \ effect} + \underbrace{(\beta_T - \beta_{T-1})X_{T-1}}_{Price\ effect} + \underbrace{(X_T - X_{T-1})(\beta_T - \beta_{T-1})}_{Interaction\ \ effect}$$

In addition, the analysis estimates the impact of changes in the composition of the workforce on wage growth across the wage distribution. For this estimation the methodology proposed by Machado and Mata (2005) is used. This methodology is very similar to the Oaxaca-Blinder decomposition, but instead of estimating the effects at the overall mean it relies on estimates based on the mean characteristics of individuals in each of the deciles of the wage distribution. Wage growth by decile is then decomposed in an explained (composition effect) and unexplained (price and interaction effect combined) part.

Since the latest wave of the SES is from 2014, a different method is needed to analyse latest developments. This method combines estimates based on the 2014 SES with the 2014 and 2017 Labour Force Survey (LFS). The following methodology is used for this extension:

- In a first step, a linear regression based on the 2014 SES data is estimated with average hourly wages as the dependent variable and individual and job characteristics as independent variables. This regression is used to obtain the coefficients on the independent variables, which are the "returns" to the individual and job characteristics.
- In a second step, the coefficients obtained in the first step are multiplied by the changes in the individual and job characteristics from the LFS between 2014 and 2017. This allows obtaining the composition effects as it measures the wage changes due to changes in individual and job characteristics keeping the returns to these characteristics constant (based on 2014 levels).

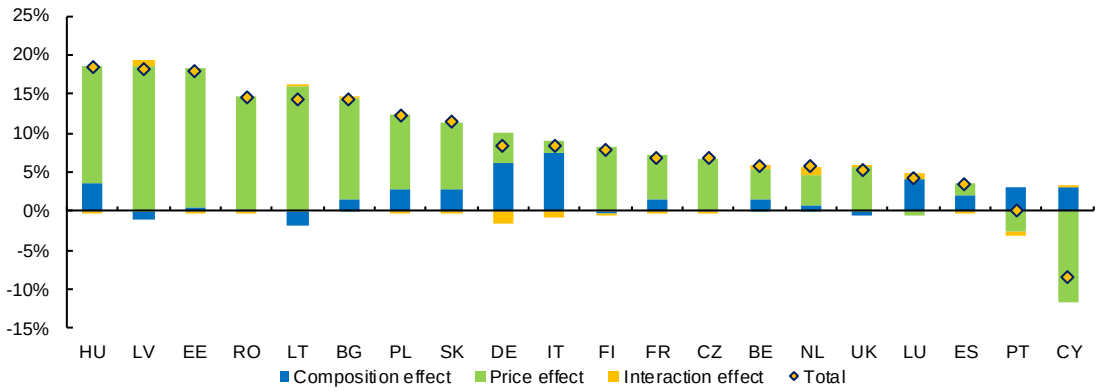
There are drawbacks to this methodology as compared to the Oaxaca-Blinder decomposition explored in the first stage. First, the method is based on a linear approximation in the second step. Second, it only allows estimating the composition effect but not the price and interaction effects. Third, there are differences in between the population sampled in the SES and LFS: while the LFS covers the entire working-age population, the SES is in most Member States limited to employees working in firms with more than 10 employees.

([1]) The fact that the survey is excluding employees working in small companies may explain why aggregate wage growth based on the survey differs from aggregate wage growth based on national accounts.

1.3.2. Data and methodology

This section analyses the impact of composition effects on wage growth in the EU between 2010 and 2017. For data availability reasons, the analysis is divided into two parts. In the first part, composition effects are identified by comparing the 2010 and 2014 waves of the Structure of Earnings Survey (SES) in a number of countries. The 2014 wave is the latest available one from this survey, so most recent developments need to be analysed by a different method. This is done in the second part, combining information from the 2014 SES with information from the Labour Force

Graph II.1.5: **Decomposition of aggregate wage growth, 2010-2014 (nominal hourly wages; in percentage)**



(1) Based on an Oaxaca Blinder decomposition including age, gender, educational attainment, sector of employment, occupation, type of contract and hours worked. No data on sector of employment included for Germany and Italy.
Source: European Commission calculations based on individual level data from the Structure of Earnings Survey (2010-2014)

Survey from the years between 2014 and 2017. In this study, 22 Member States are included. These are: Belgium, Bulgaria, the Czech Republic, Cyprus, Estonia, Finland, France, Germany, Hungary, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Malta (only 2014-2017), Poland, Portugal, Romania, Slovenia (only 2014-2017), Slovakia, Spain and the United Kingdom A detailed description of the methodology used can be found in Box II.1.2.

Wage growth can be broken down into three components, namely the composition, price and interaction effects. The "*composition effect*" measures the changes in wages due to changes in individual and job characteristics, while keeping unchanged the wages earned by the same person in the same job. The "*price effect*" measures changes in wages due to changes in how much a given worker in a given job earns, while keeping the composition of the workforce constant. The price effect includes changes in the "constant term" of the wage equation (e.g. wage increases common to all employees, for instance compensating inflation) and changes in the so-called "returns" to observed characteristics of workers. Finally, the "*interaction effect*" measures changes in wages due to the interaction between changes in characteristics and changes in returns. Generally, this effect is found to be small. Section 1.3.3 first presents the breakdown into the composition, price and interaction effect. Then the composition effect is broken down into its components. This is done for average growth as well as wage growth across the wage distribution.

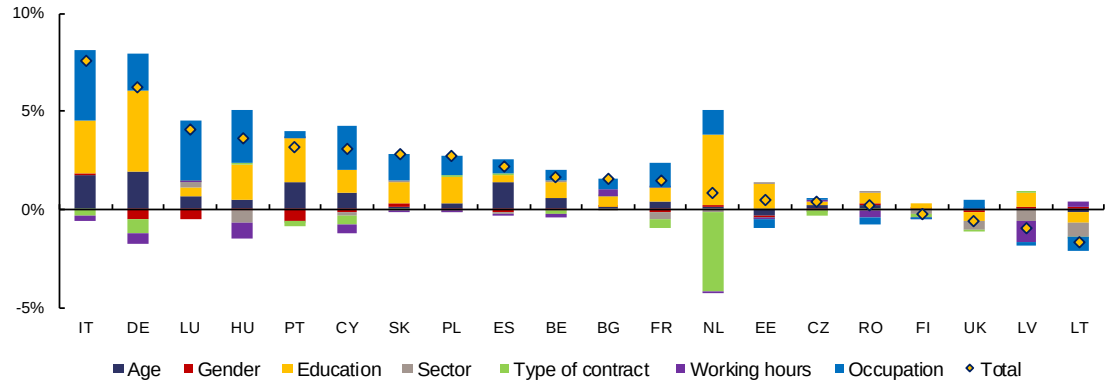
- **A simple example on educational attainment may help to understand these three different effects.** First, since graduates earn a higher wage on average, average wages may increase when more individuals in the workforce obtain higher degrees ("composition effect"). Second, average wages may increase because the returns to education increased ("price effect"). Finally, if there are both more tertiary graduates and their earnings premium increased, then the aggregate wage growth will be higher than the sum of the composition effect and the price effect due to the interactions of both ("interaction effect").

1.3.3. Results on the decomposition of wage growth between 2010 and 2014

In most Member States, composition effects had a small but positive contribution to aggregate wage growth. Graph II.1.5 provides a breakdown of the average wage growth (in percentage) between 2010 and 2014 ([108]). Average wage growth, in nominal terms, was positive in almost all Member States. It was strongest in Hungary, Latvia and Estonia (more than 15% in cumulative

([108]) In order to test for the robustness of the results, the same analysis was performed for wage growth between 2002 and 2006. The results of this analysis are in line with the results for wage growth between 2010 and 2014. In most Member States aggregate wage growth was driven by the price effect and only in few Member States, including Portugal, France and Belgium, composition effects played an important role. Note that it is not appropriate to analyse wage growth between 2006 and 2010 as the data on the sector of employment are not comparable as the result of a revision of the NACE codes.

Graph II.1.6: **Composition effects of aggregate wage growth, 2010-2014 (nominal hourly wages; in percentage)**



(1) Based on an Oaxaca Blinder decomposition including age, gender, educational attainment, sector of employment, occupation, type of contract and hours worked. No data on sector of employment included for Germany and Italy.
Source: European Commission calculations based on individual level data from the Structure of Earnings Survey (2010-2014)

terms). In contrast, it was weak in Spain and Portugal and even negative in Cyprus. These findings are consistent with official wage statistics based on national account data. In most Member States, the main driver of wage growth was the "price effect", while the impact of the composition effect was much smaller. This is particularly the case in Member States with robust nominal wage growth, in some cases because of higher inflation over the period. ([109]) Finally, the interaction effect was negligible in almost all Member States.

In a few Member States, changes in the composition of the workforce were the main driver of wage growth. This holds in particular for some of the Member States that experienced low or moderate wage growth, such as Italy, Germany, Luxembourg, Portugal, and Spain. In these countries, as well as in Cyprus and Hungary, composition effects (especially those related to education and occupation, see below) explained more than 3 pps of aggregate wage growth. In most cases, changes in the composition of the workforce have led to an increase of average hourly wages. In Portugal, the positive composition effect counterbalances the negative price effect, resulting in a largely unchanged level of aggregate nominal wages. However, there are some exceptions, such as Latvia, Lithuania and the United Kingdom, where changes in the composition of the workforce had a negative albeit small impact on wage growth.

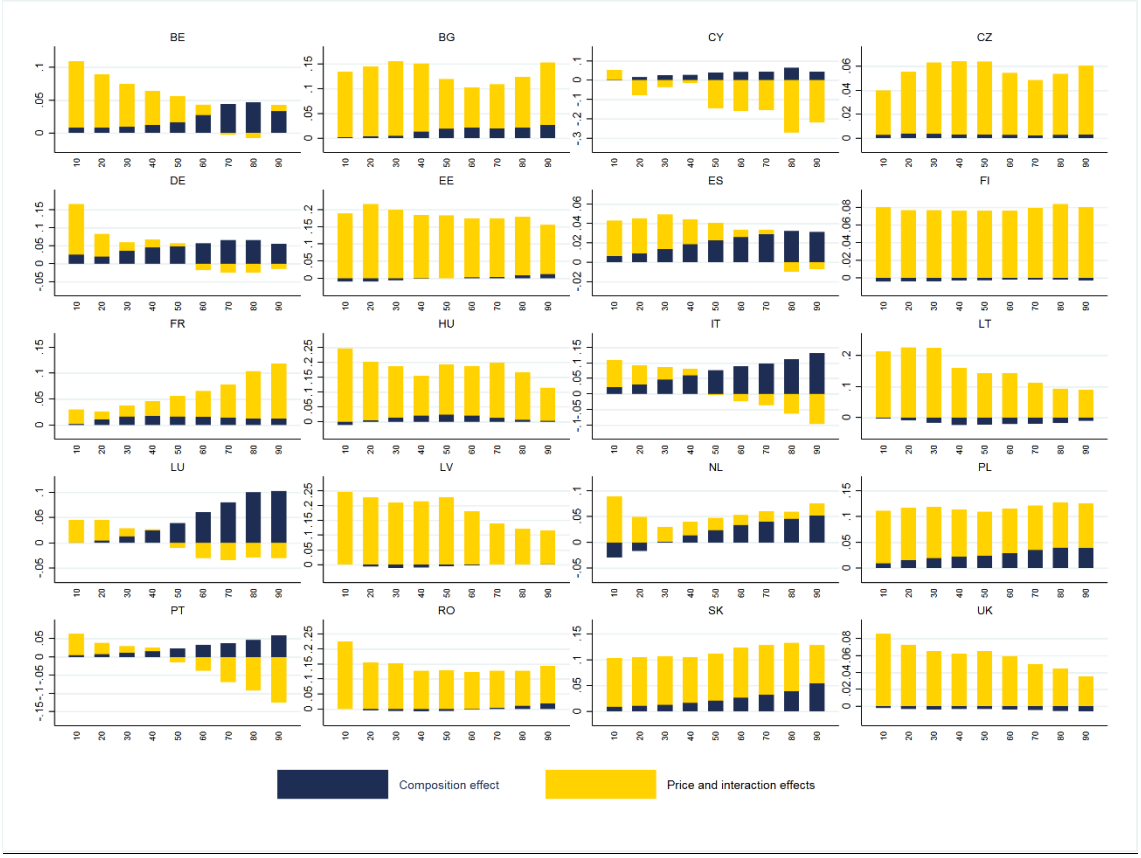
([109]) These will be included in the constant of the price effect, which captures changes in the relative prices that are common to all employees.

Upskilling of the workforce has been the main driver of composition effects. The composition effect can be broken down into its components. In the analysis the following individual and job characteristics are considered: age (6 categories), gender (male and female), education (3 categories), type of contract (permanent and fixed term), hours worked (part-time and full-time), occupation (9 categories) and sector (14 categories). Graph II.1.6 presents the breakdown of the composition effect. Changes in educational attainment and occupation represent more than half of the composition effect in a majority of the Member States. This effect is particularly large in Germany, Italy, Hungary, the Netherlands and Portugal. An exception is Lithuania where changes in educational attainment and occupations appear to have had a negative (albeit small) impact on wage growth.

Population ageing also had a positive impact on the aggregate wage level. This effect is particularly important for Germany, Italy, Portugal, and Spain and, to a lesser extent Belgium and Cyprus. It reflects the increase in the share of older workers in the workforce, which is likely related to the impact of recent reforms aiming to increase the effective retirement age.

The increase in female employment had a small negative impact on aggregate wage growth. Women, on average, earn lower wages than men. For this reason, an increase in the proportion of women in the labour market may have a small negative effect on the aggregate wage level. While

Graph II.1.7: **Decomposition of aggregate wage growth by decile, 2010-2014 (nominal hourly wages; in percentage)**



(1) Based on a decomposition methodology proposed by Machado and Mata including age, gender, educational attainment, sector of employment, occupation, type of contract and hours worked. No data on sector of employment included for Germany and Italy.
Source: Commission calculations based on the microdata from the SES (2010-2014)

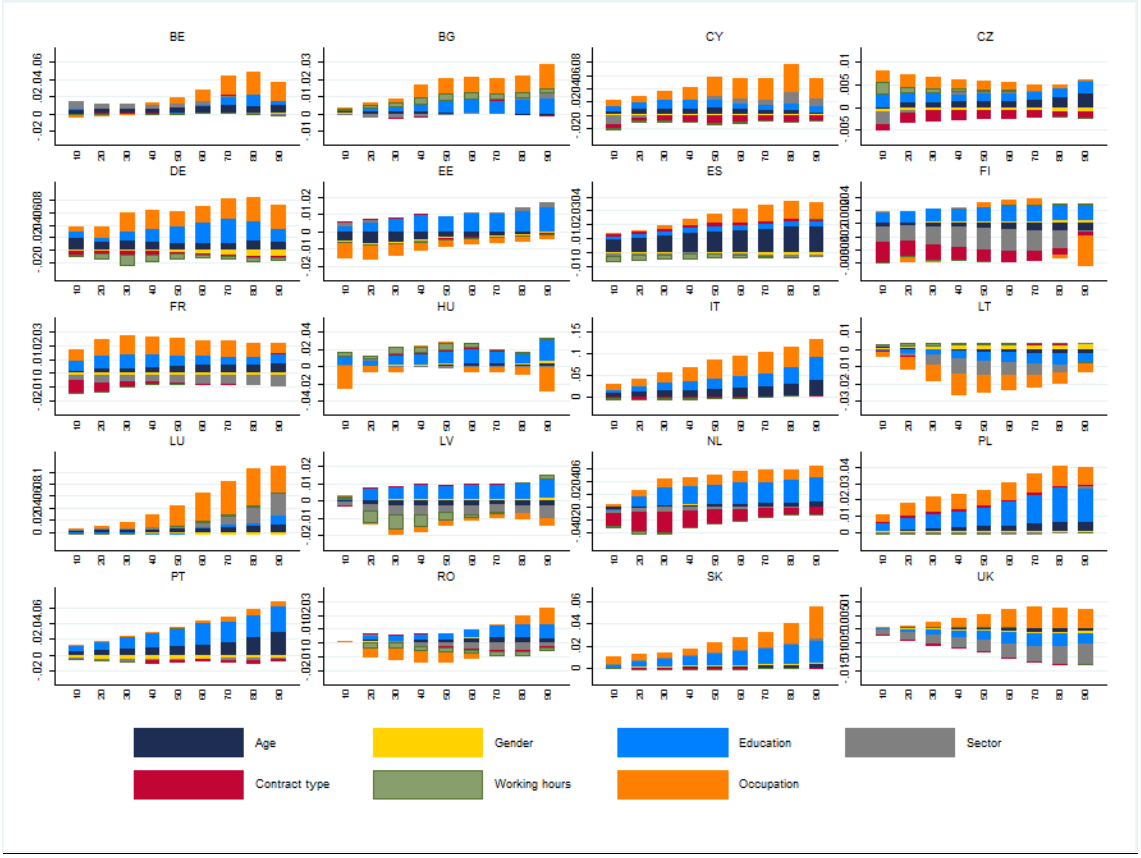
in most Member States the increase in female employment had only a marginal impact on wage growth, it was visible in others, including Germany, Luxembourg and Portugal.

The expansion of non-standard forms of work has a significant impact on aggregate wage growth in some countries. This is the case in the Netherlands where the rapid increase in the proportion of temporary contracts (2.9 pps increase between 2010 and 2014) had a large and significant negative impact on wage growth (4 pps). Similar, albeit smaller, effects are found for Germany, Cyprus, France, Italy and Portugal. In Germany, the rise in the proportion of part-time employees (in mini- and midi-jobs) led to a decline in aggregate wage growth (1 pp). Similar findings hold for Hungary, Cyprus and Latvia.

Wage growth in the Eastern European Member States is more uniform across the wage distribution than in the other Member States. In any country, aggregate wage growth is the outcome of developments in various parts of the wage distribution. Graph II.1.7 presents the results on aggregate wage growth by decile for the period 2010 to 2014. In most Eastern Member States, wages increased at almost the same pace across the wage distribution. Notable exceptions are Lithuania and Latvia, where the strongest wage growth was observed in the lower deciles, indicating a decline in wage inequality.

In the Southern Member States, wage inequality declined substantially as a result of stronger wage increases in the lowest deciles. In fact in some Member States, such as Cyprus and

Graph II.1.8: **Composition effects of aggregate wage growth by quantile, 2010-2014 (nominal hourly wages; in percentage)**



(1) Based on a decomposition methodology proposed by Machado and Mata including age, gender, educational attainment, sector of employment, occupation, type of contract and hours worked. No data on sector of employment included for Germany and Italy.
Source: Commission calculations based on the microdata of the SES (2010 and 2014)

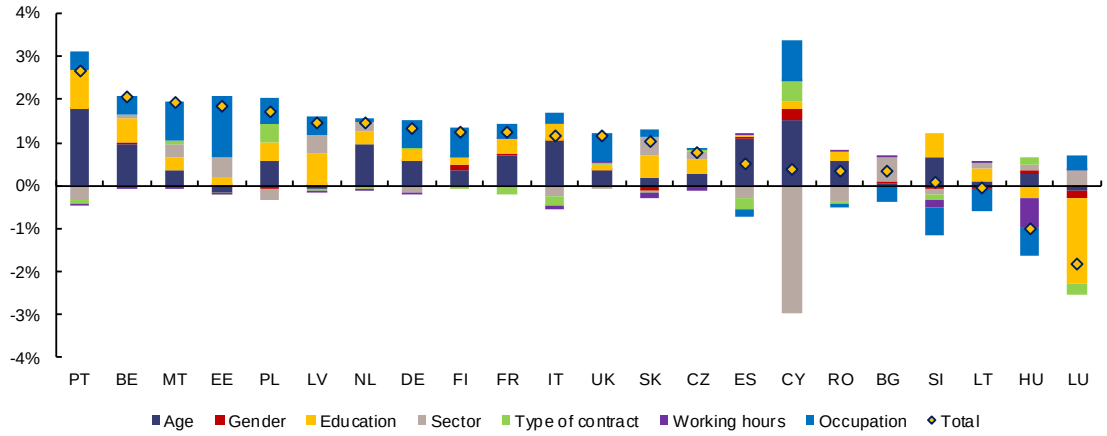
Portugal, wages in the highest deciles even decreased in the period 2010-2014. In other Member States, such as Spain and Italy, wages in the highest deciles increased, mainly driven by composition effects. Even in these countries, the overall wage increases in the highest deciles were substantially smaller than those in the lowest deciles.

There is no uniform pattern in Western European Member States as concerns wage inequality. In Belgium and Germany, similarly to Southern Member States, wages increased more in the lowest than in the highest deciles, while the opposite is observed in France. In between these polar cases are Luxembourg and the Netherlands, where price effects were stronger at the bottom, and composition effects stronger at the top of the wage distribution, with wage growth being more moderate in the middle.

In general, composition effects are positive and more important for wage growth in the higher wage deciles. In a few Member States, such as Lithuania and the United Kingdom, changes in the composition of the workforce had a negative impact on aggregate wage growth in all wage deciles. In other Member States, such as Cyprus, Latvia and Romania, composition effects had a negative impact on wage growth in some deciles, but not in all.

Up-skilling mainly affected those at the top of the wage distribution, while the effect of ageing was more uniform. The effect of specific components differs across the wage distribution. Graph II.1.8 provides a breakdown of the drivers of the compositional effect. Changes in educational attainment of the workforce had a positive impact on wage growth in all deciles of the wage distribution with the largest impact in the

Graph II.1.9: **Composition effects of aggregate wage growth, 2014-2017 (nominal hourly wages; in percentage)**



(1)The effects are calculated based on linear approximation based on the changes in individual and job characteristics obtained from LFS (2014-2017) and the wage elasticities of the individual and job characteristics obtained from a linear regressions based on the 2014 SES.
Source: Commission calculations based on microdata from the 2014 and 2107 LFS and the 2014SES.

middle and upper segments. The impact of ageing on aggregate wage growth is different across Member States. In some Member States, such as Belgium, Germany and Finland, ageing of the workforce affected the wage growth in the lowest deciles to the same extent as it affected wage growth in the highest wage deciles. In other Member States, such as Italy or Portugal, the effect is strongly increasing with the wage level, suggesting that seniority pay affected mainly those at the top of the wage distribution.

Changes in the type of employment mainly affected wages in the lower part of the wage distribution. In the Netherlands, the increase in temporary employment had a negative impact on wages across the wage distribution, while in France the effect can be observed only in the lower wage deciles. In Finland, the decline in the importance of temporary employment had a larger positive impact on wages at the bottom of the distribution than at the top. Also increases in part-time employment mainly affected wages at the bottom of the wage distribution. This is for example the case in Germany, where the increase in the share of part-time employment as a result of an increase in the share of mini- and midi-jobs, resulted in a substantial decline in the aggregate wage growth up to the fourth decile.

1.3.4. Results on the decomposition of wage growth between 2014 and 2017

The composition effect on wage growth remained small between 2014 and 2017. Graph II.1.9 presents a breakdown of the composition effect of aggregate wage growth between 2014 and 2017. The findings are broadly in line with those for the period 2010-2017. In all Member States, except Portugal, the composition effect on aggregate wage growth has been found to be lower than 2% or less than 0.67% per year.

Upskilling and ageing of the population remained the main drivers of composition effects after 2014. In the majority of Member States, changes in education and occupation explained more than half of the overall estimated composition effects. Only in Luxembourg and Hungary was there a negative impact of education on aggregate wage growth, reflecting an expansion of lower-skilled jobs during the recovery. In addition, the ageing of the population also had a positive effect on aggregate wage growth. This effect appears to be more important than in the period 2010-2014, both in terms of the number of Member States affected and the relative magnitude of the effect. The impact is particularly large for Southern Member States (Portugal, Cyprus, Italy and Spain).

The impact of gender composition was more diverse across countries after 2014 than before. As in the period between 2010 and 2014, the increasing share of women in the labour market had a small (negative) effect on aggregate wages in a few countries including Poland, Slovakia and Luxembourg. In other Member States, male employment rose faster during the recovery (after relatively larger losses in male employment during the crisis period), reducing the share of women in employment after 2014. This resulted in a positive composition effect in Cyprus, Hungary, Bulgaria and Finland.

In some Member States, an increase in the share of permanent employees had a positive impact on aggregate wage growth. This is in contrast to the period 2010-2014 when the type of contract had a negative on aggregate wage growth in all Member States. It suggests that part of the impact of an increase in temporary employment had on wage growth was transitionary and may be related to the business cycle. Nevertheless, in several Member States, including Portugal, Spain, Italy and Slovenia, the continued increases in temporary workers continue to have a negative impact on aggregate wage growth.

1.4. CONCLUSIONS

Unemployment has remained an important determinant of EU wage developments after the 2008 crisis. In estimated wage Phillips curve relationships, the link between unemployment and nominal wage growth is somewhat weaker after 2008 than before but the difference is not statistically significant when other economic fundamentals such as inflation and trend productivity growth are controlled for. This contrasts with the apparent "flattening" of the bivariate wage Phillips curve, as seen in the first two chapters of this report. Wage growth closely follows inflation and trend productivity growth since the mid-1990s. The link between wage growth and inflation has weakened in the low-inflation environment of the post-crisis period.

A shortfall in wage growth can be identified only in a few EU Member States since 2010. This appears to be in contrast with some other advanced economies, notably the US. EU Member States with a shortfall in wage growth include countries with low (the UK and the Netherlands), intermediate (Ireland, Portugal) as well as high unemployment (Croatia, Cyprus). Shortfalls had also accumulated in a number of countries in the pre-crisis period, especially in countries that developed high current account surpluses (e.g., Germany and the Netherlands) as well as some countries with significant disinflation episodes (Poland, Romania, and Slovenia). Overall, latent labour market reserves (such as involuntary part-time work) matter for wage growth in the EU, but headline unemployment matters more.

Migration, ageing and collective bargaining institutions appear to have mostly transitory effects on wage growth. Wage growth is slightly higher in years when trend net migration is higher, possibly also reflecting the fact that net migration is higher in 'good economic times'. The age of the workforce appears to slightly affect wage growth, possibly through a composition effect as older workers, remaining in the workforce for longer, tend to earn higher wages. Changes in collective bargaining coverage are estimated to have a small positive effect on wage growth. In the post-crisis period, wage growth appears to be lower in countries in which union density decreases more rapidly. These short-term effects contrast with the apparent lack of long-term effects of the levels of union density and bargaining coverage.

Some of the limitations of the analysis on wage Phillips curves are related to its scope and the time horizon studied. First, the chapter focuses on domestic economic fundamentals shaping wage developments, but does not analyse issues related to external adjustment and international competitiveness, even though they played a role in wage developments in recent years (as discussed, for instance, in Chapter I.2 of this report). Second, while it analyses the relationship between wages and productivity, it does not have a focus on the wage share. Box II.1.3 provides an overview of the recent literature on trends in the wage share and its possible explanations. Third, to have a reasonably balanced panel data set of the 28 Member States, the analysis focuses on the period since 1995. For this reason it is outside its scope to assess whether there have been structural changes in the relationships determining wage growth before that date.

Changes in the composition of the workforce over the last decade had a small but positive impact on wage growth in most of the EU. In some Member States, composition effects were a main driver of wage growth. This was the case in particular in countries with relatively low or moderate wage growth, such as Germany, Italy, Luxembourg and Portugal. This also means that underlying wage growth was lower in these countries than headline wage growth suggests.

Education, age and non-standard employment appear to be the most important factors affecting wage growth through composition effects. In almost all Member States, upskilling had a positive contribution to wage growth, underlining the importance of higher education and life-long learning as highlighted in the European Pillar of Social Rights. In addition, in some Member States, such as Italy, Germany, Portugal and Spain, the ageing of the population also had a positive impact on wages, as working lives became longer. Finally, the recent increase in non-standard employment (part-time and temporary employment) as seen in the Netherlands, Germany or Cyprus, had a negative impact on wage growth, in particular for those earning lower wages. This shows that transitions towards open-ended contracts, as advocated in the Social Pillar, could have a positive impact on wages.

There are puzzles related to low inflation and low trend productivity growth. This chapter shows that wage developments in the post-crisis period can broadly be explained by developments in inflation, productivity and unemployment. In turn, low inflation and productivity growth themselves have been puzzling to many observers. Low inflation developments have been explained by developments in energy prices and challenges inherent to the post-crisis economic environment, among other factors (ECB, 2017). In terms of longer-term, structural factors, it has been noted that inflation itself has become slower to react to measures of economic slack (Kuttner and Robinson, 2010), and that the common factor of inflation developments across countries has gained weight (Ciccarelli and Mojon, 2010). For a more detailed discussion of possible structural factors, including those related to globalisation and ageing, see Chapter I.1.

Recessions in the wake of financial crises tend to be deeper, and recoveries slower, affecting trend productivity growth. Studies have attributed this effect to high levels of private and public debt characterising such episodes. ([110]) In addition, it has been noted that the current recovery has been comparatively "job-rich" which, by a mechanical effect, holds back labour productivity growth (see, e.g., in European Commission, 2015b, 2016b, ECB 2016). But recent analyses have also discussed possible reasons why productivity trends may not return to the fast pace observed in the middle of the 20th century and a brief period starting from the mid-1990s, including ageing, global competition, and increasing inequality (Gordon, 2010; 2012). A particular aspect of the challenges posed by ageing has come to be known as the 'secular stagnation hypothesis' (see an overview by Teulings and Baldwin, 2014).

The analysis points to a number of policy conclusions. First, policies to support productivity growth in the long run, including strengthening innovation and investment, are also supportive of wage growth. Structural trends affecting investment and productivity are outside the scope of this paper, but policies extending working lives and mitigating inequality may help address some of the factors discussed in policy debates. So can policies aiming to address the legacy of the financial crisis, including mitigating the effects of debt overhang for households, financial and non-financial corporations and the public sector.

Strengthening collective bargaining can also support wage growth. The analysis suggests that some aspects of collective bargaining affect wage growth in the short run. Effective collective bargaining institutions may not only support wage growth in the short run but also improve coordination across sectors of the economy and improve the adjustment of the economy to economic shocks.

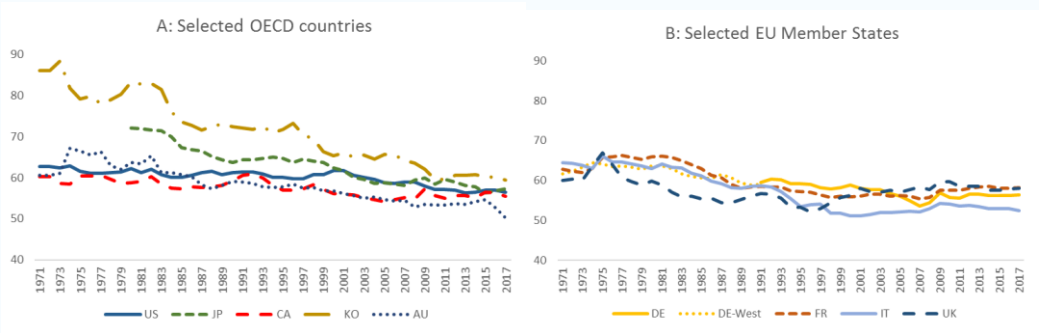
([110]) See, e.g., Abiad et al., 2009; Cerra and Saxena, 2008; Claessens et al., 2009; Reinhart and Rogoff, 2009; See also the related analysis in Box I.1.1 of Chapter I.1.

Box II.1.3: Explaining long-term trends in the labour income share

Recent research has revived interest in the labour income share, its trends and their possible explanations. This box summarises some contributions to this literature. These contributions focus on sectoral, occupational, and firm-level developments that may underlie trends in the labour share, thus complementing the aggregate-level analysis presented in this chapter.

The labour income share (or wage share) is the share of national income that is paid to remunerate labour. It has been widely observed that the labour income share has decreased in advanced economies in the last decades (see, e.g. Bentolila and Saint-Paul, 2003; Arpaia et al., 2009; and more recently Karabarbounis and Neiman, 2014; IMF, 2017a; OECD, 2018a). It has also been observed that there is a large heterogeneity across countries in terms of the degree and timing of the decrease. Graph 1 shows the adjusted wage share since the early 1970s in a selection of advanced economies within and outside the EU. In some countries, most notably in South Korea, Japan and, to a lesser extent, Australia, the downward trend has been unbroken over the last decades. In the US, the wage share has been almost unchanged until 2000 but has fallen about 5 percentage points since then. In contrast, a decrease in the wage share of about 7 percentage points can be observed in the four largest EU economies in the two decades before 1995, but no clear trend since then.

Graph 1: Adjusted wage share in selected OECD and EU Member States, 1971-2017



Note: Compensation per employee as percentage of GDP at current prices per person employed.
Source: AMECO database of the European Commission.

A number of explanations have been offered for the recent decline in wage shares. After documenting a global declining trend since the 1980s, Karabarbounis and Neiman (2014) suggest that roughly half of the observed decline can be explained by the decrease in the relative price of investment goods related to information technology. According to this explanation, this change in relative prices gives firms incentives to replace labour with capital. Elsby et al. (2013) dispute this account for the US experience. They note that the recent decline in the US wage share was concentrated in sectors most exposed to imports and suggest offshoring of labour-intensive activities as the most likely explanation. Recent studies by the IMF (2017a) and the OECD (2018a) find evidence for both technological change and participation in global value chains (GVC) as factors contributing to a decline in the labour share in advanced economies since the 1990s. The effect of the relative investment price is estimated to be larger than the effect of GVC participation. Looking at the differential effects these trends have on workers of various skills levels, the IMF (2017a) finds that automation and offshoring had the most significant negative effect on medium-skilled workers. This also implies that the recent fall in wage share is related to increasing wage inequality.

Autor et al. (2017) suggest that firm-level evidence is consistent with the notion that the rise of "superstar firms" is part of the reason for declining labour shares. Technological change and reduced international barriers allow market leaders to reap larger benefits from their competitive advantage in global markets. This leads to increasing market concentration and the emergence of global superstar firms. Evidence consistent with this explanation includes the fact that the decline in the labour share is largest in industries with the most significant increase in market concentration. Further, the decline in the aggregate labour share does not primarily occur within individual firms but is rather the result of reallocations between firms (i.e. rapid growth of large firms with a lower wage share).

(Continued on the next page)

Box (continued)

The OECD (2018a) finds support for the role of superstar firms, confirming that the aggregate decline in wage share is due to successful entrants with a capital-intensive production, rather than a decline in wage share observed for incumbent firms. Beyond this trend, the OECD (2018a) also documents a "decoupling" between median and average wage growth in advanced economies. The growth rate of the median wage is the wage growth of workers in the middle of the income distribution. Low median wage growth means that the benefits of economic growth mostly accrue to the top of the income distribution and are not shared equally in society. This development may also be linked to the growing gap between leading firms and the rest of the market. There is increasing evidence that (growing) differences between firms (rather than individuals) explain much of the increasing wage inequality in advanced countries (see, e.g., Card et al, 2018; Song et al. 2015).

Strong firm-based wage premia suggest imperfect competition in labour markets and has important consequences for the desirability of labour market institutions like the minimum wage and those related to collective bargaining. This new literature also reinforces the need upskilling in advanced economies. While the findings so far suggest that "superstar firms" gain competitive advantage by being productive and innovative, the OECD (2018a) analysis suggests that increasing concentration means that regulators and competition authorities will need to be vigilant so that dominant firms do not engage in anti-competitive practices.

The rapid growth of this literature suggests that more insights will be gained in the future about the relationship between firm-level dynamics on the one hand and aggregate wage developments, and their distributional dimension, on the other. The literature has also discussed a host of statistical measurement issues related to the wage share, including those related to capital depreciation, housing-related incomes and income from self-employment. The robustness of the aggregate patterns to some of these methodological issues is analysed by Schwellnus et al. (2017).

APPENDIX 1

Table II.1.A1.1: **Determinants of wage growth in various country groups, 1995-2017**

Dependent variable: Growth rate of gross wages and salaries per employee	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Euro area 19			Euro area 12			Eastern Member States 11		
Unemployment rate	-0.126***	-0.323***	-0.314***	-0.125***	-0.358***	-0.329***	-0.371***	-0.546***	-0.824***
	(0.036)	(0.063)	(0.067)	(0.034)	(0.043)	(0.054)	(0.074)	(0.129)	(0.169)
Change in the unemployment rate	-0.675***	-0.610**	-0.643***	-0.210	-0.114	-0.181	-0.740**	-0.618**	-0.244
	(0.232)	(0.223)	(0.219)	(0.153)	(0.205)	(0.245)	(0.276)	(0.255)	(0.213)
Inflation rate	1.081***	0.913***	1.099***	0.665***	0.260**	0.550**	0.932***	0.920***	0.657**
	(0.172)	(0.156)	(0.124)	(0.137)	(0.113)	(0.185)	(0.175)	(0.156)	(0.210)
Trend productivity growth	0.935***	0.674***	0.736**	0.741***	0.876***	0.839***	1.089***	0.958**	1.093*
	(0.152)	(0.233)	(0.312)	(0.125)	(0.154)	(0.215)	(0.277)	(0.333)	(0.534)
Constant (presented if no country effects)	0.007*	.	.	0.015**	.	.	0.036***	.	.
	(0.004)	(.)	(.)	(0.005)	(.)	(.)	(0.010)	(.)	(.)
Country effects	no	yes	yes	no	yes	yes	no	yes	yes
Year effects	no	no	yes	no	no	yes	no	no	yes
Observations	407	407	407	269	269	269	205	205	205
R-squared	0.647	0.698	0.737	0.479	0.602	0.651	0.590	0.625	0.711

(1) Ordinary least squares estimations with appropriate dummy variables. Annual data.
(2) Trend productivity growth is defined as the five-year trailing average of labour productivity growth rate.
(3) Clustered standard errors in parentheses. Asterisks mark estimated coefficients which are statistically significant at the 10% (*), 5% (**) or the 1% level (***).
(4) The country group "euro area 12" includes the first 12 members of the monetary union: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain. The country group "Eastern Member States 11" includes Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia.
Source: European Commission calculations based on Eurostat data.

Table II.1.A1.2: **Determinants of gross wage growth: Specifications with alternative measures of labour market reserves, EU28**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample period:	1995-2017	2010-2017	2005-2017	2010-2017	1995-2017	2010-2017	2005-2017	2010-2017
Dependent variable: Growth rate of gross wages and salaries per employee								
Unemployment rate	-0.374***	-0.422**	-0.389***	-0.315**				
	(0.076)	(0.173)	(0.116)	(0.135)				
Change in unemployment rate	-0.389*	-0.128	-0.552**	-0.204				
	(0.198)	(0.237)	(0.253)	(0.203)				
Underemployed part-time workers, % labour force	0.073	0.248						
	(0.106)	(0.306)						
Those available but not seeking a job, % labour force			-0.073	-0.286				
			(0.163)	(0.387)				
Labour slack A: unemployment and underemployment					-0.253***	-0.284***		
					(0.042)	(0.098)		
Change in labour slack A					-0.450**	-0.250		
					(0.207)	(0.149)		
Labour slack B: unemployed, underemployed, available b							-0.291***	-0.251***
							(0.060)	(0.084)
Change in labour slack B							-0.448**	-0.177
							(0.192)	(0.146)
Inflation rate	0.645***	0.239	0.465***	0.234*	0.605***	0.220	0.420***	0.222
	(0.088)	(0.151)	(0.111)	(0.136)	(0.087)	(0.135)	(0.121)	(0.138)
Trend productivity growth	1.144***	0.728**	1.277***	0.676**	1.121***	0.628*	1.093***	0.610*
	(0.137)	(0.311)	(0.273)	(0.324)	(0.138)	(0.319)	(0.233)	(0.327)
Country effects	yes	yes	yes	yes	yes	yes	yes	yes
Year effects	no	no	no	no	no	no	no	no
Observations	569	223	349	220	558	222	316	217
R-squared	0.665	0.624	0.647	0.625	0.664	0.618	0.617	0.617

(1) Ordinary least squares estimations with appropriate dummy variables. Annual data.
(2) Trend productivity growth is defined as the five-year trailing average of labour productivity growth rate.
(3) Clustered standard errors in parentheses. Asterisks mark estimated coefficients which are statistically significant at the 10% (*), 5% (**) or the 1% level (***).
(4) The variable on those available for work but not seeking is available only from 2005.
Source: European Commission calculations based on Eurostat data.

Table II.1.A1.3: **Determinants of gross wage growth: Specifications with demographic variables, EU28, 1995-2017**

Sample period: 1995-2017 Dependent variable: Growth rate of gross wages and salaries per employee	(1) Net migration rate	(2)	(3) Trend net migration rate	(4)	(5) Older and young workers	(6)
Unemployment rate	-0.123*** (0.042)	-0.305*** (0.074)	-0.128*** (0.040)	-0.293*** (0.074)	-0.186*** (0.042)	-0.359*** (0.064)
Change in the unemployment rate	-0.660** (0.238)	-0.596** (0.220)	-0.667*** (0.227)	-0.667*** (0.236)	-0.483** (0.185)	-0.400** (0.191)
Inflation rate	0.983*** (0.175)	0.840*** (0.163)	1.049*** (0.173)	0.873*** (0.183)	0.786*** (0.081)	0.648*** (0.095)
Trend productivity growth	1.037*** (0.220)	0.824*** (0.289)	0.976*** (0.193)	0.762*** (0.260)	1.251*** (0.112)	1.165*** (0.194)
Crude rate of net migration (rescaled, per 100 inhabitants)	0.001 (0.004)	0.005 (0.003)				
Trend of crude rate of net migration (rescaled, per 100 inhabitants)			-0.001 (0.004)	0.009* (0.005)		
Difference between the share of older (55-64) and young (20-29) workers in the labour force					0.065** (0.031)	0.018 (0.056)
Constant (if no country effects)	0.007 (0.005)	. (.)	0.008 (0.005)	. (.)	0.019*** (0.004)	. (.)
Country effects	no	yes	no	yes	no	yes
Year effects	no	no	no	no	no	no
Observations	480	480	468	468	576	576
R-squared	0.618	0.657	0.585	0.630	0.626	0.664

(1) Ordinary least squares estimations with appropriate dummy variables. Annual data for a panel of 28 EU Member States.
(2) Trend productivity growth is defined as the five-year trailing average of labour productivity growth rate.
(3) Clustered standard errors in parentheses. Asterisks mark estimated coefficients which are statistically significant at the 10% (*), 5% (**) or the 1% level (***).
(4) The "crude rate of net migration plus adjustment" is defined by Eurostat as the ratio of net migration (including statistical adjustment) during the year to the average population in that year. The value is rescaled in this analysis to be expressed per 100 inhabitants.
(5) "Trend of crude rate of net migration" is defined as the five-year trailing average of the "crude rate of net migration". Bulgaria, Hungary, Poland and Slovakia were excluded from regressions involving the variable "crude rate of net migration. For these countries, the variable likely does not capture the magnitude of outward migration. For more information on these statistics see the analysis by European Commission (2015).
Source: European Commission calculations based on Eurostat data.

Table II.1.A1.4: **Determinants of gross wage growth: Specifications with institutional variables related to collective bargaining, EU28**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Change in collective bargaing coverage				Change in union density			
Sample period:	1995-2017		2010-2017		1995-2017		2010-2017	
Dependent variable: Growth rate of gross wages and salaries per employee								
Unemployment rate	-0.167***	-0.387***	-0.223***	-0.460***	-0.169***	-0.383***	-0.226***	-0.465***
	(0.045)	(0.067)	(0.047)	(0.157)	(0.039)	(0.065)	(0.054)	(0.163)
Change in unemployment rate	-0.590**	-0.494*	-0.275	-0.109	-0.539**	-0.436**	-0.337*	-0.131
	(0.246)	(0.252)	(0.192)	(0.167)	(0.211)	(0.206)	(0.189)	(0.209)
Inflation rate	0.799***	0.560***	0.470***	0.223	0.978***	0.873***	0.485***	0.232
	(0.102)	(0.123)	(0.111)	(0.134)	(0.123)	(0.125)	(0.131)	(0.186)
Trend productivity growth	1.209***	1.183***	1.181***	0.513**	1.014***	0.866***	1.082***	0.520
	(0.136)	(0.151)	(0.247)	(0.248)	(0.174)	(0.262)	(0.261)	(0.312)
Change in collective bargaining coverage	0.103***	0.098***	0.143***	0.158***				
	(0.036)	(0.033)	(0.019)	(0.019)				
Change in union density					0.033	-0.008	0.495**	0.185
					(0.274)	(0.297)	(0.228)	(0.262)
Constant	0.013***	.	0.027***	.	0.011***	.	0.028***	.
	(0.004)	(.)	(0.004)	(.)	(0.004)	(.)	(0.004)	(.)
Counry effects	no	yes	no	yes	no	yes	no	yes
Year effects	no	no	no	no	no	no	no	no
Observations	465	465	150	150	516	516	158	158
R-squared	0.598	0.655	0.510	0.720	0.628	0.664	0.407	0.621

(1) Ordinary least squares estimations with appropriate dummy variables. Annual data for a panel of 28 EU Member States.
(2) Trend productivity growth is defined as the five-year trailing average of labour productivity growth rate.
(3) Clustered standard errors in parentheses. Asterisks mark estimated coefficients which are statistically significant at the 10% (*), 5% (**) or the 1% level (***).
(4) Information on "Collective bargaining coverage" and "Union density" were combined from OECD Statistics and Visser (2015). Missing values are approximated by linear interpolation.
Source: European Commission calculations based on Eurostat data.

2. WAGE CONVERGENCE IN CENTRAL AND EASTERN EUROPEAN MEMBER STATES

This chapter analyses the process of real wage convergence between Central and Eastern European countries (CEE countries) and the other countries of the European Union.

The analysis shows that convergence of real wages between CEE countries and the rest of the EU has occurred continuously. Yet this process is far from being completed. While the ranking of countries in terms of wage levels has not changed substantially, countries with low wage levels in 2000 grew faster during the whole period under investigation (2000-2017). The crisis slowed down but did not put an end to the convergence of real wages of CEE countries to the rest of the EU; wages started to grow fast again in the lower wage countries shortly after the crisis. Real wage growth was fastest in countries with the highest productivity and GDP per capita growth. During the process of transition, the wage shares of CEE countries converged, but they are still quite heterogeneous. Wage shares increased recently in those CEE countries that experienced fast real wage growth.

Convergence is a long-term phenomenon. The analysis in the report suggests that it may take approximately 22 years to halve the initial real wage gap between CEE and other EU countries that was present in 2000. This same gap can be halved almost in around six years between countries that share a similar economic structure, thus similar productivity, and similar rates of investment in human and physical capital. This indicates a prominent role for policies to raise productivity through structural reforms and investments in human capital. Productivity growth can be boosted by policies that ensure efficient markets, adaptable and skilled workforce and support the adoption of innovative work practices.

Moreover, the analysis finds that real wage convergence can be faster in countries that have supportive labour market institutions. In particular, it is faster in countries with a higher trade union density (relative to the median level across countries).

2.1. INTRODUCTION

Economic, social and territorial cohesion are key goals of the European Union. According to the Treaty, the EU should promote harmonious development and reduce disparities between regions; Member States should coordinate their economic policies to attain this objective. The reduction of wage disparities in the EU is one aspect that would contribute to the reduction of disparities and promote improved living and working conditions.

Wages are key to achieve inclusive growth. They contribute to inclusive growth by helping to distribute the benefits of economic growth fairly across the society. Wages are also a key component of cost competitiveness and provide the incentives to allocate resources across sectors.

Economic integration in the EU single market has been expected to bring about real wage convergence. Economic development, catching-up and the increasing mobility of labour and capital can each contribute to the convergence of real wages of workers with similar characteristics in similar jobs within the EU.

However, wage convergence is not a necessary outcome of the single market. The mobility of capital and labour can be less responsive to wage differentials across countries, due to country-specific characteristics and the costs associated with mobility. The quality of human capital, infrastructure and institutions also matter in this regard.

Temporary deviations from convergence are likely to occur. As shown by the financial crisis, investment in unproductive activities may lead to unsustainable growth patterns generating boom-bust cycles, which can slow down or even bring wage convergence to a halt. Resilient economic structures and a skilled labour force help economies to withstand shocks in the short term and are hence two conditions for sustainable growth.

Promoting wage convergence and socio-economic convergence are core objectives of the European Pillar of Social Rights, proclaimed in November 2017. The Pillar serves as a catalyst for reforms that would support a renewed process of convergence towards improved living and working conditions. It notably establishes the principle of fair wages and calls for adequate minimum wages, as well as transparent and adaptable national wage setting.

Social and political arguments underline the importance of wage convergence. The perception of limited or slow wage convergence creates concerns among citizens that the benefits of the single market in terms of convergence of living standards have not fully materialised. These fears are also fuelled by the outward mobility of labour experienced by CEE countries, and by immigration and outsourcing in Western countries.

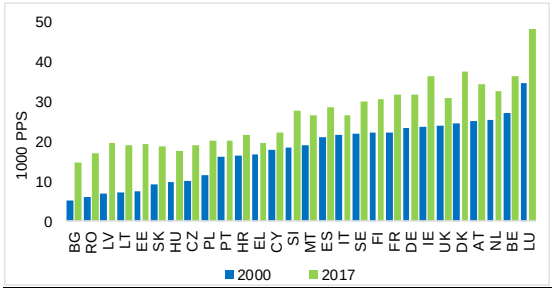
This chapter examines the process of real wage convergence and analyses its main drivers. It starts by assessing the main stylised facts and trends of real wage developments, paying particular attention to pre-crisis and post-crisis patterns. The analysis then focuses on the main determinants of wage convergence and examines whether empirical patterns of wage developments can be explained by economic fundamentals.

The chapter puts an emphasis on analysing the East-West aspect of real wage convergence from 2000 to 2017. Thus, the focus is on the group of Central and Eastern European countries (CEE-EU11), which includes the eleven Member States that shared a common transition path from a command to a market economy. It includes Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania Slovakia and Slovenia. This group of countries shares common economic characteristics and challenges. The wage developments of Southern economies are determined by a different economic trajectory and would merit a more detailed analysis, which is outside the remit of this chapter. The chapter refers to non-CEE countries as the EU17: this group includes the countries that were members of the EU before 2014 as well as Malta and Cyprus.

2.2. WAGE GROWTH IN CENTRAL AND EASTERN EUROPEAN COUNTRIES: STYLISED FACTS

Differences in wage levels have been narrowing but the gap remains sizeable. Central and Eastern European countries started the process of economic integration with the EU from a low level of wages (Graph II.2.1). In 2000, gross wages (in PPS) in Bulgaria, the country at the time with the lowest wage level, were less than one sixth of the real wages in Luxembourg (the country with the highest wages) and about one fifth of the average wage for the rest of the EU.

Graph II.2.1: **Gross wages and salaries per employee in 1000 PPS in 2000 and in 2017**



Source: Ameco

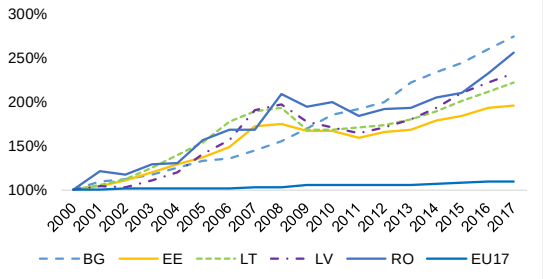
Wages in PPS grew at a faster pace in low income countries in 2000-2017. This reflects the catching-up process of their productivity to that of higher income countries. During this process, the ranking of countries in terms of wage levels has not changed significantly. In 2017, wages in Bulgaria, still the country with the lowest wage level, were about three times lower than wages in Luxembourg and about half of the average wage for the rest of the EU ([111]).

At the same time, real wages grew faster in CEE countries than in the EU17, with some heterogeneity across countries. This reflects the catching-up process of wages in CEE countries, starting from a lower level. Graphs II.2.2-II.2.3 depict real wage growth for the CEE countries and the EU17 countries over 2000-2017. CEE countries are split in two groups according to their level of wages in 2000 being below or above the

([111]) Graph II.2.A1.1 presents the levels of gross wages and salaries per employee in 2017 PPS for EU countries and the ratio of this level to the EU28 average, along with information on GDP per capita.

CEE median level of wages (Graph II.2.2 or Graph II.2.3, respectively).

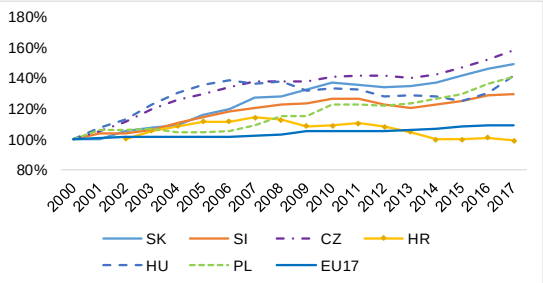
Graph II.2.2: **Cumulative real wage growth over 2000-2017 in the faster growing CEE countries.**



Source: European Commission calculations based on Ameco

For countries with wages below the median wage in 2000 (Bulgaria, Romania and the Baltics), real wages grew by 70 to 110 percentage points faster than in the rest of the EU. Conversely, for those CEE countries with relatively higher incomes (Slovakia, Czech Republic, Slovenia, and Hungary), real wages increased at a more modest rate – by 10 to 30 percent more than for the rest of the EU; real wages fell in Croatia. This heterogeneity within the group of CEE countries reflects different initial conditions as well as structural differences between countries (e.g. the share of resource-based activities in some CEE countries).

Graph II.2.3: **Cumulative real wage growth 2000-2017 in the slower growing CEE countries.**



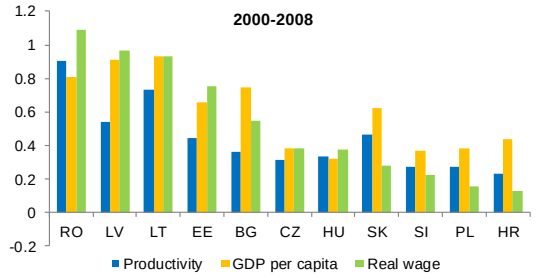
(1) Note that the vertical scale is different to the previous graph.
Source: European Commission calculations based on Ameco

Convergence slowed down during the crisis, but did not stop altogether and picked up again during recovery. With the exception of Bulgaria, which has featured solid real wage growth since 2006 – reflecting a later start of its catching-up process − and to a lesser extent Poland, wages expanded at a lower rate in several CEE countries (Graphs II.2.4 and II.2.5) in 2008-2011. After 2011, wage growth picked up in most of them with the strongest growth rates recorded in the Baltics and Romania. Conversely, wages kept falling in Hungary and Croatia until, respectively, 2014 and 2017.

2.2.1. Real wages and productivity developments

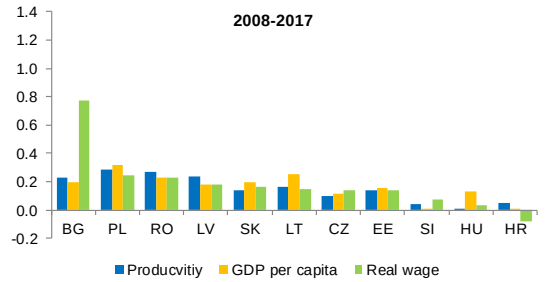
Real wage dynamics are mostly consistent with the evolution of real GDP per capita. Graph II.2.4 and II.2.5 report, respectively, for the pre- and post-crisis period, the growth of real wages together with that of GDP per capita and productivity. A number of stylised facts emerge from the inspection of the data.

Graph II.2.4: **Cumulated growth rates of real wages, productivity and GDP per capita in CEE countries, 2000-2008**



Source: European Commission calculations based on Ameco

Graph II.2.5: **Cumulated growth rates of real wages, productivity and GDP per capita in CEE countries, 2008-2017**



Source: European Commission calculations based on Ameco

Countries with the highest growth of real wages are also countries with the highest growth of GDP per capita and productivity, with a coefficient of correlation of 0.9 in both cases (1 is

Box II.2.1: **Measurement considerations**

The analysis of wage convergence is based on gross wages per employee. It captures the wages received and includes the taxes and social security contributions paid by the employee.

An alternative indicator is net earnings. This indicator excludes taxes and social security contributions paid by the employees and is a measure of the take-home pay. Taxation depends on the family composition and consistently with the indicator used in the social scoreboard, the net earnings considered are for a single earner without children, earning the average wage. For several EU Member States, time series on net earnings are available only for the 2008-2016 period; for a few of them (Croatia, Cyprus, Italy, Latvia and Lithuania) the time span is even shorter (2013-2016). This sample is too short to assess convergence, which is a long-term process that goes beyond the length of the business cycle. Thus, the analysis of convergence is based on gross wages per employee.

Gross wages are in constant prices and adjusted for differences in purchasing power parity (PPP). In order to make comparisons across countries that are not affected by different price levels, it is standard practice to convert nominal wages in a common currency, the purchasing power standard. Subsequently, PPS-adjusted wages are extrapolated relying on constant price real wage trends in national currency, to have a measure of real wages that is comparable across time and country.

the maximum). ([112]) After 2008, the correlation between real wages and productivity remain substantial (0.8) once Bulgaria is excluded from the sample.

Misalignments between wage and productivity developments have been present in Bulgaria and Romania. Before the crisis, real wages expanded in Bulgaria at a relatively moderate rate as compared to GDP per capita, while they grew faster in Romania. This difference reflects the sizable increase of the employment rate in Bulgaria (from 51.5% in 2000 to 64% in 2008) and the emergence of labour supply constraints in Romania at the time of a rapidly expanding economy. Interestingly, the reverse pattern can be observed after the crisis for Bulgaria, which points to overheating due to the limited increase in the supply of labour after 2008. ([113])

The shock of the crisis did not hamper significantly the convergence of real wages. Since 2012, real wage growth has picked up in the Baltics and in Romania, and it also continued in Bulgaria. Yet in Slovakia and Croatia, the low wage growth in 2000-2008 compared to productivity did not translate into high wage growth relative to output and productivity after 2008. The countries that exhibited lower growth prior to the crisis are facing stagnation (Slovenia and Czech Republic) or a somewhat slower catching-up relative to the EU17 (Slovakia, Poland).

Before the crisis, wages expanded more than productivity in Central and Eastern European countries with a relatively low level of income (in Romania, Latvia, Lithuania, Estonia, Bulgaria). This contributed to an increase of the wage share in these countries. The increase of real wages above productivity may reflect the rising importance of labour-specific knowledge in relation to capital-specific knowledge in catching up countries. ([114])

([112]) Goretti (2008) describes a closer short-run link between productivity, real wages and prices in the CEE countries than in the rest of the EU, and shows how wages adjust faster to the long-run wage-productivity relationship in these countries. She interprets this as the manifestation of the pressure of real wage convergence.

([113]) From 2000 to 2008, the activity rate in Bulgaria increased by more than 7 pps to 68%; in Romania, the employment rate fell by about 5 pps to 59%, and the activity rate dropped to 63%. After 2008, the activity and employment rates grew in Bulgaria to 71.3% and 63.1%, respectively. In Romania, after the crisis, the activity rate increased to 67.3% until 2017, while the employment rate increased to 63%.

([114]) This may not necessary imply the substitution of capital with labour. It is shown that when capital and skills are complementary, an increase in equipment per skilled worker increases the demand of qualified labour, leading to an increase in wages and in the wage share (Arpaia et al, 2009).

Box II.2.2: **Convergence: definitions**

The chapter relies on the following definitions of real wage convergence:

Beta convergence: the process by which real wages in catching-up countries grow faster than real wages in the more developed ones and therefore catch up on them.

- *Absolute (unconditional) beta convergence*:
  - Countries converge to a common long run growth path of real wages.
  - After convergence, both the level and the growth rate of long run level of real wages will be the same in the catching-up and in the developed country.
  - Only initial differences in real wage levels matter for the speed of convergence: less developed countries converge faster.
- *Conditional beta convergence*:
  - Each country converges to its own long run equlibrium growth path of real wages.
  - After convergence, the long run growth rates of real wages will become equal, but the long run levels of real wages may persistently differ.
  - Differences in long run real wage levels are determined by structural economic characteristics such as savings rates, the rate of investment in human capital and technology.
  - Long run real wage levels may be influenced by policies and institutions.

Sigma convergence: reduction in the disparities between the levels of real wages across countries over time, measured by the dispersion of the real wage distribution. A common approach is to measure it by the coefficient of variation, which equals the ratio of the standard deviation to the mean.

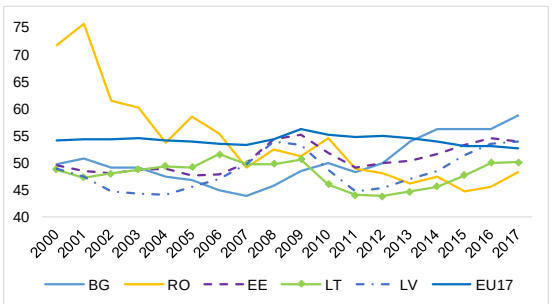
Beta convergence can take place without sigma convergence; sigma convergence typically implies beta convergence.

Such effect is not visible after the crisis (except for Bulgaria) as real wages grew broadly in line with productivity. However, the decline of self-employed in some countries may have contributed to a decline in the so-called adjusted wage share owing to the drop of the share of self-employed linked to the shift from agriculture to services. ([115])

2.2.2. Wage share developments

The dispersion of wage shares decreased from 2000 to 2017 in the CEE countries (Graphs II.2.6 and II.2.7). Transition countries started their catching-up process at diverse levels of the wage share and their levels have converged somewhat during the process of economic integration within the EU.

Graph II.2.6: **Adjusted wage shares in the CEE countries with faster real wage growth, 2000-2017**



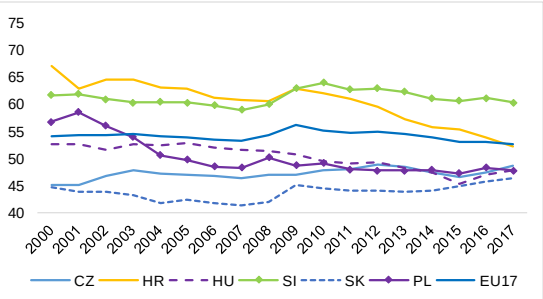
Source: Ameco.

There is still considerable heterogeneity in the wage shares of CEE countries. In the CEE countries with slow real wage growth (Poland, the Czech Republic, Slovakia, Hungary) the wage shares converged to a level that is below the EU15 average. The fast real wage growth CEE countries

([115]) The self-employed typically earn a mix of capital and labour income, which are not identified separately in the National Accounts. The standard approach is to assume that proprietors' labour is remunerated at the average compensation of wage earners (Arpaia et al 2009; Gollin, 2002; OECD, 2012). This assumption leads to the so-called "adjusted labour share". It can be shown that the adjusted wage share falls when the share of self-employed falls. From 2001 to 2007, the share of self-employed fell in Bulgaria from 30 to 26% and in Romania from 46% to 30%.

(Bulgaria, Romania, and the Baltic countries) have seen their wage shares increase since the recovery. In Bulgaria, real wage growth significantly exceeded productivity and GDP per capita growth after the crisis. At the same time, the wage share remains high in Slovenia throughout the period and shows downward convergence to the EU15 level in Croatia.

Graph II.2.7: **Adjusted wage share in the CEE countries with slower real wage growth, 2000-2017**



Source: Ameco.

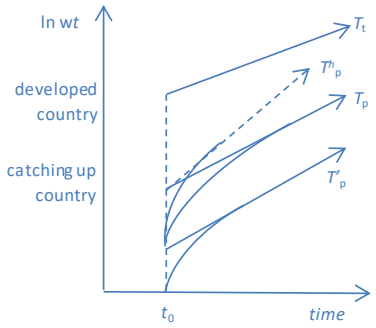
2.2.3. Absolute convergence

This section investigates whether countries with lower initial levels of wages experienced faster real wage growth in 2000-2017. By looking only at the link between initial wages and subsequent growth, the section addresses absolute convergence. It does not control for country-specific characteristics that might influence real wage growth, thus it assumes that real wages eventually converge to the same level across countries. Sections 2.6 and 2.7 will conduct a more sophisticated analysis of wage convergence, taking into account how country characteristics affect real wage growth.

EU countries with initially lower wage levels grew faster throughout 2000-2017. (Graphs II.2.9, II.2.10 and II.2.11). Thus, in the process of economic integration in the EU, one can observe a process of real wages catching up in CEE countries to the wage levels of the EU17.

The crisis temporarily slowed down real wage convergence between the CEE and EU17, and the pace of real wage convergence accelerated again since the recovery. This can be inferred from the steepness of the fitted regression lines in Graphs II.2.9, II.2.10 and II.2.11 for the group of the catching-up CEE countries. Among the EU17, real wages declined most in the Southern EU countries during the crisis. With the exception of Greece, real wages started to grow in all EU17 countries by 2013, the start of the recovery.

Graph II.2.8: **Conditional beta convergence**



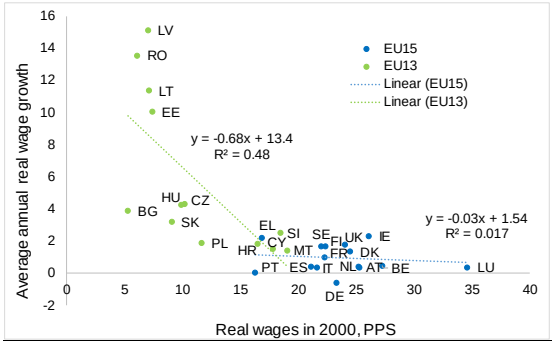
(1) The straight lines with arrows show the long-run paths of real wage growth for countries starting out with different initial levels of development.
(2) The curved lines show the process of convergence to the long run growth path.
(3) The catching-up country developing according the dashed line exhibits absolute convergence: it catches up to the real wage level and real wage growth rate of the developed country.
(4) Catching up countries following paths Tp and T'p of real wages exhibit conditional convergence. This can be due to structural differences (for example in technological endowments or savings rates) that matter for the long run level of real wages.
Source: European Commission

Within the EU17, slow pre-crisis real wage convergence switched to slow post-crisis divergence. Real wages converged to a common level slowly until the start of the crisis. This slow pace of convergence reflected two phenomena. First, developed EU15 Member States were already close to their long-run level of income and wages, and economic theory predicts that close to the long-run level, convergence slows down. Second, productivity and hence real wage growth have been slow in the Southern EU countries already since 2000, due to a misallocation of capital. ([116]) After the crisis, the emerging real wage growth divergence has been driven both by the rebalancing of current account deficits in the Southern European countries and by the slow wage growth in the other EU17 countries. Low

([116]) Gopinath et al (2017), Calligaris et al (2018).

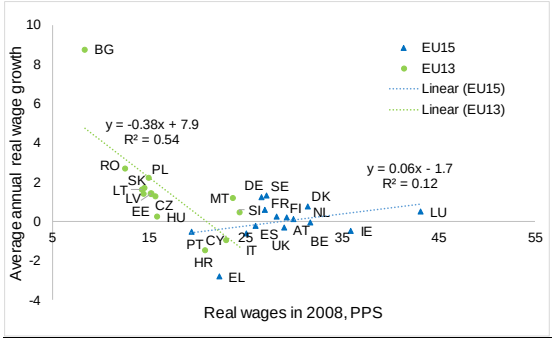
productivity growth in some of the EU17 countries contributed to this slow wage growth. ([117])

Graph II.2.9: **Absolute unconditional real wage convergence, CEE and EU17, 2000-2008**



Source: European Commission calculations based on Ameco.

Graph II.2.10: **Absolute unconditional real wage convergence, CEE and EU17, 2008-2017**

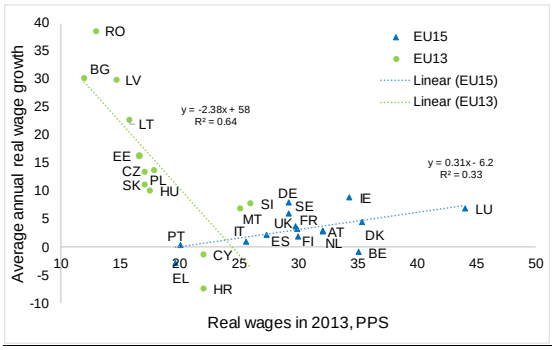


Source: European Commission calculations based on Ameco.

Stronger wage growth in surplus countries would support the recovery and rebalancing, but it would also slow down wage convergence. Higher wage growth in surplus countries would ease the competitiveness adjustment of deficit countries by allowing their wages to grow in line with productivity. Yet, since surplus countries are also high wage countries, an increase in their wages would slow down wage convergence in the EU.

The differences in East-West wage levels can be influenced by differences in the composition of the workforce and in the price of labour. Average wages in Eastern countries can be lower if a larger share of the workers and workplaces show characteristics indicative of lower productivity (for example, if there are more workers with lower skills, qualifications; if there are more jobs in sectors with lower productivity). Average wages can also be lower if workers of the same productivity in similar sectors in Eastern countries receive lower remuneration than workers in Western countries; this can be interpreted as a price effect. Clearly, this price effect is also influenced by aggregate country-level characteristics influencing productivity, such as the quality of public physical infrastructure, or the quality of domestic institutions.

Graph II.2.11: **Absolute (unconditional) real wage convergence, CEE and EU17, 2013-2017**

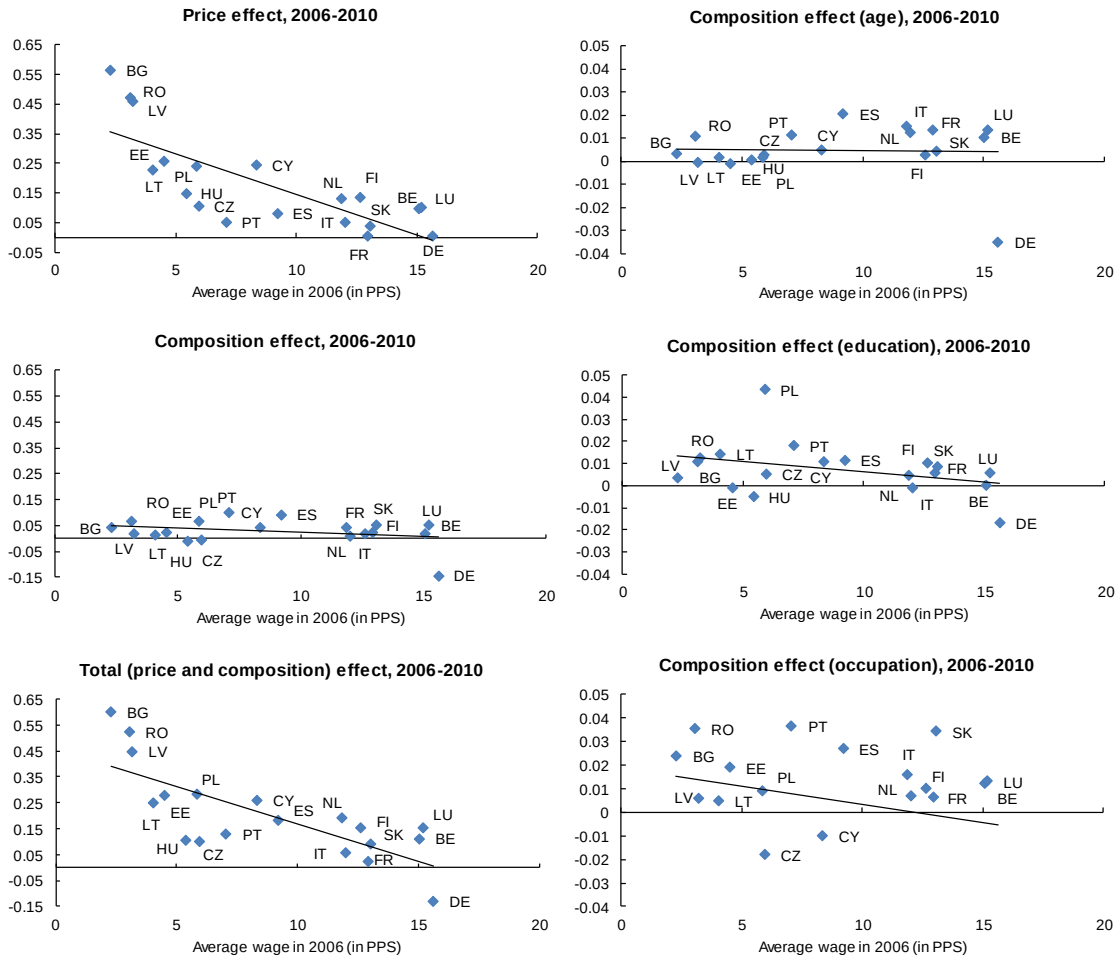


Source: European Commission calculations based on Ameco.

Convergence has been mainly driven by the change in wages for different socio-economic groups and not by the changing composition of the labour force in the CEE and EU17 countries (Graphs II.2.12 and II.2.13). Composition effects had a different impact before and after 2010: while before 2010 composition effects positively contributed to convergence (mainly based on the effects of favourable educational and occupational developments), the opposite holds after 2010. Behr and Pötter (2010), Brandolini et al (2011), Pereira and Galego (2018) and Drahokoupil and Piasna (2017) document similar findings with different methodologies. According to Pereira and Galego (2018), the price effect is mainly driven by country-specific unobserved factors affecting aggregate workforce productivity. Furthermore, the pre-crisis developments highlight how active labour market policies that support compositional changes in the workforce such as upskilling and occupational movements from low to high productivity sectors can support real wage convergence.

([117]) The previous chapter of this report explores in detail the drivers behind low wage growth in the EU17 after the crisis and after the recovery.

Graph II.2.12: **Price and composition effects in real wage convergence, 2006-2010**



(1) Note that the scales of the vertical axes differ by column.
(2) On the left bottom graph, DE is not included. The composition effect is negative in DE, in the range of -0,11; the entry has been omitted to keep the scales of the vertical axes similar and hence comparable.
Source: European Commission calculations on the basis of the Structure of Earnings Survey.

2.2.4. Sigma convergence

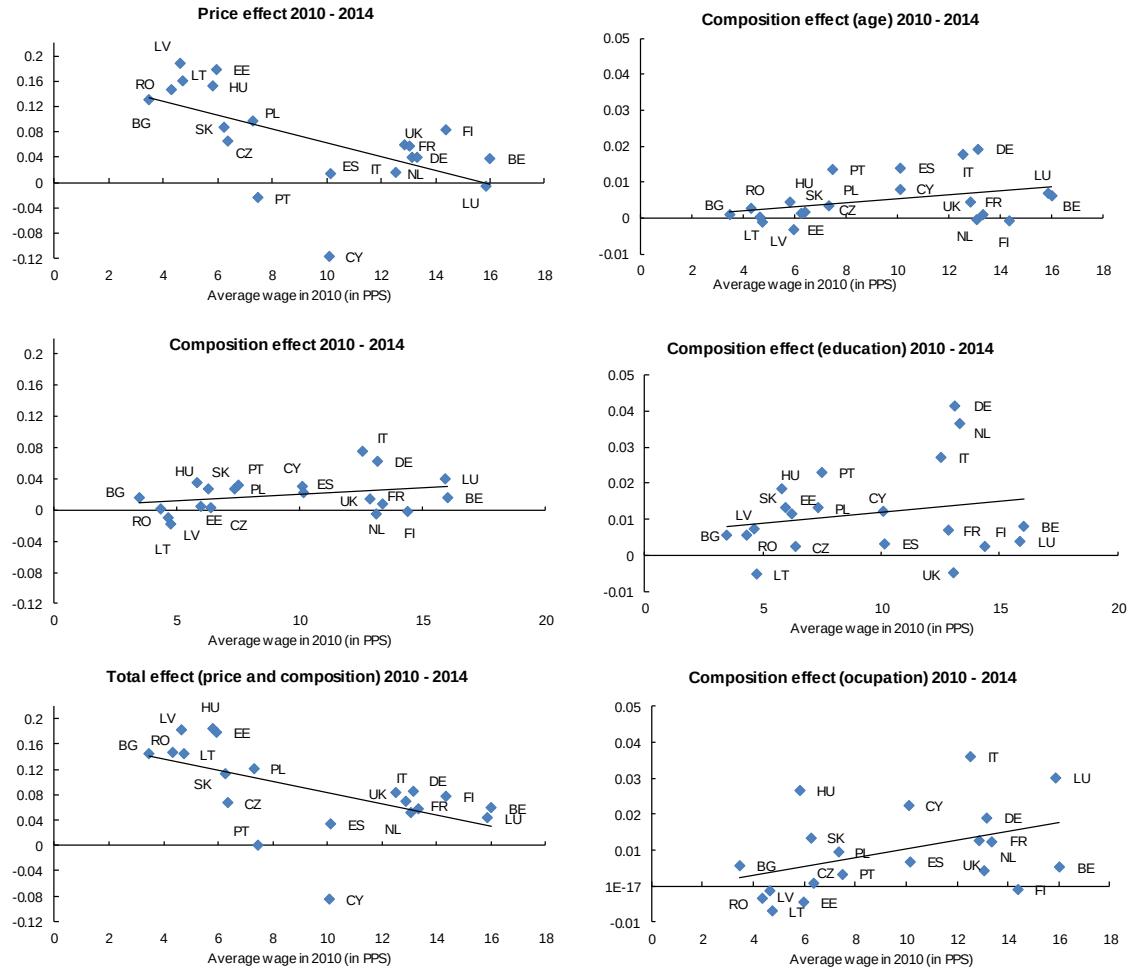
Sigma (σ) convergence occurs when the dispersion of the wage distribution declines over time for a group of countries. This approach is only concerned with dispersion and does not investigate the movements of countries within the distribution, or other statistical characteristics of the distribution. ([118]) The coefficient of variation (the ratio of the standard deviation to the mean) can be used to assess the development of the dispersion of the real wage distribution within the EU. ([119])

Real wages have been converging within the EU in the sense of *σ*-convergence. As demonstrated by Graph II.2.14, the coefficient of variation of the distribution of real wages in the EU has been falling since 2000, although this process has been slightly halted by the economic and financial crisis.

([118]) For example, one could observe a decrease in the dispersion of the real wage distribution not only in the case of upward convergence of real wages, but also in the case of downward convergence; in the latter case, not only the dispersion, but also the mean of the distribution of wages would decrease over time.

([119]) Other useful measures of the dispersion of distributions are the Gini coefficient, the Atkinson index, the Theil index and the Mean Logarithmic Deviation (MLD), see Monfort (2008).

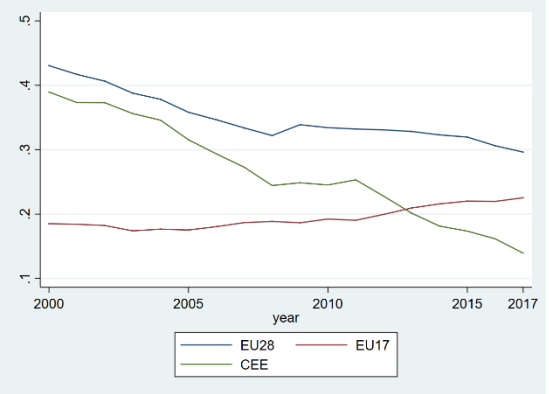
Graph II.2.13: **Price and composition effects in real wage convergence, 2010 - 2014**



(1) Note that the scales of the vertical axes differ between the columns.
Source: European Commission calculations based on the Structure of Earnings Survey.

The fall in the dispersion of real wages has been steeper in the CEE countries; this seems to have been a major driver of the fall of the dispersion within the whole EU wage distribution. In the EU17, the cross-country dispersion of real wages stagnated until the end of the crisis and started to increase since the recovery. Still, Graph II.2.14 also highlights that the overall spread of real wages has been smaller in the European countries outside Central and Eastern Europe during most of the period. ([120])

Graph II.2.14: **Sigma convergence of real wages within the EU 2000-2017**

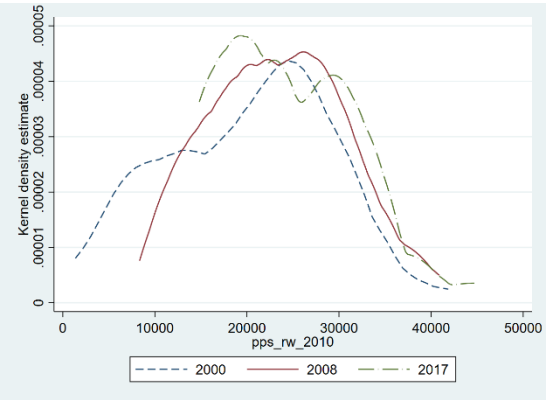


Source: European Commission calculations based on Ameco

([120]) Unfortunately, the σ-convergence concept does not provide further useful economic and policy insights about the drivers of this observed convergence process (Durlauf, Johnson and Temple 2004).

While the disparities between real wage levels decreased within the EU, upward real wage convergence also took place. Graph II.2.15 on the evolution of the distribution of real wages shows that the gradual reduction in dispersion of the real wage distribution was accompanied by a shift in the distribution towards the right, and a gradual increase in the mean of the distribution. From 2010 to 2011, there was a drop in the mean of real wages across the EU, and although it grew again since 2011, it did not exceed its 2010 level until 2015.

Graph II.2.15: **Evolution of the EU cross-country real wage distribution over time**



(1) Real wages in constant 2010 PPS
Source: European Commission calculations based on Ameco

In principle, an apparent process of σ-convergence can mask a polarisation within the distribution. Graph II.2.15 shows that since 2000, the real wage distribution shifted to the right, and its dispersion decreased, without a marked increase in polarization within the distribution. This is the outcome of the fast upward convergence of real wages in the countries with initially lower wages. If the process of real wage convergence continues in the CEE countries, the real wage distribution is likely to further shift to the right.

2.3. WAGE CONVERGENCE: THEORY AND EMPIRICAL EVIDENCE

Standard economic theory predicts wage convergence because of deepening economic integration. Trade theory highlights factor price equalization, while growth theory suggests that as the economy becomes open to trade flows, capital flows from slow growing rich countries to faster growing poorer countries; this reallocation increases productivity in the latter, leading to higher real wages. The following sections briefly review the main implications of the different theories, the links between them, and the role of structural variables (openness, trade, capital and labour mobility across countries) and labour market institutions (collective bargaining, unionization, minimum wages and other policies).

2.3.1. Wage convergence in the theory of economic growth

Growth theory predicts that real wage convergence is driven by the diminishing returns to capital investment. Standard economic theory predicts that capital should flow from countries where the returns to capital are lower to countries with greater unexploited investment opportunities. Assuming decreasing returns to factors of production, capital would flow from rich capital-abundant countries – i.e. with more physical capital per worker − to those with relatively less capital. In principle, this process should make low income countries better off by giving them access to more financial resources that they can then invest in physical and human capital; in addition, through FDI they would import the most advanced and productive technologies. This process should improve their levels of productivity, employment and income. The growth of income and wages would be faster the more the country has unexploited opportunities. ([121]) The outcome of these processes is convergence. In the short term, a wedge between real wages and labour productivity can be generated, by shocks and by the influence of government policies and institutions.

Countries with similar structural characteristics would converge to the same long-run growth path, even if their initial conditions differ. This process called absolute convergence is more likely to occur between economies with strong trade linkages, similar preferences and similar government policies and institutions influencing the level of long-run

([121]) In equilibrium, productivity, capital per worker and the real wage all grow at the rate which is set by the level of technology available, the quality of human capital and institutions. In the neoclassical growth model, the evolution of real wages is determined by the same factors as the level and the growth of real per capita income.

income. In this framework, convergence is ensured only by efficient markets, and hence there is a limited role for policies. To a certain extent, these conditions apply to the European Union, as the participation in the single market, the intensifying trade linkages and the compliance with the *acquis communautaire* have made countries gradually more strongly integrated and, within the remit of the subsidiarity principle, their labour market institutions and policies less dissimilar. ([122]) For these reasons, it is reasonable to expect that wage differentials within the EU would tend to diminish over time.

However, countries with different structural characteristics converge only to the growth rate that these allow to reach. Conditional convergence occurs when structural features affecting growth (growth of the population, saving rate, quality of human capital and of institutions, framework conditions) differ across countries([123]). In this case, each country converges to a long-run growth path (so-called *steady state*) which is determined by the structural characteristics of each country. Evidence lends support to this: in the long-term countries converge to income levels determined by framework conditions and enabling policies (Mankiw et al 1992, Bassanini et al 2001). It is only in the context of conditional convergence that the role of policies and institutions can be assessed.

Empirical evidence supports conditional convergence of labour productivity in Europe. Naveed and Ahmad (2016) and Naz et al (2017) document such convergence of labour productivity in Europe in 1999-2009 between countries, regions and industries.

Countries experiencing fast real income growth may get stuck in a middle income trap. According to Eichengreen et al (2011, 2013) and Agenor et al (2012), achieving fast economic growth may be easier in the early stages of development, relying on low labour costs and on internal transition from low to high productivity activities. Later, a slowdown of economic growth can be due to unfavourable demographics and to a too high rate of investment. The slowdown can prevent countries from reaching the income levels of the more developed economies. At the same time, Zuk and Savelin (2018) do not find evidence of such a trap in CEE countries. Within the EU, the slowdown of growth in Southern Member States has been due to a boom-bust cycle and to the need to rebalance the current account deficit during and after the economic crisis (Diaz del Hoyo et al 2017).

2.3.2. Trade theory and wage convergence

Trade theory predicts wage convergence during the process of trade integration. According to the standard trade theory, convergence is achieved through the equalisation of the price of labour and capital (i.e. the factors of production) even without mobility. Factor mobility is likely to fasten the process of convergence of wages. ([124])

Yet the relationship between trade and real wages is less clear cut. In parallel with trade integration, trade in intermediate goods and outsourcing are also affecting wage convergence (Feenstra and Hanson, 1999 and 2001), through their influence on domestic wages and on technological progress. Outsourcing and foreign direct investments and the associated knowhow transfer lead to productivity improvements in the receiving economies and allow for wage growth, but this wage growth is more likely to affect the high skilled, while it may also push down the wages of the low skilled in the sending countries.

Studies relying on macroeconomic aggregates do not find evidence of a clear link between trade and wage convergence. Onaran and Stockhammer (2008) investigate the impact of trade, exports and imports on wages, and find no link in the short run. This is similar to the finding of Goretti (2008) that suggests no link between terms of trade shocks and real wage developments in CEE countries.

([122]) The Policy Developments chapter shows that convergence of EPL regulation and of certain features of the unemployment benefits system occurred after the crisis.

([123]) For example, real wages in a low-income country with a low level of human capital will in the long-run converge to the level of real wages of a high-income country with similar level of human capital. Moreover, since the growth prospects of the high income country would be constrained by its human capital, convergence would occur faster as the living standards of the richer countries deteriorate.

([124]) The Heckscher-Ohlin theorem postulates that countries export products that use their abundant and cheap factors of production, and import products that use the countries' scarce factors. It predicts the factor price equalization.

In the short run, FDI inflows have been found to positively affect the level of real wages, while in the long run this effect disappears or turns negative. Onaran and Stockhammer (2008) investigate wages in the manufacturing sector in CEE in the period of 2000-2004 and find that FDI had a positive impact on wages in the capital-intensive sectors and sectors employing skilled labour in the short run, while in the medium run the impact of FDI on wages turned negative. This macro-level finding may be explained by the observation based on disaggregated firm-level data that the impact of FDI on wages is larger at a lower level of development (Earle et al, 2017).

Trade in intermediate goods has been a driver of East-West wage convergence in the EU before the crisis. Egger and Egger (2002) find that trade in intermediate goods has a more important influence on the level of real wages than trade in final goods and foreign investment. According to Egger and Pfaffermayr (2004), outsourcing supports conditional convergence of real wages within the EU, with CEE wages converging from below, while EU15 wages converging from above. This pattern can be interpreted as evidence of cross-country factor price equalization due to outsourcing. Egger (2006) finds that outsourcing reduces cross-country differences in wages at the industry level within Central and Eastern Europe. On the other hand, the analysis of Parteka et al (2015) suggests only a slow conditional skill-specific wage convergence across EU countries and a limited role of outsourcing for wage equalization for the period 1995-2009.

The long-run impact of migration on wages is likely to be limited. Emigration has a predominantly short-run impact on the average wages of the sending countries (Elsner, 2015). Once capital adjusts, emigration affects mainly the wage distribution. At the same time, there is a risk that in the long run, if a country experiences a significant outflow of the more educated workforce, it can become less productive, which can in turn lower the average level of wages.

Capital inflows due to economic integration can lead to boom-bust cycles. Belke et al (2018) document that in Greece, intensifying capital flows associated with European integration drove up wages in the non-tradable sector, and exerted a lasting wage-push on real wages in the tradable sector. However, the same study shows that this effect is not present in CEE countries.

2.3.3. The role of labour market institutions

Labour market institutions and policies can influence the growth of real wages attainable in the long term. Standard growth theory suggests that policy settings affect real wage growth through their influence on the accumulation of human and physical capital and technological progress. Beyond this, institutions may also influence the speed at which wages converge towards their (steady-state) growth rate – i.e. the growth rate consistent with the technology, population growth and the saving rate.

A broad set of labour market institutions affect the convergence of real wages. The institutions that exist in a country interact with each other, with other public policies and with the economic environment. The rules of unemployment benefits interact with the provision of active labour market policy, both have links to employment protection legislation, and to welfare policies; they influence the costs of hiring, firing, and the smoothness of reallocation of labour between different economic activities. The taxation of labour affects the costs of labour and this can have an impact on the real wage level or the level of unemployment, depending on the flexibility of wage setting. Collective bargaining, its coverage, extension, flexibility, representativeness and the associated wage coordination arrangements affect how wages adjust to local and macro level productivity developments and thus affect the resilience of the economy.

Institutions can bolster convergence directly over the long run if they exert a sustainable upward pressure on the wage level in a country. In theory, this can occur in two cases. First, when wage increases negotiated by collective bargaining occur in the context of limited product market competition (thus, when firms operate as monopolies or oligopolies) and the higher wages ensure that workers benefit from a higher share of rents that accrue to the firms. Second, in imperfect labour markets, where employers have market power and hence can offer lower wages, minimum wages, wage floors and the increasing bargaining power of workers resulting from collective

bargaining arrangements can lead to an increase in both wages and employment.

Labour market institutions influence indirectly the convergence process through their effect on the efficient allocation of resources in the economy.

Institutions can facilitate or hamper the reallocation of labour from low productivity to high productivity activities. For example, well-designed employment protection legislation combined with a system of unemployment benefits that provide insurance against unemployment risks and activation policies providing job-search support and assistance would contribute to the reallocation of resources from low- to high-productivity firms. This would lead to increases in productivity and provide a sustainable ground for wage increases, also in catching up countries.

Institutions can strengthen or weaken the link between the levels of productivity and of wages at the firm, sectoral and regional level. In countries with centralized collective bargaining, such links are weaker.

The link between skill investments and the returns to skills can be strengthened or weakened by the institutions. To the extent that they reduce wage dispersion, they can reduce the return to skills and hence diminish somewhat the incentives to invest in human capital.

By influencing the evolution of the cost of labour, labour market institutions increase or decrease the relative returns to capital. This changes investment incentives and therefore it may affect a key determinant of growth and convergence.

At the macroeconomic level, labour market institutions influence the speed of adjustment of the economy to shocks and to the developments of the business cycle. For example, wage bargaining coordination can be a tool for wage moderation and earnings flexibility over the business cycle.

Empirical evidence suggests that collective bargaining, unions and minimum wages compress the wage distribution (Blau and Kahn, 1999; OECD, 2004; OECD, 2018a). This can have an indirect impact on productivity growth, to the extent that this decrease in the within-country dispersion of wages is decreasing the returns to skills and experience, and hence reduces the incentives of investing in skills. OECD (2018a) provides empirical evidence that smaller wage dispersion is also associated with a smaller return to skills, experience and seniority in OECD countries. Furthermore, OECD (2018a) also finds that wage compression in countries with a higher coverage of wage bargaining is associated with a weaker link between sectoral productivity and wages. This misalignment can reduce the efficiency of resource allocation and it can also slow down the adjustment of wages to shocks and changes during the business cycle.

2.4. EMPIRICAL ANALYSIS: DETERMINANTS OF REAL WAGES CONVERGENCE

This section looks at the main drivers of *conditional* real wage convergence over the 2000-2017 period. It relies on two approaches to estimate the speed of conditional wage convergence. First, it assumes that both the speed of convergence and the long-run relationship linking real wages to their determinants are the same across countries. Subsequently, it estimates the speed of convergence assuming that the short-run dynamics of real wages is country-specific, while the link between real wages and their long-term determinants is the same across countries. This is consistent with economic integration making countries to share similar technologies of production, while the speed of convergence is country-specific. ([125])

([125]) A common production technology is a reasonable assumption because countries have access in the long-term to common technologies through trade links and foreign direct investment. However, the speed of convergence to the steady states could differ because countries have, *inter alia*, different growth rates of the population.

Table II.2.1: **Dynamic panel estimation of conditional real wage convergence. All EU countries, 2000-2017**

Dependent variable: Log real wages in constant 2010 PPS, bias corrected LSDV estimation Sample: EU28 2000-2017													
	1	2	3	4	5	6	7	8	9	10	11	12	13
Lagged real wages	0.969***	0.935***	0.934***	0.935***	0.926***	0.922***	0.924***	0.933***	0.935***	0.920***	0.875***	0.898***	0.898***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.04)	(0.01)
Crisis dummy	-0.02***	-0.01***	-0.01***	-0.01	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.02***	0.00	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)
Gross investment (log)		0.06***	0.06***	0.06***	0.06***	0.06***	0.03*	0.06***	0.06***	0.06***	0.06***	0.11***	0.05***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Population growth (log)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02*	-0.01	0.00
		(0.00)	(0.00)	(0.00)	(-0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(-0.01)	-0.03	(0.00)
Total factor productivity (log)		0.12***	0.12***	0.12***	0.12***	0.16***	0.08***	0.11***	0.12***	0.13***	0.17***	0.14***	0.17***
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.05)	(0.03)
Change in share of secondary graduates (as % of working population)			-0.06										
			(0.10)										
Change in share of tertiary graduates (as % of working population)				-0.05									
				-0.10									
Expenditure on education (as % of GDP)					-0.46								
					(0.50)								
Tax wedge						-0.06**							-0.04*
						(0.02)							(0.02)
Unemployment rate							-0.00***						-0.00*
							(0.00)						(0.00)
Openness								0.00					
								(0.00)					
Net migration rate									0.00				-0.00
									(0.00)				(0.00)
Terms of trade										0.05			0.18***
										(0.05)			(0.06)
Kaitz indicator											0.05		
											(0.07)		
Union density												0.00	
												(0.00)	
Country fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	474	457	457	457	429	411	457	457	457	457	286	294	411
Cross-sectional size	28	27	27	27	27	27	27	27	27	27	19	27	27

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: European Commission calculations based on Ameco, Eurostat, OECD.

2.4.1. Conditional convergence: common speed across countries

This sub-section aims to provide precise estimates of the speed of conditional convergence. Beyond looking at the impact of long-run determinants of productivity on wage convergence, it addresses how increasing trade integration in the single market affects wage convergence, by including information on trade openness, labour mobility and the value of exports relative to imports (terms of trade) into the estimation. Policy variables potentially relevant for wage convergence are also investigated: these include the tax wedge, the relative level of minimum wages and trade union density. The unemployment rate is added to control for the short-run influence of the business cycle. ([126])

Estimates of the speed of real wage convergence range between 3.1% and 10% ([127]). Table II.2.1 reports the speed of convergence of real wages estimated on a sample of EU28 countries over the period 2000-2017. ([128]) The 3.1% speed of convergence implies that it may take 22 years to close half of the initial wage gaps that have been present within the EU28 while the 10% speed implies faster convergence (implying 6,5 years to close half of the initial gap) ([129]).

([126]) Box II.2.2 describes the details of the estimation and Box II.2.3. describes the variables used in the estimation.

([127]) The speed of convergence can be calculated as one minus the estimated coefficient on lagged real wages in Table II.2.1.

([128]) Tables II.2.A1.1 and II.2.A1.2 in the Appendix provide a similar set of estimation results for CEE and EU17 countries.

([129]) The half-life is estimated as typical in growth theory (Barro and Sala-I-Martin 1995. Panel estimates of the speed of conditional convergence are typically higher than cross-section estimates (Islam 1995, Durlauf, Johnson and Temple 2004). At the same time, with panel estimates, this faster convergence takes place to different long-run levels of income.

Box II.2.3: **Conditional beta convergence of real wages, dynamic panel estimation**

The empirical analysis relies on the estimate of conditional convergence based on the standard panel regression:

$$\log w_{i,t} = (1+\beta)\log w_{i,t-1} + \psi X_{i,t} + \pi Z_{i,t} + \alpha_i + \epsilon_{i,t} \quad (2.1)$$

This relationship characterizing convergence can be derived from neoclassical growth models linking per capita income or real wages to its long-term determinants, i.e. the propensity to accumulate human and physical capital, technological growth and allocative efficiency. The lagged real wage variable captures convergence and β captures the estimated speed of convergence.

$X_{i,t}$ are the factors affecting economic growth in the long run. These include the the accumulation rates of physical and human capital (in logs) and the sum (in logs) of population growth, technical change and the rate of depreciation of capital; **$Z_{i,t}$ are the other explanatory variables** (sometimes called Barro variables), on institutions and country-specific growth determinants, outside the Solow model, that can influence the long-run level of real wages.

Factors forming a wedge between the short-term evolution of wages and of marginal productivity of labour are the relevant explanatory variables. These include taxes, labour market institutions affecting wage formation mechanism (i.e. the minimum wages relative to the median wage and trade union density). The analysis also takes into account the effect of the unemployment rate which consistent with evidence on its expected influence on wage growth (the Solow model assumes full employment).

The model incorporates a time-invariant country effect α_i. This can be interpreted as the unobservable initial level of efficiency in the economies investigated (Mankiw, Romer and Weil, 1992), or in a broader sense, as the time-invariant component of the combined effect of all country-specific variables that influence economic growth and wage growth. A dummy variable captures the impact of the economic crisis.

The estimations are based on the *xtlsdvc* command of Stata to deal with the bias created by the lagged dependent variable in panel data models (e.g. Judson and Owen, 1999). The consistent Blundell-Bond estimator is used to initialize the numerical bias correction; standard errors are calculated using bootstrapping.

A potential disadvantage of fixed effects estimation of convergence is that it relies on within country variation and dismisses between-country variation of the explanatory variables. This is a weakness in the case of variables that do not vary much over time or which present a typical trend (i.e. human capital stocks), yet most explanatory variables in the growth context are like this. In such cases, there is limited within country variation for the estimation to exploit, to explain a growth process that can be volatile over shorter time horizons. Furthermore, the growth and convergence influence of several potentially policy-relevant variables is subsumed into the country fixed effects. An alternative approach further explored in the analysis consists in estimating country-specific convergence parameters for different groups of countries while imposing common long-run relationships for countries that share similar characteristics of their labour market institutions (so-called pooled mean group estimator).

It is also worth noting that the speed of convergence − one minus the coefficient of lagged real wages − is faster when the effect of unemployment is taken into account. This means that the growth of real wages can be temporarily negatively affected by an increase in unemployment ([130]). The significant value for the crisis dummy confirms that wage convergence slowed down temporarily during the crisis.

Investments in physical capital and productivity growth boost the long-run level of wages in CEE countries. The coefficients of physical capital investment and of total factor productivity growth are strongly significant in each specification (EU28, CEE and EU17). Moreover, both capital investment and productivity growth have a significantly higher impact on long-run wage levels in CEE countries. Total factor productivity is a weak contributor to real wage developments in EU17 countries.

([130]) The estimate in column 5 suggests that real wages decline by 0.3% when the unemployment increase by 1 percentage point. The estimated speed of convergence is downward biased if the effect of unemployment is not taken into account

Box II.2.4: Description of the variables used in the empirical analysis

The estimations in this section rely on the following variables:

- *Dependent variable* ($\Delta ln\ w$). growth in real gross wages expressed in 2010 purchasing power parities (PPP) (calculated based on Ameco);
- *Convergence variable* ($ln\ w_{-1}$). lagged logarithm of real gross wages in 2010 PPS;

Structural growth determinants (Solow variables):

- *Physical capital accumulation* ($ln\ s_k$): the ratio of gross fixed capital formation to real GDP (Ameco);
- *Human capital accumulation* ($ln\ h$): i) the change in the share of tertiary education graduates as a % of the working age population; ii) the change in the share of secondary education graduates as a % of the working age population (calculated based on Eurostat);
- *Population growth:* growth in the working age population, log (n)([1]);
- *Technological progress:* total factor productivity, log (Ameco).

Variables related to trade, openness and economic integration:

- *Openness*: the sum of exports and imports as a % of GDP at current prices (calculated based on Ameco);
- *Terms of trade*: export prices relative to import prices (Ameco);
- *Crude rate of net migration*: expressed per 1000 inhabitants (Eurostat).

Policy-related variables:

- *Tax wedge:* the ratio between the amount of taxes paid by an average single worker (a single person at 100% of average earnings) without children and the corresponding total labour cost for the employer (OECD);
- *Expenditure on education:* as a % of GDP (based on Ameco);
- *Kaitz index:* the ratio of the statutory minimum wage to the median wage (OECD);
- *Trade union density:* union density rate, net union membership as a proportion of wage earners in employment (Visser 2015).

Furthermore, the analysis includes a *time dummy* for the crisis period (2008-2012) and the short term indicator of the *unemployment rate* to control for the effects of the business cycle.

([1]) 15-64 years.

Trade integration contributes to real wage convergence through its impact on capital accumulation and productivity growth. Beyond these influences, further macroeconomic measures of trade integration have a limited additional contribution to the long-run level of real wages. The coefficient of increasing **openness to trade** is not significant in the estimations. Similarly, an increase in the **rate of net migration** does not have an impact on the long-run level and on the speed of the convergence of wages. This is consistent with the mixed theoretical findings on the link between trade integration and wage convergence and with the finding that labour mobility is more likely to have a short term impact on wages. However, improvements in the **terms of trade** have a significant and relatively large positive impact on real wage developments. Positive shocks to terms of trade are not only due to within-EU trends; they also reflect developments vis-à-vis external trading partners of the EU and exchange rate developments, including movements in the EUR/USD exchange rate.

Policy and institutional variables affect the growth of real wages. ([131]) Estimations show that an increase in the **tax wedge** depresses real wage growth; this impact is higher in CEE countries and became even higher after the crisis. The impact of higher **education expenditures** as a % of GDP shows up negative in many specifications, and this is likely due to reverse causality: countries at a higher level of development (and hence with smaller real wage growth and convergence) afford to spend a larger share of their GDP on education. The relative level of **minimum wages** does not

([131]) Country-specific time invariant effects of the institutional variables are captured by the country fixed effects. The additional time variance of the included explanatory variables shows up in the estimated coefficients.

Box II.2.5: **Pooled mean group estimation of real wage convergence and the role of labour market institutions**

Pooled mean group estimation assumes that countries share a common long run relationship, while the speed of short-run adjustment and of convergence towards the balanced growth path can be country-specific. This is a balanced approach, in between the two extremes of assuming slope homogeneity or allowing slopes to vary by country. The assumption of a common long-run relationship between the determinants of real wage growth (and hence, the assumption of a common long-run production function) can be realistic within a group of countries that have increasingly strong trade ties and where technology is also becoming increasingly common. The validity of the restrictions of common long-run coefficients can be tested, and if this assumption holds, the PMG estimator is more efficient than the MG estimator.

The standard growth regression can be reformulated into an error correction form as follows:

$$\Delta \ln w_{i,t} = -\varphi_i\left(lnw_{i,t-1} - \theta_1 lns_{ki,t} - \theta_2 lnh_{i,t} + \theta_3 n_{i,t} - \theta_{0,i}\right) + b_{1,i}\Delta lns_{ki,t} + b_{2,i}\Delta lnh_{i,t} + b_{3,i}\Delta n_{i,t} + \varepsilon_{i,t} \quad (2.2)$$

where subscripts denote country *(i)* and time period *(t)*. This formulation involves a one lag short-run dynamic. In this regression, a common cross-country long run relationship between the main determinants of real wage growth is assumed by restricting the long-run coefficients θ to be the same across countries; φ_i is the country-specific speed of convergence.

influence the long-run level of real wages and the speed of wage convergence. Yet a higher **trade union density** has a small positive impact on the long-run level of real wages in the EU17 countries.

This sub-section allowed for a precise estimation of the speed of wage convergence. This was facilitated by the inclusion of country effects in the analysis, that capture all country-specific influences on the long-run development of real wages, also the unobservable ones. Yet these country effects also capture the combined impact of the characteristics of labour market institutions in each country, weakening the additional individual impact of each policy and institutional explanatory variable included in the estimation. The next sub-section will allow for a closer look at the role of labour market institutions for wage convergence.

2.4.2. Conditional convergence: country-specific speed of convergence and the role of labour market institutions

The main goal of this sub-section is to see the link between labour market institutions and the speed of wage convergence. Similarly to the preceding analysis, a common long-run relationship between real wages and the drivers of productivity (physical and human capital investments and technological change) is assumed. ([132]) However, to allow for estimating the impact of labour market institutions, the assumption of a common average speed of wage convergence across countries is relaxed. ([133]) Convergence in this analysis is country-specific, driven by the short-run shocks to the determinants of productivity. The influence of institutions on convergence can be estimated by grouping countries based on their institutions (e.g. lower and higher level of minimum wages) and comparing whether the averages of the country-specific convergence speeds differ in the country groups.

This analysis also provides evidence of a process of conditional real wage within the EU28 (Table II.2.3)**.** There is evidence of a common underlying relationship between real wages and the determinants of productivity**.** Capital accumulation, the expansion of tertiary education and productivity improvements are all strong drivers of the long-run level of real wages. A percentage point increase in the share of investment over GDP increases real wages in the long-run between 0.2% and 1%. The increase in the share of tertiary graduates by one percentage point would increase real wages by about 2.6%; conversely, a higher share of secondary graduates would depress wage growth. These impacts are larger if the sample is restricted to the CEE

([132]) This is subsequently tested in the empirical analysis.
([133]) The details of the estimation methodology are explained in Box II.2.4.

Table II.2.2: **Conditional convergence, role of labour market institutions**

Dependent variable: Real wages, constant 2010 PPP (log)
Samples: 2000-2017, split by labour market institution characteristics

	Minimum wages, relative level		Trade union density		Collective bargaining coverage	
	Above median	Below median	Above median	Below median	Above median	Below median
Convergence coefficient	-0.100***	-0.271***	-0.293***	-0.085***	-0.251***	-0.265***
	(0.024)	(0.097)	(0.071)	(0.030)	(0.074)	(0.064)
	Long run coefficients					
Gross investment (log)	0.71***	0.21***	0.03	1.19***	0.02	0.13*
	(0.19)	(0.07)	(0.03)	(0.25)	(0.04)	(0.07)
Population growth (log)	-0.16	0.06	0.15***	0.26***	0.08	0.02
	(0.10)	(0.05)	(0.03)	(0.07)	(0.05)	(0.06)
Total factor productivity (log)	-0.36	1.35***	0.92***	0.98***	1.06***	1.74***
	(0.36)	(0.21)	(0.07)	(0.28)	(0.12)	(0.18)
Change in share of tertiary graduates (as % of working population)	1.78***	2.11***	0.21**	4.18***	0.28***	1.40***
	(0.47)	(0.38)	(0.09)	(0.75)	(0.06)	(0.28)
Change in share of secondary graduates (as % of working	-4.15***	-4.41***	-0.04	2.19*		
	(1.27)	(0.75)	(0.15)	(1.16)		
Observations	149	153	219	238	153	153

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

(1) Pooled mean group estimation on country groups split by the level of minimum wages, trade union density and collective bargaining coverage.
Source: European Commission calculations based on Ameco.

countries. ([134]) The speed of convergence varies according to the specifications; estimations taking into account the effect of human capital are likely to show a more precise estimate. ([135])

Table II.2.3: **Conditional convergence, country-specific speed**

Dependent variable: Real wages, constant 2010 PPP
Sample: all EU countries, 2000-2017

	1	2	3	4
Convergence coefficient	-0.250***	-0.069***	-0.049***	-0.068***
	(0.05)	(0.02)	(0.01)	(0.02)
	Long run coefficients			
Gross investment (log)	0.02	0.97***	1.22***	0.91***
	(0.02)	(0.20)	(0.32)	(0.20)
Population growth (log)	0.12***	0.21***	0.11	0.20***
	(0.02)	(0.06)	(0.09)	(0.06)
Total factor productivity (log)	0.99***	1.48***	0.08	1.48***
	(0.05)	(0.25)	(0.35)	(0.25)
Change in share of tertiary graduates (as % of working population)		2.54***		2.72***
		(0.47)		(0.52)
Change in share of secondary graduates (as % of working population)			-10.08***	0.76
			(1.99)	(0.66)
Years to cover half way to full conditional convergence	3	10	14	10
Observations	457	457	457	457

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

(1) Pooled mean group estimation
Source: European Commission calculations based on Ameco

The analysis proceeds to investigate the role of labour market institutions for wage convergence by splitting the EU28 into country groups along three dimensions. ([136]) First, two groups of countries are created: countries with a relatively higher level of minimum wages (as compared to the median wage) and countries with a lower level of minimum wages. ([137]) Second, in a similar way, countries are split into two groups by the relative level of trade union density. ([138]) Third, countries are also divided based on collective bargaining coverage. ([139]) The aim of the analysis is to compare whether the speed of wage convergence is significantly different within the pairs of country groups. Estimations are summarized in Table II.2.2.

([134]) These findings are included in Table II.2.A1.3 in the Appendix.
([135]) According to the estimates, it may take 10 to 14 years to close half of the initial gap between the wage level and its long–run level.
([136]) 2013 information on the characteristics of labour market institutions is used for forming the groups, based on Visser (2015).
([137]) Countries with a statutory minimum wage in 2013 are included; and countries for which information is available on the level of the minimum wage as compared to the median wage (Italy, Germany, Cyprus, Denmark, Sweden and Finland are not included in the sample). Countries with a Kaitz index below the cross-country median value are LV, UK, EE, EL, CZ, PL, ES, SK, RO; those with a Kaitz index above include LU, NL, PT, LT, IE, BE, HU, SI, FR.
([138]) Countries with union density below the median are LV, HU, EE, CZ, LT, PL, FR, DE, ES, PT, SK, BG, RO, NL; countries with union density above include SE, IT, UK, LU, BE, SI, FI, EL, CY, AT, DK, MT, HR, IE.
([139]) Countries with collective bargaining coverage below the cross-country median are LV, HU, SK, UK, RO, CY, CZ, EL, DE; countries with coverage above the median are AT, BE, ES, FI, NL, PT, SI, SE and DK.

Box II.2.6: **Impact of the minimum wage on wage inequality**

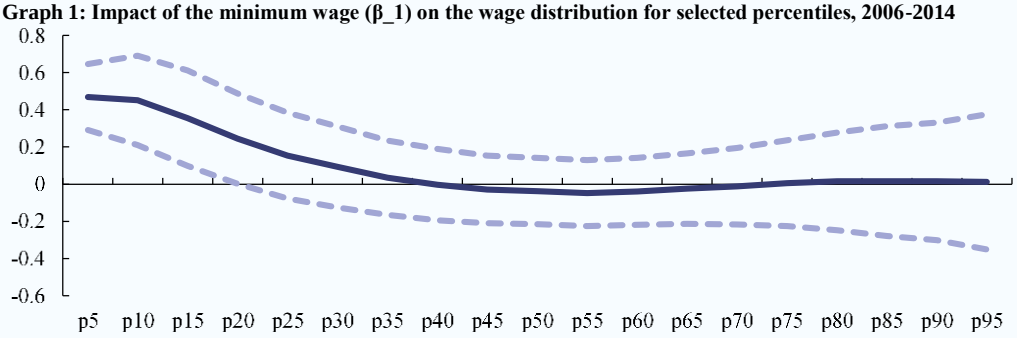
There is an extensive literature analysing the impact of the minimum wage on inequality. However, these studies have mainly exploited the variation in minimum wages across different states in the US (e.g. Lee, 1999; DiNardo et al., 1996; Autor et al., 2016). In general, they find that an increase in the minimum wage extends further up the wage distribution than it would have if the minimum wage had a purely mechanical effect on wages (i.e. when an increase in the minimum wage would only affect those which earned a wage below it). ([1]) It has a compressing effect on the wage distribution and reduces wage inequality. The analysis presented in this box is – to our knowledge – one of the first to analyse the impact of the minimum wage on wage inequality in different EU Member States. ([2])

In order to estimate the impact of the minimum wage on wage inequality, the following model based on Autor et al. (2016) is estimated:

$$w_{ipt} - w_{it}^{med} = \beta_1\left(\left[w_{it}^{min} - w_{it}^{med}\right] * \vartheta_p\right) + \gamma_i + \delta_t + \vartheta_p + \varepsilon_{it}$$

where dependent variable is defined as the log difference of the hourly wage in percentile *p* and the median hourly wage ($w_{ipt} - w_{it}^{med}$) in in country *i* and year *t*. This is a measure for the dispersion of the wage distribution. The independent variable of interest is the log difference of the minimum hourly wage and the median hourly wage ($w_{it}^{min} - w_{it}^{med}$) in country *i* and year *t* interacted with the percentile fixed effect (ϑ_p). The log difference of the minimum wage and the median wage is a measure for the bindingness of the minimum wage and more commonly known as the Kaitz ratio. The interaction with the percentile fixed effect allows estimating the effect of a change in the minimum wage at the different percentiles of the wage distribution. Finally, the equation also includes country (γ_i), year (δ_t) and percentile (ϑ_p) fixed effects.

Graph 1: Impact of the minimum wage (β_1) on the wage distribution for selected percentiles, 2006-2014



Note: The full line represents the value of β_1 for each percentile. The dotted lines represent the 95% confidence intervals.
Source: Commission own calculations based on the Structure of Earnings Survey (2006,2010 and 2014) and Eurostat

([1]) There are several reasons why spill-over effects may occur. First, an increase in the minimum wage may lead to the dismissal of those earning the minimum wage before. This may change the composition of the work force and hence the wage distribution. Second, for those remaining in employment, an increase in the minimum may incentives employers to pay also higher wages for those just above the minimum wage in order to keep wage differentials broadly unchanged to preserve efforts and retain the most productive workers in the firm (Grossman, 1983). Finally, minimum wages also affect individuals' fairness perception, which may also explain spill-over effects (Falk et al., 2006).

([2]) Data on hourly wages are obtained from the three consecutive waves (2006, 2010 and 2014) of the Structure of Earnings Survey. This survey contains detailed microdata on hourly wages for employees in firms with more than ten employees. Data on minimum wages are obtained from Eurostat. The Member States included in the analysis are those which had a minimum wage place in the period 2006 to 2014, namely Belgium, Bulgaria, Croatia, Czech Republic, Estonia, France, Latvia, Lithuania, Luxembourg, Netherlands, Malta, Spain, Poland, Portugal, Slovakia, Slovenia, Sweden and United Kingdom.

(Continued on the next page)

Box (continued)

Graph 1 presents the overall impact of the minimum wage for selected percentiles.([3]) The results indicate that an increase in the minimum wage is expected to lead to a larger increase of the wages at the bottom of the wage distribution. For example, in the 5th percentile an increase of one percentage points in the log difference of the minimum hourly wage and the median hourly wage is expected to lead to an increase of 0.47 percentage points in the log difference of average wage in the 5th percentile and the median hourly wage. This effect decreases to 0.45 percentage points for the 10th percentile, 0.36 percentage points for the 15th percentile and 0.24 percentage points for the 20th percentile. The effect becomes insignificant for higher percentiles. These findings suggest that an increase in the minimum wage has spill-over effects on the rest of the wage distribution and compresses the wage distribution at the bottom. This is likely to reduce wage inequality.

([3]) As a robustness check, a squared term was added to account for non-linear effects that may occur because a change in the minimum wage is likely to have a larger impact on the wage distribution where it is more binding (Autor et al., 2016). This did not change the results significantly.

The level of minimum wages relative to the median wage (the so–called Kaitz index) influences the speed of adjustment and the long-run real wage levels in different directions. Countries with a relatively low Kaitz index experience faster conditional real wage convergence. Yet, the effect of investment on real wages is relatively high in countries where the Kaitz index is high. In the long-term, firms may react to the increase in the minimum wage by increasing capital intensity([140]) – i.e. the capital per per person employed -, which may in turn have a positive impact on productivity and real wages. In contrast, in countries with a relatively low Kaitz index, the effect of total factor productivity (a measure of technological change and the efficiency of the economy) on real wages is larger. Moreover, an increase in minimum wages can push up wages in the lower part of the wage distribution, and support wage convergence for those with low wages (see Box II.2.6).

Countries with a relatively larger trade union density experience faster conditional real wage convergence. Trade unions might support real wage convergence by indirectly improving productivity in the economy through their influence on local working conditions, training and re-training opportunities, their leverage on other labour market institutions (such as unemployment benefits and active labour market policies) and through the role they play in wage coordination (OECD 2018a). The finding in this sub-section is consistent with the preceding analysis, which showed a small but positive and significant relationship between trade union density and the long-run level of real wages in the EU17 countries.

The findings show no clear link between the speed of real wage convergence and collective bargaining coverage (Table II.2.2). Both country groups identified converge fast to their long-run equilibria; the distinction based on collective bargaining coverage does not seem to matter in this respect. Yet collective bargaining arrangements are complex; it is difficult to form homogenous country groups that can reflect all the relevant features of country systems, such as wage coordination, flexibility, degree of centralization, representativeness and extension rules.

2.5. CONCLUSIONS

There is convergence between the levels of the purchasing power of wages in the East and the West. Countries with initially lower wage levels in the EU28 grew faster during the whole time period under investigation (2000-2017). Even within the group of CEE countries, those with a lower initial real wage level exhibited faster real wage growth. The process of catching-up is also reflected in the decreasing dispersion of the real wages distribution in the EU28 and in the CEE.

Convergence slowed down from 2008 to 2011 but resumed thereafter, with strong real wage growth among the CEE countries and weaker real wage growth in the EU17. Stronger wage growth in the EU17 in countries with current account

([140]) Acemoglu and Shimer (1999), Acemoglu (2001) and Kaas and Madden (2008)

surpluses would support the post-crisis recovery and rebalancing, yet it would also slow down wage convergence. In CEE countries, convergence has been driven mainly driven by the change in wages for different socio-economic groups and not by the changing composition of the labour force in the CEE and EU17 countries.

Real wage growth was highest in the countries with the highest productivity growth. Also, real wage growth was higher in countries with higher GDP per capita growth. The growth of productivity and of real wages has been closely aligned in most CEE countries in 2000-2017.

The close alignment of productivity and real wages in CEE is also reflected in the wage share developments. During the process of transition, the wage shares of CEE countries have converged but they remain quite heterogenous. Wage shares increased recently in countries that experienced fast real wage growth.

Estimates of the speed of (conditional) real wage convergence vary between 3.1% and 10% in the EU28 over the period 2000-2017. The 3.1% speed of convergence implies that half of the initial wage gaps within the EU28 can be closed in approximately 22 years; the 10% implies a convergence that is more than three times as fast. The crisis temporarily slowed down the convergence of real wages within the EU. Increases in unemployment have a temporary negative effect on real wage growth. A higher tax wedge decreases the long-run level of real wages.

As real wage convergence is conditional rather than absolute, policies can play a prominent role in promoting it. Raising productivity through structural reforms and investment in human capital is the most sustainable way to support wage convergence. Investments in human capital and R&D are key in this respect. Reforms can make labour markets more adaptable, allow for smooth transitions between jobs and support employment reallocation. This can have positive effects on job creation, productivity and wages and create a favourable environment for investment in skills. These reforms can increase productivity and wages in the long run.

Countries with a relatively larger trade union density experience faster conditional real wage convergence. Also, a higher trade union density has a small positive impact on the long-run level of real wages in the EU17 countries. Trade unions may function in ways that exerts an indirect positive influence on productivity, through improving local working conditions, access to training and re-training, and through their leverage on other labour market institutions and their role in wage coordination.

The level of minimum wages relative to the median wage influences wage convergence and the long-run level of real wages in a complex way. Countries with lower minimum wages experience a faster convergence of their real wages towards to the long run level of wages in their own country, along with a strong contribution of total factor productivity to real wage growth. Countries with higher minimum wages experience a slower conditional real wage convergence, while they may also experience an increase in their long-run real wage level due to increases in capital intensity as firms react to higher minimum wages by additional investments into physical capital. Moreover, minimum wages can push up the lower part of the wage distribution and support wage convergence for those with lower wages.

While higher trade union density matters, no clear link is apparent between the speed of real wage convergence and collective bargaining coverage. This can be due to the difficulty to capture the complexity of collective bargaining arrangements by simple variables in regressions. The methods in this chapter are not suited to address all the details of collective bargaining that may matter for wage outcomes.

APPENDIX 1

Graph II.2.A1.1: **GDP and wages in the European Union in 2017**

Country	Official status	Population (2017, millions)	GDP at current market prices per head of population (2017, EUR)	Real GDP per capita (2017, as a percentage of the EU28 average)	Gross wages per capita (2017, PPS)	Gross wages as % of the EU average (2017, PPS)
Euro area MS						
Austria	Member since 1995; using the euro since 1999	8,8	41969	140%	34283	121%
Belgium	Member since 1958; using the euro since 1999	11,3	38640	129%	36136	127%
Cyprus	Member since 2004; using the euro since 2008	0,9	22360	75%	22112	78%
Estonia	Member since 2004; using the euro since 2011	1,3	17484	58%	18973	67%
Finland	Member since 1995; using the euro since 1999	5,5	40568	135%	31037	109%
France	Member since 1958; using the euro since 1999	67,1	34079	114%	31668	112%
Germany	Member since 1958; using the euro since 1999	82,7	39454	132%	31859	112%
Greece	Member since 1981; using the euro since 2001	10,7	16576	55%	19600	69%
Ireland	Member since 1973; using the euro since 1999	4,8	61669	206%	37676	133%
Italy	Member since 1958; using the euro since 1999	60,5	28359	95%	26716	94%
Latvia	Member since 2004; using the euro since 2014	1,9	13855	46%	19362	68%
Lithuania	Member since 2004; using the euro since 2015	2,8	14831	50%	19014	67%
Luxembourg	Member since 1958; using the euro since 1999	0,6	92763	310%	47956	169%
Malta	Member since 2004; using the euro since 2008	0,5	23850	80%	26462	93%
Netherlands	Member since 1958; using the euro since 1999	17,1	42808	143%	32641	115%
Portugal	Member since 1986; using the euro since 1999	10,3	18737	63%	20352	72%
Slovakia	Member since 2004; using the euro since 2009	5,4	15627	52%	18897	67%
Slovenia	Member since 2004; using the euro since 2007	2,1	20951	70%	27456	97%
Spain	Member since 1986; using the euro since 1999	46,5	24999	83%	28455	100%
Non-euro area MS						
Bulgaria	Member since 2007	7,1	7099	24%	14858	52%
Croatia	Member since 2013	4,1	11750	39%	20570	73%
Czech Republic	Member since 2004	10,6	18135	61%	19530	69%
Denmark	Member since 1973	5,8	50004	167%	37093	131%
Hungary	Member since 2004	9,8	12622	42%	17743	63%
Poland	Member since 2004	38,4	12118	40%	19840	70%
Romania	Member since 2007	19,6	9564	32%	16481	58%
Sweden	Member since 1995	10,1	47437	158%	29974	106%
United Kingdom	Member since 1973	66,0	35189	117%	31601	111%

Source: Ameco

Table II.2.A1.1: **Conditional real wage convergence: CEE 2000-2017**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Lagged real wages	0.976***	0.943***	0.942***	0.943***	0.930***	0.947***	0.931***	0.947***	0.946***	0.933***	0.862***	0.897***	0.945***
	(0.016)	(0.018)	(0.019)	(0.019)	(0.023)	(0.025)	(0.019)	(0.020)	(0.018)	(0.025)	(0.027)	(0.122)	(0.024)
Crisis dummy	-0.03***	-0.03***	-0.03***	-0.03***	-0.03***	-0.04***	-0.03***	-0.03***	-0.03***	-0.03***	-0.03***	-0.01	-0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Gross investment (log)		0.09***	0.09***	0.09***	0.09***	0.14***	0.06***	0.09***	0.09***	0.09***	0.11***	0.15**	0.13***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.07)	(0.02)
Population growth (log)		0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.04**	0.00	0.00
		(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.08)	(0.00)
Total factor productivity (log)		0.16***	0.16***	0.16***	0.16***	0.22***	0.08	0.18***	0.17***	0.18***	0.24***	0.14	0.21***
		(0.05)	(0.05)	(0.05)	(0.06)	(0.05)	(0.05)	(0.06)	(0.05)	(0.05)	(0.06)	(0.13)	(0.07)
Change in share of secondary graduates (as % of working population)			-0.06										
			(0.24)										
Change in share of tertiary graduates (as % of working population)				0.01									
				(0.24)									
Expenditure on education (as % of GDP)					-1.75**								
					(0.88)								
Tax wedge						-0.11**							-0.10
						(0.05)							(0.06)
Unemployment rate							0.00***						0.00
							-0.00117						(0.00)
Openness								0.00					
								(0.00)					
Net migration rate									0.00				
									(0.00)				
Terms of trade										0.00			
										(0.09)			
Kaitz indicator											0.07		
											(0.13)		
Union density												0.00	
												(0.00)	
Country fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	185	185	185	185	173	157	185	185	185	185	140	98	157
Cross-sectional size	11	11	11	11	11	11	11	11	11	11	9	11	11

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: European Commission calculations based on Ameco, Eurostat, OECD and Visser (2015).

Table II.2.A1.2: **Conditional real wage convergence: EU17 2000-2017**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Lagged real wages	0.988***	0.947***	0.946***	0.947***	0.948***	0.958***	0.952***	0.940***	0.935***	0.950***	0.968***	0.961***	1.001***
	(0.022)	(0.023)	(0.023)	(0.023)	(0.026)	(0.025)	(0.022)	(0.024)	(0.022)	(0.024)	(0.039)	(0.035)	(0.035)
Crisis dummy	-0.07**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Gross investment (log)		0.06***	0.06***	0.06***	0.06***	0.06***	0.03*	0.06***	0.05***	0.06***	0.08***	0.08***	0.07***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)
Population growth (log)		-0.01	-0.02	-0.01	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.04	-0.01	-0.02
		(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Total factor productivity (log)		0.03	0.02	0.03	0.04	0.02	0.02	0.02	0.04	0.04	-0.02	0.04	0.05
		(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.04)	(0.06)	(0.06)	(0.07)
Change in share of secondary graduates (as % of working population)			-0.0947										
			(0.08)										
Change in share of tertiary graduates (as % of working population)				-0.10									
				(0.10)									
Expenditure on education (as % of GDP)					0.12								
					(0.48)								
Tax wedge						-0.0331*							-0.07***
						(0.02)							(0.02)
Unemployment rate							-0.00165***						
							(0.00)						
Openness								0.00					
								(0.00)					
Net migration rate									0.00				
									(0.00)				
Terms of trade										0.10**			0.132*
										(0.05)			(0.07)
Kaitz indicator											0.06		
											(0.08)		
Union density												0.00**	0.00
												(0.00)	(0.00)
Country fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	289	272	272	272	256	254	272	272	272	272	146	196	182
Cross-sectional size	17	16	16	16	16	16	16	16	16	16	10	16	16

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: European Commission calculations based on Ameco, Eurostat, OECD and Visser (2015).

Table II.2.A1.3: **Conditional real wage convergence: the role of labour market institutions**

Dependent variable: Real wages, constant 2010 PPP
Sample: CEE, 2000-2017

	1	2	3	4
Convergence coefficient	-0.056***	-0.109***	-0.093***	-0.123***
	(0.017)	(0.025)	(0.018)	(0.030)
	Long run coefficients			
Gross investment (log)	1.45**	1.42***	1.40**	1.40***
	(0.66)	(0.29)	(0.40)	(0.25)
Population growth (log)	0.38**	0.39***	0.118	0.28***
	(0.17)	(0.09)	(0.10)	(0.08)
Total factor productivity (log)	3.20***	1.06***	0.510	1.37***
	(0.61)	(0.28)	(0.39)	(0.34)
Change in share of tertiary graduates (as % of working population)		3.26***		1,421
		(0.64)		(0.87)
Change in share of secondary graduates (as % of working population)			-9.83***	-5.33***
			-2.354	-1.964
Years to cover half way to full conditional convergence	12	6	7	5
Observations	185	185	185	185

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

(1) Pooled mean group estimation
Source: European Commission calculations based on Ameco, OECD, Eurostat and Visser (2015).

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Statistical annex

APPENDIX 1
Statistical annex

Belgium	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	11125	11180	11238	11295	11348	0.5 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	7257	7266	7281	7290	7266	-0.3 %
(% of total population)	65.2	65.0	64.8	64.5	64.0	-0.5 pps
3 - **Labour force** (15-64, 1000 pers.)	4901	4920	4921	4929	4940	0.2 %
Male	2651	2644	2640	2649	2652	0.1 %
Female	2250	2277	2281	2281	2289	0.4 %
4 - **Activity rate** (% of population 15-64)	67.5	67.7	67.6	67.6	68.0	0.4 pps
Young (15-24)	31.0	30.2	30.0	28.5	28.1	-0.4 pps
Prime age (25-54)	85.3	85.6	85.1	85.1	84.8	-0.3 pps
Older (55-64)	44.1	45.1	46.6	48.1	51.3	3.1 pps
Nationals (15-64)	68.0	68.1	68.0	68.0	68.3	0.4 pps
Non-nationals (15-64)	63.7	65.0	64.8	65.0	65.7	0.7 pps
Male	72.7	72.4	72.2	72.3	72.8	0.4 pps
Young (15-24)	33.7	32.3	32.8	30.7	30.6	-0.1 pps
Prime age (25-54)	90.8	90.7	89.9	90.4	90.0	-0.3 pps
Older (55-64)	50.5	51.3	52.2	53.6	56.9	3.2 pps
Female	62.3	63.0	63.0	62.9	63.2	0.3 pps
Young (15-24)	28.2	28.1	27.1	26.1	25.4	-0.7 pps
Prime age (25-54)	79.7	80.6	80.2	79.8	79.6	-0.3 pps
Older (55-64)	37.8	39.0	41.2	42.8	45.8	3.0 pps
5 - **Employment rate** (% of population 15-64)	61.8	61.9	61.8	62.3	63.1	0.8 pps
Young (15-24)	23.6	23.2	23.4	22.7	22.7	-0.1 pps
Prime age (25-54)	79.0	79.1	78.5	79.1	79.5	0.5 pps
Older (55-64)	41.7	42.6	44.0	45.4	48.3	2.8 pps
Low-skilled (15-64)	37.5	37.3	36.0	36.0	35.5	-0.4 pps
Medium-skilled (15-64)	65.3	63.8	64.0	64.4	65.1	0.7 pps
High-skilled (15-64)	81.0	82.0	81.8	82.2	82.2	0.0 pps
Nationals (15-64)	62.9	62.9	62.8	63.3	64.1	0.8 pps
Non-nationals (15-64)	52.5	53.7	54.6	55.1	56.5	1.4 pps
Male	66.4	65.8	65.5	66.5	67.5	1.1 pps
Young (15-24)	25.3	24.5	25.0	24.0	24.4	0.4 pps
Prime age (25-54)	84.0	83.2	82.5	83.8	84.4	0.6 pps
Older (55-64)	47.7	48.5	48.9	50.7	53.8	3.1 pps
Female	57.2	57.9	58.0	58.1	58.7	0.6 pps
Young (15-24)	21.9	21.8	21.7	21.4	20.9	-0.5 pps
Prime age (25-54)	74.0	75.0	74.5	74.3	74.6	0.3 pps
Older (55-64)	35.8	37.0	39.3	40.2	42.8	2.6 pps
6 - **Employed persons** (15-64, 1000 pers.)	4484.5	4497.3	4499.3	4540.6	4587.2	1.0 %
7 - **Employment growth** (%, National accounts)	-0.3	0.4	0.9	1.3	1.4	0.1 pps
Employment growth (%, 15-64, LFS)	0.1	0.3	0.0	0.9	1.0	0.1 pps
Male	-0.6	-0.7	-0.2	1.5	1.2	-0.4 pps
Female	0.9	1.5	0.4	0.2	0.9	0.6 pps
8 - **Self employed** (15-64, % of total employment)	13.7	13.2	13.8	13.5	13.1	-0.5 pps
Male	17.8	16.8	17.5	17.3	16.3	-1.0 pps
Female	9.0	9.1	9.5	9.2	9.3	0.1 pps
9 - **Temporary employment** (15-64, % of total employment)	8.1	8.6	9.0	9.1	10.4	1.3 pps
Male	7.2	7.6	8.3	8.3	9.7	1.4 pps
Female	9.1	9.7	9.7	10.0	11.2	1.2 pps
10 - **Part-time** (15-64, % of total employment)	24.3	23.7	24.3	24.7	24.5	-0.2 pps
Male	8.7	8.4	9.3	9.5	10.2	0.7 pps
Female	42.5	41.2	41.4	42.1	41.2	-0.9 pps
11 - **Unemployment rate** (harmonised:15-74)	8.4	8.5	8.5	7.8	7.1	-0.7 pps
Young (15-24)	23.7	23.2	22.1	20.1	19.3	-0.8 pps
Prime age (25-49)	7.4	7.6	7.7	7.1	6.2	-0.9 pps
Older (55-64)	5.4	5.4	5.6	5.7	5.9	0.2 pps
Low-skilled (15-64)	16.0	16.4	17.0	16.1	14.8	-1.3 pps
Medium-skilled (15-64)	8.3	8.8	8.7	8.1	7.2	-0.9 pps
High-skilled (15-64)	4.9	4.7	4.6	4.2	4.3	0.1 pps
Nationals (15-64)	7.4	7.5	7.6	7.0	6.2	-0.8 pps
Non-nationals (15-64)	17.7	17.3	15.8	15.2	14.0	-1.2 pps
Male	8.7	9.0	9.1	8.1	7.1	-1.0 pps
Female	8.2	7.9	7.8	7.6	7.1	-0.5 pps
12 - **Long-term unemployment** (% of total unemployment)	46.1	49.9	51.7	51.6	49.9	-1.7 pps
13 - **Worked hours** (full-time, average actual weekly hours)	41.3	41.1	41.3	41.3	40.3	-2.4 %
Male	42.3	42.0	42.3	42.2	41.1	-2.6 %
Female	39.2	39.3	39.3	39.5	38.7	-2.0 %
14 - **Sectoral employment growth** (% change)						
Agriculture	-1.6	-0.3	1.0	-0.5	-1.2	-0.7 pps
Building and construction	-1.3	-1.5	-0.5	0.6	1.2	0.6 pps
Services	-0.2	1.0	1.8	1.6	1.9	0.2 pps
Manufacturing industry	-2.3	-2.6	-2.2	0.1	0.4	0.3 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	2.6	0.9	0.0	0.1	1.9	1.8 pps
Real compensation per employee based on GDP	0.0	-0.2	-0.3	1.2	1.5	0.3 pps
Labour cost index (compens. of employees plus taxes minus subs.)	1.9	0.9	0.1	0.1	1.2	1.1 pps
Labour cost index (wages and salaries, total)	1.9	0.9	0.1	0.5	1.9	1.4 pps
Labour productivity (GDP/person employed)	0.5	0.9	0.5	0.2	0.3	0.1 pps

Bulgaria	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	7265	7224	7178	7128	7104	-0.3 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	4859	4796	4727	4659	4595	-1.4 %
(% of total population)	66.9	66.4	65.8	65.4	64.7	-0.7 pps
3 - **Labour force** (15-64, 1000 pers.)	3323	3309	3276	3200	3278	2.4 %
Male	1766	1763	1744	1710	1751	2.4 %
Female	1557	1546	1532	1490	1526	2.5 %
4 - **Activity rate** (% of population 15-64)	68.4	69.0	69.3	68.7	71.3	2.6 pps
Young (15-24)	29.6	27.2	26.0	23.9	26.3	2.4 pps
Prime age (25-54)	83.1	83.3	83.2	82.0	84.3	2.3 pps
Older (55-64)	54.1	56.6	58.0	58.8	61.8	3.0 pps
Nationals (15-64)	68.4	69.0	69.3	68.7	71.4	2.7 pps
Non-nationals (15-64)	60.9	54.2	48.9	58.9	56.8	-2.1 pps
Male	72.2	72.9	73.2	72.7	75.4	2.7 pps
Young (15-24)	34.3	31.5	30.5	28.0	30.5	2.5 pps
Prime age (25-54)	85.7	86.2	86.4	85.7	88.0	2.3 pps
Older (55-64)	59.9	62.5	62.7	63.4	66.8	3.4 pps
Female	64.5	65.0	65.4	64.6	67.1	2.6 pps
Young (15-24)	24.7	22.6	21.2	19.6	21.8	2.3 pps
Prime age (25-54)	80.3	80.2	79.8	78.2	80.5	2.3 pps
Older (55-64)	49.0	51.4	53.8	54.6	57.3	2.6 pps
5 - **Employment rate** (% of population 15-64)	59.5	61.0	62.9	63.4	66.9	3.5 pps
Young (15-24)	21.2	20.7	20.3	19.8	22.9	3.1 pps
Prime age (25-54)	73.3	74.5	76.1	76.2	79.4	3.2 pps
Older (55-64)	47.4	50.0	53.0	54.5	58.2	3.7 pps
Low-skilled (15-64)	27.8	29.7	29.6	29.6	33.4	3.8 pps
Medium-skilled (15-64)	63.6	65.2	67.2	67.8	71.7	3.9 pps
High-skilled (15-64)	80.7	81.7	84.0	84.2	85.5	1.3 pps
Nationals (15-64)	59.5	61.1	62.9	63.4	66.9	3.5 pps
Non-nationals (15-64)	51.7	52.1	45.5	53.3	52.3	-1.0 pps
Male	62.1	63.9	65.9	66.7	70.6	3.9 pps
Young (15-24)	24.0	24.0	24.0	23.1	26.5	3.4 pps
Prime age (25-54)	75.0	76.4	78.5	79.2	82.8	3.6 pps
Older (55-64)	51.9	54.5	56.8	58.3	62.5	4.2 pps
Female	56.8	58.2	59.8	60.0	63.1	3.1 pps
Young (15-24)	18.4	17.3	16.5	16.3	19.1	2.9 pps
Prime age (25-54)	71.5	72.5	73.6	73.0	75.8	2.8 pps
Older (55-64)	43.4	46.0	49.5	51.0	54.3	3.2 pps
6 - **Employed persons** (15-64, 1000 pers.)	2889.4	2927.4	2973.5	2954.3	3073.4	4.0 %
7 - **Employment growth** (%, National accounts)	-0.4	0.4	0.4	0.5	1.8	1.3 pps
Employment growth (%, 15-64, LFS)	-0.2	1.3	1.6	-0.6	4.0	4.7 pps
Male	0.1	1.7	1.8	-0.2	4.4	4.6 pps
Female	-0.5	0.9	1.3	-1.2	3.6	4.8 pps
8 - **Self employed** (15-64, % of total employment)	11.2	11.5	11.1	10.8	10.8	-0.1 pps
Male	14.2	14.6	14.1	13.5	13.5	0.0 pps
Female	8.0	8.1	7.7	7.8	7.6	-0.2 pps
9 - **Temporary employment** (15-64, % of total employment)	5.6	5.3	4.4	4.1	4.4	0.3 pps
Male	6.1	5.6	4.7	4.5	4.9	0.4 pps
Female	5.1	4.9	4.1	3.6	3.9	0.3 pps
10 - **Part-time** (15-64, % of total employment)	2.5	2.5	2.2	2.0	2.2	0.2 pps
Male	2.0	2.2	1.9	1.8	2.0	0.2 pps
Female	3.0	2.8	2.5	2.2	2.4	0.2 pps
11 - **Unemployment rate** (harmonised:15-74)	13.0	11.4	9.2	7.6	6.2	-1.4 pps
Young (15-24)	28.4	23.8	21.6	17.2	12.9	-4.3 pps
Prime age (25-49)	11.8	10.5	8.5	7.1	5.9	-1.2 pps
Older (55-64)	12.4	11.7	8.7	7.3	5.9	-1.4 pps
Low-skilled (15-64)	30.3	28.6	25.5	22.5	18.3	-4.2 pps
Medium-skilled (15-64)	12.4	10.7	8.4	6.8	5.3	-1.5 pps
High-skilled (15-64)	6.4	5.2	4.0	3.4	3.1	-0.3 pps
Nationals (15-64)	13.0	11.5	9.2	7.7	6.2	-1.5 pps
Non-nationals (15-64)	0.0	0.0	0.0	0.0	0.0	0.0 pps
Male	13.9	12.3	9.8	8.1	6.4	-1.7 pps
Female	11.8	10.4	8.4	7.0	6.0	-1.0 pps
12 - **Long-term unemployment** (% of total unemployment)	57.3	60.3	61.1	58.9	54.9	-4.0 pps
13 - **Worked hours** (full-time, average actual weekly hours)	40.4	40.5	40.5	40.6	40.4	-0.5 %
Male	40.6	40.7	40.8	40.8	40.6	-0.5 %
Female	40.2	40.2	40.2	40.3	40.1	-0.5 %
14 - **Sectoral employment growth** (% change)						
Agriculture	1.2	1.6	-2.6	-3.7	6.4	10.1 pps
Building and construction	-3.5	-0.8	2.5	-3.9	0.1	4.0 pps
Services	0.1	0.0	1.0	3.0	0.6	-2.4 pps
Manufacturing industry	-3.2	0.5	2.3	1.3	1.1	-0.2 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	8.8	5.6	5.6	5.8	7.5	1.7 pps
Real compensation per employee based on GDP	1.8	0.5	2.6	-0.4	1.5	1.9 pps
Labour cost index (compens. of employees plus taxes minus subs.)	4.8	6.6	7.3	6.4	12.4	6.0 pps
Labour cost index (wages and salaries, total)	4.8	6.3	7.6	6.4	12.3	5.9 pps
Labour productivity (GDP/person employed)	1.3	1.0	3.3	3.4	1.7	-1.7 pps

Czech Republic	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	10511	10525	10543	10565	10590	0.2 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	7154	7081	7026	6968	6917	-0.7 %
(% of total population)	68.1	67.3	66.6	66.0	65.3	-0.6 pps
3 - **Labour force** (15-64, 1000 pers.)	5213	5206	5201	5226	5248	0.4 %
Male	2917	2914	2900	2906	2912	0.2 %
Female	2297	2292	2301	2321	2336	0.7 %
4 - **Activity rate** (% of population 15-64)	72.9	73.5	74.0	75.0	75.9	0.9 pps
Young (15-24)	31.6	32.2	32.5	32.0	31.7	-0.3 pps
Prime age (25-54)	89.1	88.8	88.6	88.9	89.1	0.2 pps
Older (55-64)	54.8	56.8	58.0	60.8	63.6	2.8 pps
Nationals (15-64)	72.7	73.4	73.9	74.9	75.7	0.9 pps
Non-nationals (15-64)	81.0	78.8	78.0	82.6	82.0	-0.6 pps
Male	80.5	81.2	81.4	82.2	82.9	0.7 pps
Young (15-24)	36.8	38.1	37.4	37.5	36.5	-1.0 pps
Prime age (25-54)	95.8	95.6	95.4	95.4	95.7	0.3 pps
Older (55-64)	66.1	67.9	68.3	70.9	73.2	2.2 pps
Female	65.1	65.6	66.5	67.6	68.7	1.0 pps
Young (15-24)	26.1	26.1	27.4	26.2	26.6	0.4 pps
Prime age (25-54)	81.9	81.6	81.4	82.1	82.1	0.1 pps
Older (55-64)	44.2	46.3	48.3	51.2	54.5	3.3 pps
5 - **Employment rate** (% of population 15-64)	67.7	69.0	70.2	72.0	73.6	1.7 pps
Young (15-24)	25.6	27.1	28.4	28.6	29.1	0.5 pps
Prime age (25-54)	83.5	83.8	84.5	85.7	86.7	1.0 pps
Older (55-64)	51.6	54.0	55.5	58.5	62.1	3.6 pps
Low-skilled (15-64)	22.0	22.9	22.3	23.7	26.1	2.4 pps
Medium-skilled (15-64)	72.4	73.6	75.4	77.4	78.9	1.5 pps
High-skilled (15-64)	82.5	82.2	82.6	83.4	84.2	0.8 pps
Nationals (15-64)	67.6	68.9	70.1	71.8	73.5	1.7 pps
Non-nationals (15-64)	75.3	74.1	74.4	79.3	79.8	0.5 pps
Male	75.7	77.0	77.9	79.3	80.9	1.6 pps
Young (15-24)	29.9	32.3	33.1	33.8	33.8	0.0 pps
Prime age (25-54)	91.2	91.5	91.9	92.7	93.7	1.0 pps
Older (55-64)	62.5	64.8	65.5	68.2	71.7	3.4 pps
Female	59.6	60.7	62.4	64.4	66.2	1.7 pps
Young (15-24)	21.0	21.6	23.4	23.2	24.3	1.0 pps
Prime age (25-54)	75.5	75.7	76.7	78.4	79.3	0.9 pps
Older (55-64)	41.4	43.8	45.9	49.3	53.0	3.7 pps
6 - **Employed persons** (15-64, 1000 pers.)	4845.9	4883.5	4934.3	5015.9	5093.9	1.6 %
7 - **Employment growth** (%, National accounts)	0.3	0.6	1.4	1.6	1.6	0.0 pps
Employment growth (%, 15-64, LFS)	0.7	0.8	1.0	1.7	1.6	-0.1 pps
Male	0.4	0.8	0.4	1.1	1.3	0.2 pps
Female	1.2	0.8	1.8	2.4	1.8	-0.5 pps
8 - **Self employed** (15-64, % of total employment)	16.5	17.0	16.3	16.2	16.1	0.0 pps
Male	20.3	21.3	20.2	19.5	19.8	0.2 pps
Female	11.6	11.5	11.4	11.9	11.6	-0.4 pps
9 - **Temporary employment** (15-64, % of total employment)	9.1	9.7	10.0	9.7	9.6	-0.1 pps
Male	7.6	8.4	8.4	8.1	7.8	-0.3 pps
Female	10.9	11.3	11.9	11.6	11.7	0.1 pps
10 - **Part-time** (15-64, % of total employment)	5.8	5.5	5.3	5.7	6.2	0.5 pps
Male	2.5	2.5	2.2	2.3	2.4	0.1 pps
Female	10.0	9.5	9.3	10.0	10.9	0.9 pps
11 - **Unemployment rate** (harmonised:15-74)	7.0	6.1	5.1	4.0	2.9	-1.1 pps
Young (15-24)	19.0	15.9	12.6	10.5	7.9	-2.6 pps
Prime age (25-49)	6.2	5.6	4.6	3.5	2.7	-0.8 pps
Older (55-64)	5.8	4.9	4.4	3.8	2.4	-1.4 pps
Low-skilled (15-64)	26.0	22.4	23.1	20.9	13.3	-7.6 pps
Medium-skilled (15-64)	6.9	6.1	4.8	3.6	2.7	-0.9 pps
High-skilled (15-64)	2.8	2.9	2.4	1.9	1.5	-0.4 pps
Nationals (15-64)	7.0	6.2	5.1	4.0	2.9	-1.1 pps
Non-nationals (15-64)	7.2	6.1	4.5	4.1	2.6	-1.5 pps
Male	5.9	5.1	4.2	3.4	2.3	-1.1 pps
Female	8.3	7.4	6.1	4.7	3.6	-1.1 pps
12 - **Long-term unemployment** (% of total unemployment)	43.4	43.6	47.4	42.1	35.0	-7.1 pps
13 - **Worked hours** (full-time, average actual weekly hours)	40.6	40.4	40.2	40.5	40.3	-0.5 %
Male	41.6	41.4	41.2	41.5	41.3	-0.5 %
Female	39.1	38.9	38.7	39.2	38.8	-1.0 %
14 - **Sectoral employment growth** (% change)						
Agriculture	1.0	-0.9	-1.4	-1.4	0.9	2.3 pps
Building and construction	-2.4	-4.6	-0.5	-1.7	-0.1	1.6 pps
Services	0.8	0.6	1.0	1.4	1.3	-0.1 pps
Manufacturing industry	-0.2	1.3	3.5	2.7	1.3	-1.4 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	-0.3	2.6	3.0	4.0	6.4	2.4 pps
Real compensation per employee based on GDP	6.5	3.9	3.8	5.2	2.5	-2.7 pps
Labour cost index (compens. of employees plus taxes minus subs.)	0.2	2.5	4.0	3.8	6.8	3.0 pps
Labour cost index (wages and salaries, total)	-0.3	2.7	4.1	3.8	6.8	3.0 pps
Labour productivity (GDP/person employed)	-0.8	2.2	3.8	0.8	2.7	1.9 pps

Denmark	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	5613	5643	5682	5729	5767	0.7 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	3615	3626	3644	3669	3684	0.4 %
(% of total population)	64.4	64.3	64.1	64.0	63.9	-0.2 pps
3 - **Labour force** (15-64, 1000 pers.)	2824	2831	2859	2934	2905	-1.0 %
Male	1467	1482	1500	1532	1517	-0.9 %
Female	1357	1350	1359	1402	1387	-1.1 %
4 - **Activity rate** (% of population 15-64)	78.1	78.1	78.5	80.0	78.8	-1.1 pps
Young (15-24)	61.7	61.5	62.1	66.2	63.3	-2.9 pps
Prime age (25-54)	87.5	87.1	87.1	87.4	86.2	-1.2 pps
Older (55-64)	65.0	66.4	67.6	70.6	71.6	1.0 pps
Nationals (15-64)	78.8	78.6	79.1	80.3	79.4	-0.8 pps
Non-nationals (15-64)	71.7	73.2	73.0	77.2	74.1	-3.1 pps
Male	80.6	81.1	81.6	82.6	81.5	-1.1 pps
Young (15-24)	61.0	61.0	61.7	65.0	62.4	-2.6 pps
Prime age (25-54)	90.2	90.3	90.8	90.8	89.6	-1.2 pps
Older (55-64)	70.2	72.6	72.8	74.9	75.6	0.7 pps
Female	75.6	75.0	75.3	77.2	76.1	-1.1 pps
Young (15-24)	62.4	62.0	62.5	67.4	64.1	-3.3 pps
Prime age (25-54)	84.8	83.8	83.4	83.8	82.7	-1.2 pps
Older (55-64)	59.9	60.3	62.6	66.4	67.6	1.3 pps
5 - **Employment rate** (% of population 15-64)	72.5	72.8	73.5	74.9	74.2	-0.7 pps
Young (15-24)	53.7	53.7	55.4	58.2	56.3	-1.9 pps
Prime age (25-54)	82.0	82.0	82.1	82.5	81.7	-0.8 pps
Older (55-64)	61.7	63.2	64.7	67.8	68.9	1.2 pps
Low-skilled (15-64)	54.3	54.2	54.3	57.8	55.6	-2.2 pps
Medium-skilled (15-64)	77.2	77.1	78.2	78.9	78.7	-0.2 pps
High-skilled (15-64)	86.1	85.5	85.6	85.6	85.4	-0.2 pps
Nationals (15-64)	73.5	73.8	74.7	75.8	75.2	-0.6 pps
Non-nationals (15-64)	62.5	63.3	63.6	67.0	66.0	-1.0 pps
Male	75.0	75.8	76.6	77.7	76.9	-0.8 pps
Young (15-24)	52.3	52.7	54.6	56.5	55.3	-1.2 pps
Prime age (25-54)	85.0	85.5	85.9	86.4	85.2	-1.3 pps
Older (55-64)	66.5	68.9	69.8	72.0	72.7	0.8 pps
Female	70.0	69.8	70.4	72.0	71.5	-0.5 pps
Young (15-24)	55.0	54.9	56.2	60.0	57.2	-2.8 pps
Prime age (25-54)	79.0	78.4	78.3	78.5	78.1	-0.4 pps
Older (55-64)	56.8	57.6	59.6	63.6	65.2	1.6 pps
6 - **Employed persons** (15-64, 1000 pers.)	2622.1	2640.1	2678.3	2747.7	2734.0	-0.5 %
7 - **Employment growth** (%, National accounts)	0.0	0.9	1.4	1.6	1.6	0.0 pps
Employment growth (%, 15-64, LFS)	0.0	0.7	1.4	2.6	-0.5	-3.1 pps
Male	-0.2	1.4	1.7	2.3	-0.7	-3.0 pps
Female	0.2	-0.1	1.1	2.9	-0.3	-3.2 pps
8 - **Self employed** (15-64, % of total employment)	8.2	8.0	7.8	7.7	7.3	-0.3 pps
Male	11.1	10.8	10.5	10.2	9.8	-0.4 pps
Female	5.0	4.9	4.8	4.9	4.6	-0.3 pps
9 - **Temporary employment** (15-64, % of total employment)	8.8	8.6	8.7	13.5	12.9	-0.6 pps
Male	8.1	8.2	7.9	12.0	11.9	-0.1 pps
Female	9.5	9.0	9.4	15.1	13.9	-1.2 pps
10 - **Part-time** (15-64, % of total employment)	24.7	24.6	24.7	26.4	25.3	-1.1 pps
Male	14.8	15.2	15.6	16.8	16.2	-0.6 pps
Female	35.3	35.0	34.7	36.9	35.3	-1.6 pps
11 - **Unemployment rate** (harmonised:15-74)	7.0	6.6	6.2	6.2	5.7	-0.5 pps
Young (15-24)	13.1	12.6	10.8	12.0	11.0	-1.0 pps
Prime age (25-49)	6.3	5.9	5.7	5.5	5.2	-0.3 pps
Older (55-64)	5.1	4.8	4.4	4.0	3.7	-0.3 pps
Low-skilled (15-64)	11.4	10.6	10.0	9.4	9.3	-0.1 pps
Medium-skilled (15-64)	6.4	6.1	5.4	5.3	4.7	-0.6 pps
High-skilled (15-64)	4.7	4.8	4.9	5.0	4.8	-0.2 pps
Nationals (15-64)	6.7	6.1	5.6	5.6	5.3	-0.3 pps
Non-nationals (15-64)	12.9	13.5	12.9	13.2	11.0	-2.2 pps
Male	6.7	6.4	5.9	5.8	5.6	-0.2 pps
Female	7.3	6.8	6.4	6.6	5.9	-0.7 pps
12 - **Long-term unemployment** (% of total unemployment)	25.5	25.2	26.9	22.3	22.5	0.2 pps
13 - **Worked hours** (full-time, average actual weekly hours)	39.5	39.4	39.6	38.9	38.9	0.0 %
Male	40.7	40.6	40.7	40.1	40.1	0.0 %
Female	37.7	37.7	37.8	36.9	37.2	0.8 %
14 - **Sectoral employment growth** (% change)						
Agriculture	0.0	1.4	2.9	0.0	0.0	0.0 pps
Building and construction	-1.2	1.8	3.0	3.5	3.4	-0.1 pps
Services	1.0	1.2	2.1	2.6	2.0	-0.5 pps
Manufacturing industry	-1.8	0.7	1.1	1.1	1.4	0.3 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	1.6	1.5	1.8	1.3	1.1	-0.2 pps
Real compensation per employee based on GDP	2.0	1.0	0.4	1.4	1.3	-0.1 pps
Labour cost index (compens. of employees plus taxes minus subs.)	1.5	1.8	1.8	2.0	1.7	-0.3 pps
Labour cost index (wages and salaries, total)	1.4	1.6	1.6	1.8	1.6	-0.2 pps
Labour productivity (GDP/person employed)	1.0	0.7	0.2	0.4	0.7	0.3 pps

Germany	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	80646	80983	81687	82349	82659	0.4 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	52577	52729	52964	53802	53797	0.0 %
(% of total population)	65.2	65.1	64.8	65.3	65.1	-0.3 pps
3 - **Labour force** (15-64, 1000 pers.)	40814	40990	41117	41932	42094	0.4 %
Male	21811	21881	21926	22399	22504	0.5 %
Female	19003	19109	19191	19533	19590	0.3 %
4 - **Activity rate** (% of population 15-64)	77.6	77.7	77.6	77.9	78.2	0.3 pps
Young (15-24)	50.8	49.9	48.8	49.2	49.9	0.6 pps
Prime age (25-54)	87.7	87.6	87.6	87.3	87.3	0.0 pps
Older (55-64)	67.5	69.1	69.4	71.3	72.6	1.3 pps
Nationals (15-64)	78.6	78.8	78.7	79.4	79.8	0.4 pps
Non-nationals (15-64)	69.2	69.4	69.3	68.1	68.2	0.1 pps
Male	82.6	82.5	82.1	82.2	82.4	0.2 pps
Young (15-24)	52.9	52.0	50.5	50.9	51.3	0.4 pps
Prime age (25-54)	92.9	92.6	92.5	91.9	91.9	0.0 pps
Older (55-64)	74.5	75.5	75.3	76.9	77.9	1.0 pps
Female	72.6	72.9	73.1	73.6	74.0	0.4 pps
Young (15-24)	48.7	47.7	47.1	47.4	48.3	0.9 pps
Prime age (25-54)	82.4	82.5	82.5	82.6	82.5	-0.1 pps
Older (55-64)	60.8	62.9	63.8	65.9	67.5	1.5 pps
5 - **Employment rate** (% of population 15-64)	73.5	73.8	74.0	74.7	75.2	0.6 pps
Young (15-24)	46.9	46.1	45.3	45.7	46.5	0.7 pps
Prime age (25-54)	83.4	83.5	83.7	83.9	84.2	0.3 pps
Older (55-64)	63.6	65.6	66.2	68.6	70.1	1.6 pps
Low-skilled (15-64)	53.3	46.0	46.1	47.0	47.6	0.6 pps
Medium-skilled (15-64)	77.0	77.7	78.0	78.9	79.5	0.7 pps
High-skilled (15-64)	87.6	87.7	87.8	87.9	88.1	0.2 pps
Nationals (15-64)	74.8	75.1	75.4	76.5	77.3	0.7 pps
Non-nationals (15-64)	62.5	62.8	62.9	62.2	62.6	0.5 pps
Male	78.0	78.1	78.0	78.4	78.9	0.5 pps
Young (15-24)	48.4	47.7	46.5	46.9	47.4	0.5 pps
Prime age (25-54)	88.2	88.0	88.1	88.1	88.4	0.3 pps
Older (55-64)	69.9	71.4	71.3	73.7	75.0	1.3 pps
Female	69.0	69.5	69.9	70.8	71.5	0.7 pps
Young (15-24)	45.2	44.3	44.0	44.5	45.5	1.1 pps
Prime age (25-54)	78.6	78.8	79.2	79.7	80.0	0.3 pps
Older (55-64)	57.6	60.0	61.2	63.5	65.4	1.8 pps
6 - **Employed persons** (15-64, 1000 pers.)	38640.0	38907.7	39175.9	40165.1	40481.6	0.8 %
7 - **Employment growth** (%, National accounts)	0.6	0.8	0.9	1.3	1.4	0.1 pps
Employment growth (%, 15-64, LFS)	0.8	0.7	0.7	2.5	0.8	-1.7 pps
Male	0.4	0.6	0.5	2.7	0.8	-1.9 pps
Female	1.4	0.9	0.9	2.3	0.7	-1.6 pps
8 - **Self employed** (15-64, % of total employment)	10.1	9.8	9.6	9.3	9.1	-0.2 pps
Male	12.7	12.4	12.1	11.6	11.2	-0.3 pps
Female	7.1	6.9	6.8	6.7	6.6	-0.1 pps
9 - **Temporary employment** (15-64, % of total employment)	13.4	13.1	13.2	13.2	12.9	-0.3 pps
Male	13.3	13.1	13.1	13.2	13.0	-0.2 pps
Female	13.5	13.2	13.2	13.2	12.9	-0.3 pps
10 - **Part-time** (15-64, % of total employment)	26.7	26.5	26.8	26.7	26.9	0.2 pps
Male	9.1	9.2	9.3	9.4	9.7	0.3 pps
Female	46.7	46.3	46.6	46.5	46.4	-0.1 pps
11 - **Unemployment rate** (harmonised:15-74)	5.2	5.0	4.6	4.1	3.8	-0.3 pps
Young (15-24)	7.8	7.7	7.2	7.1	6.8	-0.3 pps
Prime age (25-49)	4.9	4.7	4.4	3.9	3.5	-0.4 pps
Older (55-64)	5.7	5.1	4.7	3.9	3.4	-0.5 pps
Low-skilled (15-64)	12.0	12.0	11.4	10.3	9.7	-0.6 pps
Medium-skilled (15-64)	5.2	4.7	4.3	3.8	3.4	-0.4 pps
High-skilled (15-64)	2.4	2.5	2.4	2.2	2.0	-0.2 pps
Nationals (15-64)	4.9	4.6	4.2	3.6	3.2	-0.4 pps
Non-nationals (15-64)	9.8	9.4	9.2	8.6	8.1	-0.5 pps
Male	5.5	5.3	5.0	4.5	4.1	-0.4 pps
Female	4.9	4.6	4.2	3.8	3.3	-0.5 pps
12 - **Long-term unemployment** (% of total unemployment)	44.6	44.3	44.0	41.1	41.9	0.8 pps
13 - **Worked hours** (full-time, average actual weekly hours)	41.4	41.4	41.2	41.2	40.9	-0.7 %
Male	42.2	42.1	42.0	42.0	41.6	-1.0 %
Female	39.9	39.9	39.8	39.8	39.5	-0.8 %
14 - **Sectoral employment growth** (% change)						
Agriculture	-3.9	1.2	-1.8	-2.8	-0.5	2.3 pps
Building and construction	0.6	0.4	-0.4	1.0	1.6	0.6 pps
Services	0.7	0.8	1.0	1.5	1.4	-0.1 pps
Manufacturing industry	0.3	0.6	0.3	0.4	1.0	0.6 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	1.8	2.8	2.7	2.2	2.6	0.4 pps
Real compensation per employee based on GDP	0.3	-0.9	-0.4	0.7	-0.8	-1.5 pps
Labour cost index (compens. of employees plus taxes minus subs.)	0.4	2.5	2.5	2.2	3.4	1.2 pps
Labour cost index (wages and salaries, total)	1.1	2.2	2.5	2.1	3.1	1.0 pps
Labour productivity (GDP/person employed)	-0.1	1.3	0.8	0.9	0.7	-0.2 pps

Estonia	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	1320	1316	1313	1316	1316	0.0 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	871	862	853	849	844	-0.6 %
(% of total population)	66.0	65.5	65.0	64.5	64.1	-0.4 pps
3 - **Labour force** (15-64, 1000 pers.)	655	648	654	658	665	1.1 %
Male	336	336	338	343	346	0.7 %
Female	319	313	316	315	320	1.5 %
4 - **Activity rate** (% of population 15-64)	75.1	75.2	76.7	77.5	78.8	1.3 pps
Young (15-24)	39.8	39.2	41.8	43.2	46.1	2.9 pps
Prime age (25-54)	87.6	87.1	87.9	87.8	88.6	0.8 pps
Older (55-64)	66.6	67.7	68.7	71.0	72.2	1.2 pps
Nationals (15-64)	74.9	75.3	77.0	77.6	78.8	1.1 pps
Non-nationals (15-64)	76.4	74.9	75.0	76.6	79.2	2.6 pps
Male	78.6	79.3	80.4	81.9	82.7	0.8 pps
Young (15-24)	41.4	41.3	45.8	46.2	49.7	3.5 pps
Prime age (25-54)	92.3	92.2	92.6	93.7	93.3	-0.3 pps
Older (55-64)	66.8	69.2	67.7	70.4	71.9	1.5 pps
Female	71.8	71.3	73.0	73.2	75.1	1.8 pps
Young (15-24)	38.1	37.0	37.8	40.4	42.5	2.1 pps
Prime age (25-54)	82.9	82.0	83.0	81.8	83.7	1.9 pps
Older (55-64)	66.4	66.5	69.5	71.4	72.3	1.0 pps
5 - **Employment rate** (% of population 15-64)	68.5	69.6	71.9	72.1	74.1	2.0 pps
Young (15-24)	32.4	33.4	36.3	37.5	40.5	3.1 pps
Prime age (25-54)	80.4	80.9	83.0	82.6	83.9	1.3 pps
Older (55-64)	62.6	64.0	64.5	65.2	68.0	2.8 pps
Low-skilled (15-64)	35.4	40.4	39.9	41.8	44.9	3.2 pps
Medium-skilled (15-64)	70.0	71.0	74.0	74.0	76.2	2.1 pps
High-skilled (15-64)	82.2	83.2	85.2	84.1	85.5	1.4 pps
Nationals (15-64)	69.1	70.3	72.5	72.9	74.6	1.8 pps
Non-nationals (15-64)	65.3	65.2	68.0	67.4	71.2	3.8 pps
Male	71.3	73.0	75.3	75.7	77.4	1.8 pps
Young (15-24)	34.1	33.4	39.4	38.8	42.8	4.0 pps
Prime age (25-54)	84.7	85.6	87.7	87.9	88.5	0.6 pps
Older (55-64)	61.4	65.2	63.0	63.8	66.7	2.9 pps
Female	65.7	66.3	68.5	68.6	70.9	2.3 pps
Young (15-24)	30.7	33.3	33.1	36.1	38.2	2.1 pps
Prime age (25-54)	76.1	76.1	78.2	77.2	79.2	2.0 pps
Older (55-64)	63.6	63.1	65.8	66.5	69.3	2.7 pps
6 - **Employed persons** (15-64, 1000 pers.)	596.6	599.5	613.1	612.3	625.6	2.2 %
7 - **Employment growth** (%, National accounts)	1.2	0.8	2.9	0.3	2.7	2.4 pps
Employment growth (%, 15-64, LFS)	0.9	0.5	2.3	-0.1	2.2	2.3 pps
Male	1.7	1.3	2.6	0.2	2.0	1.8 pps
Female	0.2	-0.4	1.9	-0.5	2.4	2.8 pps
8 - **Self employed** (15-64, % of total employment)	8.8	8.8	9.3	9.5	9.9	0.4 pps
Male	12.1	12.1	11.9	12.1	13.3	1.2 pps
Female	5.4	5.4	6.4	6.7	6.3	-0.4 pps
9 - **Temporary employment** (15-64, % of total employment)	3.5	3.1	3.4	3.7	3.1	-0.6 pps
Male	4.1	3.3	3.9	3.9	3.4	-0.5 pps
Female	2.9	3.0	3.0	3.5	2.9	-0.6 pps
10 - **Part-time** (15-64, % of total employment)	8.9	8.3	9.5	9.9	9.5	-0.4 pps
Male	5.5	5.7	6.0	6.8	6.0	-0.8 pps
Female	12.4	11.2	13.4	13.3	13.3	0.0 pps
11 - **Unemployment rate** (harmonised:15-74)	8.6	7.4	6.2	6.8	5.8	-1.0 pps
Young (15-24)	18.7	15.0	13.1	13.4	12.1	-1.3 pps
Prime age (25-49)	8.3	7.2	5.5	5.9	5.3	-0.6 pps
Older (55-64)	6.0	5.4	6.0	8.1	5.7	-2.4 pps
Low-skilled (15-64)	15.7	13.2	12.8	13.4	11.4	-2.0 pps
Medium-skilled (15-64)	9.8	8.3	6.7	8.0	6.8	-1.2 pps
High-skilled (15-64)	5.9	4.9	4.0	3.8	3.3	-0.5 pps
Nationals (15-64)	7.8	6.6	5.8	6.1	5.2	-0.9 pps
Non-nationals (15-64)	14.5	12.8	9.3	12.1	10.2	-1.9 pps
Male	9.1	7.9	6.2	7.4	6.2	-1.2 pps
Female	8.2	6.8	6.1	6.1	5.3	-0.8 pps
12 - **Long-term unemployment** (% of total unemployment)	44.5	45.2	38.8	31.6	33.2	1.6 pps
13 - **Worked hours** (full-time, average actual weekly hours)	40.1	39.7	39.7	40.1	40.3	0.5 %
Male	40.7	40.2	40.2	40.8	40.9	0.2 %
Female	39.5	39.1	39.2	39.3	39.6	0.8 %
14 - **Sectoral employment growth** (% change)						
Agriculture	-6.0	-9.2	7.5	0.8	-9.0	-9.8 pps
Building and construction	0.2	1.7	8.1	-12.1	3.1	15.2 pps
Services	3.8	2.0	0.8	4.5	6.1	1.6 pps
Manufacturing industry	1.2	-2.3	5.8	0.7	3.5	2.8 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	4.8	6.5	3.3	6.3	6.9	0.6 pps
Real compensation per employee based on GDP	6.5	7.0	4.2	5.4	12.6	7.2 pps
Labour cost index (compens. of employees plus taxes minus subs.)	7.9	6.2	4.6	5.4	7.7	2.3 pps
Labour cost index (wages and salaries, total)	8.2	6.4	4.7	5.3	7.9	2.6 pps
Labour productivity (GDP/person employed)	0.7	2.1	-0.9	3.2	2.1	-1.1 pps

Ireland		2013	2014	2015	2016	2017	2016-2017
1	- **Population** (LFS, total, 1000 pers.)	4620	4652	4696	4749	4802	1.1 %
2	- **Population** (LFS, working age:15-64, 1000 pers.)	3053	3061	3081	3110	3141	1.0 %
	(% of total population)	66.1	65.8	65.6	65.5	65.4	-0.1 pps
3	- **Labour force** (15-64, 1000 pers.)	2193	2198	2219	2261	2282	0.9 %
	Male	1189	1193	1205	1221	1227	0.4 %
	Female	1004	1006	1014	1039	1055	1.5 %
4	- **Activity rate** (% of population 15-64)	71.8	71.8	72.0	72.7	72.6	0.0 pps
	Young (15-24)	49.9	48.0	47.4	50.6	46.7	-3.9 pps
	Prime age (25-54)	81.3	81.7	81.9	81.9	82.8	0.9 pps
	Older (55-64)	57.5	58.6	60.3	61.1	62.2	1.1 pps
	Nationals (15-64)	71.1	71.3	71.7	72.1	72.0	-0.1 pps
	Non-nationals (15-64)	75.9	74.9	74.2	76.0	76.2	0.2 pps
	Male	78.4	78.6	79.0	79.2	78.8	-0.4 pps
	Young (15-24)	51.6	50.2	50.2	52.7	47.9	-4.9 pps
	Prime age (25-54)	88.8	89.4	89.5	89.2	90.1	0.8 pps
	Older (55-64)	66.7	68.0	70.6	70.4	70.9	0.4 pps
	Female	65.4	65.2	65.2	66.3	66.6	0.3 pps
	Young (15-24)	48.1	45.8	44.6	48.4	45.5	-2.8 pps
	Prime age (25-54)	74.0	74.2	74.5	74.8	75.8	1.0 pps
	Older (55-64)	48.4	49.2	50.1	51.9	53.6	1.7 pps
5	- **Employment rate** (% of population 15-64)	61.7	63.1	64.7	66.5	67.7	1.2 pps
	Young (15-24)	36.6	36.8	37.8	42.1	40.0	-2.1 pps
	Prime age (25-54)	71.2	73.0	74.6	75.7	77.9	2.2 pps
	Older (55-64)	51.3	53.0	55.6	57.2	58.7	1.5 pps
	Low-skilled (15-64)	36.5	34.9	36.0	37.5	36.9	-0.5 pps
	Medium-skilled (15-64)	62.0	64.2	65.3	67.9	67.9	-0.1 pps
	High-skilled (15-64)	79.9	81.1	82.3	83.0	84.4	1.4 pps
	Nationals (15-64)	61.5	62.9	64.6	66.0	67.1	1.1 pps
	Non-nationals (15-64)	63.1	64.5	65.7	68.9	70.4	1.5 pps
	Male	66.4	68.3	70.2	71.8	73.0	1.2 pps
	Young (15-24)	35.9	36.9	38.3	42.3	40.2	-2.2 pps
	Prime age (25-54)	77.0	79.3	81.1	82.2	84.5	2.3 pps
	Older (55-64)	58.8	60.8	64.5	65.4	66.7	1.3 pps
	Female	57.1	58.0	59.3	61.2	62.4	1.2 pps
	Young (15-24)	37.2	36.8	37.3	41.8	39.8	-2.1 pps
	Prime age (25-54)	65.7	66.8	68.4	69.5	71.6	2.2 pps
	Older (55-64)	43.9	45.2	46.9	49.1	50.6	1.5 pps
6	- **Employed persons** (15-64, 1000 pers.)	1884.8	1931.8	1994.0	2067.0	2124.9	2.8 %
7	- **Employment growth** (%, National accounts)	3.0	2.7	3.5	3.8	2.9	-0.9 pps
	Employment growth (%, 15-64, LFS)	3.0	2.5	3.2	3.7	2.8	-0.9 pps
	Male	4.1	2.9	3.4	3.4	2.6	-0.7 pps
	Female	1.6	2.0	3.0	4.0	3.0	-1.0 pps
8	- **Self employed** (15-64, % of total employment)	14.7	14.5	14.1	13.8	13.3	-0.6 pps
	Male	21.5	21.1	20.4	19.9	19.0	-1.0 pps
	Female	6.9	6.7	6.8	6.8	6.7	-0.1 pps
9	- **Temporary employment** (15-64, % of total employment)	10.8	10.1	9.6	9.0	9.1	0.1 pps
	Male	10.9	10.0	9.5	8.7	8.8	0.1 pps
	Female	10.7	10.3	9.6	9.2	9.4	0.2 pps
10	- **Part-time** (15-64, % of total employment)	24.2	23.6	22.8	22.6	20.4	-2.2 pps
	Male	14.2	13.9	13.1	13.1	11.1	-2.0 pps
	Female	35.6	34.8	34.2	33.5	31.2	-2.3 pps
11	- **Unemployment rate** (harmonised:15-74)	13.8	11.9	10.0	8.4	6.7	-1.7 pps
	Young (15-24)	26.7	23.4	20.2	16.8	14.4	-2.4 pps
	Prime age (25-49)	12.4	10.7	8.9	7.5	5.9	-1.6 pps
	Older (55-64)	10.8	9.5	7.7	6.4	5.7	-0.7 pps
	Low-skilled (15-64)	23.1	21.3	18.6	15.8	12.7	-3.1 pps
	Medium-skilled (15-64)	17.1	14.6	12.3	10.0	8.5	-1.5 pps
	High-skilled (15-64)	7.7	6.8	5.7	5.0	4.1	-0.9 pps
	Nationals (15-64)	13.5	11.8	9.9	8.4	6.8	-1.6 pps
	Non-nationals (15-64)	16.8	13.9	11.4	9.3	7.6	-1.7 pps
	Male	14.9	12.7	10.8	9.1	7.1	-2.0 pps
	Female	12.4	10.9	8.9	7.6	6.3	-1.3 pps
12	- **Long-term unemployment** (% of total unemployment)	58.6	57.2	55.7	52.8	46.8	-6.0 pps
13	- **Worked hours** (full-time, average actual weekly hours)	40.1	40.0	39.8	40.1	40.2	0.2 %
	Male	42.0	41.9	41.7	42.0	42.1	0.2 %
	Female	37.0	36.9	36.6	37.0	37.1	0.3 %
14	- **Sectoral employment growth** (% change)						
	Agriculture	2.9	-3.2	1.4	3.7	-2.4	-6.1 pps
	Building and construction	2.9	9.4	16.1	9.6	8.2	-1.4 pps
	Services	3.8	3.6	2.1	3.7	2.8	-0.9 pps
	Manufacturing industry	4.5	1.0	5.4	6.4	1.3	-5.1 pps
15	- **Indicator board on wage developments** (% change)						
	Compensation per employee	-0.5	0.6	2.6	2.1	0.9	-1.2 pps
	Real compensation per employee based on GDP	2.4	4.5	2.0	0.9	4.5	3.6 pps
	Labour cost index (compens. of employees plus taxes minus subs.)	0.9	0.6	0.8	1.8	2.2	0.4 pps
	Labour cost index (wages and salaries, total)	0.6	1.0	0.8	1.7	2.2	0.5 pps
	Labour productivity (GDP/person employed)	-1.6	6.0	20.9	1.2	4.2	3.0 pps

Greece	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	10965	10892	10821	10776	10723	-0.5 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	7090	7040	6987	6937	6886	-0.7 %
(% of total population)	64.7	64.6	64.6	64.4	64.2	-0.2 pps
3 - **Labour force** (15-64, 1000 pers.)	4784	4747	4738	4732	4701	-0.7 %
Male	2692	2646	2621	2613	2605	-0.3 %
Female	2092	2101	2117	2119	2096	-1.1 %
4 - **Activity rate** (% of population 15-64)	67.5	67.4	67.8	68.2	68.3	0.0 pps
Young (15-24)	28.4	28.0	26.0	24.6	25.1	0.4 pps
Prime age (25-54)	83.9	84.3	85.4	85.5	85.0	-0.5 pps
Older (55-64)	42.4	41.1	41.6	44.9	46.7	1.9 pps
Nationals (15-64)	66.9	66.8	67.4	67.8	68.0	0.2 pps
Non-nationals (15-64)	74.9	75.0	73.8	73.9	71.9	-2.0 pps
Male	76.9	76.0	75.9	76.2	76.4	0.3 pps
Young (15-24)	31.6	30.0	27.7	26.4	26.2	-0.3 pps
Prime age (25-54)	93.6	93.1	93.1	93.2	93.0	-0.2 pps
Older (55-64)	55.0	53.4	54.9	57.3	59.8	2.6 pps
Female	58.3	59.0	59.9	60.4	60.3	-0.2 pps
Young (15-24)	25.3	26.1	24.3	22.9	23.9	1.1 pps
Prime age (25-54)	74.3	75.6	77.7	77.7	77.0	-0.8 pps
Older (55-64)	31.0	29.9	29.5	33.6	34.9	1.3 pps
5 - **Employment rate** (% of population 15-64)	48.8	49.4	50.8	52.0	53.5	1.4 pps
Young (15-24)	11.8	13.3	13.0	13.0	14.1	1.1 pps
Prime age (25-54)	61.3	62.4	64.5	66.0	67.4	1.4 pps
Older (55-64)	35.6	34.0	34.3	36.3	38.3	2.0 pps
Low-skilled (15-64)	38.3	39.0	39.7	39.4	39.8	0.4 pps
Medium-skilled (15-64)	46.3	47.0	48.8	50.1	51.8	1.7 pps
High-skilled (15-64)	68.2	67.6	67.9	69.6	70.8	1.2 pps
Nationals (15-64)	49.0	49.3	50.8	52.0	53.6	1.5 pps
Non-nationals (15-64)	46.3	50.4	51.0	52.0	51.9	-0.2 pps
Male	57.9	58.0	59.3	61.0	62.7	1.8 pps
Young (15-24)	14.6	15.8	15.1	14.7	15.9	1.2 pps
Prime age (25-54)	71.4	71.7	73.7	76.0	77.5	1.5 pps
Older (55-64)	46.0	44.0	44.9	46.2	49.6	3.3 pps
Female	39.9	41.1	42.5	43.3	44.4	1.1 pps
Young (15-24)	9.1	10.9	10.9	11.3	12.4	1.1 pps
Prime age (25-54)	51.4	53.1	55.4	55.9	57.2	1.3 pps
Older (55-64)	26.0	25.0	24.7	27.2	28.0	0.8 pps
6 - **Employed persons** (15-64, 1000 pers.)	3459.0	3479.5	3548.0	3610.3	3682.7	2.0 %
7 - **Employment growth** (%, National accounts)	-2.6	0.9	0.7	0.5	2.1	1.6 pps
Employment growth (%, 15-64, LFS)	-4.9	0.6	2.0	1.8	2.0	0.2 pps
Male	-4.6	-0.5	1.6	2.1	2.2	0.1 pps
Female	-5.2	2.2	2.5	1.2	1.7	0.5 pps
8 - **Self employed** (15-64, % of total employment)	31.7	30.7	29.9	29.5	29.4	-0.1 pps
Male	37.1	36.4	35.3	34.2	34.4	0.2 pps
Female	23.9	22.9	22.5	22.9	22.4	-0.5 pps
9 - **Temporary employment** (15-64, % of total employment)	10.2	11.6	11.9	11.2	11.4	0.2 pps
Male	9.3	11.0	11.4	10.3	9.9	-0.4 pps
Female	11.3	12.4	12.6	12.3	13.3	1.0 pps
10 - **Part-time** (15-64, % of total employment)	8.4	9.3	9.4	9.8	9.7	-0.1 pps
Male	5.4	6.5	6.7	6.9	6.6	-0.3 pps
Female	12.6	13.0	13.1	13.7	14.1	0.4 pps
11 - **Unemployment rate** (harmonised:15-74)	27.5	26.5	24.9	23.6	21.5	-2.1 pps
Young (15-24)	58.3	52.4	49.8	47.3	43.6	-3.7 pps
Prime age (25-49)	26.9	26.0	24.4	22.8	20.7	-2.1 pps
Older (55-64)	16.2	17.2	17.5	19.2	18.1	-1.1 pps
Low-skilled (15-64)	30.2	28.7	27.2	26.9	24.8	-2.1 pps
Medium-skilled (15-64)	31.3	30.3	27.7	26.2	24.0	-2.2 pps
High-skilled (15-64)	20.5	20.1	20.0	18.1	16.6	-1.5 pps
Nationals (15-64)	26.7	26.1	24.6	23.3	21.2	-2.1 pps
Non-nationals (15-64)	38.2	32.8	30.9	29.6	27.8	-1.8 pps
Male	24.5	23.7	21.8	19.9	17.8	-2.1 pps
Female	31.4	30.2	28.9	28.1	26.1	-2.0 pps
12 - **Long-term unemployment** (% of total unemployment)	67.0	73.4	73.0	71.8	72.6	0.8 pps
13 - **Worked hours** (full-time, average actual weekly hours)	42.8	42.8	42.8	43.1	42.9	-0.5 %
Male	44.0	44.1	44.2	44.6	44.4	-0.4 %
Female	40.8	40.7	40.6	40.8	40.7	-0.2 %
14 - **Sectoral employment growth** (% change)						
Agriculture	-0.5	0.4	-3.5	-2.4	0.3	2.7 pps
Building and construction	-1.9	1.2	-4.3	1.3	1.2	-0.1 pps
Services	-2.8	2.5	2.3	1.6	2.4	0.7 pps
Manufacturing industry	-6.3	-3.0	1.1	-1.8	3.0	4.8 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	-7.5	-2.0	-2.3	-0.9	0.1	1.0 pps
Real compensation per employee based on GDP	4.0	1.3	6.1	-0.4	1.1	1.5 pps
Labour cost index (compens. of employees plus taxes minus subs.)	-7.2	-1.1	-3.0	-1.2	2.5	3.7 pps
Labour cost index (wages and salaries, total)	-12.1	-1.2	-2.7	-0.9	1.1	2.0 pps
Labour productivity (GDP/person employed)	-0.6	-0.2	-1.0	-0.7	-0.8	-0.1 pps

Spain		2013	2014	2015	2016	2017	2016-2017
1 -	**Population** (LFS, total, 1000 pers.)	46593	46455	46410	46450	46549	0.2 %
2 -	**Population** (LFS, working age:15-64, 1000 pers.)	31024	30750	30642	30536	30531	0.0 %
	(% of total population)	66.6	66.2	66.0	65.7	65.6	-0.1 pps
3 -	**Labour force** (15-64, 1000 pers.)	23043	22814	22767	22657	22558	-0.4 %
	Male	12437	12277	12232	12120	12064	-0.5 %
	Female	10606	10537	10535	10536	10495	-0.4 %
4 -	**Activity rate** (% of population 15-64)	74.3	74.2	74.3	74.2	73.9	-0.3 pps
	Young (15-24)	37.8	35.7	34.7	33.0	33.3	0.3 pps
	Prime age (25-54)	87.2	87.3	87.4	87.4	87.0	-0.4 pps
	Older (55-64)	54.1	55.4	57.6	59.2	59.6	0.5 pps
	Nationals (15-64)	73.7	73.7	73.8	73.8	73.5	-0.3 pps
	Non-nationals (15-64)	78.4	77.7	78.0	77.2	76.8	-0.4 pps
	Male	79.8	79.5	79.5	79.2	78.9	-0.3 pps
	Young (15-24)	39.6	37.3	36.2	34.7	35.1	0.4 pps
	Prime age (25-54)	92.4	92.6	92.6	92.5	92.0	-0.5 pps
	Older (55-64)	63.3	64.3	66.2	67.0	67.9	0.9 pps
	Female	68.7	68.8	69.0	69.2	68.8	-0.3 pps
	Young (15-24)	35.9	34.0	33.2	31.3	31.5	0.2 pps
	Prime age (25-54)	81.8	82.0	82.0	82.3	82.0	-0.3 pps
	Older (55-64)	45.2	46.9	49.4	51.7	51.8	0.1 pps
5 -	**Employment rate** (% of population 15-64)	54.8	56.0	57.8	59.5	61.1	1.5 pps
	Young (15-24)	16.8	16.7	17.9	18.4	20.5	2.1 pps
	Prime age (25-54)	65.8	67.4	69.4	71.5	73.2	1.7 pps
	Older (55-64)	43.2	44.3	46.9	49.1	50.5	1.4 pps
	Low-skilled (15-64)	43.2	44.0	46.2	48.1	49.6	1.5 pps
	Medium-skilled (15-64)	55.2	56.0	57.5	58.7	59.8	1.2 pps
	High-skilled (15-64)	74.1	75.3	76.7	77.9	79.4	1.5 pps
	Nationals (15-64)	55.6	56.6	58.3	59.9	61.4	1.5 pps
	Non-nationals (15-64)	49.4	50.8	54.2	56.6	58.5	1.9 pps
	Male	59.2	60.7	62.9	64.8	66.5	1.7 pps
	Young (15-24)	17.3	17.4	18.6	19.4	21.2	1.8 pps
	Prime age (25-54)	70.4	72.5	75.1	77.4	79.2	1.9 pps
	Older (55-64)	50.5	51.2	54.0	55.7	57.8	2.1 pps
	Female	50.3	51.2	52.7	54.3	55.7	1.3 pps
	Young (15-24)	16.3	16.0	17.3	17.2	19.7	2.5 pps
	Prime age (25-54)	61.2	62.3	63.7	65.6	67.1	1.5 pps
	Older (55-64)	36.3	37.8	40.1	42.8	43.5	0.8 pps
6 -	**Employed persons** (15-64, 1000 pers.)	17001.6	17210.5	17717.5	18182.7	18648.5	2.6 %
7 -	**Employment growth** (%, National accounts)	-2.6	1.0	2.8	2.6	2.6	0.0 pps
	Employment growth (%, 15-64, LFS)	-2.7	1.2	2.9	2.6	2.6	-0.1 pps
	Male	-3.0	1.4	3.3	2.4	2.5	0.1 pps
	Female	-2.4	1.1	2.5	2.9	2.6	-0.3 pps
8 -	**Self employed** (15-64, % of total employment)	16.9	16.7	16.4	16.1	15.7	-0.4 pps
	Male	21.0	20.7	20.2	19.7	19.3	-0.4 pps
	Female	12.0	11.9	11.8	11.9	11.4	-0.5 pps
9 -	**Temporary employment** (15-64, % of total employment)	23.2	24.0	25.2	26.1	26.8	0.7 pps
	Male	22.2	23.6	25.1	25.8	26.0	0.2 pps
	Female	24.2	24.6	25.3	26.5	27.6	1.1 pps
10 -	**Part-time** (15-64, % of total employment)	15.7	15.8	15.6	15.1	14.9	-0.2 pps
	Male	7.7	7.7	7.8	7.6	7.2	-0.4 pps
	Female	25.2	25.5	25.1	24.1	24.1	0.0 pps
11 -	**Unemployment rate** (harmonised:15-74)	26.1	24.5	22.1	19.6	17.2	-2.4 pps
	Young (15-24)	55.5	53.2	48.3	44.4	38.6	-5.8 pps
	Prime age (25-49)	24.5	22.8	20.6	18.2	15.9	-2.3 pps
	Older (55-64)	20.0	20.0	18.6	17.0	15.3	-1.7 pps
	Low-skilled (15-64)	35.5	34.0	31.2	28.2	25.2	-3.0 pps
	Medium-skilled (15-64)	25.9	24.2	21.6	19.2	17.0	-2.2 pps
	High-skilled (15-64)	16.1	14.8	13.3	11.7	10.0	-1.7 pps
	Nationals (15-64)	24.6	23.2	21.0	18.8	16.4	-2.4 pps
	Non-nationals (15-64)	37.0	34.6	30.5	26.7	23.9	-2.8 pps
	Male	25.6	23.6	20.8	18.1	15.7	-2.4 pps
	Female	26.7	25.4	23.6	21.4	19.0	-2.4 pps
12 -	**Long-term unemployment** (% of total unemployment)	49.7	52.8	51.6	48.3	44.4	-3.9 pps
13 -	**Worked hours** (full-time, average actual weekly hours)	40.9	40.7	40.6	40.4	40.1	-0.7 %
	Male	41.8	41.7	41.5	41.3	41.0	-0.7 %
	Female	39.5	39.3	39.1	39.0	38.8	-0.5 %
14 -	**Sectoral employment growth** (% change)						
	Agriculture	-1.2	0.6	-0.2	4.0	2.1	-1.9 pps
	Building and construction	-12.3	-3.1	6.6	1.5	5.9	4.4 pps
	Services	-2.5	2.1	4.0	2.6	2.3	-0.4 pps
	Manufacturing industry	-4.8	-0.7	2.6	4.1	3.6	-0.5 pps
15 -	**Indicator board on wage developments** (% change)						
	Compensation per employee	0.3	0.1	1.4	-0.2	0.6	0.7 pps
	Real compensation per employee based on GDP	-0.4	-0.6	-0.5	0.0	1.4	1.4 pps
	Labour cost index (compens. of employees plus taxes minus subs.)	0.4	0.1	0.2	0.2	0.8	0.6 pps
	Labour cost index (wages and salaries, total)	0.0	0.4	0.8	0.4	0.8	0.4 pps
	Labour productivity (GDP/person employed)	0.9	0.4	0.8	0.6	0.4	-0.2 pps

France	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	65990	66311	66593	66860	67106	0.4 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	39895	41010	40927	40890	40947	0.1 %
(% of total population)	60.5	61.8	61.5	61.2	61.0	-0.1 pps
3 - **Labour force** (15-64, 1000 pers.)	28377	29121	29164	29207	29288	0.3 %
Male	14790	15103	15127	15129	15194	0.4 %
Female	13588	14018	14037	14078	14094	0.1 %
4 - **Activity rate** (% of population 15-64)	71.1	71.0	71.3	71.4	71.5	0.1 pps
Young (15-24)	37.4	36.5	37.1	36.9	36.9	0.0 pps
Prime age (25-54)	88.3	87.8	87.5	87.5	87.4	-0.1 pps
Older (55-64)	49.0	50.7	52.6	53.7	54.9	1.2 pps
Nationals (15-64)	71.5	71.4	71.8	72.0	72.2	0.2 pps
Non-nationals (15-64)	65.9	65.4	64.1	64.1	63.9	-0.2 pps
Male	75.5	75.1	75.3	75.4	75.6	0.3 pps
Young (15-24)	40.8	39.7	40.2	39.8	40.3	0.5 pps
Prime age (25-54)	93.3	92.9	92.4	92.4	92.6	0.2 pps
Older (55-64)	52.3	53.1	55.1	56.1	56.9	0.8 pps
Female	66.9	67.1	67.3	67.6	67.6	-0.1 pps
Young (15-24)	33.9	33.2	33.9	34.0	33.4	-0.6 pps
Prime age (25-54)	83.5	83.0	82.7	82.7	82.4	-0.3 pps
Older (55-64)	46.0	48.5	50.3	51.4	53.0	1.6 pps
5 - **Employment rate** (% of population 15-64)	64.0	63.7	63.8	64.2	64.7	0.6 pps
Young (15-24)	28.4	27.6	27.9	27.8	28.7	0.8 pps
Prime age (25-54)	80.6	79.8	79.4	79.7	80.0	0.3 pps
Older (55-64)	45.6	46.9	48.7	49.8	51.3	1.5 pps
Low-skilled (15-64)	42.9	41.1	39.7	38.8	39.7	0.9 pps
Medium-skilled (15-64)	66.2	65.5	65.9	66.1	66.2	0.1 pps
High-skilled (15-64)	81.3	81.0	81.4	82.4	82.9	0.5 pps
Nationals (15-64)	64.8	64.5	64.8	65.2	65.8	0.6 pps
Non-nationals (15-64)	53.3	52.4	50.8	51.4	52.1	0.7 pps
Male	67.8	67.1	67.1	67.6	68.4	0.9 pps
Young (15-24)	31.1	29.7	29.9	29.8	31.0	1.2 pps
Prime age (25-54)	85.2	84.4	83.7	84.2	85.0	0.8 pps
Older (55-64)	48.4	48.8	50.7	51.6	52.7	1.2 pps
Female	60.4	60.3	60.6	60.9	61.2	0.3 pps
Young (15-24)	25.7	25.5	26.0	25.8	26.3	0.5 pps
Prime age (25-54)	76.2	75.4	75.2	75.3	75.2	-0.1 pps
Older (55-64)	43.0	45.2	46.9	48.2	49.9	1.8 pps
6 - **Employed persons** (15-64, 1000 pers.)	25546.4	26108.6	26118.5	26243.4	26511.8	1.0 %
7 - **Employment growth** (%, National accounts)	0.2	0.5	0.2	0.7	1.1	0.4 pps
Employment growth (%, 15-64, LFS)	-0.1	2.2	0.0	0.5	1.0	0.5 pps
Male	-0.6	1.6	-0.2	0.6	1.4	0.7 pps
Female	0.4	2.9	0.3	0.3	0.7	0.3 pps
8 - **Self employed** (15-64, % of total employment)	10.6	10.9	10.8	11.0	10.9	-0.1 pps
Male	14.0	14.2	14.1	14.3	13.8	-0.5 pps
Female	6.8	7.2	7.3	7.5	7.7	0.2 pps
9 - **Temporary employment** (15-64, % of total employment)	15.3	15.3	16.0	16.1	16.8	0.7 pps
Male	14.7	14.5	15.4	15.7	16.2	0.5 pps
Female	16.0	16.1	16.6	16.6	17.4	0.8 pps
10 - **Part-time** (15-64, % of total employment)	18.1	18.6	18.4	18.3	18.2	-0.1 pps
Male	6.7	7.4	7.4	7.5	7.7	0.2 pps
Female	30.4	30.6	30.1	29.8	29.6	-0.2 pps
11 - **Unemployment rate** (harmonised:15-74)	10.3	10.3	10.4	10.1	9.4	-0.7 pps
Young (15-24)	24.1	24.2	24.7	24.6	22.3	-2.3 pps
Prime age (25-49)	8.7	9.2	9.3	8.9	8.5	-0.4 pps
Older (55-64)	7.0	7.5	7.4	7.2	6.5	-0.7 pps
Low-skilled (15-64)	16.4	17.3	17.8	18.3	17.3	-1.0 pps
Medium-skilled (15-64)	10.2	10.7	10.9	10.7	10.1	-0.6 pps
High-skilled (15-64)	6.0	6.4	6.4	5.7	5.2	-0.5 pps
Nationals (15-64)	9.4	9.7	9.8	9.5	8.8	-0.7 pps
Non-nationals (15-64)	19.1	19.9	20.7	19.8	18.5	-1.3 pps
Male	10.4	10.5	10.8	10.3	9.5	-0.8 pps
Female	10.2	10.0	9.9	9.9	9.3	-0.6 pps
12 - **Long-term unemployment** (% of total unemployment)	40.4	44.2	44.2	45.8	45.3	-0.5 pps
13 - **Worked hours** (full-time, average actual weekly hours)	38.9	38.8	38.8	39.1	39.0	-0.3 %
Male	40.0	39.8	39.9	40.2	39.9	-0.7 %
Female	37.2	37.2	37.3	37.5	37.6	0.3 %
14 - **Sectoral employment growth** (% change)						
Agriculture	0.4	0.7	-0.3	-0.4	-1.1	-0.7 pps
Building and construction	-0.5	-0.7	-2.5	-1.6	-0.3	1.3 pps
Services	0.0	0.5	0.8	1.6	2.3	0.8 pps
Manufacturing industry	-1.2	-0.5	-2.0	-0.9	-0.6	0.3 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	1.8	1.2	1.1	0.8	1.9	1.0 pps
Real compensation per employee based on GDP	0.9	1.7	1.1	0.6	-0.1	-0.7 pps
Labour cost index (compens. of employees plus taxes minus subs.)	0.6	0.9	1.1	1.5	1.4	-0.1 pps
Labour cost index (wages and salaries, total)	2.2	1.6	1.5	1.5	2.0	0.5 pps
Labour productivity (GDP/person employed)	0.4	0.4	0.9	0.5	1.1	0.6 pps

Croatia		2013	2014	2015	2016	2017	2016-2017
1	- **Population** (LFS, total, 1000 pers.)	4257	4240	4201	4171	4143	-0.7 %
2	- **Population** (LFS, working age:15-64, 1000 pers.)	2844	2826	2786	2753	2720	-1.2 %
	(% of total population)	66.8	66.7	66.3	66.0	65.7	-0.3 pps
3	- **Labour force** (15-64, 1000 pers.)	1811	1868	1865	1806	1807	0.1 %
	Male	979	1003	998	968	973	0.4 %
	Female	832	865	867	838	835	-0.4 %
4	- **Activity rate** (% of population 15-64)	63.7	66.1	66.9	65.6	66.4	0.8 pps
	Young (15-24)	29.9	33.6	33.2	37.2	35.7	-1.6 pps
	Prime age (25-54)	80.8	84.1	84.5	82.0	83.3	1.4 pps
	Older (55-64)	41.9	41.0	44.3	42.2	43.6	1.4 pps
	Nationals (15-64)	63.7	66.1	67.0	65.7	66.5	0.8 pps
	Non-nationals (15-64)	55.2	53.8	44.4	37.8	43.7	5.9 pps
	Male	68.9	70.9	71.6	70.3	71.5	1.2 pps
	Young (15-24)	34.7	38.5	38.2	41.9	40.9	-1.0 pps
	Prime age (25-54)	84.7	86.6	86.9	85.2	86.7	1.5 pps
	Older (55-64)	51.0	52.1	54.9	50.7	52.8	2.0 pps
	Female	58.5	61.3	62.3	60.9	61.4	0.5 pps
	Young (15-24)	24.8	28.5	28.0	32.3	30.2	-2.1 pps
	Prime age (25-54)	76.8	81.5	82.1	78.8	79.9	1.2 pps
	Older (55-64)	33.4	30.6	34.4	34.2	35.1	0.9 pps
5	- **Employment rate** (% of population 15-64)	52.5	54.6	56.0	56.9	58.9	2.0 pps
	Young (15-24)	14.9	18.3	19.1	25.6	25.9	0.3 pps
	Prime age (25-54)	68.3	71.2	72.3	72.4	74.9	2.5 pps
	Older (55-64)	37.8	36.2	39.2	38.1	40.4	2.2 pps
	Low-skilled (15-64)	27.5	26.7	28.0	27.4	24.4	-2.9 pps
	Medium-skilled (15-64)	55.5	57.0	58.0	59.5	62.6	3.2 pps
	High-skilled (15-64)	75.7	78.4	78.7	79.7	81.5	1.8 pps
	Nationals (15-64)	52.5	54.6	56.0	57.0	59.0	2.0 pps
	Non-nationals (15-64)	44.8	40.0	38.9	34.1	42.5	8.4 pps
	Male	56.5	59.1	60.3	61.4	63.8	2.4 pps
	Young (15-24)	17.4	21.2	22.4	28.9	29.8	1.0 pps
	Prime age (25-54)	71.6	74.5	75.4	76.3	78.7	2.4 pps
	Older (55-64)	45.0	45.8	48.2	45.1	49.0	3.9 pps
	Female	48.5	50.0	51.6	52.4	54.0	1.6 pps
	Young (15-24)	12.4	15.3	15.7	22.2	21.8	-0.4 pps
	Prime age (25-54)	64.9	67.9	69.3	68.5	71.1	2.6 pps
	Older (55-64)	31.0	27.3	30.7	31.6	32.3	0.6 pps
6	- **Employed persons** (15-64, 1000 pers.)	1493.6	1541.8	1559.1	1566.6	1603.0	2.3 %
7	- **Employment growth** (%, National accounts)	-2.6	2.7	1.2	0.3	2.2	1.9 pps
	Employment growth (%, 15-64, LFS)	-2.3	3.2	1.1	0.5	2.3	1.8 pps
	Male	-3.8	4.0	0.6	0.6	2.7	2.1 pps
	Female	-0.4	2.3	1.8	0.4	1.9	1.5 pps
8	- **Self employed** (15-64, % of total employment)	15.4	13.4	12.9	11.8	10.5	-1.3 pps
	Male	18.2	16.7	16.4	14.9	12.6	-2.3 pps
	Female	12.1	9.6	8.9	8.1	7.9	-0.2 pps
9	- **Temporary employment** (15-64, % of total employment)	14.5	16.9	20.2	22.2	20.7	-1.5 pps
	Male	14.8	16.6	20.4	21.9	20.6	-1.3 pps
	Female	14.1	17.1	19.9	22.4	20.7	-1.7 pps
10	- **Part-time** (15-64, % of total employment)	5.4	5.3	6.0	5.6	4.8	-0.8 pps
	Male	4.6	4.2	4.8	4.4	3.8	-0.6 pps
	Female	6.4	6.7	7.3	7.1	6.0	-1.1 pps
11	- **Unemployment rate** (harmonised:15-74)	17.4	17.2	16.1	13.4	11.1	-2.3 pps
	Young (15-24)	50.0	45.5	42.3	31.3	27.4	-3.9 pps
	Prime age (25-49)	15.5	15.3	14.4	11.6	10.1	-1.5 pps
	Older (55-64)	9.9	11.6	11.6	9.6	7.5	-2.1 pps
	Low-skilled (15-64)	22.7	26.5	22.5	18.1	20.5	2.4 pps
	Medium-skilled (15-64)	18.7	18.8	18.1	14.7	11.7	-3.0 pps
	High-skilled (15-64)	11.4	9.6	9.4	7.9	7.2	-0.7 pps
	Nationals (15-64)	17.5	17.4	16.4	13.3	11.3	-2.0 pps
	Non-nationals (15-64)	0.0	0.0	0.0	0.0	0.0	0.0 pps
	Male	17.6	16.6	15.6	12.7	10.4	-2.3 pps
	Female	17.2	18.0	16.7	14.2	12.0	-2.2 pps
12	- **Long-term unemployment** (% of total unemployment)	63.6	58.5	63.1	50.6	41.0	-9.6 pps
13	- **Worked hours** (full-time, average actual weekly hours)	40.4	40.4	39.6	39.7	39.9	0.5 %
	Male	40.8	40.8	40.1	40.2	40.4	0.5 %
	Female	39.9	39.8	38.9	39.2	39.3	0.3 %
14	- **Sectoral employment growth** (% change)						
	Agriculture	-14.3	-9.4	-1.9	-17.4	-6.1	11.3 pps
	Building and construction	-0.8	-3.8	5.0	2.8	-4.6	-7.4 pps
	Services	-2.7	4.9	2.8	3.2	5.5	2.3 pps
	Manufacturing industry	-4.6	2.8	-1.8	2.7	2.0	-0.7 pps
15	- **Indicator board on wage developments** (% change)						
	Compensation per employee	-0.9	-5.2	0.4	1.3	-1.1	-2.4 pps
	Real compensation per employee based on GDP	3.0	0.9	2.6	-0.9	1.1	2.0 pps
	Labour cost index (compens. of employees plus taxes minus subs.)	2.1	-0.5	1.7	4.0	5.2	1.2 pps
	Labour cost index (wages and salaries, total)	2.1	-0.5	1.7	4.0	5.1	1.1 pps
	Labour productivity (GDP/person employed)	2.2	-2.7	1.1	3.2	0.7	-2.5 pps

Italy		2013	2014	2015	2016	2017	2016-2017
1	- **Population** (LFS, total, 1000 pers.)	60646	60789	60731	60628	60537	-0.1 %
2	- **Population** (LFS, working age:15-64, 1000 pers.)	39172	39161	39035	38871	38726	-0.4 %
	(% of total population)	64.6	64.4	64.3	64.1	64.0	-0.1 pps
3	- **Labour force** (15-64, 1000 pers.)	24816	25039	24997	25243	25340	0.4 %
	Male	14253	14327	14382	14464	14467	0.0 %
	Female	10563	10712	10615	10779	10873	0.9 %
4	- **Activity rate** (% of population 15-64)	63.4	63.9	64.0	64.9	65.4	0.5 pps
	Young (15-24)	27.1	27.1	26.2	26.6	26.2	-0.4 pps
	Prime age (25-54)	77.1	77.0	76.8	77.5	77.9	0.4 pps
	Older (55-64)	45.3	48.9	51.1	53.4	55.4	2.0 pps
	Nationals (15-64)	62.6	63.2	63.3	64.3	64.8	0.5 pps
	Non-nationals (15-64)	70.5	70.4	70.3	70.4	70.8	0.4 pps
	Male	73.3	73.6	74.1	74.8	75.0	0.2 pps
	Young (15-24)	30.7	31.0	30.4	30.2	30.0	-0.3 pps
	Prime age (25-54)	88.3	87.7	87.7	88.2	88.5	0.2 pps
	Older (55-64)	56.6	60.2	63.3	65.9	67.0	1.2 pps
	Female	53.6	54.4	54.1	55.2	55.9	0.7 pps
	Young (15-24)	23.4	23.1	21.7	22.8	22.1	-0.6 pps
	Prime age (25-54)	66.1	66.4	65.9	66.8	67.3	0.5 pps
	Older (55-64)	34.7	38.3	39.6	41.7	44.5	2.8 pps
5	- **Employment rate** (% of population 15-64)	55.5	55.7	56.3	57.2	58.0	0.7 pps
	Young (15-24)	16.3	15.6	15.6	16.6	17.1	0.5 pps
	Prime age (25-54)	68.5	67.9	68.2	68.8	69.4	0.6 pps
	Older (55-64)	42.7	46.2	48.2	50.3	52.2	1.9 pps
	Low-skilled (15-64)	42.0	41.8	42.2	42.9	43.4	0.5 pps
	Medium-skilled (15-64)	62.5	62.6	62.9	63.7	64.1	0.3 pps
	High-skilled (15-64)	75.9	75.5	76.3	77.5	78.2	0.7 pps
	Nationals (15-64)	55.2	55.4	56.0	57.0	57.7	0.7 pps
	Non-nationals (15-64)	58.3	58.5	58.9	59.5	60.6	1.1 pps
	Male	64.7	64.7	65.5	66.5	67.1	0.6 pps
	Young (15-24)	18.7	18.2	18.6	19.2	20.1	0.9 pps
	Prime age (25-54)	79.2	78.2	78.6	79.3	79.9	0.5 pps
	Older (55-64)	52.8	56.5	59.3	61.7	62.8	1.2 pps
	Female	46.5	46.8	47.2	48.1	48.9	0.8 pps
	Young (15-24)	13.7	12.8	12.4	13.7	13.9	0.1 pps
	Prime age (25-54)	58.0	57.6	57.9	58.5	59.0	0.6 pps
	Older (55-64)	33.2	36.6	37.9	39.7	42.3	2.6 pps
6	- **Employed persons** (15-64, 1000 pers.)	21755.3	21809.5	21972.6	22241.1	22443.6	0.9 %
7	- **Employment growth** (%, National accounts)	-1.8	0.1	0.7	1.3	1.2	-0.1 pps
	Employment growth (%, 15-64, LFS)	-1.8	0.2	0.7	1.2	0.9	-0.3 pps
	Male	-2.2	0.0	1.0	1.1	0.6	-0.4 pps
	Female	-1.1	0.5	0.4	1.4	1.3	-0.2 pps
8	- **Self employed** (15-64, % of total employment)	22.4	22.2	21.9	21.5	20.8	-0.6 pps
	Male	27.2	26.7	26.2	25.6	25.2	-0.4 pps
	Female	15.8	16.0	15.9	15.8	14.9	-0.9 pps
9	- **Temporary employment** (15-64, % of total employment)	13.2	13.6	14.1	14.0	15.5	1.5 pps
	Male	12.4	13.1	13.6	13.5	15.1	1.6 pps
	Female	14.2	14.2	14.6	14.7	16.0	1.3 pps
10	- **Part-time** (15-64, % of total employment)	17.6	18.1	18.3	18.5	18.5	0.0 pps
	Male	7.4	7.8	8.0	8.2	8.3	0.1 pps
	Female	31.7	32.1	32.4	32.7	32.5	-0.2 pps
11	- **Unemployment rate** (harmonised:15-74)	12.1	12.7	11.9	11.7	11.2	-0.5 pps
	Young (15-24)	40.0	42.7	40.3	37.8	34.7	-3.1 pps
	Prime age (25-49)	11.2	11.8	11.2	11.1	10.9	-0.2 pps
	Older (55-64)	5.7	5.5	5.5	5.7	5.8	0.1 pps
	Low-skilled (15-64)	16.2	17.0	15.9	16.0	15.8	-0.2 pps
	Medium-skilled (15-64)	11.5	12.0	11.5	11.2	10.6	-0.6 pps
	High-skilled (15-64)	7.3	8.0	7.2	6.9	6.5	-0.4 pps
	Nationals (15-64)	11.7	12.4	11.6	11.4	11.1	-0.3 pps
	Non-nationals (15-64)	17.3	17.0	16.3	15.4	14.4	-1.0 pps
	Male	11.5	11.9	11.3	10.9	10.3	-0.6 pps
	Female	13.1	13.8	12.7	12.8	12.4	-0.4 pps
12	- **Long-term unemployment** (% of total unemployment)	56.9	61.4	58.9	58.3	58.7	0.4 pps
13	- **Worked hours** (full-time, average actual weekly hours)	39.6	39.6	39.7	39.9	40.0	0.3 %
	Male	40.8	40.8	40.9	41.1	41.2	0.2 %
	Female	37.4	37.5	37.5	37.7	37.7	0.0 %
14	- **Sectoral employment growth** (% change)						
	Agriculture	-2.9	-0.2	1.0	2.3	-0.9	-3.2 pps
	Building and construction	-7.6	-4.0	-1.2	-0.1	0.2	0.3 pps
	Services	-1.2	0.5	1.6	2.2	1.7	-0.5 pps
	Manufacturing industry	-2.9	-1.8	-0.9	0.9	0.7	-0.2 pps
15	- **Indicator board on wage developments** (% change)						
	Compensation per employee	0.8	0.2	1.0	0.5	0.1	-0.4 pps
	Real compensation per employee based on GDP	1.1	1.0	1.0	0.6	0.0	-0.6 pps
	Labour cost index (compens. of employees plus taxes minus subs.)	2.2	0.7	-0.3	-0.7	0.7	1.4 pps
	Labour cost index (wages and salaries, total)	1.8	0.6	0.5	0.0	0.5	0.5 pps
	Labour productivity (GDP/person employed)	0.1	0.0	0.3	-0.2	0.4	0.6 pps

Cyprus		2013	2014	2015	2016	2017	2016-2017
1	- **Population** (LFS, total, 1000 pers.)	862	853	848	852	860	0.9 %
2	- **Population** (LFS, working age:15-64, 1000 pers.)	578	572	559	556	564	1.5 %
	(% of total population)	67.0	67.0	65.9	65.2	65.6	0.4 pps
3	- **Labour force** (15-64, 1000 pers.)	425	425	413	408	417	2.3 %
	Male	221	218	210	209	215	2.6 %
	Female	204	207	202	199	202	1.9 %
4	- **Activity rate** (% of population 15-64)	73.6	74.3	73.9	73.4	73.9	0.5 pps
	Young (15-24)	38.4	40.3	37.8	37.3	36.6	-0.6 pps
	Prime age (25-54)	87.7	88.4	87.9	86.8	87.5	0.7 pps
	Older (55-64)	56.6	56.0	57.4	59.0	60.0	1.1 pps
	Nationals (15-64)	72.4	73.2	72.9	73.0	73.7	0.7 pps
	Non-nationals (15-64)	78.4	79.4	78.3	75.2	74.8	-0.3 pps
	Male	80.6	80.0	78.8	78.7	78.8	0.1 pps
	Young (15-24)	40.7	41.1	36.9	35.8	33.2	-2.7 pps
	Prime age (25-54)	94.0	93.5	92.6	92.2	93.0	0.7 pps
	Older (55-64)	71.3	69.9	70.0	70.5	71.6	1.2 pps
	Female	67.2	69.1	69.4	68.5	69.3	0.8 pps
	Young (15-24)	36.3	39.5	38.9	38.5	39.9	1.4 pps
	Prime age (25-54)	82.0	83.9	83.8	81.8	82.5	0.7 pps
	Older (55-64)	42.3	42.3	45.3	47.8	48.9	1.2 pps
5	- **Employment rate** (% of population 15-64)	61.7	62.1	62.7	63.7	65.6	1.9 pps
	Young (15-24)	23.4	25.8	25.4	26.3	27.5	1.2 pps
	Prime age (25-54)	75.5	76.2	76.5	76.6	78.4	1.8 pps
	Older (55-64)	49.6	46.9	48.5	52.2	55.3	3.1 pps
	Low-skilled (15-64)	40.5	40.4	40.7	42.6	41.7	-0.9 pps
	Medium-skilled (15-64)	62.4	62.5	62.4	62.6	66.4	3.7 pps
	High-skilled (15-64)	76.3	77.3	78.3	78.3	79.1	0.8 pps
	Nationals (15-64)	60.7	60.8	61.6	63.2	65.2	2.0 pps
	Non-nationals (15-64)	65.9	68.1	67.5	65.7	67.1	1.4 pps
	Male	67.0	66.1	66.7	68.6	70.0	1.5 pps
	Young (15-24)	24.0	25.9	24.0	26.5	24.2	-2.4 pps
	Prime age (25-54)	80.4	79.6	80.6	81.7	83.6	1.9 pps
	Older (55-64)	61.1	57.2	57.7	60.9	64.9	4.0 pps
	Female	56.9	58.6	59.0	59.2	61.4	2.2 pps
	Young (15-24)	23.0	25.8	26.7	26.3	30.7	4.3 pps
	Prime age (25-54)	71.1	73.1	72.7	72.0	73.5	1.5 pps
	Older (55-64)	38.4	36.9	39.4	43.7	46.2	2.5 pps
6	- **Employed persons** (15-64, 1000 pers.)	356.7	355.1	350.0	353.9	369.8	4.5 %
7	- **Employment growth** (%, National accounts)	-5.9	-1.8	1.5	4.6	3.9	-0.7 pps
	Employment growth (%, 15-64, LFS)	-4.9	-0.4	-1.4	1.1	4.5	3.4 pps
	Male	-5.2	-2.4	-0.9	2.4	4.6	2.2 pps
	Female	-4.5	1.7	-1.9	-0.2	4.4	4.7 pps
8	- **Self employed** (15-64, % of total employment)	14.9	15.2	13.0	12.2	11.4	-0.8 pps
	Male	20.4	20.3	15.9	15.5	13.7	-1.7 pps
	Female	9.0	10.0	9.9	8.6	8.9	0.2 pps
9	- **Temporary employment** (15-64, % of total employment)	17.5	19.0	18.4	16.5	15.3	-1.2 pps
	Male	10.3	13.1	13.2	11.7	12.0	0.3 pps
	Female	24.2	24.4	23.4	21.3	18.6	-2.7 pps
10	- **Part-time** (15-64, % of total employment)	11.9	13.5	13.0	13.4	12.2	-1.2 pps
	Male	8.4	10.3	10.3	11.3	9.1	-2.2 pps
	Female	15.6	16.8	15.8	15.6	15.6	0.0 pps
11	- **Unemployment rate** (harmonised:15-74)	15.9	16.1	15.0	13.0	11.1	-1.9 pps
	Young (15-24)	38.9	36.0	32.8	29.1	24.7	-4.4 pps
	Prime age (25-49)	13.9	13.9	13.1	11.7	10.4	-1.3 pps
	Older (55-64)	12.4	16.3	15.6	11.5	7.8	-3.7 pps
	Low-skilled (15-64)	20.2	20.3	19.4	16.4	14.9	-1.5 pps
	Medium-skilled (15-64)	17.2	18.4	16.7	14.5	11.6	-2.9 pps
	High-skilled (15-64)	13.3	13.0	12.1	10.9	9.8	-1.1 pps
	Nationals (15-64)	16.1	16.9	15.5	13.4	11.5	-1.9 pps
	Non-nationals (15-64)	15.9	14.1	13.7	12.6	10.5	-2.1 pps
	Male	16.6	17.1	15.1	12.7	10.9	-1.8 pps
	Female	15.2	15.1	14.8	13.4	11.3	-2.1 pps
12	- **Long-term unemployment** (% of total unemployment)	38.2	47.7	45.6	44.5	40.7	-3.8 pps
13	- **Worked hours** (full-time, average actual weekly hours)	40.8	40.5	40.5	40.9	40.7	-0.5 %
	Male	41.6	41.7	41.7	42.0	42.0	0.0 %
	Female	39.7	39.3	39.1	39.6	39.2	-1.0 %
14	- **Sectoral employment growth** (% change)						
	Agriculture	-10.2	-3.9	2.1	2.0	-0.5	-2.5 pps
	Building and construction	-20.1	-9.5	0.0	7.8	11.0	3.2 pps
	Services	-3.6	0.5	2.6	5.7	4.2	-1.4 pps
	Manufacturing industry	-9.8	-4.2	1.5	5.2	4.0	-1.2 pps
15	- **Indicator board on wage developments** (% change)						
	Compensation per employee	-5.4	-3.5	-1.3	-1.1	0.7	1.9 pps
	Real compensation per employee based on GDP	2.4	-0.5	4.5	1.1	-2.2	-3.3 pps
	Labour cost index (compens. of employees plus taxes minus subs.)	-2.9	-2.9	-0.8	1.1	1.2	0.1 pps
	Labour cost index (wages and salaries, total)	-2.6	-3.4	-0.7	1.0	1.5	0.5 pps
	Labour productivity (GDP/person employed)	0.1	0.5	0.5	0.2	0.4	0.2 pps

Latvia	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	2013	1994	1977	1959	1938	-1.1 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	1333	1295	1275	1254	1230	-2.0 %
(% of total population)	66.2	65.0	64.5	64.0	63.4	-0.6 pps
3 - **Labour force** (15-64, 1000 pers.)	986	966	965	957	946	-1.1 %
Male	491	486	486	479	475	-0.8 %
Female	495	480	479	478	471	-1.5 %
4 - **Activity rate** (% of population 15-64)	74.0	74.6	75.7	76.3	77.0	0.7 pps
Young (15-24)	39.4	40.4	41.3	39.7	39.7	0.0 pps
Prime age (25-54)	87.6	87.2	87.6	87.8	88.5	0.7 pps
Older (55-64)	61.2	62.6	65.5	67.6	67.9	0.3 pps
Nationals (15-64)	74.3	74.9	76.1	76.9	77.5	0.7 pps
Non-nationals (15-64)	72.0	72.6	73.3	72.8	73.2	0.4 pps
Male	76.6	77.8	78.9	78.8	79.8	1.0 pps
Young (15-24)	42.6	45.3	45.2	43.2	42.8	-0.4 pps
Prime age (25-54)	90.6	90.5	90.7	90.2	91.8	1.5 pps
Older (55-64)	62.2	63.7	68.0	69.5	69.2	-0.3 pps
Female	71.6	71.6	72.8	74.0	74.3	0.3 pps
Young (15-24)	36.0	35.3	37.1	35.9	36.6	0.7 pps
Prime age (25-54)	84.8	84.0	84.6	85.5	85.4	-0.1 pps
Older (55-64)	60.5	61.7	63.6	66.1	66.9	0.7 pps
5 - **Employment rate** (% of population 15-64)	65.0	66.3	68.1	68.7	70.1	1.4 pps
Young (15-24)	30.2	32.5	34.5	32.8	33.0	0.1 pps
Prime age (25-54)	77.9	78.2	79.2	79.7	81.2	1.6 pps
Older (55-64)	54.8	56.4	59.4	61.4	62.3	0.9 pps
Low-skilled (15-64)	31.8	32.6	34.7	35.5	35.8	0.4 pps
Medium-skilled (15-64)	65.6	67.7	68.8	68.2	70.5	2.2 pps
High-skilled (15-64)	84.2	83.4	85.1	86.5	86.9	0.4 pps
Nationals (15-64)	66.0	67.0	68.8	69.6	70.9	1.4 pps
Non-nationals (15-64)	59.4	61.9	63.6	63.5	64.4	0.9 pps
Male	66.8	68.4	69.9	70.0	71.9	1.9 pps
Young (15-24)	33.2	36.5	37.1	34.0	35.0	1.0 pps
Prime age (25-54)	79.9	80.3	81.2	81.4	83.5	2.1 pps
Older (55-64)	55.1	56.4	60.1	61.3	62.4	1.1 pps
Female	63.4	64.4	66.4	67.6	68.4	0.8 pps
Young (15-24)	27.0	28.2	31.9	31.6	30.9	-0.7 pps
Prime age (25-54)	76.1	76.0	77.3	78.1	79.0	1.0 pps
Older (55-64)	54.6	56.4	58.9	61.4	62.2	0.7 pps
6 - **Employed persons** (15-64, 1000 pers.)	866.5	858.6	867.9	862.3	861.9	0.0 %
7 - **Employment growth** (%, National accounts)	2.3	-1.3	1.4	-0.3	0.6	0.9 pps
Employment growth (%, 15-64, LFS)	1.7	-0.9	1.1	-0.6	0.0	0.6 pps
Male	2.6	-0.3	1.0	-1.4	0.7	2.0 pps
Female	0.9	-1.5	1.2	0.0	-0.8	-0.8 pps
8 - **Self employed** (15-64, % of total employment)	10.5	10.6	11.6	11.8	11.8	0.0 pps
Male	12.6	13.2	14.7	14.7	13.9	-0.8 pps
Female	8.4	8.0	8.5	9.0	9.8	0.8 pps
9 - **Temporary employment** (15-64, % of total employment)	4.3	3.3	3.8	3.7	3.0	-0.7 pps
Male	5.3	4.3	4.6	4.6	3.7	-0.9 pps
Female	3.4	2.4	3.0	2.8	2.4	-0.4 pps
10 - **Part-time** (15-64, % of total employment)	7.5	6.8	7.2	8.5	7.7	-0.8 pps
Male	5.7	4.7	4.5	6.1	4.8	-1.3 pps
Female	9.4	8.9	10.0	10.8	10.6	-0.2 pps
11 - **Unemployment rate** (harmonised:15-74)	11.9	10.8	9.9	9.6	8.7	-0.9 pps
Young (15-24)	23.2	19.6	16.3	17.3	17.0	-0.3 pps
Prime age (25-49)	11.0	10.4	9.5	9.3	8.3	-1.0 pps
Older (55-64)	10.5	9.9	9.3	9.2	8.3	-0.9 pps
Low-skilled (15-64)	25.7	24.5	22.3	21.1	19.2	-1.9 pps
Medium-skilled (15-64)	13.3	11.9	11.1	11.6	10.4	-1.2 pps
High-skilled (15-64)	6.1	5.7	5.0	4.4	4.0	-0.4 pps
Nationals (15-64)	11.3	10.5	9.6	9.5	8.5	-1.0 pps
Non-nationals (15-64)	17.5	14.8	13.2	12.7	12.1	-0.6 pps
Male	12.6	11.8	11.1	10.9	9.8	-1.1 pps
Female	11.1	9.8	8.6	8.4	7.7	-0.7 pps
12 - **Long-term unemployment** (% of total unemployment)	48.7	43.0	45.5	41.5	37.4	-4.1 pps
13 - **Worked hours** (full-time, average actual weekly hours)	39.9	40.0	39.8	40.3	39.9	-1.0 %
Male	40.3	40.3	40.1	40.6	40.3	-0.7 %
Female	39.5	39.7	39.5	39.9	39.5	-1.0 %
14 - **Sectoral employment growth** (% change)						
Agriculture	-0.3	-3.8	7.2	-3.4	2.8	6.2 pps
Building and construction	6.2	3.3	-1.8	-8.0	3.2	11.2 pps
Services	3.6	0.5	2.3	-0.1	0.3	0.3 pps
Manufacturing industry	0.1	-5.0	-1.3	0.4	-0.4	-0.8 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	5.5	8.6	7.7	6.8	7.9	1.1 pps
Real compensation per employee based on GDP	6.9	7.6	13.6	9.0	12.3	3.3 pps
Labour cost index (compens. of employees plus taxes minus subs.)	5.2	6.2	7.3	6.8	6.5	-0.3 pps
Labour cost index (wages and salaries, total)	5.3	7.3	7.4	6.1	6.6	0.5 pps
Labour productivity (GDP/person employed)	0.1	3.3	1.5	2.5	3.9	1.4 pps

Lithuania	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	2958	2932	2905	2868	2822	-1.6 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	1984	1961	1935	1899	1854	-2.4 %
(% of total population)	67.1	66.9	66.6	66.2	65.7	-0.5 pps
3 - **Labour force** (15-64, 1000 pers.)	1436	1446	1434	1433	1408	-1.7 %
Male	716	721	710	709	697	-1.7 %
Female	721	724	724	724	711	-1.8 %
4 - **Activity rate** (% of population 15-64)	72.4	73.7	74.1	75.5	75.9	0.5 pps
Young (15-24)	31.5	34.2	33.8	35.4	35.0	-0.3 pps
Prime age (25-54)	89.5	89.7	89.3	89.3	89.3	-0.1 pps
Older (55-64)	60.1	63.0	66.2	70.0	71.3	1.2 pps
Nationals (15-64)	72.4	73.7	74.1	75.5	76.0	0.5 pps
Non-nationals (15-64)	81.7	82.1	73.3	70.5	73.9	3.4 pps
Male	74.7	76.0	75.8	77.1	77.4	0.3 pps
Young (15-24)	35.8	38.6	36.7	38.7	37.8	-0.9 pps
Prime age (25-54)	90.6	90.8	90.4	90.2	90.4	0.2 pps
Older (55-64)	65.3	68.2	69.8	73.6	73.3	-0.3 pps
Female	70.3	71.6	72.5	73.9	74.6	0.7 pps
Young (15-24)	27.0	29.6	30.8	31.8	32.2	0.3 pps
Prime age (25-54)	88.3	88.7	88.2	88.5	88.1	-0.3 pps
Older (55-64)	56.1	58.9	63.3	67.2	69.6	2.5 pps
5 - **Employment rate** (% of population 15-64)	63.7	65.7	67.2	69.4	70.4	1.0 pps
Young (15-24)	24.6	27.6	28.3	30.2	30.4	0.2 pps
Prime age (25-54)	79.6	80.8	81.6	82.7	83.3	0.6 pps
Older (55-64)	53.4	56.2	60.4	64.6	66.1	1.5 pps
Low-skilled (15-64)	17.1	19.5	19.9	19.2	20.9	1.7 pps
Medium-skilled (15-64)	63.0	64.6	66.1	67.6	68.8	1.1 pps
High-skilled (15-64)	87.6	88.4	88.7	90.4	90.0	-0.4 pps
Nationals (15-64)	63.7	65.6	67.2	69.4	70.4	1.0 pps
Non-nationals (15-64)	73.1	72.6	67.5	64.8	71.2	6.4 pps
Male	64.7	66.6	68.0	70.0	70.6	0.7 pps
Young (15-24)	27.6	31.0	30.9	32.5	32.3	-0.2 pps
Prime age (25-54)	79.8	80.7	81.8	82.6	83.1	0.5 pps
Older (55-64)	56.1	58.8	62.4	66.9	67.1	0.3 pps
Female	62.8	64.9	66.5	68.8	70.2	1.4 pps
Young (15-24)	21.5	24.0	25.7	27.8	28.4	0.6 pps
Prime age (25-54)	79.4	80.9	81.4	82.9	83.6	0.7 pps
Older (55-64)	51.2	54.3	58.8	62.8	65.2	2.4 pps
6 - **Employed persons** (15-64, 1000 pers.)	1264.3	1288.0	1300.6	1317.7	1305.6	-0.9 %
7 - **Employment growth** (%, National accounts)	1.3	2.0	1.3	2.0	-0.5	-2.5 pps
Employment growth (%, 15-64, LFS)	1.6	1.9	1.0	1.3	-0.9	-2.2 pps
Male	2.9	1.9	0.9	0.9	-1.1	-2.1 pps
Female	0.4	1.9	1.1	1.7	-0.7	-2.4 pps
8 - **Self employed** (15-64, % of total employment)	10.5	10.6	10.8	11.1	10.9	-0.3 pps
Male	13.0	12.6	13.4	14.3	13.8	-0.6 pps
Female	8.1	8.6	8.4	8.1	8.1	0.0 pps
9 - **Temporary employment** (15-64, % of total employment)	2.7	2.8	2.1	2.0	1.7	-0.3 pps
Male	3.5	3.6	2.4	2.2	2.1	-0.1 pps
Female	1.9	2.0	1.8	1.7	1.3	-0.4 pps
10 - **Part-time** (15-64, % of total employment)	8.4	8.6	7.6	7.1	7.6	0.5 pps
Male	6.4	6.4	5.5	5.4	5.7	0.3 pps
Female	10.2	10.6	9.7	8.8	9.4	0.6 pps
11 - **Unemployment rate** (harmonised:15-74)	11.8	10.7	9.1	7.9	7.1	-0.8 pps
Young (15-24)	21.9	19.3	16.3	14.5	13.3	-1.2 pps
Prime age (25-49)	11.0	9.9	8.6	7.4	6.6	-0.8 pps
Older (55-64)	11.2	10.7	8.7	7.7	7.3	-0.4 pps
Low-skilled (15-64)	33.9	30.7	27.3	25.9	21.6	-4.3 pps
Medium-skilled (15-64)	14.5	13.7	11.9	10.6	9.6	-1.0 pps
High-skilled (15-64)	5.2	4.3	3.7	3.0	3.0	0.0 pps
Nationals (15-64)	12.0	10.9	9.3	8.1	7.3	-0.8 pps
Non-nationals (15-64)	0.0	0.0	0.0	0.0	0.0	0.0 pps
Male	13.1	12.2	10.1	9.1	8.6	-0.5 pps
Female	10.5	9.2	8.2	6.7	5.7	-1.0 pps
12 - **Long-term unemployment** (% of total unemployment)	42.9	44.6	42.8	38.2	37.7	-0.5 pps
13 - **Worked hours** (full-time, average actual weekly hours)	39.7	39.6	39.6	39.7	39.3	-1.0 %
Male	40.2	40.1	40.1	40.3	39.9	-1.0 %
Female	39.2	39.1	39.1	39.1	38.7	-1.0 %
14 - **Sectoral employment growth** (% change)						
Agriculture	-3.0	11.0	0.2	-10.3	-3.0	7.3 pps
Building and construction	10.9	0.0	5.8	-1.4	-4.5	-3.1 pps
Services	2.0	2.6	-0.1	3.5	0.1	-3.4 pps
Manufacturing industry	-0.4	-0.4	2.1	3.6	-0.8	-4.4 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	5.4	4.7	5.8	6.2	9.1	2.9 pps
Real compensation per employee based on GDP	9.8	9.1	6.5	13.1	5.1	-8.0 pps
Labour cost index (compens. of employees plus taxes minus subs.)	7.4	4.3	5.4	8.2	9.6	1.4 pps
Labour cost index (wages and salaries, total)	7.0	4.7	5.9	8.2	8.8	0.6 pps
Labour productivity (GDP/person employed)	2.1	1.5	0.7	0.4	4.4	4.0 pps

Luxembourg	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	545	558	569	584	597	2.2 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	359	364	386	396	407	2.9 %
(% of total population)	65.9	65.3	67.8	67.7	68.2	0.5 pps
3 - **Labour force** (15-64, 1000 pers.)	251	258	274	277	286	3.2 %
Male	139	143	149	151	153	1.3 %
Female	112	116	125	126	133	5.4 %
4 - **Activity rate** (% of population 15-64)	69.8	70.8	70.9	70.0	70.2	0.2 pps
Young (15-24)	25.9	26.4	35.2	30.7	30.5	-0.2 pps
Prime age (25-54)	87.6	88.0	87.7	87.2	88.0	0.8 pps
Older (55-64)	42.5	44.4	40.4	41.7	41.0	-0.7 pps
Nationals (15-64)	65.1	66.3	66.8	66.1	65.7	-0.4 pps
Non-nationals (15-64)	75.0	75.6	75.1	73.8	74.4	0.6 pps
Male	76.3	77.2	76.0	75.1	74.0	-1.1 pps
Young (15-24)	30.0	29.5	36.3	30.5	32.5	2.0 pps
Prime age (25-54)	94.4	95.0	93.9	93.0	91.9	-1.2 pps
Older (55-64)	50.7	52.0	45.4	49.1	46.7	-2.4 pps
Female	63.2	64.2	65.6	64.7	66.2	1.5 pps
Young (15-24)	21.9	22.9	34.2	30.9	28.2	-2.7 pps
Prime age (25-54)	80.5	80.9	81.4	81.1	84.0	2.9 pps
Older (55-64)	34.4	36.5	35.1	34.0	35.2	1.3 pps
5 - **Employment rate** (% of population 15-64)	65.7	66.6	66.1	65.6	66.3	0.7 pps
Young (15-24)	21.9	20.3	29.0	24.9	25.8	0.9 pps
Prime age (25-54)	82.9	83.8	82.6	82.5	83.7	1.2 pps
Older (55-64)	40.6	42.5	38.4	39.6	39.7	0.2 pps
Low-skilled (15-64)	43.2	41.9	46.8	42.1	42.0	-0.1 pps
Medium-skilled (15-64)	65.4	65.9	65.9	65.3	67.8	2.5 pps
High-skilled (15-64)	82.9	83.0	83.3	83.8	84.0	0.2 pps
Nationals (15-64)	62.8	63.8	63.9	63.3	63.2	-0.1 pps
Non-nationals (15-64)	69.0	69.7	68.4	67.7	69.2	1.5 pps
Male	72.1	72.6	71.3	70.5	69.9	-0.7 pps
Young (15-24)	24.2	21.9	29.5	24.3	26.8	2.5 pps
Prime age (25-54)	90.1	90.6	89.3	88.5	87.4	-1.1 pps
Older (55-64)	48.3	49.7	42.9	46.4	45.3	-1.1 pps
Female	59.1	60.5	60.8	60.4	62.6	2.2 pps
Young (15-24)	19.5	18.8	28.9	25.5	24.7	-0.7 pps
Prime age (25-54)	75.5	76.8	75.7	76.4	79.8	3.5 pps
Older (55-64)	32.3	35.2	33.5	32.4	34.0	1.6 pps
6 - **Employed persons** (15-64, 1000 pers.)	236.1	242.8	255.2	259.4	269.9	4.0 %
7 - **Employment growth** (%, National accounts)	1.8	2.6	2.6	3.0	3.4	0.4 pps
Employment growth (%, 15-64, LFS)	1.0	2.8	5.1	1.6	4.0	2.4 pps
Male	0.9	1.9	4.3	1.6	1.8	0.2 pps
Female	1.1	4.1	6.1	1.7	6.7	5.0 pps
8 - **Self employed** (15-64, % of total employment)	7.9	7.8	8.6	9.0	8.9	-0.2 pps
Male	8.4	9.0	9.4	10.3	9.7	-0.6 pps
Female	7.2	6.4	7.5	7.5	8.0	0.5 pps
9 - **Temporary employment** (15-64, % of total employment)	7.0	8.1	10.2	9.0	9.1	0.1 pps
Male	5.6	7.1	10.2	8.9	8.8	-0.1 pps
Female	8.8	9.2	10.2	9.1	9.4	0.3 pps
10 - **Part-time** (15-64, % of total employment)	18.7	18.5	18.5	19.2	19.6	0.4 pps
Male	5.1	4.7	5.6	6.2	6.1	-0.1 pps
Female	35.9	35.6	34.2	35.1	35.3	0.2 pps
11 - **Unemployment rate** (harmonised:15-74)	5.9	6.0	6.5	6.3	5.6	-0.7 pps
Young (15-24)	15.5	22.6	17.3	18.9	15.4	-3.5 pps
Prime age (25-49)	5.3	4.9	5.8	5.3	4.9	-0.4 pps
Older (55-64)	4.7	4.3	4.7	5.0	3.3	-1.7 pps
Low-skilled (15-64)	10.3	10.2	10.7	9.9	8.9	-1.0 pps
Medium-skilled (15-64)	5.9	6.3	6.3	6.8	5.3	-1.5 pps
High-skilled (15-64)	3.9	4.0	4.7	4.0	3.9	-0.1 pps
Nationals (15-64)	3.6	3.8	4.3	4.2	3.9	-0.3 pps
Non-nationals (15-64)	8.1	7.8	8.9	8.2	6.9	-1.3 pps
Male	5.6	5.8	5.9	6.1	5.6	-0.5 pps
Female	6.2	6.4	7.1	6.5	5.6	-0.9 pps
12 - **Long-term unemployment** (% of total unemployment)	30.4	27.3	28.4	34.9	38.1	3.2 pps
13 - **Worked hours** (full-time, average actual weekly hours)	41.4	41.5	41.3	41.1	40.8	-0.7 %
Male	42.2	42.1	42.2	42.0	41.6	-1.0 %
Female	39.9	40.3	39.7	39.5	39.5	0.0 %
14 - **Sectoral employment growth** (% change)						
Agriculture	-2.2	-0.9	-0.6	-0.2	-0.1	0.1 pps
Building and construction	0.0	1.6	1.7	2.9	3.1	0.2 pps
Services	2.0	2.9	2.9	3.6	3.9	0.3 pps
Manufacturing industry	-2.0	-0.3	0.1	1.5	1.0	-0.5 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	2.3	2.2	3.0	0.7	3.2	2.4 pps
Real compensation per employee based on GDP	-1.3	0.9	-0.4	-2.7	2.6	5.3 pps
Labour cost index (compens. of employees plus taxes minus subs.)	3.6	3.2	0.5	1.1	2.4	1.3 pps
Labour cost index (wages and salaries, total)	3.6	3.4	0.6	1.2	3.7	2.5 pps
Labour productivity (GDP/person employed)	1.8	3.1	0.3	0.0	-1.0	-1.0 pps

Hungary	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	9893	9866	9843	9814	9784	-0.3 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	6647	6588	6530	6478	6415	-1.0 %
(% of total population)	67.2	66.8	66.3	66.0	65.6	-0.4 pps
3 - **Labour force** (15-64, 1000 pers.)	4300	4413	4483	4543	4565	0.5 %
Male	2324	2384	2426	2465	2485	0.8 %
Female	1977	2029	2057	2079	2080	0.0 %
4 - **Activity rate** (% of population 15-64)	64.7	67.0	68.6	70.1	71.2	1.0 pps
Young (15-24)	27.4	29.5	31.0	32.3	32.4	0.1 pps
Prime age (25-54)	83.3	85.0	85.8	86.1	86.9	0.7 pps
Older (55-64)	41.2	44.6	48.1	52.1	53.6	1.5 pps
Nationals (15-64)	64.6	66.9	68.6	70.1	71.2	1.1 pps
Non-nationals (15-64)	72.6	74.9	70.6	68.4	62.5	-5.9 pps
Male	71.0	73.4	75.3	76.9	78.2	1.3 pps
Young (15-24)	31.0	33.0	34.4	36.1	36.5	0.3 pps
Prime age (25-54)	89.5	91.2	92.0	92.4	93.3	0.9 pps
Older (55-64)	49.0	53.2	57.8	62.4	64.5	2.2 pps
Female	58.6	60.7	62.2	63.5	64.2	0.7 pps
Young (15-24)	23.6	25.9	27.5	28.2	28.2	-0.1 pps
Prime age (25-54)	77.1	78.8	79.6	79.8	80.4	0.6 pps
Older (55-64)	34.7	37.4	39.9	43.5	44.3	0.8 pps
5 - **Employment rate** (% of population 15-64)	58.1	61.8	63.9	66.5	68.2	1.6 pps
Young (15-24)	20.1	23.5	25.7	28.1	29.0	0.9 pps
Prime age (25-54)	75.7	79.2	80.6	82.2	83.7	1.4 pps
Older (55-64)	37.9	41.8	45.3	49.8	51.7	1.8 pps
Low-skilled (15-64)	26.9	31.5	33.9	36.6	38.5	1.9 pps
Medium-skilled (15-64)	63.3	66.7	68.8	71.5	73.1	1.7 pps
High-skilled (15-64)	78.8	80.8	82.1	84.4	84.3	-0.1 pps
Nationals (15-64)	58.0	61.7	63.9	66.5	68.2	1.7 pps
Non-nationals (15-64)	64.6	71.0	67.5	65.3	60.6	-4.8 pps
Male	63.7	67.8	70.3	73.0	75.2	2.3 pps
Young (15-24)	23.0	26.4	28.1	31.5	32.9	1.5 pps
Prime age (25-54)	81.4	85.3	86.8	88.2	90.1	1.9 pps
Older (55-64)	44.8	49.6	54.4	59.7	62.5	2.9 pps
Female	52.6	55.9	57.8	60.2	61.3	1.0 pps
Young (15-24)	17.0	20.5	23.1	24.6	24.8	0.2 pps
Prime age (25-54)	70.0	73.2	74.4	76.2	77.2	1.0 pps
Older (55-64)	32.1	35.2	37.7	41.5	42.4	0.9 pps
6 - **Employed persons** (15-64, 1000 pers.)	3860.0	4069.9	4175.8	4309.4	4373.4	1.5 %
7 - **Employment growth** (%, National accounts)	1.1	4.8	2.4	2.6	2.0	-0.6 pps
Employment growth (%, 15-64, LFS)	1.8	5.4	2.6	3.2	1.5	-1.7 pps
Male	2.8	5.7	2.8	3.2	2.2	-1.0 pps
Female	0.6	5.2	2.4	3.2	0.6	-2.6 pps
8 - **Self employed** (15-64, % of total employment)	10.6	10.3	10.2	10.0	9.7	-0.4 pps
Male	13.2	13.0	12.6	12.1	11.5	-0.7 pps
Female	7.5	7.1	7.4	7.5	7.5	0.0 pps
9 - **Temporary employment** (15-64, % of total employment)	10.9	10.8	11.4	9.7	8.8	-0.9 pps
Male	11.4	11.2	11.6	9.4	8.2	-1.2 pps
Female	10.4	10.3	11.1	10.2	9.5	-0.7 pps
10 - **Part-time** (15-64, % of total employment)	6.4	6.0	5.7	4.8	4.3	-0.5 pps
Male	4.2	4.1	4.0	3.1	2.7	-0.4 pps
Female	9.0	8.3	7.7	6.8	6.3	-0.5 pps
11 - **Unemployment rate** (harmonised:15-74)	10.2	7.7	6.8	5.1	4.2	-0.9 pps
Young (15-24)	26.6	20.4	17.3	12.9	10.7	-2.2 pps
Prime age (25-49)	9.1	6.8	6.0	4.5	3.7	-0.8 pps
Older (55-64)	8.1	6.4	5.8	4.4	3.6	-0.8 pps
Low-skilled (15-64)	23.8	18.6	17.4	13.3	11.2	-2.1 pps
Medium-skilled (15-64)	10.0	7.4	6.4	4.8	3.8	-1.0 pps
High-skilled (15-64)	4.0	3.2	2.4	1.8	1.6	-0.2 pps
Nationals (15-64)	10.2	7.8	6.9	5.2	4.2	-1.0 pps
Non-nationals (15-64)	10.9	0.0	0.0	0.0	0.0	0.0 pps
Male	10.2	7.6	6.6	5.1	3.8	-1.3 pps
Female	10.1	7.9	7.0	5.1	4.6	-0.5 pps
12 - **Long-term unemployment** (% of total unemployment)	48.5	47.4	45.5	46.5	40.4	-6.1 pps
13 - **Worked hours** (full-time, average actual weekly hours)	39.4	39.3	39.3	39.8	39.3	-1.3 %
Male	40.0	39.8	39.9	40.4	39.9	-1.2 %
Female	38.6	38.7	38.6	39.1	38.6	-1.3 %
14 - **Sectoral employment growth** (% change)						
Agriculture	-2.5	1.4	-3.9	-3.0	-2.8	0.2 pps
Building and construction	0.0	3.3	1.9	2.9	4.0	1.1 pps
Services	2.9	6.5	2.9	4.2	3.1	-1.1 pps
Manufacturing industry	-4.6	2.9	-0.5	2.0	3.3	1.3 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	1.8	0.8	-1.5	4.0	7.9	3.9 pps
Real compensation per employee based on GDP	5.8	5.7	5.2	1.7	-0.2	-1.8 pps
Labour cost index (compens. of employees plus taxes minus subs.)	2.4	2.9	3.5	4.8	9.3	4.5 pps
Labour cost index (wages and salaries, total)	3.8	3.3	3.9	5.1	13.4	8.3 pps
Labour productivity (GDP/person employed)	1.0	-0.6	0.9	-0.4	2.0	2.4 pps

Malta		2013	2014	2015	2016	2017	2016-2017
1	- **Population** (LFS, total, 1000 pers.)	426	435	445	456	469	2.8 %
2	- **Population** (LFS, working age:15-64, 1000 pers.)	285	285	285	287	310	7.9 %
	(% of total population)	66.8	65.5	64.0	63.0	66.1	3.1 pps
3	- **Labour force** (15-64, 1000 pers.)	185	189	193	198	219	10.5 %
	Male	115	116	118	120	132	9.7 %
	Female	70	73	75	78	88	11.9 %
4	- **Activity rate** (% of population 15-64)	65.0	66.3	67.6	69.1	70.7	1.7 pps
	Young (15-24)	52.7	52.3	51.7	51.9	52.0	0.1 pps
	Prime age (25-54)	78.1	79.6	80.9	82.0	83.3	1.3 pps
	Older (55-64)	38.5	40.3	42.3	45.5	46.4	0.9 pps
	Nationals (15-64)	65.0	66.2	67.5	69.0	70.9	1.9 pps
	Non-nationals (15-64)	65.3	68.3	68.3	70.1	69.7	-0.4 pps
	Male	79.3	79.9	80.8	82.0	82.6	0.6 pps
	Young (15-24)	56.0	52.9	53.3	54.5	53.3	-1.2 pps
	Prime age (25-54)	94.5	95.1	95.4	95.9	95.9	0.0 pps
	Older (55-64)	57.1	60.1	62.2	63.7	64.4	0.6 pps
	Female	50.2	52.2	53.8	55.6	58.2	2.6 pps
	Young (15-24)	49.6	51.7	50.0	49.4	50.4	1.0 pps
	Prime age (25-54)	61.1	63.5	65.8	67.3	69.7	2.4 pps
	Older (55-64)	19.7	20.7	22.8	26.9	28.5	1.6 pps
5	- **Employment rate** (% of population 15-64)	60.8	62.4	63.9	65.7	67.5	1.7 pps
	Young (15-24)	46.0	46.2	45.6	46.1	46.1	0.0 pps
	Prime age (25-54)	74.0	75.9	77.4	78.8	80.1	1.3 pps
	Older (55-64)	36.3	37.8	40.3	44.1	45.1	1.0 pps
	Low-skilled (15-64)	48.9	50.4	52.0	54.6	55.0	0.4 pps
	Medium-skilled (15-64)	68.3	69.8	69.6	69.8	71.7	1.9 pps
	High-skilled (15-64)	86.6	86.5	88.6	89.6	88.2	-1.5 pps
	Nationals (15-64)	60.9	62.5	63.9	65.8	68.2	2.4 pps
	Non-nationals (15-64)	58.5	61.2	63.4	66.4	62.9	-3.4 pps
	Male	74.1	74.9	76.2	78.3	78.8	0.4 pps
	Young (15-24)	47.5	45.7	46.0	48.5	46.7	-1.8 pps
	Prime age (25-54)	89.6	90.6	91.2	92.6	92.2	-0.3 pps
	Older (55-64)	54.1	56.0	58.8	61.7	62.4	0.7 pps
	Female	47.1	49.4	51.0	52.7	55.5	2.7 pps
	Young (15-24)	44.4	46.7	45.3	43.9	44.9	1.0 pps
	Prime age (25-54)	57.9	60.6	62.8	64.3	67.1	2.8 pps
	Older (55-64)	18.6	20.0	21.8	26.5	27.8	1.3 pps
6	- **Employed persons** (15-64, 1000 pers.)	173.0	177.9	182.2	188.7	208.9	10.7 %
7	- **Employment growth** (%, National accounts)	3.7	5.1	3.9	4.2	5.2	1.0 pps
	Employment growth (%, 15-64, LFS)	3.1	2.8	2.4	3.6	10.7	7.1 pps
	Male	0.9	1.4	2.0	3.3	9.5	6.2 pps
	Female	6.8	4.9	3.0	4.1	12.6	8.5 pps
8	- **Self employed** (15-64, % of total employment)	13.3	13.2	13.3	13.1	14.1	1.0 pps
	Male	17.7	17.3	17.6	17.9	18.4	0.5 pps
	Female	6.1	6.7	6.7	5.8	7.7	1.9 pps
9	- **Temporary employment** (15-64, % of total employment)	7.5	7.7	7.4	7.5	5.8	-1.7 pps
	Male	6.8	6.6	6.5	6.2	5.2	-1.0 pps
	Female	8.4	9.3	8.7	9.3	6.7	-2.6 pps
10	- **Part-time** (15-64, % of total employment)	14.2	15.5	14.5	14.0	13.4	-0.6 pps
	Male	6.7	7.0	6.3	5.9	6.0	0.1 pps
	Female	26.5	28.8	27.3	26.5	24.5	-2.0 pps
11	- **Unemployment rate** (harmonised:15-74)	6.8	6.3	5.9	5.2	4.6	-0.6 pps
	Young (15-24)	13.0	11.7	11.8	11.0	11.3	0.3 pps
	Prime age (25-49)	5.2	4.6	4.4	3.9	3.8	-0.1 pps
	Older (55-64)	5.7	6.3	4.8	3.2	2.9	-0.3 pps
	Low-skilled (15-64)	10.0	9.2	8.8	7.6	7.1	-0.5 pps
	Medium-skilled (15-64)	4.2	3.7	3.6	3.4	3.6	0.2 pps
	High-skilled (15-64)	2.6	2.6	1.8	1.5	2.4	0.9 pps
	Nationals (15-64)	6.3	5.7	5.4	4.7	3.8	-0.9 pps
	Non-nationals (15-64)	10.9	10.1	6.9	5.9	9.6	3.7 pps
	Male	6.9	6.6	6.0	5.0	4.5	-0.5 pps
	Female	6.7	5.8	5.7	5.7	4.7	-1.0 pps
12	- **Long-term unemployment** (% of total unemployment)	45.6	46.9	43.4	40.7	40.3	-0.4 pps
13	- **Worked hours** (full-time, average actual weekly hours)	40.3	40.1	40.0	40.7	40.1	-1.5 %
	Male	41.3	41.1	41.1	41.8	41.0	-1.9 %
	Female	38.1	38.0	37.7	38.4	38.2	-0.5 %
14	- **Sectoral employment growth** (% change)						
	Agriculture	-3.9	-4.3	-0.6	1.9	2.8	0.9 pps
	Building and construction	-2.2	0.9	4.4	1.3	3.9	2.6 pps
	Services	4.8	7.0	5.0	6.2	6.8	0.5 pps
	Manufacturing industry	1.4	1.8	2.0	-0.7	0.8	1.5 pps
15	- **Indicator board on wage developments** (% change)						
	Compensation per employee	2.1	1.6	5.0	2.8	1.7	-1.1 pps
	Real compensation per employee based on GDP	3.4	1.4	-0.9	1.6	0.9	-0.8 pps
	Labour cost index (compens. of employees plus taxes minus subs.)	3.8	3.1	6.4	-0.8	1.7	2.5 pps
	Labour cost index (wages and salaries, total)	3.8	3.2	6.4	-0.8	1.6	2.4 pps
	Labour productivity (GDP/person employed)	0.8	2.9	5.4	1.0	1.4	0.4 pps

Netherlands	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	16800	16863	16931	17026	17127	0.6 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	11014	10980	10950	10988	11044	0.5 %
(% of total population)	65.6	65.1	64.7	64.5	64.5	-0.1 pps
3 - **Labour force** (15-64, 1000 pers.)	8743	8677	8719	8754	8805	0.6 %
Male	4663	4638	4641	4645	4659	0.3 %
Female	4079	4040	4078	4109	4146	0.9 %
4 - **Activity rate** (% of population 15-64)	79.4	79.0	79.6	79.7	79.7	0.1 pps
Young (15-24)	69.2	67.4	68.5	68.2	68.3	0.1 pps
Prime age (25-54)	87.4	87.1	87.1	86.9	86.7	-0.2 pps
Older (55-64)	63.5	64.9	67.1	68.4	69.5	1.2 pps
Nationals (15-64)	80.0	79.6	80.2	80.3	80.4	0.1 pps
Non-nationals (15-64)	68.9	69.1	69.0	68.8	68.4	-0.4 pps
Male	84.3	84.2	84.6	84.4	84.2	-0.2 pps
Young (15-24)	68.4	67.0	67.6	67.2	67.0	-0.2 pps
Prime age (25-54)	92.3	92.2	92.1	91.7	91.3	-0.4 pps
Older (55-64)	74.2	75.5	77.6	78.2	79.0	0.7 pps
Female	74.4	73.8	74.7	75.0	75.2	0.3 pps
Young (15-24)	70.0	67.7	69.4	69.2	69.7	0.5 pps
Prime age (25-54)	82.6	81.9	82.1	82.2	82.0	-0.1 pps
Older (55-64)	52.8	54.3	56.7	58.6	60.2	1.6 pps
5 - **Employment rate** (% of population 15-64)	73.6	73.1	74.1	74.8	75.8	1.0 pps
Young (15-24)	60.1	58.8	60.8	60.8	62.3	1.5 pps
Prime age (25-54)	82.2	81.7	82.2	82.9	83.5	0.6 pps
Older (55-64)	59.2	59.9	61.7	63.5	65.7	2.2 pps
Low-skilled (15-64)	57.2	55.6	57.0	57.8	58.8	1.0 pps
Medium-skilled (15-64)	76.2	76.0	76.5	77.4	78.0	0.6 pps
High-skilled (15-64)	86.9	86.8	87.4	87.4	87.8	0.4 pps
Nationals (15-64)	74.4	73.9	74.9	75.6	76.7	1.0 pps
Non-nationals (15-64)	59.3	60.5	59.8	61.5	62.8	1.3 pps
Male	78.2	78.1	79.0	79.6	80.4	0.8 pps
Young (15-24)	59.2	58.7	59.9	59.6	61.0	1.5 pps
Prime age (25-54)	86.8	86.9	87.5	88.1	88.4	0.3 pps
Older (55-64)	68.9	69.4	71.1	72.8	74.8	2.0 pps
Female	69.0	68.1	69.2	70.1	71.3	1.2 pps
Young (15-24)	61.0	58.8	61.7	62.1	63.6	1.5 pps
Prime age (25-54)	77.5	76.5	77.0	77.7	78.6	0.8 pps
Older (55-64)	49.5	50.4	52.4	54.2	56.6	2.4 pps
6 - **Employed persons** (15-64, 1000 pers.)	8103.6	8028.5	8115.5	8223.4	8376.4	1.9 %
7 - **Employment growth** (%, National accounts)	-1.2	-0.1	1.0	1.1	2.2	1.1 pps
Employment growth (%, 15-64, LFS)	-0.9	-0.9	1.1	1.3	1.9	0.5 pps
Male	-1.2	-0.5	0.7	1.1	1.5	0.4 pps
Female	-0.5	-1.5	1.5	1.6	2.3	0.6 pps
8 - **Self employed** (15-64, % of total employment)	14.8	15.1	15.3	15.5	15.5	-0.1 pps
Male	18.1	18.4	18.3	18.6	18.4	-0.2 pps
Female	11.0	11.4	12.0	12.1	12.2	0.1 pps
9 - **Temporary employment** (15-64, % of total employment)	20.2	21.1	20.0	20.6	21.7	1.1 pps
Male	19.2	20.2	18.8	19.3	20.4	1.1 pps
Female	21.3	22.0	21.2	22.0	23.1	1.1 pps
10 - **Part-time** (15-64, % of total employment)	49.8	49.6	50.0	49.7	49.8	0.1 pps
Male	26.0	26.1	26.5	26.2	27.0	0.8 pps
Female	77.1	76.7	76.9	76.4	75.8	-0.6 pps
11 - **Unemployment rate** (harmonised:15-74)	7.3	7.4	6.9	6.0	4.9	-1.1 pps
Young (15-24)	13.2	12.7	11.3	10.8	8.9	-1.9 pps
Prime age (25-49)	6.0	6.2	5.6	4.6	3.7	-0.9 pps
Older (55-64)	6.8	7.7	8.1	7.2	5.5	-1.7 pps
Low-skilled (15-64)	11.5	12.3	11.3	10.0	8.5	-1.5 pps
Medium-skilled (15-64)	7.3	7.5	7.0	6.1	4.8	-1.3 pps
High-skilled (15-64)	4.1	4.0	3.8	3.5	2.9	-0.6 pps
Nationals (15-64)	7.0	7.2	6.6	5.8	4.7	-1.1 pps
Non-nationals (15-64)	13.9	12.4	13.3	10.6	8.2	-2.4 pps
Male	7.2	7.2	6.5	5.6	4.5	-1.1 pps
Female	7.3	7.8	7.3	6.5	5.3	-1.2 pps
12 - **Long-term unemployment** (% of total unemployment)	35.3	39.4	43.2	42.4	40.0	-2.4 pps
13 - **Worked hours** (full-time, average actual weekly hours)	41.3	41.7	41.5	41.7	41.5	-0.5 %
Male	41.9	42.2	42.1	42.3	42.0	-0.7 %
Female	39.3	39.8	39.6	39.9	39.8	-0.3 %
14 - **Sectoral employment growth** (% change)						
Agriculture	-1.5	-0.5	-0.5	0.5	0.5	0.0 pps
Building and construction	-6.2	-2.8	-0.9	-0.2	2.0	2.2 pps
Services	-0.8	1.0	2.4	2.1	2.9	0.8 pps
Manufacturing industry	-1.8	-0.7	0.1	0.3	0.9	0.6 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	1.8	1.6	-0.3	1.7	1.2	-0.5 pps
Real compensation per employee based on GDP	1.8	1.5	-0.3	-1.0	1.1	2.1 pps
Labour cost index (compens. of employees plus taxes minus subs.)	1.6	1.3	0.0	0.5	1.8	1.3 pps
Labour cost index (wages and salaries, total)	1.5	-0.3	1.9	0.6	1.6	1.0 pps
Labour productivity (GDP/person employed)	1.1	1.5	1.0	1.1	0.7	-0.4 pps

Austria	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	8477	8544	8630	8740	8795	0.6 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	5643	5676	5721	5790	5800	0.2 %
(% of total population)	66.6	66.4	66.3	66.3	65.9	-0.3 pps
3 - **Labour force** (15-64, 1000 pers.)	4261	4279	4319	4412	4433	0.5 %
Male	2257	2260	2287	2340	2350	0.4 %
Female	2004	2018	2032	2072	2083	0.5 %
4 - **Activity rate** (% of population 15-64)	75.5	75.4	75.5	76.2	76.4	0.2 pps
Young (15-24)	58.8	58.0	57.4	57.5	56.1	-1.4 pps
Prime age (25-54)	88.3	88.0	88.0	88.4	88.7	0.3 pps
Older (55-64)	45.5	46.9	48.6	51.7	53.6	1.8 pps
Nationals (15-64)	76.3	76.0	76.2	77.2	77.3	0.1 pps
Non-nationals (15-64)	70.4	71.6	71.5	71.3	72.4	1.1 pps
Male	80.4	80.0	80.1	80.7	81.0	0.3 pps
Young (15-24)	62.3	60.7	60.7	60.2	58.4	-1.8 pps
Prime age (25-54)	92.1	91.5	91.6	91.8	92.3	0.5 pps
Older (55-64)	55.1	56.8	57.4	61.2	63.0	1.9 pps
Female	70.7	70.8	70.9	71.7	71.8	0.1 pps
Young (15-24)	55.3	55.4	54.1	54.6	53.7	-0.9 pps
Prime age (25-54)	84.5	84.5	84.4	84.9	85.0	0.1 pps
Older (55-64)	36.4	37.5	40.2	42.7	44.5	1.8 pps
5 - **Employment rate** (% of population 15-64)	71.4	71.1	71.1	71.5	72.2	0.6 pps
Young (15-24)	53.1	52.1	51.4	51.0	50.6	-0.4 pps
Prime age (25-54)	84.0	83.4	83.5	83.6	84.1	0.5 pps
Older (55-64)	43.8	45.1	46.3	49.2	51.3	2.1 pps
Low-skilled (15-64)	47.3	47.5	47.2	47.3	46.9	-0.4 pps
Medium-skilled (15-64)	76.2	73.8	73.5	73.8	74.5	0.7 pps
High-skilled (15-64)	85.3	83.3	83.3	84.0	84.6	0.6 pps
Nationals (15-64)	72.7	72.3	72.5	73.3	73.8	0.4 pps
Non-nationals (15-64)	63.3	63.6	63.3	62.6	64.5	1.8 pps
Male	76.0	75.3	75.1	75.4	76.2	0.7 pps
Young (15-24)	56.4	54.3	54.0	52.9	52.1	-0.8 pps
Prime age (25-54)	87.5	86.6	86.6	86.6	87.2	0.6 pps
Older (55-64)	52.8	54.3	54.1	57.6	60.1	2.5 pps
Female	66.9	66.9	67.1	67.7	68.2	0.5 pps
Young (15-24)	49.7	49.9	48.7	49.0	49.0	0.0 pps
Prime age (25-54)	80.5	80.3	80.3	80.6	81.0	0.4 pps
Older (55-64)	35.2	36.4	38.8	41.1	42.8	1.7 pps
6 - **Employed persons** (15-64, 1000 pers.)	4030.0	4034.2	4067.6	4142.7	4185.3	1.0 %
7 - **Employment growth** (%, National accounts)	0.3	1.0	0.6	1.3	1.7	0.4 pps
Employment growth (%, 15-64, LFS)	0.4	0.1	0.8	1.8	1.0	-0.8 pps
Male	0.2	-0.3	0.9	2.0	1.0	-1.0 pps
Female	0.6	0.6	0.8	1.7	1.1	-0.6 pps
8 - **Self employed** (15-64, % of total employment)	11.0	10.9	11.0	10.8	10.6	-0.3 pps
Male	13.3	13.3	13.3	13.2	12.9	-0.3 pps
Female	8.4	8.3	8.4	8.1	7.9	-0.2 pps
9 - **Temporary employment** (15-64, % of total employment)	9.2	9.2	9.1	9.0	9.2	0.2 pps
Male	9.4	9.2	9.1	8.9	9.2	0.3 pps
Female	9.0	9.2	9.1	9.1	9.2	0.1 pps
10 - **Part-time** (15-64, % of total employment)	26.0	26.9	27.3	27.8	27.9	0.1 pps
Male	9.0	9.6	9.8	10.5	10.6	0.1 pps
Female	45.1	46.3	46.8	47.1	47.2	0.1 pps
11 - **Unemployment rate** (harmonised:15-74)	5.4	5.6	5.7	6.0	5.5	-0.5 pps
Young (15-24)	9.7	10.3	10.6	11.2	9.8	-1.4 pps
Prime age (25-49)	4.9	5.2	5.2	5.4	5.1	-0.3 pps
Older (55-64)	3.8	3.8	4.7	5.0	4.2	-0.8 pps
Low-skilled (15-64)	10.6	11.8	11.5	13.0	13.3	0.3 pps
Medium-skilled (15-64)	4.8	5.1	5.5	5.8	5.1	-0.7 pps
High-skilled (15-64)	3.5	4.0	3.9	3.6	3.2	-0.4 pps
Nationals (15-64)	4.7	4.8	4.9	5.0	4.5	-0.5 pps
Non-nationals (15-64)	10.1	11.3	11.4	12.1	10.9	-1.2 pps
Male	5.4	5.9	6.1	6.5	5.9	-0.6 pps
Female	5.3	5.4	5.3	5.6	5.0	-0.6 pps
12 - **Long-term unemployment** (% of total unemployment)	24.6	27.2	29.2	32.2	33.3	1.1 pps
13 - **Worked hours** (full-time, average actual weekly hours)	41.4	41.3	40.9	41.0	40.7	-0.7 %
Male	42.2	42.0	41.5	41.7	41.4	-0.7 %
Female	39.9	39.9	39.5	39.5	39.4	-0.3 %
14 - **Sectoral employment growth** (% change)						
Agriculture	-1.3	3.2	-6.3	-2.7	-2.4	0.3 pps
Building and construction	-1.2	1.3	-0.3	1.3	2.2	0.9 pps
Services	0.7	0.9	0.6	1.5	2.2	0.7 pps
Manufacturing industry	-0.3	-0.1	0.5	0.5	1.4	0.9 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	2.2	1.9	1.9	2.4	1.5	-0.9 pps
Real compensation per employee based on GDP	0.4	0.3	-0.5	1.2	0.7	-0.4 pps
Labour cost index (compens. of employees plus taxes minus subs.)	2.5	2.8	3.2	1.1	2.7	1.6 pps
Labour cost index (wages and salaries, total)	2.4	3.0	3.3	1.0	2.7	1.7 pps
Labour productivity (GDP/person employed)	-0.3	-0.3	0.5	0.7	0.8	0.1 pps

Poland	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	38502	38484	38455	38427	38422	0.0 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	25525	25278	25128	24649	24317	-1.3 %
(% of total population)	66.3	65.7	65.3	64.1	63.3	-0.9 pps
3 - **Labour force** (15-64, 1000 pers.)	17101	17153	17112	16961	16919	-0.2 %
Male	9409	9419	9389	9315	9304	-0.1 %
Female	7692	7734	7723	7646	7616	-0.4 %
4 - **Activity rate** (% of population 15-64)	67.0	67.9	68.1	68.8	69.6	0.8 pps
Young (15-24)	33.3	33.9	32.8	34.5	34.8	0.3 pps
Prime age (25-54)	84.6	85.1	85.1	84.9	84.9	0.0 pps
Older (55-64)	44.0	45.6	46.9	48.3	50.1	1.9 pps
Nationals (15-64)	67.0	67.8	68.1	68.8	69.5	0.7 pps
Non-nationals (15-64)	71.3	73.7	67.8	67.9	77.6	9.6 pps
Male	73.9	74.6	74.8	75.7	76.6	0.9 pps
Young (15-24)	38.4	38.8	38.4	39.8	39.7	-0.1 pps
Prime age (25-54)	90.0	90.5	90.6	90.8	91.1	0.3 pps
Older (55-64)	55.9	57.2	57.5	58.6	60.8	2.2 pps
Female	60.1	61.1	61.4	62.0	62.6	0.6 pps
Young (15-24)	27.9	28.7	26.9	28.9	29.7	0.7 pps
Prime age (25-54)	79.1	79.6	79.6	79.0	78.7	-0.2 pps
Older (55-64)	33.3	35.2	37.3	39.0	40.5	1.5 pps
5 - **Employment rate** (% of population 15-64)	60.0	61.7	62.9	64.5	66.1	1.6 pps
Young (15-24)	24.2	25.8	26.0	28.4	29.6	1.2 pps
Prime age (25-54)	77.0	78.4	79.5	80.3	81.4	1.0 pps
Older (55-64)	40.6	42.5	44.3	46.2	48.3	2.1 pps
Low-skilled (15-64)	22.4	22.7	23.3	23.0	23.3	0.3 pps
Medium-skilled (15-64)	61.6	62.9	64.0	65.6	67.0	1.4 pps
High-skilled (15-64)	82.3	83.9	85.0	85.8	86.8	0.9 pps
Nationals (15-64)	60.0	61.7	62.9	64.5	66.1	1.6 pps
Non-nationals (15-64)	60.8	66.0	62.4	60.5	71.2	10.7 pps
Male	66.6	68.2	69.2	71.0	72.8	1.8 pps
Young (15-24)	28.6	30.0	30.5	32.9	33.9	1.0 pps
Prime age (25-54)	82.7	83.9	84.9	86.1	87.3	1.2 pps
Older (55-64)	51.3	53.1	54.2	55.7	58.3	2.6 pps
Female	53.4	55.2	56.6	58.1	59.5	1.4 pps
Young (15-24)	19.5	21.4	21.3	23.7	25.2	1.4 pps
Prime age (25-54)	71.2	72.7	73.9	74.5	75.3	0.8 pps
Older (55-64)	31.0	32.9	35.5	37.6	39.3	1.7 pps
6 - **Employed persons** (15-64, 1000 pers.)	15313.3	15591.0	15811.6	15901.8	16078.8	1.1 %
7 - **Employment growth** (%, National accounts)	-0.1	1.7	1.5	0.6	1.4	0.8 pps
Employment growth (%, 15-64, LFS)	-0.2	1.8	1.4	0.6	1.1	0.5 pps
Male	-0.1	1.4	1.0	0.5	1.2	0.7 pps
Female	-0.2	2.3	2.0	0.6	1.0	0.4 pps
8 - **Self employed** (15-64, % of total employment)	18.1	17.9	17.9	17.7	17.4	-0.3 pps
Male	21.9	21.9	21.8	21.7	21.8	0.0 pps
Female	13.4	13.0	13.1	12.7	12.0	-0.7 pps
9 - **Temporary employment** (15-64, % of total employment)	26.8	28.3	28.0	27.5	26.1	-1.4 pps
Male	27.2	28.5	28.0	27.3	25.6	-1.7 pps
Female	26.3	28.0	27.9	27.6	26.6	-1.0 pps
10 - **Part-time** (15-64, % of total employment)	7.1	7.1	6.8	6.4	6.6	0.2 pps
Male	4.5	4.4	4.2	3.7	3.7	0.0 pps
Female	10.4	10.3	9.9	9.7	10.0	0.3 pps
11 - **Unemployment rate** (harmonised:15-74)	10.3	9.0	7.5	6.2	4.9	-1.3 pps
Young (15-24)	27.3	23.9	20.8	17.7	14.8	-2.9 pps
Prime age (25-49)	9.0	7.9	6.6	5.4	4.2	-1.2 pps
Older (55-64)	7.7	6.8	5.4	4.4	3.7	-0.7 pps
Low-skilled (15-64)	21.3	19.7	17.3	14.9	12.6	-2.3 pps
Medium-skilled (15-64)	11.5	10.2	8.4	7.0	5.7	-1.3 pps
High-skilled (15-64)	5.7	4.7	4.0	3.3	2.5	-0.8 pps
Nationals (15-64)	10.4	9.1	7.6	6.2	5.0	-1.2 pps
Non-nationals (15-64)	14.6	0.0	0.0	11.0	8.2	-2.8 pps
Male	9.7	8.5	7.3	6.1	4.9	-1.2 pps
Female	11.1	9.6	7.7	6.2	4.9	-1.3 pps
12 - **Long-term unemployment** (% of total unemployment)	42.5	42.7	39.3	34.9	31.0	-3.9 pps
13 - **Worked hours** (full-time, average actual weekly hours)	40.8	41.1	41.1	41.2	40.8	-1.0 %
Male	42.2	42.3	42.3	42.3	41.9	-0.9 %
Female	39.0	39.4	39.4	39.6	39.3	-0.8 %
14 - **Sectoral employment growth** (% change)						
Agriculture	-4.8	-2.6	2.1	-8.0	-2.5	5.5 pps
Building and construction	-5.5	-0.9	1.9	0.7	-0.2	-0.9 pps
Services	-0.5	3.6	1.9	0.8	1.7	0.9 pps
Manufacturing industry	2.2	2.2	3.0	4.9	4.3	-0.6 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	1.7	2.2	1.7	5.1	4.6	-0.5 pps
Real compensation per employee based on GDP	0.9	-2.4	-0.5	0.4	2.0	1.6 pps
Labour cost index (compens. of employees plus taxes minus subs.)	3.4	3.4	3.8	4.4	6.6	2.2 pps
Labour cost index (wages and salaries, total)	3.4	3.4	3.8	4.4	6.6	2.2 pps
Labour productivity (GDP/person employed)	1.5	1.5	2.3	2.4	3.2	0.8 pps

Portugal	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	10457	10401	10358	10326	10300	-0.2 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	6859	6794	6743	6700	6659	-0.6 %
(% of total population)	65.6	65.3	65.1	64.9	64.6	-0.2 pps
3 - **Labour force** (15-64, 1000 pers.)	5010	4976	4949	4940	4972	0.7 %
Male	2550	2523	2501	2498	2506	0.3 %
Female	2460	2454	2448	2441	2466	1.0 %
4 - **Activity rate** (% of population 15-64)	73.0	73.2	73.4	73.7	74.7	0.9 pps
Young (15-24)	35.0	34.3	33.5	33.2	34.0	0.8 pps
Prime age (25-54)	88.3	88.6	88.8	89.1	89.6	0.5 pps
Older (55-64)	54.4	55.3	57.0	58.5	61.5	3.0 pps
Nationals (15-64)	72.9	73.2	73.3	73.6	74.6	0.9 pps
Non-nationals (15-64)	77.5	76.3	76.7	78.7	79.3	0.7 pps
Male	76.5	76.7	76.7	77.2	77.9	0.8 pps
Young (15-24)	36.2	34.8	34.2	35.0	35.6	0.5 pps
Prime age (25-54)	91.1	91.6	91.7	91.9	92.3	0.5 pps
Older (55-64)	62.7	64.0	65.0	66.9	69.2	2.3 pps
Female	69.8	70.0	70.3	70.5	71.6	1.1 pps
Young (15-24)	33.8	33.8	32.8	31.3	32.3	1.1 pps
Prime age (25-54)	85.5	85.8	86.0	86.6	87.0	0.5 pps
Older (55-64)	46.9	47.5	49.9	51.0	54.6	3.7 pps
5 - **Employment rate** (% of population 15-64)	60.6	62.6	63.9	65.2	67.8	2.6 pps
Young (15-24)	21.7	22.4	22.8	23.9	25.9	2.0 pps
Prime age (25-54)	74.6	77.4	78.8	80.2	82.5	2.4 pps
Older (55-64)	46.9	47.8	49.9	52.1	56.2	4.2 pps
Low-skilled (15-64)	54.7	55.4	56.3	57.0	59.8	2.8 pps
Medium-skilled (15-64)	63.5	65.9	66.9	68.3	70.5	2.2 pps
High-skilled (15-64)	76.9	79.4	80.4	81.8	83.5	1.7 pps
Nationals (15-64)	60.8	62.7	64.0	65.3	67.8	2.5 pps
Non-nationals (15-64)	54.9	59.4	61.4	65.1	68.3	3.3 pps
Male	63.5	65.8	66.9	68.3	71.1	2.8 pps
Young (15-24)	22.9	22.9	24.1	25.5	27.6	2.1 pps
Prime age (25-54)	77.1	80.6	81.8	83.0	85.6	2.6 pps
Older (55-64)	53.5	54.3	56.0	58.5	63.0	4.5 pps
Female	57.9	59.6	61.1	62.4	64.8	2.3 pps
Young (15-24)	20.4	21.9	21.5	22.2	24.1	1.8 pps
Prime age (25-54)	72.2	74.3	76.1	77.6	79.7	2.1 pps
Older (55-64)	41.0	42.0	44.5	46.3	50.2	3.9 pps
6 - **Employed persons** (15-64, 1000 pers.)	4158.0	4254.5	4309.0	4371.2	4515.4	3.3 %
7 - **Employment growth** (%, National accounts)	-2.9	1.4	1.4	1.6	3.3	1.7 pps
Employment growth (%, 15-64, LFS)	-2.3	2.3	1.3	1.4	3.3	1.9 pps
Male	-2.8	2.2	0.8	1.3	3.4	2.1 pps
Female	-1.8	2.4	1.7	1.6	3.2	1.6 pps
8 - **Self employed** (15-64, % of total employment)	17.1	15.5	14.5	13.9	13.4	-0.5 pps
Male	20.4	19.3	17.8	17.1	16.6	-0.5 pps
Female	13.6	11.7	11.1	10.7	10.1	-0.5 pps
9 - **Temporary employment** (15-64, % of total employment)	21.4	21.4	22.0	22.3	22.0	-0.3 pps
Male	21.2	21.6	22.4	22.5	22.3	-0.2 pps
Female	21.6	21.1	21.5	22.1	21.7	-0.4 pps
10 - **Part-time** (15-64, % of total employment)	11.1	10.1	9.8	9.5	8.9	-0.6 pps
Male	8.2	7.6	7.1	6.8	6.1	-0.7 pps
Female	14.0	12.6	12.5	12.1	11.7	-0.4 pps
11 - **Unemployment rate** (harmonised:15-74)	16.4	14.1	12.6	11.2	9.0	-2.2 pps
Young (15-24)	38.1	34.8	32.0	28.0	23.9	-4.1 pps
Prime age (25-49)	15.5	12.7	11.2	10.0	7.9	-2.1 pps
Older (55-64)	13.7	13.5	12.5	11.0	8.5	-2.5 pps
Low-skilled (15-64)	18.4	16.2	14.2	12.7	10.2	-2.5 pps
Medium-skilled (15-64)	17.5	15.3	14.0	12.3	10.0	-2.3 pps
High-skilled (15-64)	12.8	10.1	9.3	8.4	6.6	-1.8 pps
Nationals (15-64)	16.6	14.3	12.7	11.4	9.1	-2.3 pps
Non-nationals (15-64)	29.2	22.1	20.0	17.3	13.8	-3.5 pps
Male	16.3	13.8	12.4	11.1	8.6	-2.5 pps
Female	16.6	14.5	12.9	11.3	9.5	-1.8 pps
12 - **Long-term unemployment** (% of total unemployment)	56.3	59.5	57.2	55.2	49.6	-5.6 pps
13 - **Worked hours** (full-time, average actual weekly hours)	41.5	41.5	41.4	40.7	40.6	-0.2 %
Male	42.6	42.4	42.4	41.7	41.6	-0.2 %
Female	40.3	40.4	40.3	39.6	39.4	-0.5 %
14 - **Sectoral employment growth** (% change)						
Agriculture	-5.4	-4.6	-5.7	-3.7	-2.7	1.0 pps
Building and construction	-10.2	-4.7	1.3	1.2	5.8	4.6 pps
Services	-2.2	4.8	3.3	3.3	5.1	1.8 pps
Manufacturing industry	-1.8	2.3	3.1	1.7	3.8	2.1 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	3.6	-1.8	0.4	1.7	1.6	-0.1 pps
Real compensation per employee based on GDP	0.2	0.4	1.3	-1.3	0.5	1.8 pps
Labour cost index (compens. of employees plus taxes minus subs.)	-1.3	-0.6	2.0	1.5	2.1	0.6 pps
Labour cost index (wages and salaries, total)	-1.9	-0.7	2.3	1.9	2.2	0.3 pps
Labour productivity (GDP/person employed)	1.8	-0.5	0.4	0.3	-0.5	-0.8 pps

Romania	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	19989	19916	19820	19707	19644	-0.3 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	13606	13527	13404	13263	13095	-1.3 %
(% of total population)	68.1	67.9	67.6	67.3	66.7	-0.6 pps
3 - **Labour force** (15-64, 1000 pers.)	8832	8883	8858	8696	8812	1.3 %
Male	5021	5061	5099	5006	5034	0.6 %
Female	3811	3822	3759	3690	3778	2.4 %
4 - **Activity rate** (% of population 15-64)	64.9	65.7	66.1	65.6	67.3	1.7 pps
Young (15-24)	30.1	29.6	31.3	28.0	29.9	1.9 pps
Prime age (25-54)	81.5	82.1	82.5	81.9	83.4	1.5 pps
Older (55-64)	43.4	44.6	42.7	44.2	46.0	1.8 pps
Nationals (15-64)	64.9	65.7	66.1	65.6	67.3	1.7 pps
Non-nationals (15-64)	:	:	:	:	74.5	: pps
Male	73.4	74.3	75.3	74.8	76.2	1.4 pps
Young (15-24)	35.1	34.8	37.0	33.9	34.6	0.7 pps
Prime age (25-54)	90.0	90.5	91.6	91.0	92.2	1.2 pps
Older (55-64)	53.9	55.4	53.8	55.1	57.4	2.3 pps
Female	56.3	56.9	56.7	56.2	58.2	2.1 pps
Young (15-24)	24.7	23.9	25.2	21.8	25.0	3.2 pps
Prime age (25-54)	72.7	73.3	72.9	72.4	74.2	1.9 pps
Older (55-64)	34.1	35.0	32.8	34.4	35.7	1.3 pps
5 - **Employment rate** (% of population 15-64)	60.1	61.0	61.4	61.6	63.9	2.3 pps
Young (15-24)	22.9	22.5	24.5	22.3	24.5	2.2 pps
Prime age (25-54)	76.3	77.1	77.4	77.6	79.9	2.3 pps
Older (55-64)	41.8	43.1	41.1	42.8	44.5	1.8 pps
Low-skilled (15-64)	42.2	44.4	42.6	41.0	42.5	1.5 pps
Medium-skilled (15-64)	63.7	65.0	64.9	65.2	67.5	2.3 pps
High-skilled (15-64)	82.6	82.5	85.3	86.2	87.9	1.7 pps
Nationals (15-64)	60.1	61.0	61.4	61.6	63.9	2.3 pps
Non-nationals (15-64)	:	:	:	:	68.2	: pps
Male	67.6	68.7	69.5	69.7	71.8	2.1 pps
Young (15-24)	27.0	26.6	29.4	27.2	28.4	1.2 pps
Prime age (25-54)	83.7	84.6	85.2	85.5	87.6	2.1 pps
Older (55-64)	51.4	53.2	51.2	53.0	55.3	2.3 pps
Female	52.6	53.3	53.2	53.3	55.8	2.5 pps
Young (15-24)	18.6	18.0	19.3	17.1	20.4	3.3 pps
Prime age (25-54)	68.6	69.3	69.2	69.2	71.8	2.6 pps
Older (55-64)	33.2	34.2	32.1	33.6	34.9	1.2 pps
6 - **Employed persons** (15-64, 1000 pers.)	8178.9	8254.4	8234.8	8166.1	8363.2	2.4 %
7 - **Employment growth** (%, National accounts)	-0.9	0.8	-1.3	-0.9	2.6	3.5 pps
Employment growth (%, 15-64, LFS)	-0.5	0.9	-0.2	-0.8	2.4	3.2 pps
Male	0.0	1.2	0.6	-0.8	1.6	2.4 pps
Female	-1.2	0.5	-1.3	-0.9	3.5	4.4 pps
8 - **Self employed** (15-64, % of total employment)	18.8	18.4	17.6	16.5	16.4	-0.1 pps
Male	24.3	23.8	22.5	21.2	21.1	-0.1 pps
Female	11.7	11.5	11.1	10.2	10.1	-0.1 pps
9 - **Temporary employment** (15-64, % of total employment)	1.4	1.5	1.4	1.4	1.2	-0.2 pps
Male	1.7	1.7	1.6	1.7	1.4	-0.3 pps
Female	1.1	1.2	1.1	1.0	0.9	-0.1 pps
10 - **Part-time** (15-64, % of total employment)	9.0	8.7	8.8	7.4	6.8	-0.6 pps
Male	8.6	8.2	8.5	7.3	6.7	-0.6 pps
Female	9.6	9.5	9.2	7.7	6.9	-0.8 pps
11 - **Unemployment rate** (harmonised:15-74)	7.1	6.8	6.8	5.9	4.9	-1.0 pps
Young (15-24)	23.7	24.0	21.7	20.6	18.3	-2.3 pps
Prime age (25-49)	6.4	6.1	6.2	5.3	4.2	-1.1 pps
Older (55-64)	3.7	3.3	3.7	3.2	3.2	0.0 pps
Low-skilled (15-64)	7.9	7.7	9.1	8.6	7.6	-1.0 pps
Medium-skilled (15-64)	7.8	7.2	7.3	6.3	5.2	-1.1 pps
High-skilled (15-64)	5.4	5.9	4.1	3.1	2.4	-0.7 pps
Nationals (15-64)	7.4	7.1	7.0	6.1	5.1	-1.0 pps
Non-nationals (15-64)	0.0	0.0	0.0	0.0	0.0	0.0 pps
Male	7.7	7.3	7.5	6.6	5.6	-1.0 pps
Female	6.3	6.1	5.8	5.0	4.0	-1.0 pps
12 - **Long-term unemployment** (% of total unemployment)	45.2	41.1	43.9	50.0	41.5	-8.5 pps
13 - **Worked hours** (full-time, average actual weekly hours)	40.4	40.4	40.1	40.2	40.1	-0.2 %
Male	40.9	40.8	40.5	40.6	40.5	-0.2 %
Female	39.7	39.8	39.5	39.6	39.6	0.0 %
14 - **Sectoral employment growth** (% change)						
Agriculture	-2.2	-2.4	-11.0	-9.9	1.2	11.1 pps
Building and construction	-1.1	1.3	-0.3	7.4	2.7	-4.7 pps
Services	1.2	3.0	4.5	2.2	3.4	1.2 pps
Manufacturing industry	0.2	4.1	-2.8	3.0	4.4	1.4 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	3.6	6.9	1.9	12.3	13.8	1.5 pps
Real compensation per employee based on GDP	3.2	-1.5	15.1	1.7	-5.7	-7.4 pps
Labour cost index (compens. of employees plus taxes minus subs.)	4.0	5.4	5.0	10.4	14.2	3.8 pps
Labour cost index (wages and salaries, total)	3.6	6.8	7.6	10.5	14.2	3.7 pps
Labour productivity (GDP/person employed)	4.4	2.6	5.2	5.8	4.2	-1.6 pps

Slovenia	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	2060	2062	2063	2065	2066	0.1 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	1404	1397	1382	1371	1362	-0.6 %
(% of total population)	68.2	67.8	67.0	66.4	65.9	-0.5 pps
3 - **Labour force** (15-64, 1000 pers.)	990	991	992	982	1011	2.9 %
Male	536	535	536	524	538	2.7 %
Female	454	456	456	458	473	3.2 %
4 - **Activity rate** (% of population 15-64)	70.5	70.9	71.8	71.6	74.2	2.6 pps
Young (15-24)	33.9	33.6	35.3	33.7	39.1	5.4 pps
Prime age (25-54)	90.7	90.3	90.8	90.5	91.9	1.4 pps
Older (55-64)	36.0	38.4	39.7	41.2	45.6	4.4 pps
Nationals (15-64)	70.4	71.0	71.5	71.4	74.1	2.7 pps
Non-nationals (15-64)	75.4	67.8	77.6	76.7	76.1	-0.6 pps
Male	74.2	74.3	75.4	74.5	77.1	2.5 pps
Young (15-24)	37.2	36.6	38.9	36.9	42.9	6.0 pps
Prime age (25-54)	92.6	92.2	92.9	92.0	93.4	1.4 pps
Older (55-64)	45.1	45.7	46.3	47.1	51.7	4.6 pps
Female	66.6	67.2	67.9	68.6	71.2	2.6 pps
Young (15-24)	30.2	30.5	31.7	30.5	34.9	4.4 pps
Prime age (25-54)	88.7	88.3	88.6	88.9	90.2	1.4 pps
Older (55-64)	27.0	31.1	32.9	35.2	39.5	4.4 pps
5 - **Employment rate** (% of population 15-64)	63.3	63.9	65.2	65.8	69.3	3.4 pps
Young (15-24)	26.5	26.8	29.6	28.6	34.7	6.1 pps
Prime age (25-54)	81.9	81.9	82.9	83.5	86.1	2.6 pps
Older (55-64)	33.5	35.4	36.6	38.5	42.7	4.2 pps
Low-skilled (15-64)	33.7	36.1	35.7	32.3	35.4	3.1 pps
Medium-skilled (15-64)	64.6	64.9	65.9	67.4	70.7	3.4 pps
High-skilled (15-64)	82.4	82.0	83.1	84.0	86.2	2.3 pps
Nationals (15-64)	63.5	64.2	65.2	65.8	69.3	3.5 pps
Non-nationals (15-64)	56.7	55.1	66.3	66.4	69.1	2.7 pps
Male	67.1	67.5	69.2	68.9	72.5	3.7 pps
Young (15-24)	29.7	29.5	32.0	31.1	38.6	7.6 pps
Prime age (25-54)	84.3	84.6	86.1	85.6	88.5	2.9 pps
Older (55-64)	41.8	41.7	42.6	43.6	48.0	4.4 pps
Female	59.2	60.0	61.0	62.6	65.8	3.2 pps
Young (15-24)	23.0	23.9	27.0	26.0	30.4	4.4 pps
Prime age (25-54)	79.3	79.1	79.5	81.2	83.5	2.3 pps
Older (55-64)	25.3	29.0	30.5	33.4	37.4	4.1 pps
6 - **Employed persons** (15-64, 1000 pers.)	888.1	892.5	901.6	902.5	943.5	4.5 %
7 - **Employment growth** (%, National accounts)	-1.1	0.4	1.3	1.8	2.9	1.1 pps
Employment growth (%, 15-64, LFS)	-2.0	0.5	1.0	0.1	4.5	4.4 pps
Male	-1.2	0.3	1.2	-1.6	4.6	6.2 pps
Female	-3.0	0.7	0.8	2.1	4.5	2.3 pps
8 - **Self employed** (15-64, % of total employment)	11.6	12.1	12.1	11.5	11.4	-0.1 pps
Male	15.3	15.9	15.7	15.1	14.3	-0.8 pps
Female	7.2	7.7	7.8	7.4	8.1	0.6 pps
9 - **Temporary employment** (15-64, % of total employment)	16.3	16.5	17.8	16.9	17.6	0.7 pps
Male	15.6	16.0	17.0	15.9	16.4	0.5 pps
Female	17.1	17.1	18.7	18.0	18.9	0.9 pps
10 - **Part-time** (15-64, % of total employment)	9.3	10.0	10.1	9.3	10.3	1.0 pps
Male	6.5	6.8	7.0	6.0	6.7	0.7 pps
Female	12.6	13.7	13.7	13.1	14.5	1.4 pps
11 - **Unemployment rate** (harmonised:15-74)	10.1	9.7	9.0	8.0	6.6	-1.4 pps
Young (15-24)	21.6	20.2	16.3	15.2	11.2	-4.0 pps
Prime age (25-49)	9.7	9.3	8.7	7.7	6.3	-1.4 pps
Older (55-64)	7.0	7.8	7.8	6.5	6.4	-0.1 pps
Low-skilled (15-64)	18.8	16.4	14.6	15.1	11.5	-3.6 pps
Medium-skilled (15-64)	10.8	10.5	10.0	8.1	6.8	-1.3 pps
High-skilled (15-64)	6.2	6.3	5.8	6.2	5.3	-0.9 pps
Nationals (15-64)	9.8	9.6	8.9	7.9	6.5	-1.4 pps
Non-nationals (15-64)	25.0	18.8	14.6	13.4	9.2	-4.2 pps
Male	9.5	9.0	8.1	7.5	5.8	-1.7 pps
Female	10.9	10.6	10.1	8.6	7.5	-1.1 pps
12 - **Long-term unemployment** (% of total unemployment)	51.0	54.5	52.3	53.3	47.5	-5.8 pps
13 - **Worked hours** (full-time, average actual weekly hours)	40.9	41.0	41.0	40.5	39.9	-1.5 %
Male	41.4	41.5	41.6	41.2	40.5	-1.7 %
Female	40.1	40.4	40.2	39.6	39.2	-1.0 %
14 - **Sectoral employment growth** (% change)						
Agriculture	0.0	-1.7	-0.8	-1.3	-1.0	0.3 pps
Building and construction	-7.0	-1.1	0.4	-1.0	2.6	3.6 pps
Services	-0.7	0.9	2.1	2.3	3.7	1.4 pps
Manufacturing industry	-2.1	0.2	1.4	3.0	3.7	0.7 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	0.5	1.3	1.3	3.0	3.2	0.1 pps
Real compensation per employee based on GDP	2.1	4.2	4.4	3.1	1.9	-1.2 pps
Labour cost index (compens. of employees plus taxes minus subs.)	-1.1	2.4	1.4	1.8	5.6	3.8 pps
Labour cost index (wages and salaries, total)	-1.1	2.5	1.0	1.4	5.1	3.7 pps
Labour productivity (GDP/person employed)	0.0	2.5	1.0	1.2	1.9	0.7 pps

Slovak Republic	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	5413	5419	5422	5431	5438	0.1 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	3870	3853	3834	3810	3781	-0.8 %
(% of total population)	71.5	71.1	70.7	70.2	69.5	-0.6 pps
3 - **Labour force** (15-64, 1000 pers.)	2703	2707	2719	2738	2726	-0.5 %
Male	1498	1501	1493	1499	1489	-0.7 %
Female	1205	1206	1226	1239	1237	-0.2 %
4 - **Activity rate** (% of population 15-64)	69.9	70.3	70.9	71.9	72.1	0.2 pps
Young (15-24)	30.8	31.0	31.7	32.4	33.2	0.8 pps
Prime age (25-54)	87.2	87.3	87.3	87.6	86.6	-1.0 pps
Older (55-64)	49.5	50.1	51.8	53.9	56.4	2.5 pps
Nationals (15-64)	69.8	70.2	70.9	71.8	72.1	0.2 pps
Non-nationals (15-64)	87.5	81.5	81.8	75.8	79.6	3.9 pps
Male	77.2	77.6	77.5	78.3	78.2	0.0 pps
Young (15-24)	37.5	38.0	38.3	39.7	39.6	-0.2 pps
Prime age (25-54)	93.6	94.0	93.6	93.5	93.1	-0.4 pps
Older (55-64)	59.5	58.9	58.4	60.1	60.0	-0.1 pps
Female	62.5	62.9	64.3	65.4	65.9	0.5 pps
Young (15-24)	23.7	23.6	24.9	24.7	26.5	1.8 pps
Prime age (25-54)	80.5	80.4	80.8	81.5	79.8	-1.7 pps
Older (55-64)	40.4	42.2	45.8	48.2	53.0	4.8 pps
5 - **Employment rate** (% of population 15-64)	59.9	61.0	62.7	64.9	66.2	1.3 pps
Young (15-24)	20.4	21.8	23.3	25.2	26.9	1.7 pps
Prime age (25-54)	76.0	76.8	78.2	80.0	80.0	0.0 pps
Older (55-64)	44.0	44.8	47.0	49.0	53.0	3.9 pps
Low-skilled (15-64)	15.8	17.7	18.4	19.8	21.4	1.6 pps
Medium-skilled (15-64)	65.6	66.9	68.6	70.9	72.5	1.6 pps
High-skilled (15-64)	74.7	75.6	76.5	77.3	78.5	1.2 pps
Nationals (15-64)	59.9	60.9	62.7	64.9	66.2	1.3 pps
Non-nationals (15-64)	78.1	77.8	77.3	69.7	75.0	5.3 pps
Male	66.4	67.6	69.5	71.4	72.0	0.6 pps
Young (15-24)	24.4	26.9	28.4	31.9	32.4	0.5 pps
Prime age (25-54)	82.2	83.2	85.1	86.3	86.3	0.0 pps
Older (55-64)	53.2	53.2	53.6	55.1	56.6	1.5 pps
Female	53.4	54.3	55.9	58.3	60.3	2.0 pps
Young (15-24)	16.2	16.5	18.0	18.2	21.1	2.9 pps
Prime age (25-54)	69.6	70.2	71.0	73.5	73.4	0.0 pps
Older (55-64)	35.7	37.2	41.0	43.5	49.6	6.1 pps
6 - **Employed persons** (15-64, 1000 pers.)	2317.7	2349.2	2405.1	2471.7	2502.1	1.2 %
7 - **Employment growth** (%, National accounts)	-0.8	1.4	2.0	2.4	2.2	-0.2 pps
Employment growth (%, 15-64, LFS)	0.0	1.4	2.4	2.8	1.2	-1.5 pps
Male	-0.6	1.5	2.3	2.2	0.2	-2.0 pps
Female	0.8	1.2	2.5	3.5	2.5	-1.0 pps
8 - **Self employed** (15-64, % of total employment)	15.4	15.2	14.9	15.2	15.0	-0.2 pps
Male	20.1	19.6	18.8	19.1	19.0	-0.1 pps
Female	9.6	9.7	10.0	10.4	10.2	-0.2 pps
9 - **Temporary employment** (15-64, % of total employment)	6.8	8.8	10.5	9.9	9.4	-0.5 pps
Male	6.6	9.0	9.8	9.7	9.1	-0.6 pps
Female	7.0	8.5	11.3	10.2	9.8	-0.4 pps
10 - **Part-time** (15-64, % of total employment)	4.5	5.1	5.8	5.8	5.8	0.0 pps
Male	3.3	3.7	4.0	4.1	4.0	-0.1 pps
Female	6.2	6.8	8.0	7.9	8.0	0.1 pps
11 - **Unemployment rate** (harmonised:15-74)	14.2	13.2	11.5	9.7	8.1	-1.6 pps
Young (15-24)	33.7	29.7	26.5	22.2	18.9	-3.3 pps
Prime age (25-49)	12.8	12.0	10.5	8.7	7.6	-1.1 pps
Older (55-64)	11.0	10.6	9.3	9.0	6.0	-3.0 pps
Low-skilled (15-64)	42.6	41.4	37.7	31.7	29.9	-1.8 pps
Medium-skilled (15-64)	14.0	12.6	11.0	9.2	7.6	-1.6 pps
High-skilled (15-64)	7.3	6.4	6.1	5.7	4.2	-1.5 pps
Nationals (15-64)	14.3	13.2	11.6	9.7	8.2	-1.5 pps
Non-nationals (15-64)	0.0	0.0	0.0	0.0	0.0	0.0 pps
Male	14.0	12.8	10.3	8.8	7.9	-0.9 pps
Female	14.5	13.6	12.9	10.8	8.4	-2.4 pps
12 - **Long-term unemployment** (% of total unemployment)	70.2	70.2	65.8	60.2	62.4	2.2 pps
13 - **Worked hours** (full-time, average actual weekly hours)	40.5	40.0	40.2	40.1	39.7	-1.0 %
Male	41.3	40.9	40.9	40.8	40.5	-0.7 %
Female	39.4	38.9	39.2	39.1	38.7	-1.0 %
14 - **Sectoral employment growth** (% change)						
Agriculture	4.8	-2.1	1.3	-1.1	-2.3	-1.2 pps
Building and construction	-3.0	-1.4	-0.6	1.8	1.8	0.0 pps
Services	-0.9	1.6	2.8	2.4	2.0	-0.4 pps
Manufacturing industry	-1.5	2.0	2.4	3.7	4.3	0.6 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	2.6	1.8	3.5	2.3	4.1	1.7 pps
Real compensation per employee based on GDP	2.6	2.1	6.5	4.9	7.5	2.6 pps
Labour cost index (compens. of employees plus taxes minus subs.)	2.6	5.2	3.4	2.9	6.8	3.9 pps
Labour cost index (wages and salaries, total)	1.3	5.4	3.7	2.8	6.3	3.5 pps
Labour productivity (GDP/person employed)	2.3	1.3	1.8	0.9	1.2	0.3 pps

Finland	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	5439	5463	5481	5495	5508	0.2 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	3489	3472	3455	3445	3434	-0.3 %
(% of total population)	64.1	63.6	63.0	62.7	62.3	-0.3 pps
3 - **Labour force** (15-64, 1000 pers.)	2622	2617	2619	2615	2635	0.8 %
Male	1350	1344	1343	1350	1362	0.9 %
Female	1272	1274	1277	1265	1273	0.7 %
4 - **Activity rate** (% of population 15-64)	75.2	75.4	75.8	75.9	76.7	0.8 pps
Young (15-24)	51.8	52.1	52.2	52.2	53.2	1.0 pps
Prime age (25-54)	86.8	86.6	86.6	86.3	86.8	0.4 pps
Older (55-64)	62.9	63.8	65.2	66.4	67.8	1.4 pps
Nationals (15-64)	75.3	75.6	76.1	76.3	77.1	0.8 pps
Non-nationals (15-64)	70.2	68.8	67.9	67.3	68.7	1.3 pps
Male	76.8	76.8	77.2	77.7	78.5	0.8 pps
Young (15-24)	50.7	51.5	51.1	51.2	52.3	1.1 pps
Prime age (25-54)	90.1	89.5	89.6	89.7	89.8	0.1 pps
Older (55-64)	61.5	61.9	63.2	65.2	67.5	2.4 pps
Female	73.4	73.9	74.4	74.1	74.9	0.8 pps
Young (15-24)	52.9	52.6	53.3	53.2	54.2	1.0 pps
Prime age (25-54)	83.3	83.6	83.6	82.8	83.6	0.8 pps
Older (55-64)	64.3	65.5	67.2	67.6	68.2	0.5 pps
5 - **Employment rate** (% of population 15-64)	68.9	68.7	68.5	69.1	70.0	0.9 pps
Young (15-24)	41.5	41.4	40.5	41.7	42.5	0.9 pps
Prime age (25-54)	81.0	80.5	80.0	79.9	80.6	0.7 pps
Older (55-64)	58.5	59.1	60.0	61.4	62.5	1.1 pps
Low-skilled (15-64)	39.7	39.3	37.9	38.6	38.5	-0.1 pps
Medium-skilled (15-64)	71.2	70.6	70.2	70.6	71.1	0.6 pps
High-skilled (15-64)	83.8	83.3	82.9	82.9	84.4	1.4 pps
Nationals (15-64)	69.2	69.2	69.0	69.7	70.5	0.8 pps
Non-nationals (15-64)	58.7	56.7	55.9	55.5	58.2	2.8 pps
Male	69.9	69.5	69.3	70.5	71.4	0.8 pps
Young (15-24)	39.1	39.8	38.2	40.1	41.3	1.3 pps
Prime age (25-54)	83.9	82.7	82.5	83.0	83.3	0.2 pps
Older (55-64)	56.5	56.8	57.4	59.8	61.6	1.9 pps
Female	67.8	68.0	67.7	67.6	68.5	0.9 pps
Young (15-24)	43.9	43.0	42.8	43.3	43.7	0.4 pps
Prime age (25-54)	78.1	78.1	77.3	76.7	77.9	1.2 pps
Older (55-64)	60.5	61.4	62.5	63.0	63.4	0.4 pps
6 - **Employed persons** (15-64, 1000 pers.)	2403.2	2385.9	2367.9	2379.5	2402.6	1.0 %
7 - **Employment growth** (%, National accounts)	-0.7	-0.5	-0.1	0.5	1.2	0.7 pps
Employment growth (%, 15-64, LFS)	-1.1	-0.7	-0.8	0.5	1.0	0.5 pps
Male	-1.3	-1.1	-0.7	1.6	1.0	-0.5 pps
Female	-1.0	-0.4	-0.8	-0.6	0.9	1.5 pps
8 - **Self employed** (15-64, % of total employment)	12.2	12.6	12.7	12.4	11.6	-0.8 pps
Male	16.3	16.5	16.7	16.4	15.0	-1.4 pps
Female	7.9	8.4	8.5	8.2	8.1	-0.1 pps
9 - **Temporary employment** (15-64, % of total employment)	15.3	15.4	15.1	15.6	15.8	0.2 pps
Male	12.2	12.3	12.3	12.9	12.9	0.0 pps
Female	18.3	18.2	17.8	18.2	18.6	0.4 pps
10 - **Part-time** (15-64, % of total employment)	14.0	14.1	14.1	14.9	15.1	0.2 pps
Male	8.8	9.2	9.7	10.0	9.9	-0.1 pps
Female	19.4	19.3	18.7	20.2	20.5	0.3 pps
11 - **Unemployment rate** (harmonised:15-74)	8.2	8.7	9.4	8.8	8.6	-0.2 pps
Young (15-24)	19.9	20.5	22.4	20.1	20.1	0.0 pps
Prime age (25-49)	6.6	7.1	7.7	7.4	7.1	-0.3 pps
Older (55-64)	7.0	7.3	8.0	7.5	7.8	0.3 pps
Low-skilled (15-64)	17.8	18.0	18.7	17.6	18.9	1.3 pps
Medium-skilled (15-64)	8.9	9.5	10.4	9.7	9.6	-0.1 pps
High-skilled (15-64)	4.5	5.1	6.1	5.9	5.3	-0.6 pps
Nationals (15-64)	8.1	8.5	9.3	8.7	8.6	-0.1 pps
Non-nationals (15-64)	16.5	17.6	17.6	17.6	15.2	-2.4 pps
Male	8.8	9.3	9.9	9.0	8.9	-0.1 pps
Female	7.5	8.0	8.8	8.6	8.4	-0.2 pps
12 - **Long-term unemployment** (% of total unemployment)	20.8	22.4	24.6	25.9	24.4	-1.5 pps
13 - **Worked hours** (full-time, average actual weekly hours)	38.5	38.4	38.5	38.8	38.7	-0.3 %
Male	40.0	39.8	40.0	40.2	40.0	-0.5 %
Female	36.7	36.7	36.7	37.1	37.0	-0.3 %
14 - **Sectoral employment growth** (% change)						
Agriculture	-2.1	-0.9	-2.8	-3.1	0.5	3.6 pps
Building and construction	-1.3	-1.3	1.8	4.8	3.1	-1.7 pps
Services	-0.3	0.4	-0.2	0.8	1.3	0.5 pps
Manufacturing industry	-3.8	-2.8	-1.5	-0.9	0.9	1.8 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	1.3	1.0	1.4	1.1	-1.2	-2.2 pps
Real compensation per employee based on GDP	1.9	2.9	2.5	2.5	0.5	-1.9 pps
Labour cost index (compens. of employees plus taxes minus subs.)	1.8	1.7	1.4	0.6	-0.8	-1.4 pps
Labour cost index (wages and salaries, total)	2.1	1.5	1.2	0.2	0.3	0.1 pps
Labour productivity (GDP/person employed)	0.0	-0.2	0.3	2.0	1.6	-0.4 pps

Sweden	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	9600	9696	9799	9934	10074	1.4 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	6120	6141	6170	6214	6290	1.2 %
(% of total population)	63.8	63.3	63.0	62.6	62.4	-0.1 pps
3 - **Labour force** (15-64, 1000 pers.)	4963	5005	5044	5100	5190	1.8 %
Male	2592	2612	2624	2658	2709	1.9 %
Female	2371	2393	2420	2442	2481	1.6 %
4 - **Activity rate** (% of population 15-64)	81.1	81.5	81.7	82.1	82.5	0.4 pps
Young (15-24)	54.5	55.4	55.1	54.8	54.7	-0.1 pps
Prime age (25-54)	90.9	90.8	90.9	90.9	91.2	0.3 pps
Older (55-64)	77.5	78.2	78.7	79.7	80.5	0.8 pps
Nationals (15-64)	81.8	82.2	82.5	82.9	83.2	0.3 pps
Non-nationals (15-64)	72.5	73.5	73.1	73.7	75.9	2.2 pps
Male	83.3	83.6	83.5	83.9	84.3	0.4 pps
Young (15-24)	53.9	54.9	53.8	54.2	54.1	-0.1 pps
Prime age (25-54)	93.6	93.5	93.3	93.3	93.6	0.3 pps
Older (55-64)	81.6	81.5	81.8	82.5	83.2	0.6 pps
Female	78.8	79.3	79.9	80.2	80.7	0.5 pps
Young (15-24)	55.2	56.1	56.5	55.5	55.4	-0.2 pps
Prime age (25-54)	88.1	88.0	88.4	88.5	88.8	0.3 pps
Older (55-64)	73.4	74.9	75.5	76.9	77.8	1.0 pps
5 - **Employment rate** (% of population 15-64)	74.4	74.9	75.5	76.2	76.9	0.7 pps
Young (15-24)	41.7	42.8	43.9	44.5	44.9	0.4 pps
Prime age (25-54)	85.4	85.4	85.6	85.9	86.3	0.4 pps
Older (55-64)	73.6	74.0	74.5	75.5	76.4	0.9 pps
Low-skilled (15-64)	45.5	45.9	46.0	45.8	46.5	0.8 pps
Medium-skilled (15-64)	80.3	80.2	80.9	81.6	82.6	0.9 pps
High-skilled (15-64)	87.3	87.3	87.7	88.1	88.1	0.1 pps
Nationals (15-64)	75.8	76.2	77.0	78.0	78.6	0.6 pps
Non-nationals (15-64)	57.3	58.4	57.7	57.6	59.8	2.1 pps
Male	76.3	76.5	77.0	77.5	78.3	0.7 pps
Young (15-24)	40.5	41.6	42.4	43.1	43.9	0.8 pps
Prime age (25-54)	88.0	87.9	87.9	88.1	88.5	0.4 pps
Older (55-64)	76.9	76.5	76.8	77.5	78.4	0.9 pps
Female	72.5	73.1	74.0	74.8	75.4	0.6 pps
Young (15-24)	42.9	44.0	45.5	45.9	46.0	0.0 pps
Prime age (25-54)	82.7	82.8	83.3	83.7	84.1	0.4 pps
Older (55-64)	70.3	71.5	72.1	73.5	74.4	0.9 pps
6 - **Employed persons** (15-64, 1000 pers.)	4554.3	4597.5	4659.9	4735.6	4833.9	2.1 %
7 - **Employment growth** (%, National accounts)	1.0	1.4	1.5	1.9	2.3	0.4 pps
Employment growth (%, 15-64, LFS)	1.0	0.9	1.4	1.6	2.1	0.5 pps
Male	1.0	0.7	1.2	1.6	2.3	0.8 pps
Female	1.0	1.2	1.5	1.7	1.8	0.1 pps
8 - **Self employed** (15-64, % of total employment)	9.4	9.1	8.9	8.7	8.6	-0.1 pps
Male	12.9	12.4	12.1	11.8	11.8	0.0 pps
Female	5.5	5.4	5.4	5.3	5.1	-0.2 pps
9 - **Temporary employment** (15-64, % of total employment)	16.3	16.8	16.6	16.1	16.1	0.0 pps
Male	14.0	14.7	14.9	14.5	14.5	0.0 pps
Female	18.6	18.8	18.3	17.7	17.7	0.0 pps
10 - **Part-time** (15-64, % of total employment)	24.7	24.6	24.3	23.9	23.3	-0.6 pps
Male	12.8	12.8	13.2	13.0	13.1	0.1 pps
Female	37.7	37.3	36.3	35.6	34.4	-1.2 pps
11 - **Unemployment rate** (harmonised:15-74)	8.0	7.9	7.4	6.9	6.7	-0.2 pps
Young (15-24)	23.5	22.9	20.4	18.9	17.9	-1.0 pps
Prime age (25-49)	6.1	6.0	5.8	5.5	5.4	-0.1 pps
Older (55-64)	5.1	5.4	5.3	5.3	5.1	-0.2 pps
Low-skilled (15-64)	19.5	20.0	19.7	19.7	19.4	-0.3 pps
Medium-skilled (15-64)	7.3	7.1	6.4	5.8	5.2	-0.6 pps
High-skilled (15-64)	4.4	4.4	4.3	4.1	4.1	0.0 pps
Nationals (15-64)	7.4	7.2	6.6	5.9	5.5	-0.4 pps
Non-nationals (15-64)	21.0	20.6	21.1	21.8	21.3	-0.5 pps
Male	8.2	8.2	7.5	7.3	6.9	-0.4 pps
Female	7.9	7.7	7.3	6.5	6.4	-0.1 pps
12 - **Long-term unemployment** (% of total unemployment)	18.6	19.0	20.8	19.4	19.6	0.2 pps
13 - **Worked hours** (full-time, average actual weekly hours)	39.4	39.2	39.1	39.4	39.1	-0.8 %
Male	40.2	39.9	39.8	40.1	39.8	-0.7 %
Female	38.2	38.1	37.9	38.3	38.0	-0.8 %
14 - **Sectoral employment growth** (% change)						
Agriculture	0.5	-0.1	-1.6	-2.9	-0.4	2.5 pps
Building and construction	0.9	2.5	2.9	1.8	5.5	3.7 pps
Services	1.2	1.5	2.5	1.8	2.2	0.5 pps
Manufacturing industry	-2.2	-1.1	-4.3	-1.8	1.7	3.5 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	1.9	2.2	2.7	2.5	2.0	-0.5 pps
Real compensation per employee based on GDP	1.9	3.8	2.3	1.3	2.4	1.1 pps
Labour cost index (compens. of employees plus taxes minus subs.)	1.8	2.7	2.8	3.8	2.8	-1.0 pps
Labour cost index (wages and salaries, total)	2.2	2.5	2.5	2.6	2.3	-0.3 pps
Labour productivity (GDP/person employed)	0.3	1.2	2.9	0.8	-0.2	-1.0 pps

United Kingdom	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	64106	64597	65110	65648	66040	0.6 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	40991	41117	41283	41397	41521	0.3 %
(% of total population)	63.9	63.7	63.4	63.1	62.9	-0.2 pps
3 - **Labour force** (15-64, 1000 pers.)	31334	31533	31742	32005	32214	0.7 %
Male	16685	16754	16840	16969	17008	0.2 %
Female	14649	14779	14902	15036	15206	1.1 %
4 - **Activity rate** (% of population 15-64)	76.4	76.7	76.9	77.3	77.6	0.3 pps
Young (15-24)	58.3	57.8	58.5	58.4	57.6	-0.8 pps
Prime age (25-54)	85.7	86.0	85.8	86.1	86.5	0.5 pps
Older (55-64)	62.8	63.5	64.4	65.8	66.4	0.6 pps
Nationals (15-64)	76.6	76.9	77.0	77.5	77.7	0.2 pps
Non-nationals (15-64)	74.5	74.9	75.9	75.9	76.5	0.6 pps
Male	82.1	82.2	82.2	82.5	82.3	-0.1 pps
Young (15-24)	60.2	59.5	60.0	59.3	58.3	-1.0 pps
Prime age (25-54)	92.0	92.2	91.9	92.2	92.4	0.2 pps
Older (55-64)	70.6	70.9	71.4	72.6	72.2	-0.4 pps
Female	70.9	71.3	71.7	72.2	72.9	0.6 pps
Young (15-24)	56.4	56.1	57.0	57.5	56.9	-0.6 pps
Prime age (25-54)	79.5	79.9	79.8	80.1	80.8	0.7 pps
Older (55-64)	55.3	56.4	57.7	59.2	60.9	1.7 pps
5 - **Employment rate** (% of population 15-64)	70.5	71.9	72.7	73.5	74.1	0.6 pps
Young (15-24)	46.3	48.0	50.0	50.8	50.7	-0.2 pps
Prime age (25-54)	80.8	82.1	82.4	82.9	83.8	0.8 pps
Older (55-64)	59.8	61.0	62.2	63.4	64.1	0.7 pps
Low-skilled (15-64)	53.2	55.0	55.9	58.3	59.6	1.3 pps
Medium-skilled (15-64)	71.4	72.7	73.3	73.7	74.2	0.5 pps
High-skilled (15-64)	83.8	84.3	84.7	84.9	85.0	0.1 pps
Nationals (15-64)	70.9	72.2	72.9	73.7	74.4	0.6 pps
Non-nationals (15-64)	67.6	69.4	71.0	71.5	72.5	0.9 pps
Male	75.4	76.8	77.6	78.3	78.6	0.3 pps
Young (15-24)	46.4	48.2	50.3	50.5	50.5	-0.1 pps
Prime age (25-54)	86.7	88.0	88.3	89.0	89.6	0.6 pps
Older (55-64)	66.8	67.8	68.6	69.6	69.3	-0.3 pps
Female	65.8	67.1	67.9	68.8	69.7	0.9 pps
Young (15-24)	46.2	47.8	49.7	51.1	50.9	-0.3 pps
Prime age (25-54)	75.1	76.2	76.6	77.0	78.1	1.1 pps
Older (55-64)	53.0	54.4	56.0	57.4	59.1	1.7 pps
6 - **Employed persons** (15-64, 1000 pers.)	28917.1	29558.7	30015.7	30423.8	30783.1	1.2 %
7 - **Employment growth** (%, National accounts)	1.2	2.4	1.7	1.4	1.0	-0.4 pps
Employment growth (%, 15-64, LFS)	0.9	2.2	1.5	1.4	1.2	-0.2 pps
Male	0.6	2.2	1.5	1.3	0.8	-0.5 pps
Female	1.3	2.2	1.6	1.4	1.6	0.2 pps
8 - **Self employed** (15-64, % of total employment)	13.4	14.0	13.6	14.1	14.0	-0.1 pps
Male	17.4	18.0	17.4	17.9	17.7	-0.2 pps
Female	8.9	9.5	9.4	9.9	10.0	0.1 pps
9 - **Temporary employment** (15-64, % of total employment)	6.1	6.3	6.1	6.0	5.6	-0.4 pps
Male	5.6	5.8	5.6	5.4	5.2	-0.2 pps
Female	6.5	6.8	6.5	6.5	6.1	-0.4 pps
10 - **Part-time** (15-64, % of total employment)	25.6	25.4	25.2	25.2	24.9	-0.3 pps
Male	11.5	11.2	11.2	11.3	11.1	-0.2 pps
Female	41.5	41.3	41.0	40.8	40.3	-0.5 pps
11 - **Unemployment rate** (harmonised:15-74)	7.5	6.1	5.3	4.8	4.4	-0.4 pps
Young (15-24)	20.7	17.0	14.6	13.0	12.1	-0.9 pps
Prime age (25-49)	5.7	4.6	4.0	3.6	3.2	-0.4 pps
Older (55-64)	4.8	4.0	3.4	3.7	3.5	-0.2 pps
Low-skilled (15-64)	14.4	11.7	10.0	8.6	7.6	-1.0 pps
Medium-skilled (15-64)	8.4	7.0	6.1	5.5	4.9	-0.6 pps
High-skilled (15-64)	4.0	3.2	3.0	3.0	2.8	-0.2 pps
Nationals (15-64)	7.6	6.2	5.3	4.8	4.3	-0.5 pps
Non-nationals (15-64)	9.2	7.2	6.5	5.8	5.3	-0.5 pps
Male	8.0	6.4	5.5	5.0	4.5	-0.5 pps
Female	7.1	5.8	5.1	4.7	4.2	-0.5 pps
12 - **Long-term unemployment** (% of total unemployment)	36.2	35.7	30.6	27.0	25.9	-1.1 pps
13 - **Worked hours** (full-time, average actual weekly hours)	41.3	41.3	41.3	41.4	41.2	-0.5 %
Male	42.6	42.6	42.6	42.7	42.5	-0.5 %
Female	38.9	39.1	39.0	39.2	38.9	-0.8 %
14 - **Sectoral employment growth** (% change)						
Agriculture	-8.7	16.5	-8.5	2.3	9.4	7.1 pps
Building and construction	0.0	3.3	2.5	3.8	3.3	-0.5 pps
Services	1.6	2.9	2.6	2.0	1.1	-0.9 pps
Manufacturing industry	-0.7	0.6	1.0	-0.3	0.9	1.2 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	2.7	0.6	1.1	2.9	2.9	0.1 pps
Real compensation per employee based on GDP	2.2	2.1	0.9	2.8	2.8	0.0 pps
Labour cost index (compens. of employees plus taxes minus subs.)	1.1	1.5	4.3	1.7	2.8	1.1 pps
Labour cost index (wages and salaries, total)	1.0	1.6	3.9	1.8	2.6	0.8 pps
Labour productivity (GDP/person employed)	0.9	0.6	0.6	0.4	0.6	0.2 pps

European Union (28 countries)	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	507092	508293	509750	511346	512535	0.2 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	329116	329509	328991	328831	328136	-0.2 %
(% of total population)	64.9	64.8	64.5	64.3	64.0	-0.3 pps
3 - **Labour force** (15-64, 1000 pers.)	236897	238206	238611	239803	240663	0.4 %
Male	127854	128280	128463	128993	129325	0.3 %
Female	109043	109927	110148	110810	111337	0.5 %
4 - **Activity rate** (% of population 15-64)	72.0	72.3	72.5	72.9	73.3	0.4 pps
Young (15-24)	42.1	41.7	41.6	41.6	41.7	0.1 pps
Prime age (25-54)	85.4	85.5	85.4	85.5	85.7	0.2 pps
Older (55-64)	54.3	55.9	57.3	59.1	60.6	1.5 pps
Nationals (15-64)	72.0	72.3	72.6	73.1	73.5	0.4 pps
Non-nationals (15-64)	71.8	71.7	71.6	71.3	71.4	0.2 pps
Male	77.9	78.1	78.3	78.5	78.9	0.3 pps
Young (15-24)	44.9	44.4	44.2	44.1	44.0	0.0 pps
Prime age (25-54)	91.5	91.5	91.4	91.4	91.6	0.2 pps
Older (55-64)	62.5	63.9	65.0	66.6	67.8	1.2 pps
Female	66.0	66.5	66.8	67.3	67.8	0.5 pps
Young (15-24)	39.3	38.9	38.8	39.0	39.2	0.2 pps
Prime age (25-54)	79.2	79.5	79.4	79.6	79.7	0.2 pps
Older (55-64)	46.5	48.4	50.0	52.0	53.8	1.8 pps
5 - **Employment rate** (% of population 15-64)	64.1	64.8	65.6	66.6	67.7	1.1 pps
Young (15-24)	32.2	32.4	33.1	33.8	34.7	0.8 pps
Prime age (25-54)	76.9	77.4	78.0	78.7	79.6	0.9 pps
Older (55-64)	50.1	51.8	53.3	55.2	57.1	1.8 pps
Low-skilled (15-64)	43.7	43.3	43.7	44.5	45.5	1.0 pps
Medium-skilled (15-64)	67.7	68.4	69.0	69.9	70.9	0.9 pps
High-skilled (15-64)	81.7	82.0	82.7	83.4	84.0	0.6 pps
Nationals (15-64)	64.5	65.2	66.0	67.1	68.1	1.1 pps
Non-nationals (15-64)	58.9	59.9	60.8	61.5	62.5	1.1 pps
Male	69.4	70.1	70.8	71.8	72.9	1.1 pps
Young (15-24)	34.0	34.2	34.9	35.5	36.3	0.8 pps
Prime age (25-54)	82.6	83.1	83.8	84.6	85.5	1.0 pps
Older (55-64)	57.4	58.8	60.1	62.0	63.7	1.7 pps
Female	58.8	59.5	60.4	61.4	62.4	1.1 pps
Young (15-24)	30.3	30.6	31.3	32.0	32.9	0.8 pps
Prime age (25-54)	71.1	71.7	72.2	72.9	73.7	0.8 pps
Older (55-64)	43.3	45.2	46.9	48.9	50.8	1.9 pps
6 - **Employed persons** (15-64, 1000 pers.)	210840.4	213476.0	215804.2	218956.8	221984.3	1.4 %
7 - **Employment growth** (%, National accounts)	-0.3	1.0	1.1	1.3	1.6	0.3 pps
Employment growth (%, 15-64, LFS)	-0.3	1.3	1.1	1.5	1.4	-0.1 pps
Male	-0.5	1.1	1.1	1.5	1.3	-0.1 pps
Female	0.1	1.4	1.1	1.5	1.5	0.0 pps
8 - **Self employed** (15-64, % of total employment)	14.4	14.4	14.1	14.0	13.7	-0.3 pps
Male	18.3	18.2	17.8	17.5	17.2	-0.3 pps
Female	9.9	9.9	9.9	9.9	9.7	-0.2 pps
9 - **Temporary employment** (15-64, % of total employment)	13.6	13.9	14.1	14.2	14.3	0.1 pps
Male	13.2	13.5	13.8	13.8	13.9	0.1 pps
Female	14.1	14.3	14.5	14.7	14.8	0.1 pps
10 - **Part-time** (15-64, % of total employment)	19.6	19.6	19.6	19.5	19.4	-0.1 pps
Male	8.7	8.8	8.9	8.9	8.8	-0.1 pps
Female	32.4	32.2	32.1	31.9	31.7	-0.2 pps
11 - **Unemployment rate** (harmonised:15-74)	10.9	10.2	9.4	8.6	7.6	-1.0 pps
Young (15-24)	23.7	22.2	20.3	18.7	16.8	-1.9 pps
Prime age (25-49)	10.0	9.4	8.7	7.9	7.0	-0.9 pps
Older (55-64)	7.7	7.4	7.0	6.5	5.8	-0.7 pps
Low-skilled (15-64)	19.7	19.0	17.9	16.6	15.2	-1.4 pps
Medium-skilled (15-64)	10.1	9.5	8.8	7.9	7.0	-0.9 pps
High-skilled (15-64)	6.5	6.2	5.7	5.2	4.6	-0.6 pps
Nationals (15-64)	10.4	9.9	9.1	8.2	7.3	-0.9 pps
Non-nationals (15-64)	18.1	16.5	15.2	13.8	12.5	-1.3 pps
Male	10.8	10.1	9.3	8.4	7.4	-1.0 pps
Female	10.9	10.3	9.5	8.8	7.9	-0.9 pps
12 - **Long-term unemployment** (% of total unemployment)	47.3	49.6	48.5	46.8	45.2	-1.6 pps
13 - **Worked hours** (full-time, average actual weekly hours)	40.6	40.5	40.5	40.6	40.3	-0.7 %
Male	41.6	41.5	41.5	41.5	41.3	-0.5 %
Female	38.9	38.9	38.9	39.0	38.8	-0.5 %
14 - **Sectoral employment growth** (% change)						
Agriculture	-2.7	-0.4	-3.3	-3.9	0.3	4.2 pps
Building and construction	-3.0	-0.4	0.7	0.9	2.0	1.1 pps
Services	0.0	1.7	1.9	2.0	1.9	-0.1 pps
Manufacturing industry	-1.1	0.3	0.4	1.4	1.7	0.3 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	0.9	1.8	3.2	-0.5	0.9	1.5 pps
Real compensation per employee based on GDP	1.1	0.5	0.6	0.7	0.6	-0.1 pps
Labour cost index (compens. of employees plus taxes minus subs.)	1.0	1.6	2.1	1.6	2.6	1.0 pps
Labour cost index (wages and salaries, total)	1.3	1.6	2.3	1.7	2.6	0.9 pps
Labour productivity (GDP/person employed)	0.6	0.7	1.2	0.7	0.8	0.1 pps

Euro Area	2013	2014	2015	2016	2017	2016-2017
1 - **Population** (LFS, total, 1000 pers.)	337356	338102	339118	340224	340967	0.2 %
2 - **Population** (LFS, working age:15-64, 1000 pers.)	217754	218529	218293	218779	218582	-0.1 %
(% of total population)	64.5	64.6	64.4	64.3	64.1	-0.2 pps
3 - **Labour force** (15-64, 1000 pers.)	157195	158007	158173	159332	159725	0.2 %
Male	84694	84889	84944	85464	85633	0.2 %
Female	72501	73118	73229	73869	74092	0.3 %
4 - **Activity rate** (% of population 15-64)	72.2	72.3	72.5	72.8	73.1	0.2 pps
Young (15-24)	41.0	40.1	39.7	39.7	39.8	0.1 pps
Prime age (25-54)	85.5	85.4	85.3	85.5	85.5	0.0 pps
Older (55-64)	54.6	56.4	58.0	59.8	61.3	1.5 pps
Nationals (15-64)	72.3	72.4	72.7	73.1	73.4	0.3 pps
Non-nationals (15-64)	71.3	71.0	70.6	70.1	70.1	0.0 pps
Male	78.1	78.0	78.1	78.3	78.5	0.2 pps
Young (15-24)	43.5	42.6	42.1	41.9	42.1	0.1 pps
Prime age (25-54)	91.8	91.5	91.4	91.4	91.4	0.0 pps
Older (55-64)	62.4	63.7	65.2	66.9	68.1	1.2 pps
Female	66.3	66.6	66.9	67.4	67.7	0.3 pps
Young (15-24)	38.4	37.5	37.2	37.3	37.4	0.1 pps
Prime age (25-54)	79.3	79.3	79.3	79.6	79.6	0.0 pps
Older (55-64)	47.3	49.5	51.1	53.1	54.8	1.8 pps
5 - **Employment rate** (% of population 15-64)	63.5	63.8	64.5	65.4	66.4	0.9 pps
Young (15-24)	31.0	30.6	30.8	31.4	32.3	0.9 pps
Prime age (25-54)	75.9	76.0	76.6	77.4	78.1	0.8 pps
Older (55-64)	50.0	51.7	53.3	55.3	57.1	1.8 pps
Low-skilled (15-64)	44.7	43.6	44.1	44.7	45.6	0.9 pps
Medium-skilled (15-64)	68.2	68.4	68.9	69.7	70.3	0.7 pps
High-skilled (15-64)	80.9	81.0	81.6	82.4	83.1	0.7 pps
Nationals (15-64)	64.1	64.4	65.1	66.1	67.1	0.9 pps
Non-nationals (15-64)	57.0	57.8	58.5	59.1	60.2	1.1 pps
Male	68.7	68.9	69.6	70.5	71.5	1.0 pps
Young (15-24)	32.8	32.3	32.4	33.0	33.9	1.0 pps
Prime age (25-54)	81.7	81.8	82.4	83.2	84.1	0.9 pps
Older (55-64)	56.7	58.0	59.5	61.5	63.2	1.7 pps
Female	58.2	58.7	59.4	60.3	61.2	0.9 pps
Young (15-24)	29.2	28.8	29.2	29.7	30.6	0.9 pps
Prime age (25-54)	70.1	70.3	70.8	71.6	72.2	0.7 pps
Older (55-64)	43.6	45.7	47.4	49.4	51.3	1.9 pps
6 - **Employed persons** (15-64, 1000 pers.)	138165.6	139411.7	140761.4	143135.7	145047.6	1.3 %
7 - **Employment growth** (%, National accounts)	-0.6	0.6	1.0	1.4	1.6	0.2 pps
Employment growth (%, 15-64, LFS)	-0.6	0.9	1.0	1.7	1.3	-0.4 pps
Male	-1.0	0.7	0.9	1.7	1.3	-0.4 pps
Female	-0.2	1.2	1.0	1.6	1.3	-0.3 pps
8 - **Self employed** (15-64, % of total employment)	14.3	14.2	14.0	13.8	13.5	-0.3 pps
Male	18.1	17.9	17.6	17.3	16.8	-0.4 pps
Female	9.9	9.9	9.9	9.8	9.7	-0.2 pps
9 - **Temporary employment** (15-64, % of total employment)	14.9	15.1	15.4	15.6	16.1	0.5 pps
Male	14.3	14.6	15.1	15.2	15.6	0.4 pps
Female	15.5	15.5	15.8	16.0	16.5	0.5 pps
10 - **Part-time** (15-64, % of total employment)	21.5	21.6	21.6	21.6	21.6	0.0 pps
Male	8.9	9.2	9.3	9.4	9.4	0.0 pps
Female	36.1	36.0	36.0	35.9	35.7	-0.2 pps
11 - **Unemployment rate** (harmonised:15-74)	12.0	11.6	10.9	10.0	9.1	-0.9 pps
Young (15-24)	24.2	23.7	22.3	20.9	18.8	-2.1 pps
Prime age (25-49)	11.3	11.0	10.3	9.5	8.6	-0.9 pps
Older (55-64)	8.5	8.4	8.1	7.6	6.8	-0.8 pps
Low-skilled (15-64)	20.9	20.6	19.4	18.2	16.8	-1.4 pps
Medium-skilled (15-64)	10.5	10.2	9.7	9.0	8.2	-0.8 pps
High-skilled (15-64)	7.5	7.3	6.9	6.2	5.5	-0.7 pps
Nationals (15-64)	11.3	11.1	10.4	9.6	8.7	-0.9 pps
Non-nationals (15-64)	20.0	18.6	17.2	15.6	14.1	-1.5 pps
Male	11.9	11.5	10.7	9.7	8.7	-1.0 pps
Female	12.2	11.8	11.0	10.4	9.5	-0.9 pps
12 - **Long-term unemployment** (% of total unemployment)	49.6	52.6	51.5	50.2	48.9	-1.3 pps
13 - **Worked hours** (full-time, average actual weekly hours)	40.5	40.4	40.4	40.4	40.2	-0.5 %
Male	41.5	41.4	41.4	41.4	41.2	-0.5 %
Female	38.8	38.7	38.7	38.8	38.6	-0.5 %
14 - **Sectoral employment growth** (% change)						
Agriculture	-2.0	0.0	-1.1	-0.1	-0.3	-0.2 pps
Building and construction	-3.7	-1.3	0.1	-0.2	1.8	2.0 pps
Services	-0.4	1.1	1.7	2.0	2.1	0.1 pps
Manufacturing industry	-1.5	-0.4	0.2	0.8	1.2	0.4 pps
15 - **Indicator board on wage developments** (% change)						
Compensation per employee	1.5	1.3	1.5	1.2	1.5	0.3 pps
Real compensation per employee based on GDP	0.5	0.4	0.4	0.4	0.2	-0.2 pps
Labour cost index (compens. of employees plus taxes minus subs.)	0.8	1.5	1.4	1.3	2.2	0.9 pps
Labour cost index (wages and salaries, total)	1.3	1.5	1.7	1.3	2.2	0.9 pps
Labour productivity (GDP/person employed)	0.4	0.8	1.0	0.5	0.8	0.3 pps

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