Article

1 Labour supply and employment growth

Prepared by Katalin Bodnár

This article examines the main factors behind the recent changes in euro area labour supply and how they have influenced employment developments. It finds that the increasing supply from older people and women, as well as immigration, have had a significant influence on employment growth during the economic recovery. Both migration and the numbers of older people and women in or seeking work have been driven by long-term trends and structural changes, while migration has also been affected by several cyclical factors. In the medium to longer term, labour supply is expected to decline as the population ages. This calls for policies to support labour force and employment growth, for example by helping the long-term unemployed, migrants and other groups whose participation rates remain low, to enter or return to the labour market, or find jobs that better match their skills.

1 Introduction

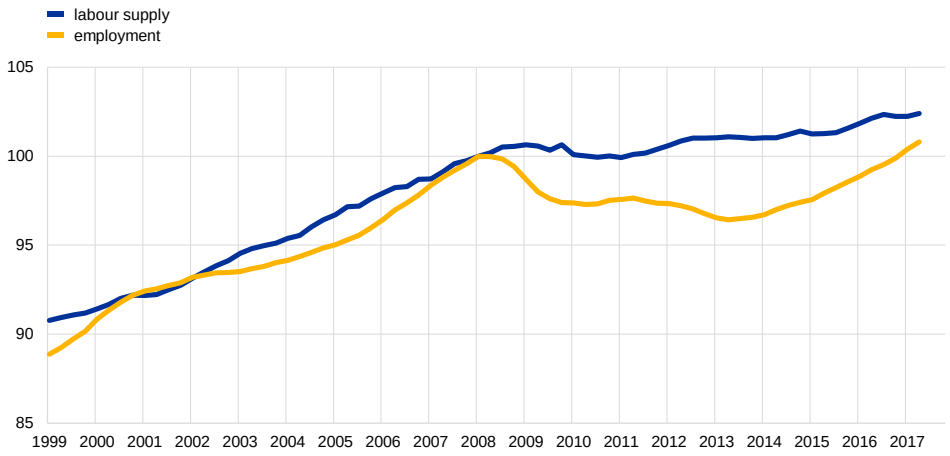
Labour supply in the euro area has been increasing and its composition changing. Although labour supply growth in the euro area slowed down after the start of the financial crisis, the labour force is now 2% larger than before the crisis (see Chart 1). Three main factors have contributed to the increase in the euro area labour supply in the last few decades: an increasing number of older people and women seeking or in work, and immigration.[19] These changes have been influenced by several structural factors, for example the rising pension age, the increasing educational level of the population and the opening of the labour markets to migrants, coupled with strong labour demand in some euro area countries.

[19] See the box entitled “Recent developments in euro area labour supply”, *Economic Bulletin*, Issue 6, ECB, 2017.

Chart 1

The development of labour supply and employment in the euro area

(index: Q1 2008=100)



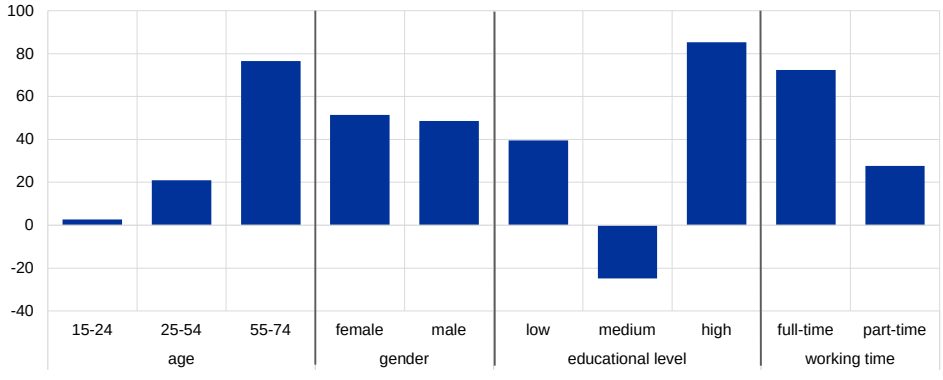
Sources: Eurostat (national accounts and European Union labour force survey).

The changes are also reflected in the composition of recent euro area employment growth. Over the recovery, which has created a significant increase in employment, three-quarters of the employment growth in the euro area has been provided by older workers. As far as the gender composition is concerned, more than half of the employment growth is accounted for by women. In some countries, immigration has also provided a considerable proportion of employment growth. These changes in the composition of employment coincide with a strong reliance on part-time contracts[20] and increasing employment of the highly skilled (see Chart 2).

Chart 2

Composition of the cumulative increase in the euro area employment over the economic recovery period

(percentages of total employment growth between the second quarter of 2013 and the second quarter of 2017)



Source: Eurostat (European Union labour force survey).

[20] The terms part-time and full-time employment are used on the basis of the EU labour force survey concepts. The distinction between full-time and part-time work is generally based on a spontaneous response by the respondent, except in the Netherlands where a 35-hour threshold is applied. For more details see the survey's methodological page.

This article considers the degree to which the developments in employment are driven by labour supply. A better understanding of the linkages between labour supply and employment is important for assessing employment growth over the recovery period, while it can also help in projecting future employment developments. The remainder of the article is organised as follows. Section 2 focuses on the reasons behind the increasing share of older workers among the employed, as well as the characteristics of the older workers. Section 3 describes the differences between male and female employment and the driving factors. A box explores the channels through which the changing composition of employment affects wage developments. Section 4 focuses on the drivers of part-time employment, which is linked to both ageing and gender issues. This is followed by an examination of recent trends in migration in the euro area and the conclusions.

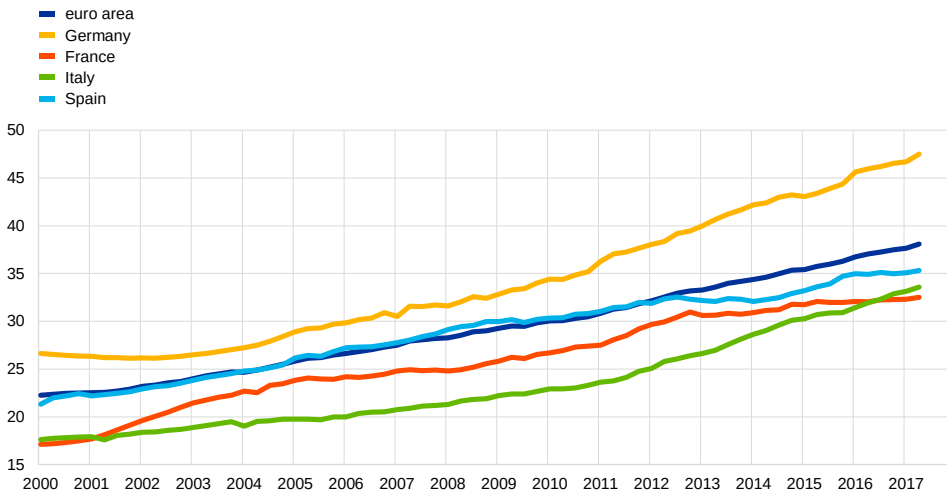
2 Older workers

The composition of the working age population is changing, with the share of people over 55 rising. As life expectancy is increasing and fertility rates are very low, the share of older people in the overall population is growing. The number of those already in retirement is on the rise – as reflected in increasing old age dependency ratios, i.e. the ratio of people over 65 to those of active age. In the working age population too, the share of older people (those who are above 55) has been increasing in all euro area countries as the baby boom generations have entered this category.[21]

Chart 3

Participation rates of the 55-74 age group in the euro area and its largest member countries

(percentages of the population aged 55-74)



Source: European Union labour force survey.

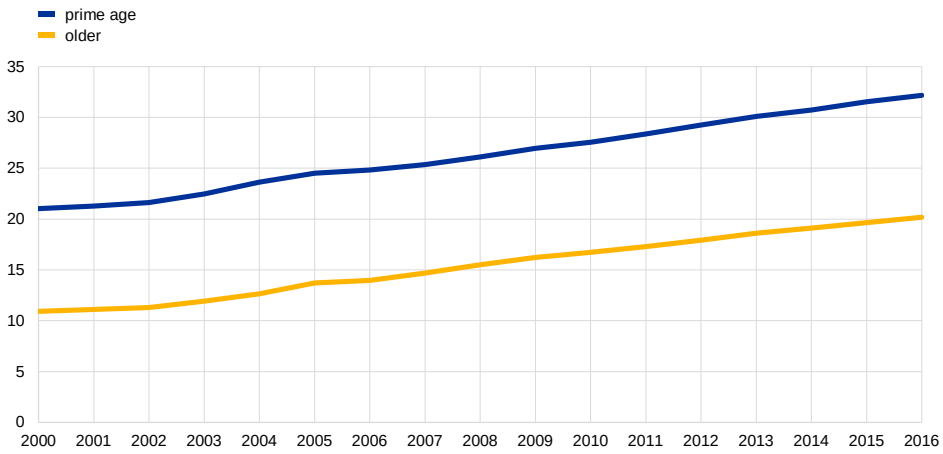
[21] See also "Population structure and ageing", *Eurostat Statistics Explained*, June 2017.

The labour market participation rate of older people is also increasing very strongly.[22] The participation rate of those above 55 is following a steady upward trend (see Chart 3). Increasing life expectancy as well as sustainability considerations after the start of the financial crisis led pension reforms to be implemented in several euro area countries: Germany and France before the crisis, and Italy and Spain after the crisis.[23] These reforms increased the statutory pension age or made early retirement difficult and thus had an upward impact on the participation rates of older people.[24] Increasing life expectancy also influences the length of active life through other factors, as people may decide to stay longer in work to avoid very long inactive periods and protect themselves against the risk of poverty in old age. Finally, participation rates are increasing with the level of education. As the share of older people with higher education is rising, compositional effects are also playing a role in driving up the participation rate of older people (see Chart 4).

Chart 4

The share of the population with tertiary education by age category in the euro area

(percentages of the respective population)



Source: European Union labour force survey.
Note: Prime age: 25-54 years, older: 55-74 years.

Rising participation rates and demographic changes are the primary drivers of increasing employment among the older population. For those aged 55 and over, the increasing participation rate explains most of the employment increase both before and after the crisis; a further, considerable portion of the increase is due to population changes (see Charts 5 and 6). However, the employment to labour force ratio is still below its pre-crisis level in most age groups, including the over 55s,

22 The participation rate is defined as the sum of the employed and the unemployed divided by the working age population.

23 See "The 2018 Ageing Report: Underlying Assumptions & Projection Methodologies", *Institutional Paper*, No 065, European Commission, 2017. In addition, Beetsma, R., Romp, W. and van Maurik, R., "Drivers of pension reform measures in the OECD", VOX, 13 November 2017 shows that pension reforms are linked more closely to the cyclical position of the economy than to projected demographic developments.

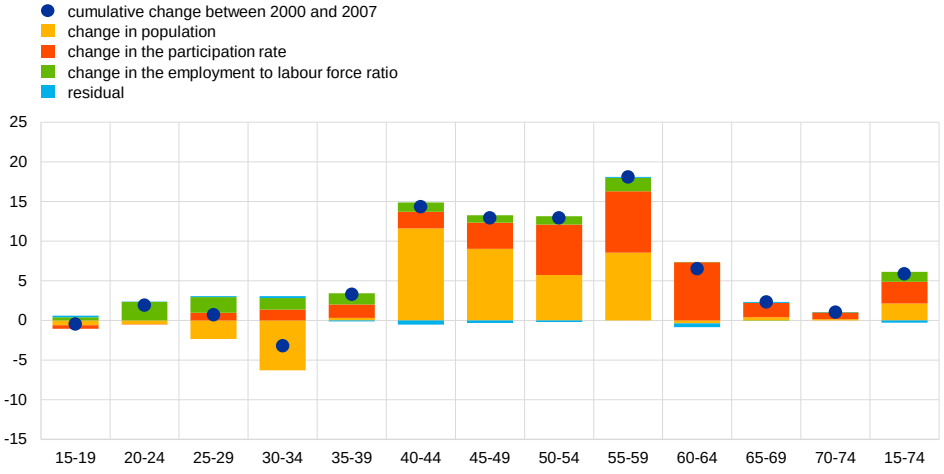
24 The statutory pension age has increased in all of the largest euro area countries. The effective pension age, however, has only increased significantly in Germany, from 59 years in 1996 to 62.7 years in 2014 (OECD statistics).

despite a general increase since 2013. To sum up, pension reforms, the increasing educational level among older people and the growing number of older people are the main explanatory factors behind the strong rise in employment in this age group. These results do not necessarily mean, however, that employment of the older population is driven exclusively by increasing labour supply, as the participation rate, at least, may also increase as a response to rising labour demand.

Chart 5

Composition of the change in employment by age category, 2000-07

(percentages of the respective population in 2000 and percentage point contributions)

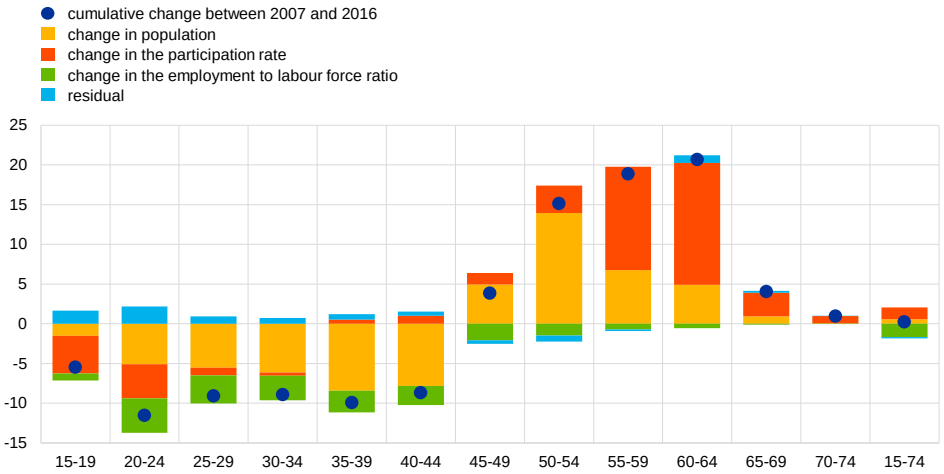


Sources: Eurostat and ECB calculations.

Chart 6

Composition of the change in employment by age category, 2007-16

(percentages of the respective population in 2007 and percentage point contributions)



Sources: Eurostat and ECB calculations.

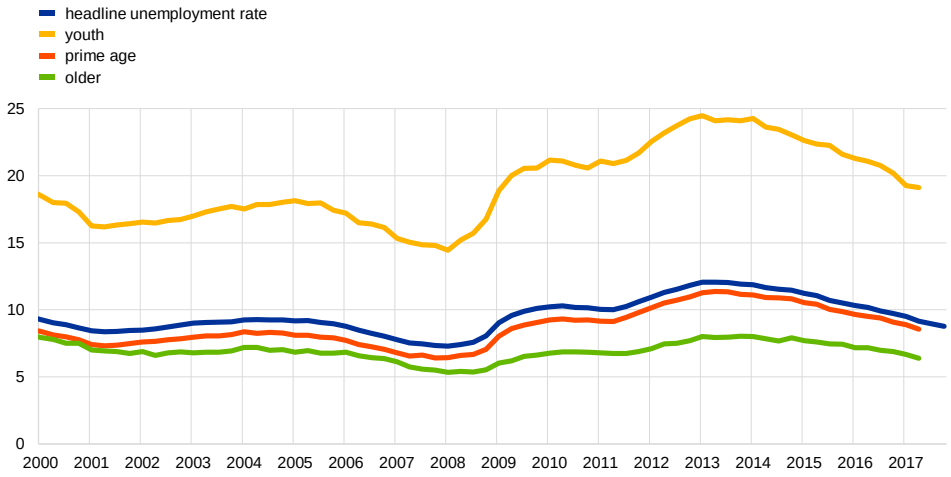
Despite the increasing labour supply in older age groups, their unemployment rate has remained low, even during the financial crisis (see Chart 7). The unemployment rates of prime-age, i.e. 25-54 year-olds, and older persons were relatively close before the crisis. Since then, however, they have developed

differently. Patterns have differed from country to country. In Germany, the unemployment rate of older people was well above the prime-age unemployment rate before the crisis, but the gap between the two rates had started to decline at the end of the 1990s and has closed in recent quarters. The unemployment rate of older people was kept high in part by the generous benefit system, while its decline has reflected the impact of several pension and labour market reforms.[25] In other large euro area countries, the unemployment rate among older people was well below that of the prime-age group before the crisis. One explanation for the generally low unemployment rates of older people relative to other groups is that older people tend to move between employment and inactivity rather than employment and unemployment. As a consequence, labour supply and employment move even more closely together in this age group than in others.[26]

Chart 7

Unemployment rate by age category in the euro area

(percentages of the respective labour force)



Source: European Union labour force survey.
Note: Youth: 15-24 years, prime age: 25-54 years, older: 55-74 years, headline unemployment rate: 15-74 years.

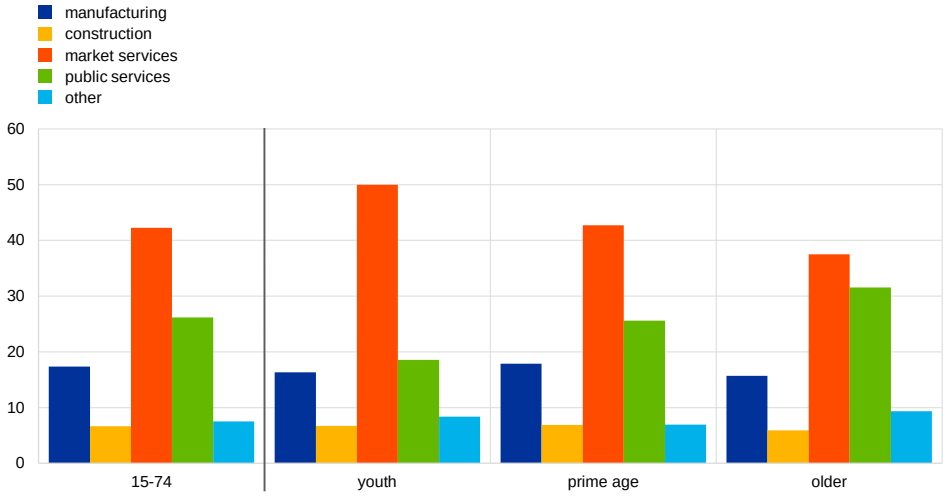
25 Steiner, V., "The labor market for older workers in Germany", *Journal for Labour Market Research*, Vol. 50, No 1, August 2017, pp. 1-14.

26 The low unemployment rate among older people has meant that their increasing population share has also contributed to the decline in the economy-wide unemployment rate. Barnichon R. and Mesters, G., "How Tight Is the U.S. Labor Market?", FRBSF Economic Letter, 20 March 2017 shows that changes in the composition of the labour force have influenced the dynamics of the unemployment rate in the United States as the share of groups with a high (low) unemployment rate is declining (increasing).

Chart 8

Sectoral composition of employment by age category in the second quarter of 2017

(percentages of the employed population in the respective age category)



Source: Eurostat.
Note: Youth: 15-24 years, prime age: 25-54 years, older: 55-74 years, headline unemployment rate: 15-74 years.

Older workers are more likely to be employed in less cyclical sectors and positions than others. The older generations are more concentrated in public services, particularly in health and social services and in public administration, and are represented to a lesser extent in most market services sectors, than prime-age workers (see Chart 8). At the same time, the share of older workers increased in all of the sectors in the last decade. Older workers, especially women, are more likely to work in part-time positions than prime-age workers (see Chart 9), and they account for the bulk of the increase in part-time employment over the recovery period (see also Section 4).Temporary employment[27] is less likely for older than for prime-age workers, and employment growth in the older age category over the recovery has been primarily driven by permanent contracts. Together these factors suggest that older workers are more likely to work in less cyclical sectors and positions than other workers. Furthermore, some of the differences may also be related to the skills demanded: in some fast-growing services sectors the need for skills in up-to-date technologies is greater than in public services. An important question here is the relationship between the increasing employment of older workers and the employment of younger ones. There is no evidence that older workers crowd out younger workers in the longer term, while the employment of older workers may help to replace the declining labour supply in the younger age groups.[28] Moreover, the

27 Temporary employment means work under a fixed-term contract, as against permanent work, where there is no end date.

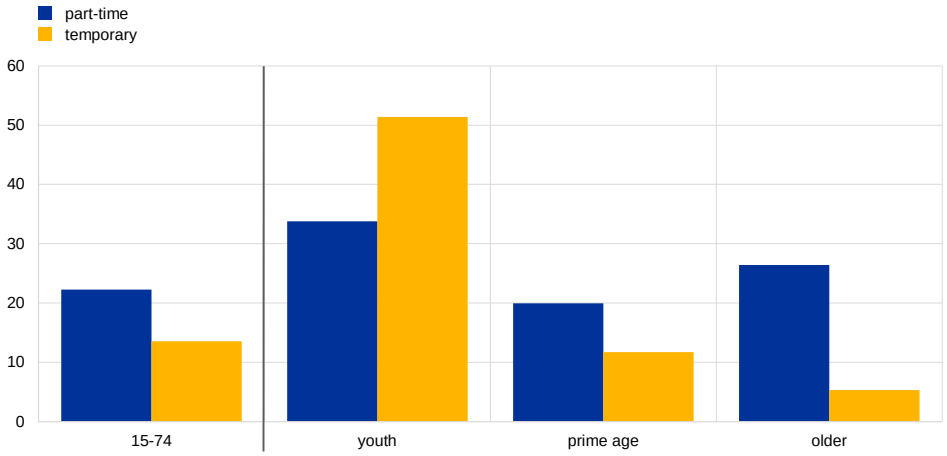
28 The empirical literature finds no evidence of older workers crowding out younger workers in the longer term. See for example the box entitled "The lump of labour fallacy: a reassessment for the euro area", in "Comparisons and contrasts of the impact of the crisis on euro area labour markets", *Occasional Paper Series*, No 159, ECB, February 2015; Banks, J., Blundell, R., Bozio, A. and Emmerson, C., "Releasing Jobs for the Young? Early Retirement and Youth Unemployment in the United Kingdom", in Gruber, J. and Wise, D.A. (eds.), *Social Security Programs and Retirement around the World: The Relationship to Youth Employment*, University of Chicago Press, 2010; Jousten, A., Lefebvre, M., Perelman, S., Pestieau, P., "The Effects of Early Retirement on Youth Unemployment: The Case of Belgium", IMF Working Paper No 08/30, 2008.

ageing of the population has an indirect upward impact on overall employment growth through an increasing demand for services.[29] Finally, it is very likely that, with working lives becoming longer, older workers are staying longer in their positions than previously. Policy measures also support this in some countries. This may also have important implications for the wage development of this age group, as those entering a new position at older ages have different wage levels, wage growth and wage bargaining power from those who remain in their positions. See also the box entitled “Changes in employment composition and their impact on wage growth: an example based on age groups” in the next section.

Chart 9

Part-time and temporary employment by age category in the second quarter of 2017

(percentages of total employment in the respective age group)



Sources: Eurostat and ECB calculations.
Note: Youth: 15-24 years, prime age: 25-54 years, older: 55-74 years, headline unemployment rate: 15-74 years.

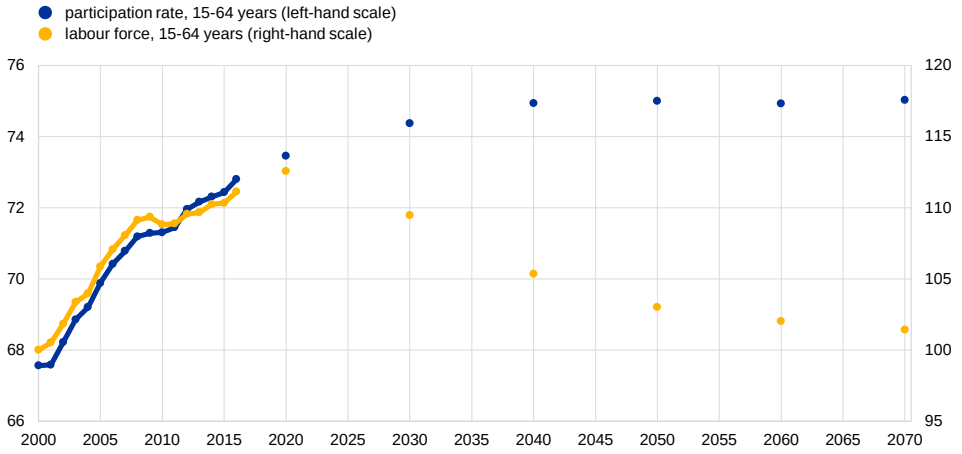
Looking ahead, the changing age composition of the euro area population will imply a decline in the labour supply. While until now increasing participation rates have been able to counterbalance the declining numbers entering the labour force, this will not be the case in the future. Labour supply is projected to decline in the medium term (see Chart 10). This, together with the increasing share of the population already retired, will be a major challenge. While there is room for further policy measures to help groups still with low participation rates to enter or stay in the labour market, these may also primarily be the older age groups, which may result in a further increase in the share of older people in the labour supply.

[29] See Bobeica, E., Lis, E., Nickel, C., Sun, Y., “Demographics and inflation”, Working Paper Series, No 2006, ECB, January 2017.

Chart 10

Projections for the euro area labour force and participation rate

(participation rate: percentage of the labour force; labour force: index: 2000=100)



Source: European Commission (2018 Ageing Report).

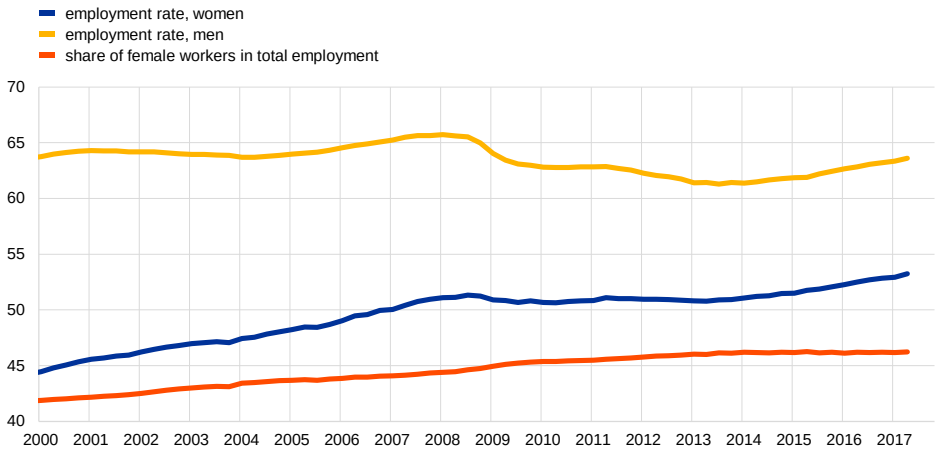
3 Gender composition of recent employment growth

The share of female workers in the euro area has risen to a historically high level. The gap between male and female employment rates (the ratio of the employed to the working age population) has narrowed considerably in the last two decades. This was driven primarily by a strong increase in the female employment rate (the ratio of employed women to the female working age population), and to a smaller extent by a declining employment rate for men (the ratio of employed men to the male working age population) over the crisis period (see Chart 11). As a consequence, the share of women in total employment is now close to 50%.

Chart 11

Female and male employment rates and the share of female workers in total employment in the euro area

(employment rates: employment as a percentage of the respective working age population; share of female workers in total employment: percentages)



Source: Eurostat.
Note: Refers to the age group 15-74.

Female employment is influenced by several structural factors. The increasing employment of women is closely linked to their rising labour market participation over the last few decades. This, in turn, reflects the strongly increasing educational level of women, policy measures to increase female employment as well as the greater role played by part-time employment, which is discussed in the next section. Policies that have been found to be related to the participation of women include providing childcare services to working parents with small children, tax changes and leave policies.[30] Female participation rates are also influenced by cyclical factors, namely discouragement (i.e. when the unemployed give up searching for work because they think that they will not find any) and the "added worker" effect (the tendency for women to enter the labour market when their male partner loses his job or withdraws from participation), but these have had a smaller impact on female labour supply and employment in the euro area than structural factors.

Cyclical factors have a larger influence on male employment. The male participation rate is already very high at 70% in the euro area, compared with 59% for women, and has remained broadly flat at that level in the last two decades with only a minor impact overall from the crisis.[31] The dynamics of male employment are thus influenced primarily by demographics – the increasing number of older male workers and declining number of younger workers – and cyclical labour demand (as measured by the ratio of employment to the labour force), to a larger degree than the employment of women (see Chart 12).

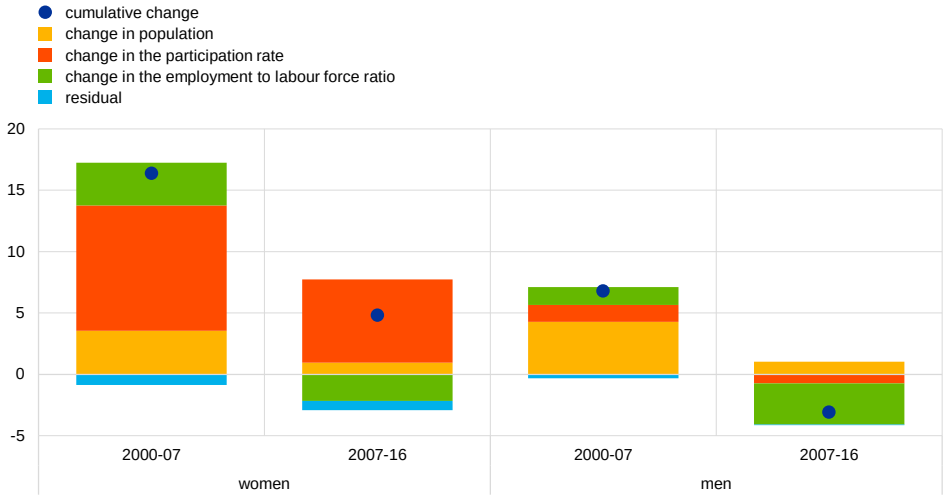
30 See Thévenon, O., "Drivers of Female Labour Force Participation in the OECD", *OECD Social, Employment and Migration Working Papers*, No 145, OECD, 2013.

31 This is different from the developments seen in the United States, where the participation rate of prime-age men has declined in the last six decades. This is found to be explained by reductions in the demand for labour, mainly for the low-skilled. See *The long-term decline in prime-age male labor force participation*, Executive Office of the President of the United States, June 2016.

Chart 12

Composition of the change in employment by gender before and after the crisis

(percentages of the working age population by gender in 2000 and 2007 and percentage point contributions)



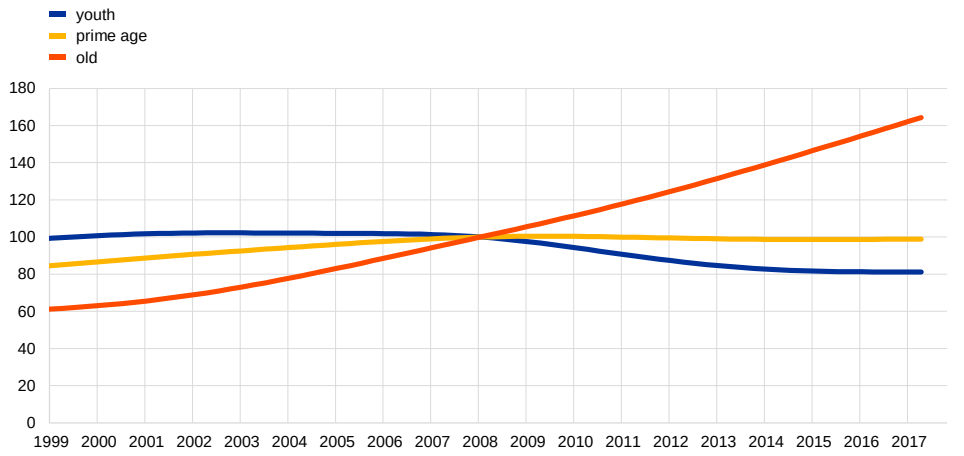
Sources: Eurostat and ECB calculations.
Note: Refers to the age group 15-74.

Looking ahead, the older generations are likely to continue to be the main source of further employment growth for both genders. A trend-cycle decomposition of employment levels by gender suggests that the trend component for older female workers has been increasing much more steeply than that for older male workers (see Charts 13 and 14).[32] This is due to differences in educational level: the level of education is increasing more steeply for older women than for older men; thus, labour market participation and employment are also increasing faster for women. The rise in prime-age female employment has already come to a halt, however, so further increases in female employment may come primarily from older women in the future.

[32] The trend components of employment by age and gender were calculated using a Hodrick-Prescott filter, using a lambda of 1600. The filtering techniques imply end-point uncertainties.

Chart 13

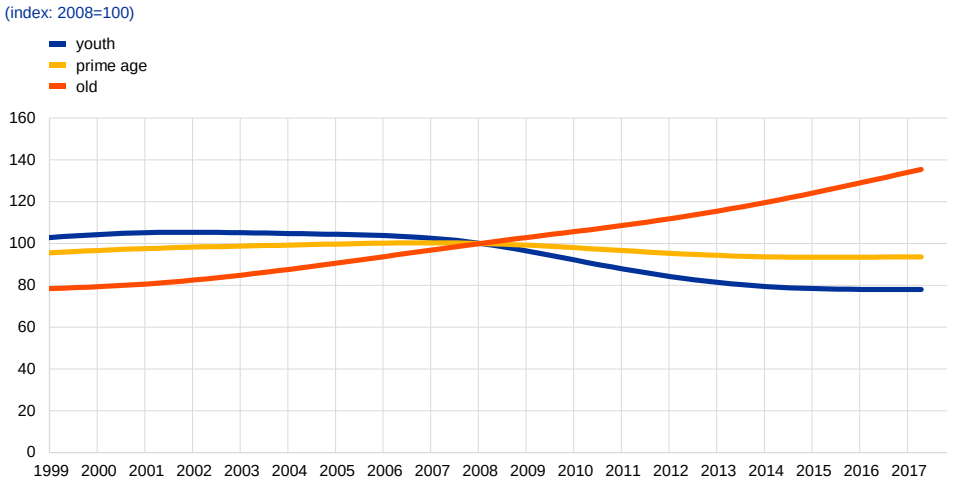
Trend component of female employment by age category



Sources: Eurostat and ECB calculations.
Notes: Youth: 15-24 years, prime age: 25-54 years, older: 55-74 years. Trend components calculated using a Hodrick-Prescott filter.

Chart 14

Trend component of male employment by age category



Sources: Eurostat and ECB calculations.
Notes: Youth: 15-24 years, prime age: 25-54 years, older: 55-74 years. Trend components calculated using a Hodrick-Prescott filter.

Box 1

Changes in employment composition and their impact on wage growth: an example based on age groups

Prepared by Maarten Dossche and Gerrit Koester

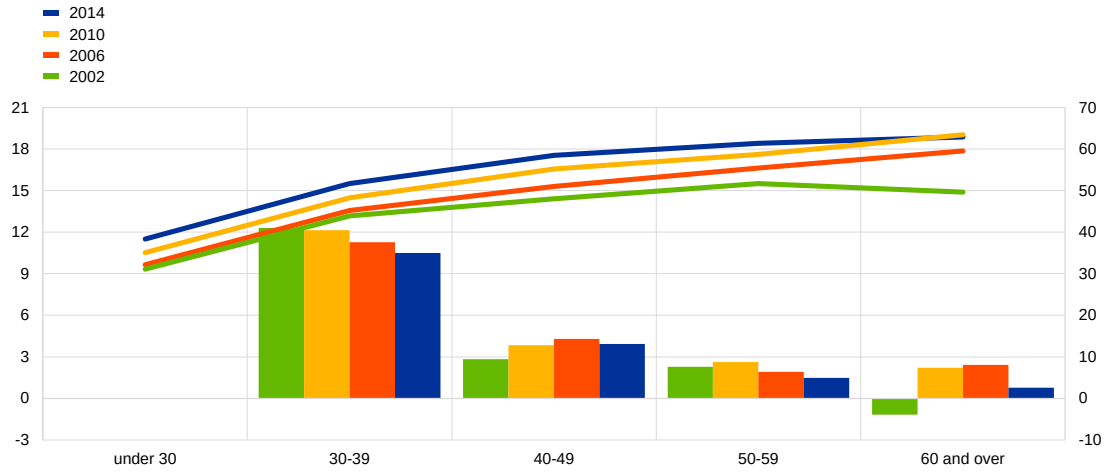
Changes in the composition of employment can have knock-on effects on average wage growth. This is most evident in case of sectoral shifts, which change the employment shares of sectors that have different wage levels and/or dynamics. For example, in some services sectors wages tend to be lower and to grow more slowly than in industry. But other compositional changes, such as those related to the personal characteristics of employees, can also have an effect.

One important factor for wage growth is the age composition of the workforce. Data from the structure of earnings survey[33] show that wages tend – on average – to be higher for older employees, and to increase particularly strongly in the early years of a career, and less so in the later phases. Different vintages of the survey indicate that this relationship between age and salary has been relatively stable over the last 15 years. Changes in the age structure of employment can therefore have substantial effects on wage growth. The main channel for such effects seems to be the different wage levels, given that the average hourly wage of an employee who is 60 or older (see Chart A) is more than 50% higher than that of an employee under 30. The fact that wage growth tends to decrease with age works in the opposite direction. However, this effect tends to be more gradual and is therefore often less important – especially in times of large cyclical fluctuations in participation rates or employment across age groups.

Chart A

Mean hourly earnings by age group

(left-hand scale: wage levels in euro; right-hand scale: percentage changes versus the preceding age group)



Sources: Eurostat (structure of earnings survey) and ECB calculations.
Notes: The lines refer to the left-hand scale and show hourly earnings (in euro) for different age groups across different vintages (2002, 2006, 2010 and 2014) of the structure of earnings survey. The bars refer to the right-hand scale and reflect the percentage difference in hourly earnings versus the preceding age bracket across the different vintages of the survey.

In the euro area, the steady increase in the share of older employees before and after the crisis has supported average wage growth. The ageing of the baby boom generation and the strong increase in the participation rates of older people (see the discussion in Section 2 of the main text) have pushed up the share of older workers in employment, and, as these are typically in higher wage categories, average wage growth as well. However, especially in recent years, the upward effect of an increase in the share of employees above 50 has been more muted as it has to a large extent reflected just the ageing of employees previously in the 40-49 age group (see Chart 6 in the main text), which has a wage level very similar to those of the age groups above 50.[34]

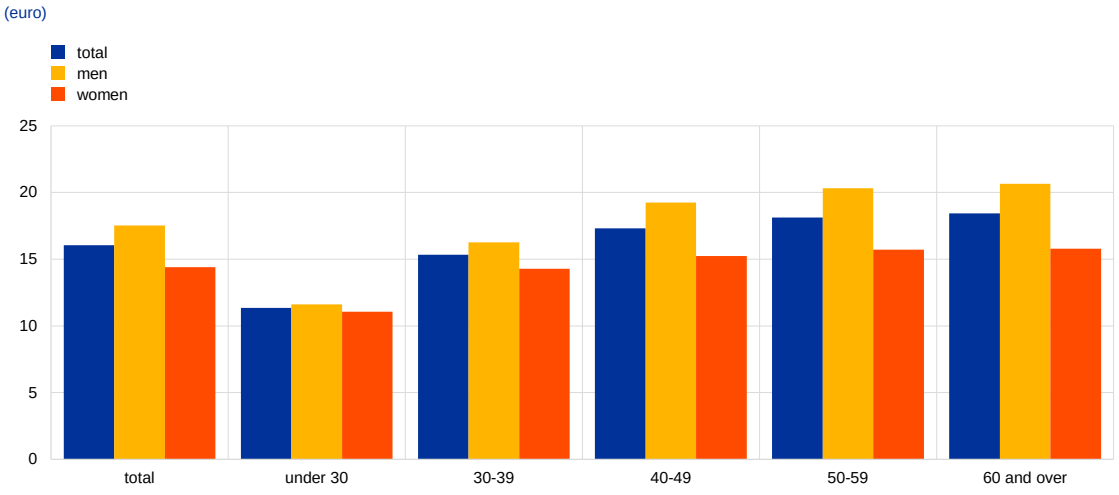
33 The structure of earnings survey is a four-yearly enterprise survey on the structure of earnings in the EU (2002, 2006, 2010 and 2014). It provides information on the link between the level of gross earnings and the individual characteristics of employees (gender, age, occupation, educational level). It also includes information about employers (economic activity, size of the enterprise, etc.). Gross earnings refer to the gross wages and salaries earned by full-time and part-time employees per hour in the reference month (October).

34 For evidence from the United States on this aspect, see Rich, R., Tracy, J. and Fu, E., "U.S. Real Wage Growth: Slowing Down With Age", *Liberty Street Economics*, Federal Reserve Bank of New York, 2016.

Additionally, there was a cyclical decrease in the share of younger employees during the crisis. This initially had an upward effect on wage growth: during the crisis the young and typically less well-paid workers were the first to be laid off – which pushed up average wages. In countries such as Spain this effect was relatively pronounced. Since 2013, however, the reduction in employment of the younger age groups in the euro area has been reversed (see Chart 7 in the main text), leading to negative effects on average wage growth. This downward impact on wage growth is likely to persist for some time as the share of young people in employment can be expected to rise further.

Chart B

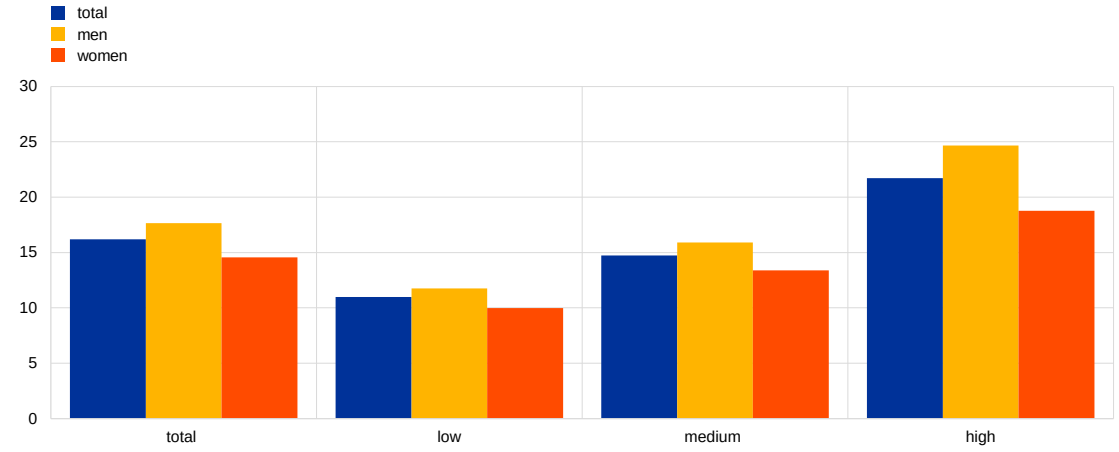
Mean hourly earnings by age and gender



Sources: Eurostat (structure of earnings survey) and ECB calculations.
Note: Data from the 2014 vintage of the structure of earnings survey.

Chart C

Mean hourly earnings by gender and educational attainment



Sources: Eurostat (structure of earnings survey) and ECB calculations.
Note: Data from the 2014 vintage of the structure of earnings survey.

However, an assessment of the effects of employment composition on wages must take a broad range of characteristics into account. These include not only age but also the level of

education, skills, gender, nationality and type of employment, which all have an influence on individual wages. This requires granular data and is complicated by the fact that the distributions of these characteristics are often correlated. This can be illustrated, for example, by the fact that the wage gap between men and women tends to increase with age (see Chart B). It also increases with education (see Chart C). To avoid a biased assessment of the total compositional effect of employment on wage growth requires an econometric estimation of the marginal effect of each of these different characteristics.[35] In the literature, one important approach aimed at making a comprehensive assessment of compositional effects is based on micro data, such as the EU statistics on income and living conditions, which allows the link between a broad range of personal characteristics and wage developments to be analysed.[36]

4 Labour supply factors behind part-time employment

One-fifth of employment in the euro area is now part-time. Part-time employment is following a long-term upward trend, which did not stop during the crisis but moderated somewhat in the subsequent recovery (see Chart 15). Increases have been seen in virtually all euro area countries, for both genders and all broad age groups. This change is also reflected in the declining trend of average hours worked.[37] Over the recovery, almost a third of employment growth has come from part-time positions, contributing to the strong dynamics of headcount employment. To better understand developments in headcount employment as well as changes in hours worked, it is important to examine the factors behind the dynamics of part-time employment.

35 See for instance Oaxaca, R., "Male-Female Wage Differentials in Urban Labour Markets", *International Economic Review*, Vol. 14, 1973, pp. 693-709.

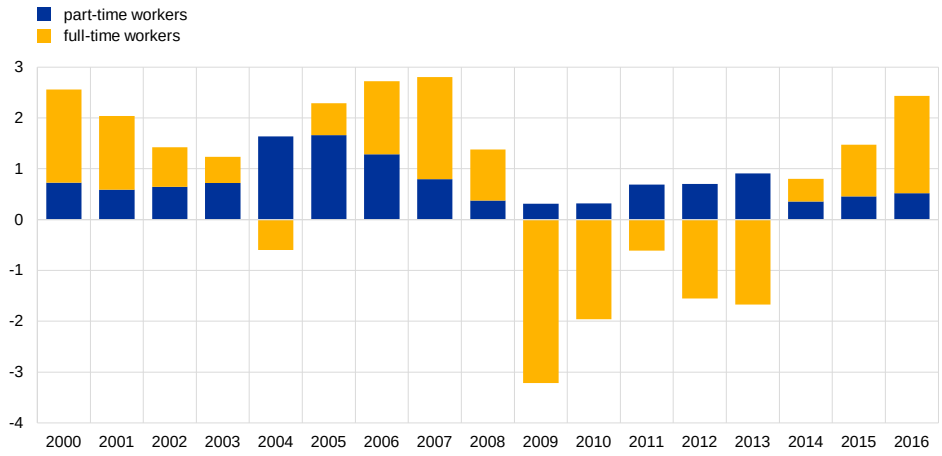
36 See for example Verdugo, G., "Real wage cyclicality in the Eurozone before and during the Great Recession: Evidence from micro data", *European Economic Review*, Vol. 82, 2016, pp. 46-69. These micro data are only available with a considerable time lag, however.

37 See the box entitled "Factors behind developments in average hours worked per person employed since 2008", *Economic Bulletin*, Issue 6, ECB, 2016.

Chart 15

Full-time and part-time employment in the euro area

(annual changes, millions)



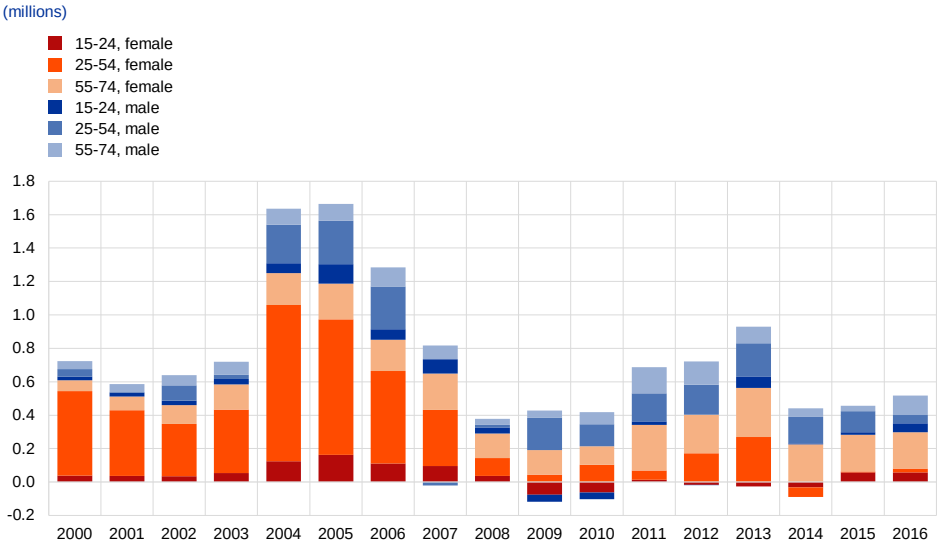
Source: Eurostat.

Cohort effects have a major influence on the dynamics of part-time employment. Before the crisis, prime-age female workers made the largest contribution to the increase in part-time employment, but this contribution declined considerably over the recovery, and growth in prime-age female employment is now being driven by full-time positions. Older workers are making a large contribution to the increase in part-time employment, which is thus used as a way to stay in the labour market when close to or beyond the statutory retirement age.[38] Moreover, prime-age male workers are continuing to take up part-time employment, likely reflecting, at least partially, better work-life balance opportunities (see Chart 16).

[38] See Aranki, T. and Macchiarelli, C., "Employment duration and shifts into retirement in the EU", *Working Paper Series*, No 1517, ECB, February 2013.

Chart 16

Composition of part-time employment growth in the euro area by age and gender



Source: Eurostat.
Note: The data are influenced by structural breaks in 2003 in France, in 2004 in Italy and in 2005 in Spain.

Part-time employment is closely linked to the increasing supply of female and older workers. In theory, the drivers of part-time employment may be cyclical or structural, and both can be related to labour demand or labour supply.[39] The most important structural factors are, on the demand side, the increasing share of market and public services in the economy (as these sectors have a higher propensity for part-time employment), and, on the supply side, the increasing participation of women and older workers. All of these factors have followed similar increasing trends in the euro area (see Chart 17). However, it is difficult to find the direction of causality among them, as they may reinforce each other. While these structural factors, together with labour market measures to promote flexible forms of employment, are likely to have played a major role, cyclical factors have also contributed during both the crisis and the recovery. Indeed, in a recession, companies frequently use part-time employment (i.e. by reducing the hours worked by incumbent workers) to hoard labour. They can thus decrease their firing, rehiring and training costs over the business cycle and prevent erosion of the skills of their employees. Labour hoarding indeed played a role in increasing part-time employment during the crisis.[40] Finally, part-time labour supply also changes with the business cycle. When the unemployment rate is high, finding any job may become more important than finding a full-time job. Indeed, the numbers of unemployed looking only for full-time work decreased after 2008, while the numbers of those who had no clear preference increased substantially (see Chart 18). Overall, the rise in part-time employment from 2008 was primarily demand rather than supply-driven, as

39 Bodnár, K., "Part-time employment during the crisis", *MNB Bulletin*, Magyar Nemzeti Bank, March 2014.

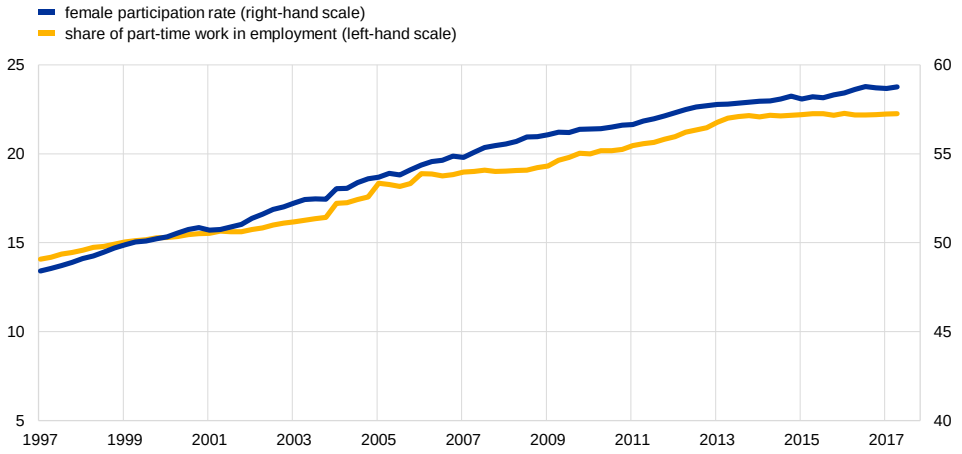
40 See for example Lydon, R., Mathä, T., Millard, S., "Short-time work during the great recession – evidence from 20 countries", mimeo.

shown by the increase in underemployment.[41] Underemployment has started to decline over the recovery, which means that part-time employment is increasing again on a voluntary basis.

Chart 17

Part-time work and the female participation rate in the euro area

(left-hand scale: percentage of employment; right-hand scale: percentage of working age population)

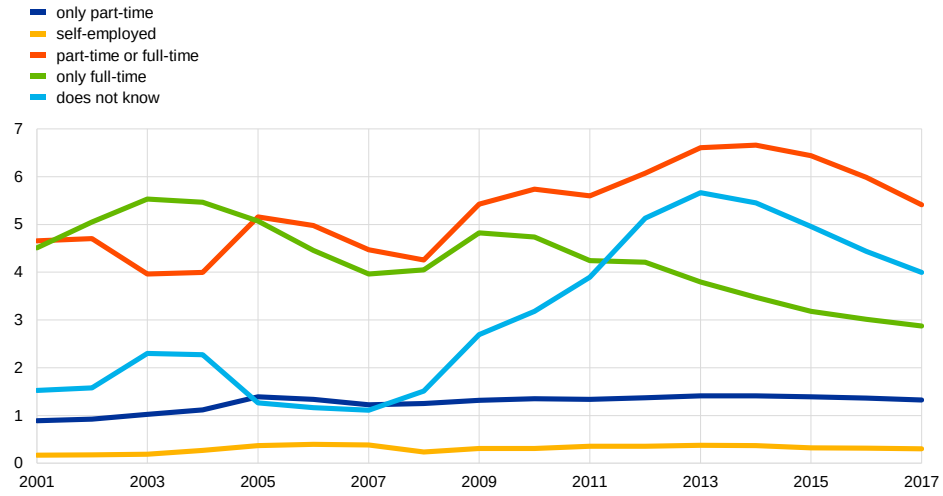


Source: Eurostat.

Chart 18

Type of employment sought by unemployed people in the euro area

(millions)



Source: Eurostat.
Note: 2017 data refer to the first two quarters only.

Looking ahead, the increase in part-time employment is likely to continue, although at a moderate rate. Further increases in the labour market participation of older workers as well as the continuing concentration of employment growth in services are likely to support this. At the same time, increasing labour shortages in

[41] See the box entitled "Assessing labour market slack", *Economic Bulletin*, Issue 3, ECB, 2017.

some countries and sectors may result in declining part-time employment and/or higher average hours worked.

5 The impact of migration on employment developments

The analysis of migration suffers from several methodological and data issues. First of all, it is not clear how migrants should be defined.[42] In this article, migrants are defined by citizenship, while the time spent in a country and the degree of assimilation are not taken into account. Second, data on migration are not always comparable across countries, and time series are generally short and published with a significant lag. Third, an additional problem with stock variables (as opposed to flows) is that calculating the number of immigrant workers or the size of immigrant labour supply for the euro area as a whole is virtually impossible. This is due to the lack of detailed statistics on the origin of people with a migration background. In the light of these caveats, data on migration must be assessed with caution.

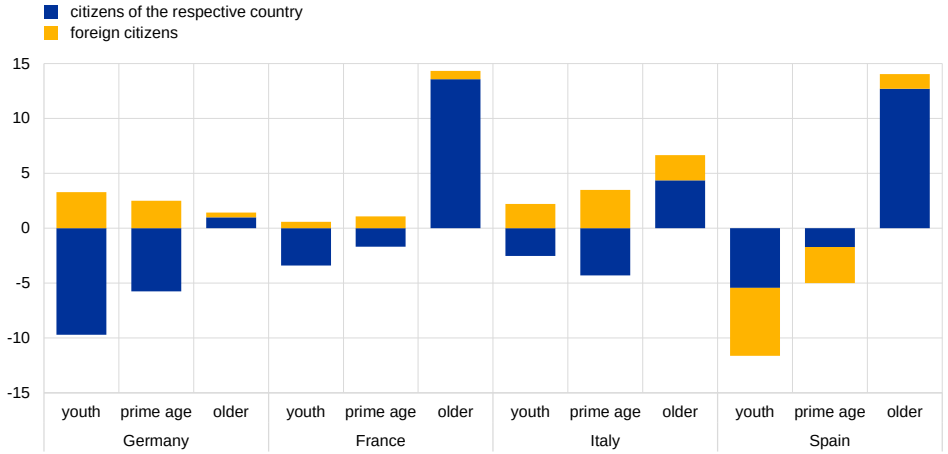
A major part of the recent population growth in several euro area countries can be linked to developments in migration. Immigration, as measured in terms of people with foreign citizenship, has had an upward impact on the growth of, particularly, the youth and prime-age population in the largest euro area countries (see Chart 19). This reflects the fact that net immigration flows have been positive in the euro area since data have been available (see Chart 20). The pattern of migration in the euro area has changed considerably in the last decade. Before the crisis, Spain was the main destination country, but recently Germany has received the largest numbers of immigrants. Several other large countries are net destination countries, while some smaller countries tend to be net senders of migrants.

[42] Place of birth or citizenship are not necessarily the right indicators to identify those who move between countries. For example, some people with a foreign passport or place of birth may have moved to the country as a child and be very similar to nationals. At the same time, people who have left their home country may return after a while and may be different from both those who had remained in the country as well as foreign migrants in terms of the characteristics important for the labour market. While the time spent in a country and the degree of assimilation would be important to take into account, data on these are usually scarce.

Chart 19

Population growth by citizenship and age in the largest euro area countries between 2009 and 2015

(percentages of the respective total population in 2009)

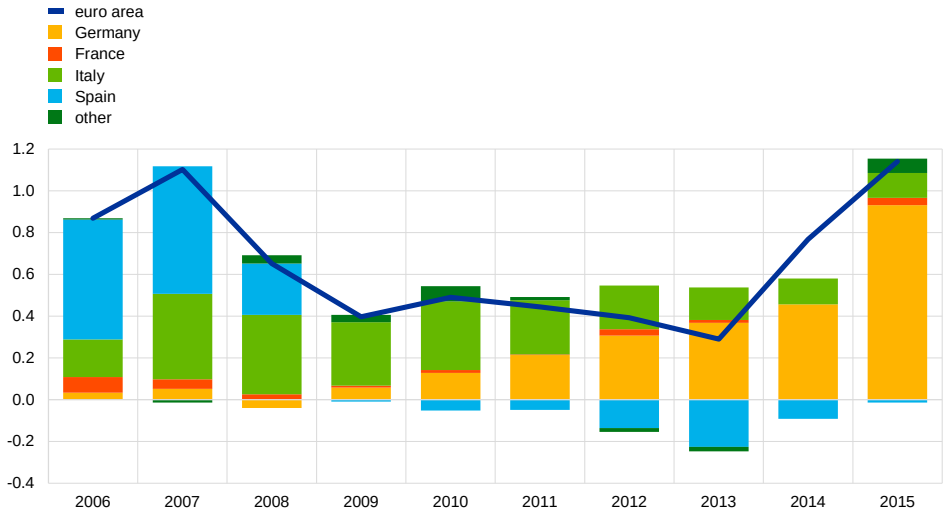


Sources: Eurostat and ECB calculations.
Note: Youth: 15-24 years, prime age: 25-54 years, older: 55-74 years.

Chart 20

Migration flows into the euro area and member countries

(millions)



Source: Eurostat.
Notes: Difference between gross immigration and gross emigration of the working age population (aged 15-64). The euro area figure is the sum of the net immigration of the member countries; thus net migration among euro area countries is netted out and the chart shows net immigration flows into the euro area. Migration data are missing for Belgium in 2008 and 2009 and for France in 2014.

Migration in the euro area has been influenced by three main factors in the last decade. First, the enlargements of the EU in 2004 and 2007 resulted in a large inflow of workers from the new to the existing Member States; the destination countries included the largest euro area countries, primarily Italy and Spain. The inflow at the euro area level continued after the start of the crisis, owing to a large degree to the opening up of the German and Austrian labour markets in 2011 and 2014 (for nationals of the countries that joined the EU in 2004 and in 2007,

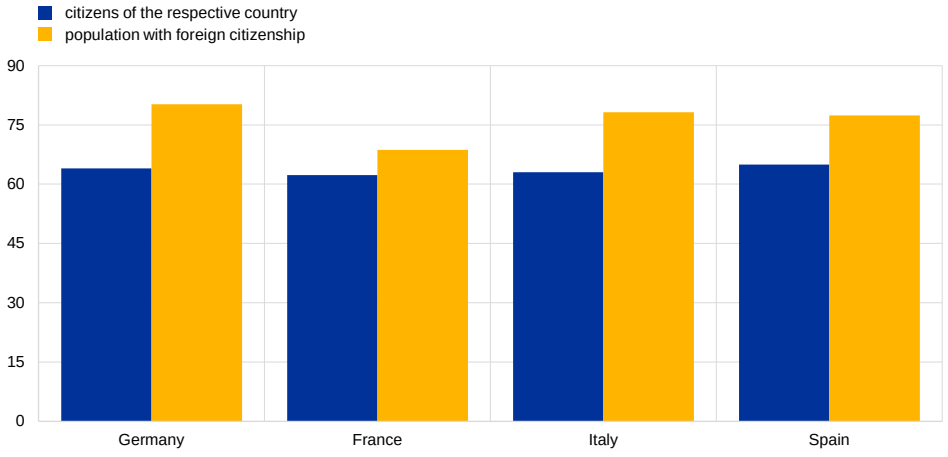
respectively). Second, the impact of the crisis on labour markets triggered large-scale outward migration from some countries. The largest contribution came from Spain, which witnessed large-scale immigration before the crisis which then became emigration, partly by pre-crisis immigrants. In other countries, emigrants were primarily nationals, whose destination was in many cases Germany, owing to high labour demand in that country. Third, the refugee crisis has resulted in a considerable increase in immigration flows into Germany, Italy and Austria, but the impact on the labour force has so far remained limited.

Immigrants in the largest euro area countries have a lower average age and slightly lower average educational level than nationals. In the largest euro area countries, a larger share of foreign citizens than of nationals are in the working age population (15-64) (see Chart 21). This also suggests that the increase in the share of older workers in the working age population would have been even more pronounced without the recent migration flows. The average educational level of foreign citizens is lower than that of nationals in all countries (see Chart 22).

Chart 21

Ratio of the working age population to total population by citizenship

(percentages of the respective population, 2016)

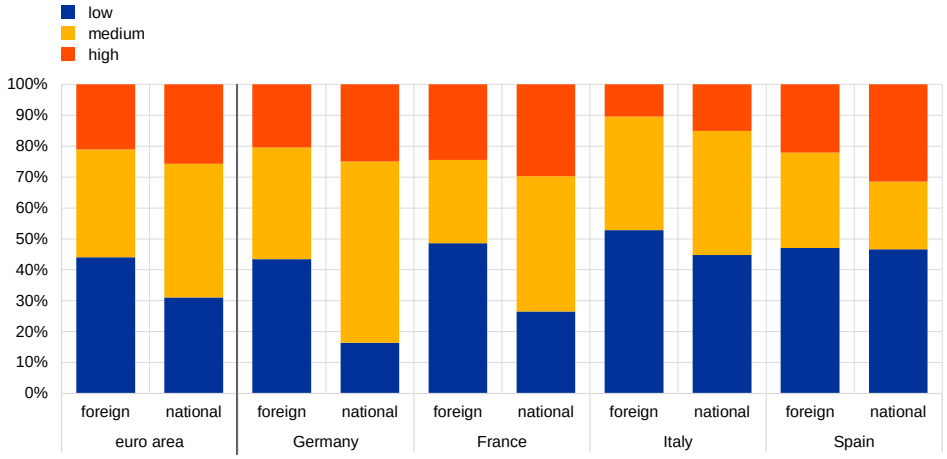


Source: Eurostat.
Note: Data are for the population aged 15-64.

Chart 22

Distribution of the working age population by educational level and citizenship

(percentages of the respective working age population, 2016)



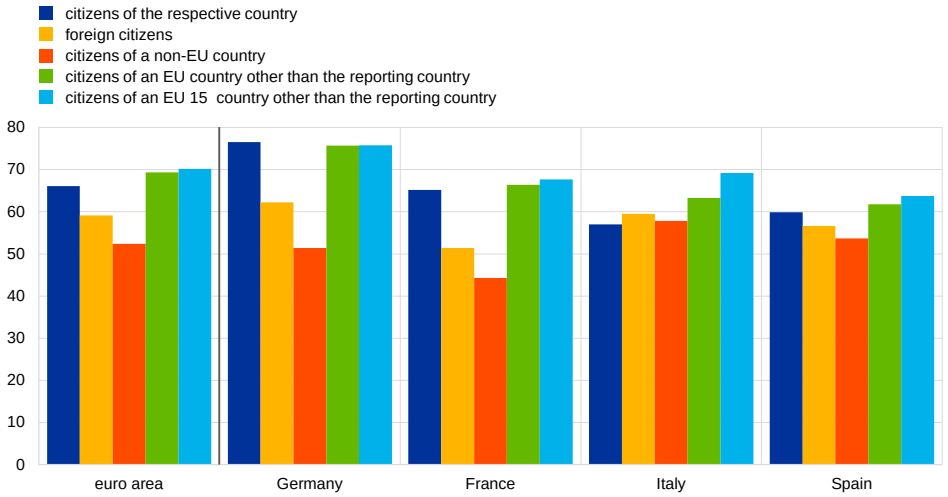
Source: Eurostat.
Note: Data are for the population aged 15-74.

Immigration in the largest countries also contributes to the growth of employment. A major part of the immigration into the euro area is aimed at finding employment. Participation and employment rates of immigrants are relatively high, but they tend to remain lower than for nationals. While those coming from EU countries have employment rates similar to or higher than those of nationals, those coming from outside the EU have lower employment rates (see Chart 23). This at least partially reflects differences in educational and skill levels as well as difficulties with the recognition of qualifications. According to the available data or, in the absence of data, estimations on the basis of the population by citizenship and the employment rates, immigration has contributed considerably to recent employment growth in the euro area.

Chart 23

Employment rates by citizenship in the euro area and its largest member countries, 2016

(percentages of the working age population)



Source: Eurostat.
Notes: "EU 15" denotes the following countries: Belgium, Denmark, Germany, Ireland, Greece, Spain, France, Italy, Luxembourg, the Netherlands, Austria, Portugal, Finland, Sweden and the United Kingdom. The working age population refers to ages 15-64.

The labour market situation of immigrants in Europe is less favourable than that of nationals. Immigration in Europe is frequently associated with down-skilling – i.e. immigrants work in occupations for which a lower educational level is needed than they possess. This is usually explained by their lack of country-specific skills and experience, as well as the time required for qualification recognition. With time, the difference between the skill distributions of nationals and immigrants declines, but gaps usually remain.[43] The less favourable labour market situation of immigrants has been found to be reflected in several other indicators (for example, the share of temporary work is higher (see Chart 24), income is lower, and living conditions and children's scores in the PISA knowledge and skills survey are worse). Differences between nationals and immigrants in terms of the degree of labour market integration have been found to be inherited by or in some cases enlarged for the descendants of immigrants in Europe[44] but not in the United States.[45] This suggests that there is room for improvement in the labour market integration of immigrants in the European countries.

43 See, for example, Alcobendas, M.A. and Rodríguez-Planas, N., "Immigrants' Assimilation Process in a Segmented Labor Market", *Discussion Paper Series*, IZA, No 4394, 2009 and Fernández, C. and Ortega, C., "Labor Market Assimilation of Immigrants in Spain: Employment at the Expense of Bad Job-Matches?", *Documento de Trabajo* No 2006-21, FEDEA, 2006.

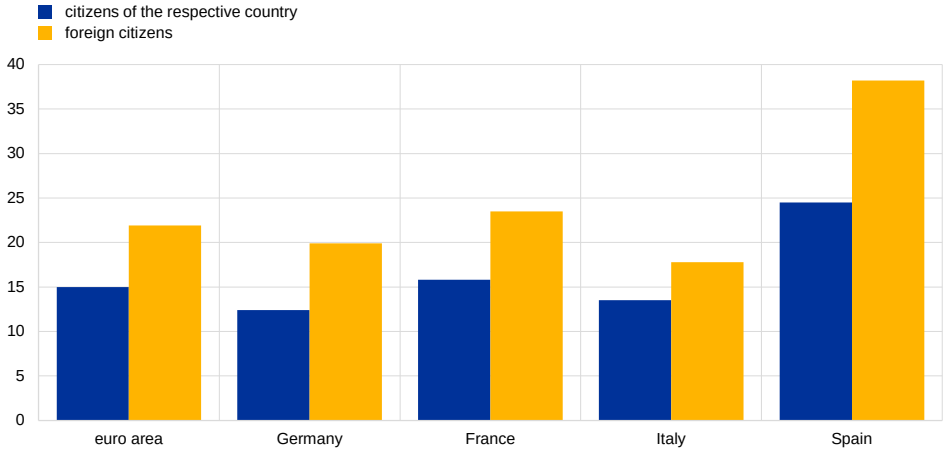
44 Gorodzeisky, A. and Semyonov, M., "Labor force participation, unemployment and occupational attainment among immigrants in West European countries", PLoS ONE, 12(5): e0176856, 2017.

45 Liebig, T. and Widmaier, S., "Children of Immigrants in the Labour Markets of EU and OECD Countries: An Overview", OECD Social, *Employment and Migration Working Papers*, No 97, 2009.

Chart 24

Share of temporary workers in employment by citizenship in the euro area and its largest member countries, 2016

(percentages of total employment)



Source: Eurostat.

Immigration has influenced labour markets in the euro area through several channels. Immigration has two main impacts: first, it influences the composition of total employment, and second, it impacts the labour market situation of nationals. Empirical papers frequently find that immigrants complement nationals in the labour market,[46] which results in an improvement of nationals' labour market situation and wages. Empirical studies in both Europe and the United States have mostly shown that immigrants bring complementary skills, ideas and connections, and fill important niches in both fast-growing and declining sectors of the economy.[47] Also, cross-country evidence in OECD countries points to overall positive effects from immigration.[48] The complementarity of immigrants may also help nationals to increase their labour market participation, hours worked or their skill level.[49]

46 See for example Ottaviano, G.I.P. and Peri, G., "Rethinking The Effect Of Immigration On Wages", *Journal of the European Economic Association*, Vol. 10(1), February 2012, pp. 152-197.

47 For evidence on European countries see, for example, D'Amuri, F., Ottaviano, G.I.P. and Peri, G., "The labor market impact of immigration in Western Germany in the 1990's", *Working Paper* No 687, Banca d'Italia, 2008; De la Rica, S., Glitz, A., Ortega, F., "Immigration in Europe: Trends, Policies and Empirical Evidence", *Discussion Paper Series*, No 7778, IZA, November 2013; "The Economic Impact of Migration", in OECD Economic Surveys: Spain 2003, OECD Publishing, 2003.

48 For a literature review, see Peri, G., "Do immigrant workers depress the wages of native workers?", IZA, 2014. See also "Is migration good for the economy?", *Migration Policy Debates*, OECD, May 2014.

49 See Cortés, P. and Tessada, J., "Low-Skilled Immigration and the Labor Supply of Highly Skilled women", *American Economic Journal: Applied Economics*, Vol. 3, No 3, July 2011; Farré, L., González, L. and Ortega, F., "Immigration, Family Responsibilities and the Labor Supply of Skilled Native Women", *The B.E. Journal of Economic Analysis & Policy*, Vol. 11, No 1, 2011; Barone, G. and Mocetti, S., "With a little help from abroad: The effect of low-skilled immigration on the female labour supply", *Labour Economics*, Vol. 18, No 5, October 2011, pp. 664-675; and Cavounidis, J., "Labor Market Impact of Migration: Employment Structures and the Case of Greece", *International Migration Review*, Vol. 40, No 3, August 2006, pp. 635-660.

6 Conclusions

Labour supply in the euro area has changed considerably in the last few decades in terms of both quantity and composition. The changes have been complex and affected the age, gender and skill composition of the labour force.

These developments have also impacted employment and unemployment over the recovery period. The continuation of the longer-term trends in the labour market participation of older people and women, as well as recent waves of net immigration, have helped to meet the rising labour demand. The increasing employment of these groups also explains, at least partially, the recent developments in part-time and temporary employment. Compositional effects in employment have also had an impact on wage dynamics.

A reversal of the recent increase in labour supply is expected in the medium term, owing to the ageing of the population. Thus, policy measures will be needed to boost labour supply and employment of all age groups, to foster productivity growth despite the ageing workforce, and to further enhance flexible forms of employment that give access to the labour markets to groups with still low participation rates.