



EUROPEAN CENTRAL BANK

EUROSYSTEM

# Economic Bulletin

Issue 2 / 2018



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# Economic and monetary developments

## Overview

**At its monetary policy meeting on 8 March 2018, the Governing Council concluded that an ample degree of monetary stimulus remains necessary for underlying inflation pressures to continue to build up and support headline inflation developments over the medium term.** The information that has become available since the previous monetary policy meeting in January, including the new ECB staff projections, confirmed a strong and broad-based growth momentum in the euro area economy, which is projected to expand in the near term at a somewhat faster pace than previously expected. This outlook for growth confirmed the Governing Council's confidence that inflation will converge towards the inflation aim of below, but close to, 2% over the medium term. At the same time, measures of underlying inflation remained subdued and have yet to show convincing signs of a sustained upward trend. In this context, the Governing Council will continue monitoring developments in the exchange rate and financial conditions with regard to their possible implications for the medium-term outlook for price stability. The continued monetary support required for a sustained return of inflation rates towards levels that are below, but close to, 2% is provided by the ongoing net asset purchases, by the sizeable stock of acquired assets and the forthcoming reinvestments, and by the forward guidance on interest rates.

## Economic and monetary assessment at the time of the Governing Council meeting of 8 March 2018

**The global economy expanded at an even faster rate in the second half of 2017 and is providing further impetus to euro area exports.** Global economic activity is expected to remain strong going forward, although the pace of growth will gradually moderate. Global trade growth is expected to remain sustained in the near term, while inflation is expected to rise slowly as spare capacity at the global level diminishes.

**Amid the ongoing economic expansion, euro area sovereign bond yields have increased since mid-December 2017.** However, corporate bond spreads have remained broadly stable and average sovereign bond spreads over the overnight index swap rate have decreased somewhat overall. Equity prices have declined in an environment of heightened volatility. In foreign exchange markets, the euro has appreciated in nominal effective terms.

**The euro area economic expansion continues to be strong and broad-based across countries and sectors, with real GDP increasing by 0.6% quarter on quarter in the fourth quarter of 2017.** Private consumption is supported by rising employment, which is also benefiting from past labour market reforms, and by growing household wealth. Business investment has continued to strengthen on the

back of very favourable financing conditions, rising corporate profitability and solid demand, while housing investment has improved further over recent quarters. In addition, the broad-based global expansion is providing impetus to euro area exports.

**This assessment is also broadly reflected in the March 2018 ECB staff macroeconomic projections for the euro area, which foresee annual real GDP in the euro area increasing by 2.4% in 2018, 1.9% in 2019 and 1.7% in 2020.**

Compared with the December 2017 Eurosystem staff macroeconomic projections, the outlook for GDP growth has been revised up in 2018 and remains unchanged thereafter. Risks surrounding the growth outlook are assessed as broadly balanced. On the one hand, the prevailing cyclical momentum could lead to stronger growth in the near term. On the other hand, downside risks continue to relate primarily to global factors, including rising protectionism and developments in foreign exchange and other financial markets.

**According to Eurostat's flash estimate, euro area annual HICP inflation decreased to 1.2% in February, from 1.3% in January.** This reflected mainly negative base effects in unprocessed food price inflation. Looking ahead, on the basis of current futures prices for oil, annual rates of headline inflation are likely to hover around 1.5% for the remainder of the year. Measures of underlying inflation remained subdued but are expected to rise gradually over the medium term, supported by the ECB's monetary policy measures, the continuing economic expansion, the corresponding absorption of economic slack and rising wage growth.

**The March 2018 ECB staff macroeconomic projections for the euro area foresee annual HICP inflation at 1.4% in 2018, 1.4% in 2019 and 1.7% in 2020.**

Compared with the December 2017 Eurosystem staff macroeconomic projections, the outlook for headline HICP inflation has been revised down slightly for 2019 but remains unchanged for 2018 and 2020. Declines in HICP energy inflation in 2018 and 2019 are expected to broadly offset a strengthening in underlying inflation, with HICP inflation excluding energy and food rising from 1.1% in 2018 to 1.5% in 2019 and 1.8% in 2020.

**The latest staff projections also foresee the euro area budget deficit declining further over the projection horizon, mainly as a result of favourable cyclical conditions and decreasing interest payments.** The aggregate fiscal stance for the euro area is projected to remain on average broadly neutral in 2018-20. Although the euro area government debt-to-GDP ratio will continue to decline, it will still remain elevated. The current economic expansion calls for rebuilding fiscal buffers.

**The monetary analysis showed broad money continuing to expand at a robust pace, with an annual rate of growth of 4.6% in January 2018 – unchanged from the previous month – reflecting the impact of the ECB's monetary policy measures and the low opportunity cost of holding the most liquid deposits.**

Accordingly, the narrow monetary aggregate M1 continued to be the main contributor to broad money growth. At the same time, the recovery in loan growth to the private sector progressed. The pass-through of the monetary policy measures continued to

support borrowing conditions for firms and households, access to financing – notably for small and medium-sized enterprises – and credit flows across the euro area.

## Monetary policy decisions

**Based on the regular economic and monetary analyses, the Governing Council confirmed the need for an ample degree of monetary accommodation to secure a sustained return of inflation rates towards levels that are below, but close to, 2%.** The Governing Council decided to keep the key ECB interest rates unchanged and continues to expect them to remain at their present levels for an extended period of time, and well past the horizon of the net asset purchases. Regarding non-standard monetary policy measures, the Governing Council confirmed that the net asset purchases are intended to run at the current monthly pace of €30 billion until the end of September 2018, or beyond, if necessary, and in any case until the Governing Council sees a sustained adjustment in the path of inflation consistent with its inflation aim. The Governing Council also reiterated that the Eurosystem will continue to reinvest the principal payments from maturing securities purchased under the asset purchase programme for an extended period of time after the end of its net asset purchases, and in any case for as long as necessary.

## 1 External environment

*The global economy expanded at an even faster rate in the second half of 2017. Global economic activity is expected to remain strong going forward, although the pace of growth will gradually moderate. The outlook for advanced economies is for robust expansion, reinforced by the significant fiscal stimulus in the United States. For emerging market economies, the outlook is supported by strengthening activity among commodity exporters. Global trade growth is seen to remain buoyant in the near term, while inflation is expected to rise slowly as spare capacity at the global level diminishes.*

### Global economic activity and trade

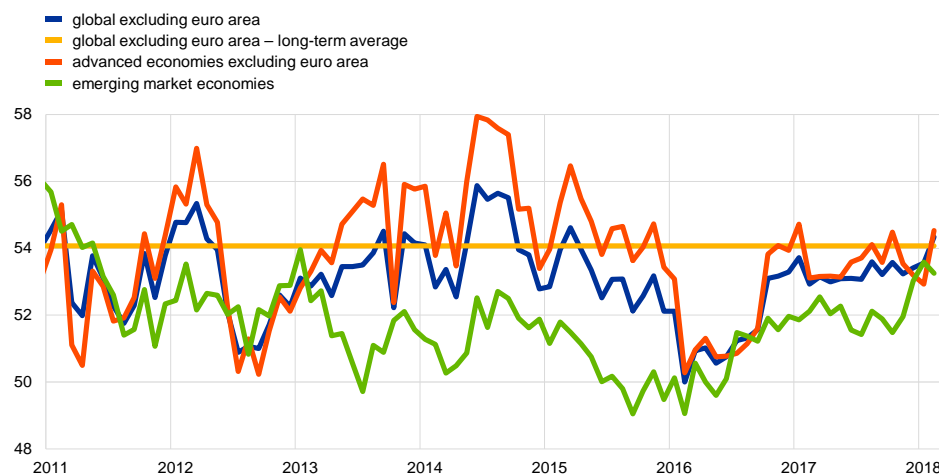
**The pace of global economic expansion strengthened in the second half of 2017. Overall, data releases in this period surprised on the upside in both advanced economies and, to a lesser extent, emerging market economies (EMEs).** Available GDP data across countries point to a sustained expansion of global economic activity in the final quarter of the year. Specifically, US real GDP growth proved resilient in the second half of 2017, shaking off the impact of the hurricanes. Economic activity in Japan also remained brisk, benefiting from policy support, solid job creation and recovering external demand. By contrast, real GDP growth in the United Kingdom remained relatively muted in 2017, in spite of a moderate rebound in the second half of the year. Activity across EMEs has been supported by resilient growth in India and China, while the recoveries from deep recessions in Brazil and Russia continued, albeit at a very gradual pace.

**Survey-based indicators point to sustained global growth in the near term.** The global composite output Purchasing Managers' Index (PMI), excluding the euro area, remained at a similar level in the last quarter of 2017 to that of the previous quarter – slightly above the first half of the year and close to the long-run average – and improved marginally in January and February, suggesting that global activity continued to expand robustly into this year (Chart 1).

## Chart 1

### Global composite output PMI

(diffusion index)



Sources: Haver Analytics, Markit and ECB staff calculations.

Notes: The latest observations are for February 2018. "Long-term average" refers to the period from January 1999 to February 2018.

**Global financial conditions remain supportive of the global outlook but have tightened in recent weeks.** Following a period of buoyant sentiment and large increases in equity market valuations, stock markets started to suffer sharp losses at the beginning of February, while volatility picked up. The financial market turmoil remained concentrated in equity markets, and the correction, while large, only unwound the gains made since the start of the year. However, the market volatility came against the background of a steady rise in long-term yields in the United States over the past three months, amid increasing investor nervousness about the inflation outlook and potentially faster than expected monetary policy tightening. The Fed Funds futures curve has shifted upwards in recent weeks, following last December's rate hike. Markets continue to anticipate a gradual tightening and now price in the next policy rate increase in March 2018 and three hikes for the year as a whole – in line with the December projections of the Federal Open Market Committee. Interest rate expectations have also shifted upwards in the United Kingdom, following the hawkish tone of the Bank of England's February Inflation Report. By contrast, the Bank of Japan has retained a very accommodative stance, holding ten-year yields close to zero in line with its yield curve control programme. In China, the People's Bank of China sought to curb leverage in the financial system and contain financial stability risks with tightened financial conditions in the course of 2017, increasing the rates it charges on open-market operations with a view to guiding interbank rates upwards. Among other EMEs, in particular Brazil and Russia, policy rates have been lowered further as inflationary pressures have subsided.

**Looking ahead, global economic activity growth is expected to remain resilient before moderating somewhat over the medium term.** The outlook for advanced economies is for robust expansion, now reinforced by the additional fiscal impact emanating from the US tax reform and agreement on increased expenditure by the US Congress. However, growth is seen to slow going forward, as the recovery matures in some countries and output gaps become more positive. For EMEs, the

outlook is supported by strengthening activity among commodity exporters like Brazil and, to a lesser extent, Russia. At the same time, growth remains resilient in India, while activity continues to follow a gradual long-term downward trend in China.

**The pace of global expansion is projected to remain below pre-crisis levels, in line with lower potential growth.** ECB estimates suggest that the growth potential has declined across most advanced and emerging economies in recent years. In advanced economies, all components weigh on potential, although this is particularly true of labour and total factor productivity (TFP) contributions. Capital contributions also remain below historical averages, as weakened expectations of growth prospects and heightened uncertainty have delayed investment decisions. Investment has similarly moderated in EMEs, in commodity-exporting countries in particular but also in China in response to its rebalancing process and policy drive to contain leverage. However, TFP was the main factor behind the decline in potential among EMEs. Overall, potential output growth is expected to remain broadly stable in advanced economies over the medium term, a slight increase in US potential growth in 2019-20 notwithstanding, while it is expected to continue declining in EMEs.

**In the United States, activity is expected to remain robust on the back of solid domestic demand.** The ongoing expansion is seen to proceed on the back of solid growth in investment and consumer spending, as tight labour market conditions gradually feed into higher wage growth and still favourable financial conditions boost wealth. The approval of tax reform legislation last December and the rise in the ceilings on government expenditure agreed in February are projected to further boost domestic demand.

**In the United Kingdom, real GDP growth is expected to remain subdued yet resilient.** Economic activity rebounded moderately in the second half of the 2017, having slowed markedly in the first half. Looking ahead, a boost from stronger net export growth over the coming quarters and a slight rebound in investment will underpin the resilience of real GDP growth in the United Kingdom.

**In Japan, the economic expansion is seen to gradually decelerate.** Economic activity is projected to remain relatively solid over the short term, benefiting from the current positive momentum and accommodative monetary policy stance. Looking further ahead, however, growth is expected to gradually slow. Apart from diminishing support from fiscal policy and quickly contracting spare capacity, this deceleration also reflects a decline in the positive impact of infrastructure investment related to the 2020 Olympics.

**In China, activity continues to expand at a robust pace, supported by strong consumption and a still thriving housing market.** The near-term outlook is dominated by the authorities' focus on stable growth and the mitigation of financial risks. The assumption over the medium term is that continued structural reforms will gradually be implemented, leading to an orderly growth slowdown.

**Economic activity in central and eastern European countries will remain robust, albeit at a more moderate pace than in 2017.** Economic activity in central

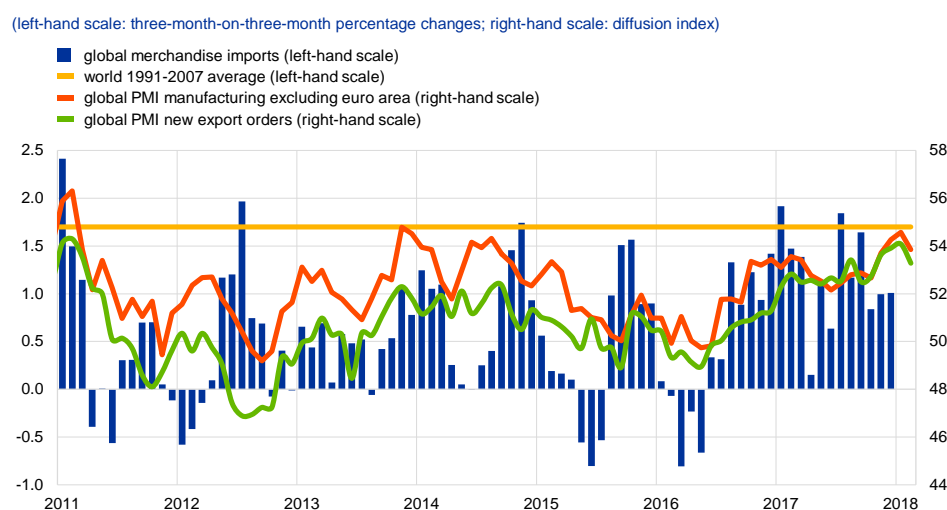


and eastern European countries grew strongly in 2017, driven by a rebound in investment and solid private consumption. Looking forward, it is expected to remain supported by strong investment, linked to the absorption of EU funds, solid consumer spending and improvements in the labour market.

**Economic activity is gradually strengthening in the large commodity-exporting countries.** In Russia, leading indicators signal a temporary dip in economic activity in the last quarter of 2017, following robust growth in the first half of the year, as industrial production declined. Over the medium term, economic activity is expected to expand moderately, amid fiscal challenges weighing on the business environment, weak fixed investment and growth potential undermined by a lack of structural reforms. Activity in Brazil should continue recovering. Rising confidence, an improved labour market and continuing monetary accommodation should support consumption, against the backdrop of inflationary pressures remaining contained. Political uncertainty in this election year and a potential reversal of the benign external financial conditions are key risks to the country's improving economic outlook.

**Global trade growth prospects are expected to remain sustained in the near term.** While global merchandise import growth momentum receded somewhat in December, available country data and leading indicators point to robust growth at the turn of 2017-18. The volume of merchandise imports increased by 1% in December (in three-month-on-three-month terms), down from 1.6% in the third quarter (Chart 2). Trade activity picked up substantially in the United States, while weakening in Asia and central and eastern Europe.

**Chart 2**  
World trade in goods



Sources: Markit, CPB Netherlands Bureau for Economic Policy Analysis and ECB calculations.  
 Note: The latest observations are for February 2018 (global PMI manufacturing and global PMI new export orders) and December 2017 (trade).

**Over the medium term, the trade projections are anchored in the view that global imports will grow broadly in line with activity.** This is consistent with the evidence that the longer-term structural factors that previously drove the fast

expansion of global trade – including trade liberalisation, reductions in tariffs and transportation costs and the expansion of global value chains – have waned since the financial crisis. Uncertainty about these longer-term factors is clearly high and, in some instances, data are scarce. But the available evidence would suggest that the projection for imports to grow in line with activity over the medium term remains a reasonable baseline.

**Overall, global growth is projected to remain broadly stable over the projection horizon.** According to the March 2018 ECB staff macroeconomic projections, world real GDP growth (excluding the euro area) is expected to increase from 3.8% in 2017 to 4.1% in 2018 before declining to 3.9% and 3.7% in 2019 and 2020 respectively. This projection path reflects the anticipated slowdown in activity in advanced economies in general, and the United States in particular, partly offset by a modest gain in dynamism in EMEs. Growth in euro area foreign demand is forecast to expand by 4.7% in 2018, 4.1% in 2019 and 3.6% in 2020. Compared with the December 2017 projections, global GDP growth has been revised upwards for 2017-19, while growth in euro area foreign demand has been revised upwards over the whole projection horizon, in both cases mostly reflecting the impact of the additional fiscal stimulus in the United States.

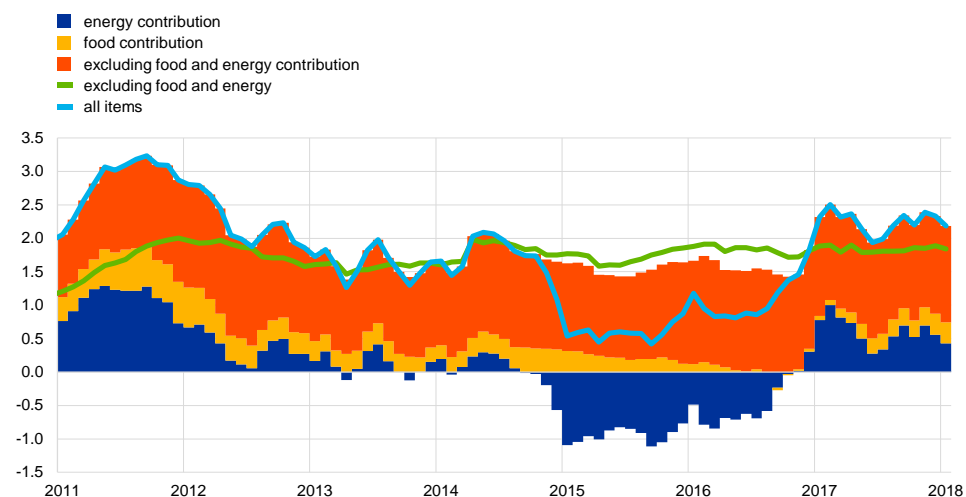
**Although on the upside in the short term, risks to the outlook for global activity remain skewed to the downside in the medium term.** On the upside, the broadening of the global recovery could lead to stronger investment and trade in the short term, while the US fiscal package could have a stronger impact on activity than currently anticipated. Over the medium term, however, these factors are seen to be outweighed by downside risks such as an increase in trade protectionism, a sudden financial market correction – which would result in a tightening of global financial conditions – disruptions associated with China's reform and liberalisation process, and political and geopolitical uncertainties associated with Brexit-related risks in particular.

## Global price developments

**Global consumer price inflation has declined slightly of late, while wage developments have remained subdued.** Following a slight increase in November, annual consumer price inflation in the OECD area slowed in December and in January, to 2.2%. This resulted from a slight deceleration in energy price rises, although still close to 5%, while food price inflation remained stable. Excluding food and energy, OECD annual inflation declined marginally to 1.8% (Chart 3). Turning to wages, compensation per employee remained broadly unchanged at very low levels (rising 1.5% year-on-year), in spite of a further decline in the OECD unemployment rate in the third quarter (to below 6%). Only hourly earnings in the manufacturing sector show a swift upward trend, more in line with the tightening of the labour market.

### Chart 3 OECD consumer price inflation

(year-on-year percentage changes; percentage point contributions)



Source: OECD.

Note: The latest observation is for January 2018.

**Brent crude oil prices have declined somewhat over the last few weeks, from USD 70 per barrel on 23 January to USD 66 on 22 February.** This recent decline was underpinned by record US crude production, high compliance with the OPEC/non-OPEC agreement to reduce supply and the end of the pipeline disruption suffered during December and January – notably including the return of the North Sea pipeline to full capacity. Oil futures suggest that oil prices will fall below current levels, to around USD 65 per barrel in 2018 and USD 61 per barrel in 2019. Non-energy commodity prices have increased slightly in recent weeks, with food prices rising by 3.5% and metal prices by 1.6%.

**Looking ahead, global inflation is expected to rise slowly.** In the short term, inflation is seen to increase following the recent pick-up in oil prices. Thereafter, the slowly diminishing spare capacity at the global level is projected to further support underlying inflation. However, the rise in inflation is seen to be moderated by a negative contribution from energy prices to inflation, as currently implied by an oil futures curve that anticipates falling oil prices over the medium term.

## 2 Financial developments

Since the Governing Council's meeting in December 2017 euro area sovereign bond yields have increased, against the background of the ongoing economic expansion. As inflation expectations have remained broadly stable, real interest rates have recorded a corresponding rise. Although corporate earnings expectations have improved, equity prices have declined in an environment of heightened volatility. At the same time, corporate bond spreads have remained broadly stable. Average sovereign bond spreads vis-à-vis the overnight index swap (OIS) rate have decreased somewhat overall. In foreign exchange markets, the euro has appreciated in nominal effective terms.

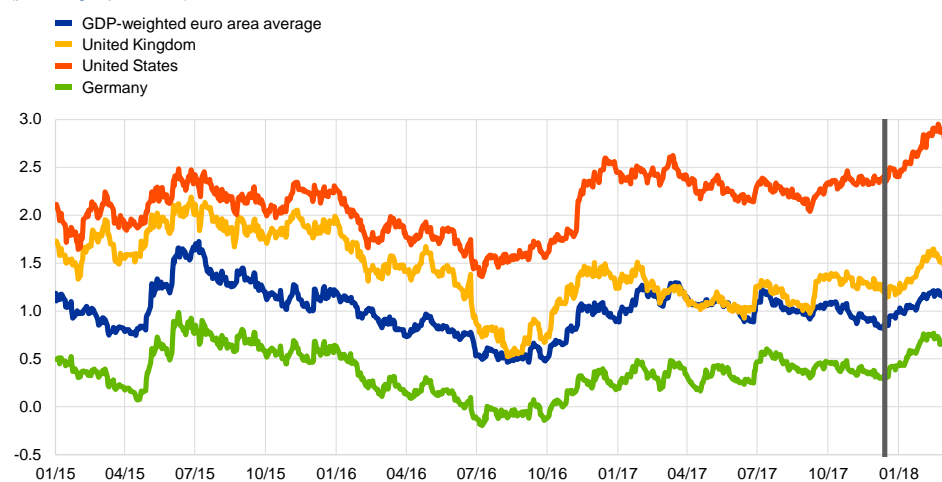
### Long-term government bond yields have increased on both sides of the Atlantic since mid-December.

During the period under review (from 14 December 2017 to 7 March 2018) the GDP-weighted euro area ten-year sovereign bond yield increased by 28 basis points, to 1.13% (see Chart 4). In the United States and the United Kingdom, long-term government bond yields increased by 53 basis points and 33 basis points, to 2.88% and 1.50% respectively. The euro area ten-year OIS rate increased by 31 basis points to stand at 0.90%, mainly driven by an increase in the long-term real interest rate. Overall, bond market developments on both sides of the Atlantic reflect improving market expectations of economic growth and inflation, as well as revisions to expectations regarding the associated monetary policy reaction.

#### Chart 4

##### Ten-year sovereign bond yields

(percentages per annum)



Sources: Bloomberg and ECB.

Notes: The vertical grey line denotes the start of the review period on 14 December 2017. The latest observation is for 7 March 2018.

### Sovereign bond spreads vis-à-vis the risk-free OIS rate declined overall, reflecting the favourable macroeconomic outlook.

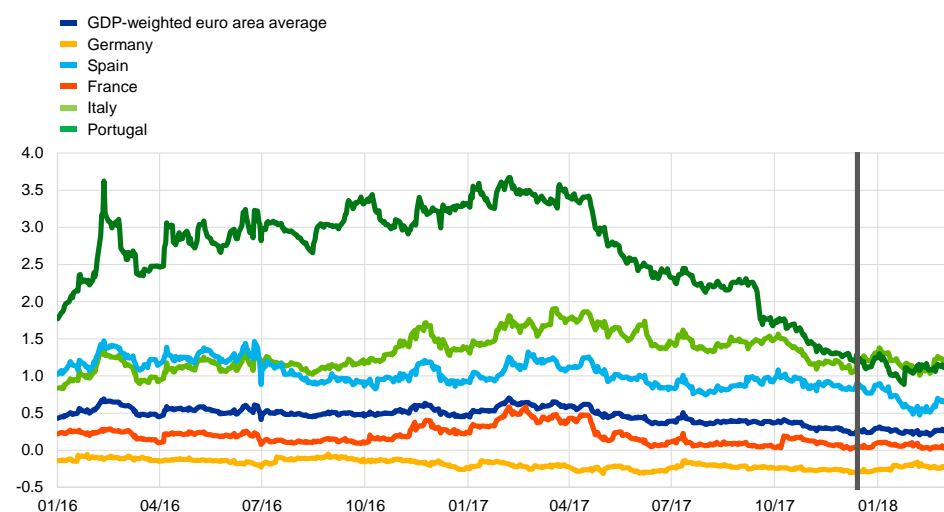
The fall in ten-year bond spreads ranged from 31 basis points for Spain and 22 basis points for Portugal to 4 basis points for Italy (see Chart 5). In Italy, a temporary larger decline in the period to January was subsequently reversed in the weeks preceding the parliamentary

elections in March. In Germany, ten-year Bund yields increased by 5 basis points more than the OIS rate. This resulted in a less negative spread, which probably signalled, inter alia, lower scarcity premia.

### Chart 5

#### Euro area sovereign bond spreads vis-à-vis the OIS rate

(percentages per annum)



Sources: Thomson Reuters and ECB calculations.

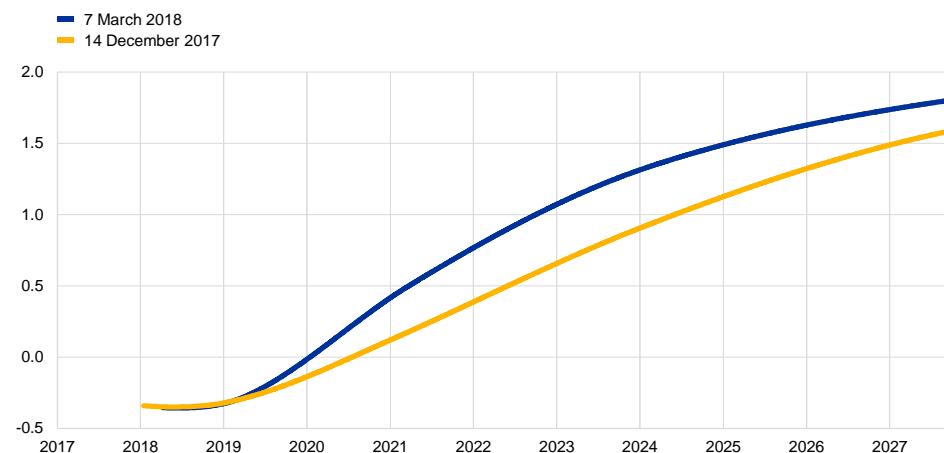
Notes: The spread is calculated by subtracting the ten-year OIS rate from the sovereign yield. The vertical grey line denotes the start of the review period on 14 December 2017. The latest observation is for 7 March 2018.

**The euro overnight index average (EONIA) forward curve steepened.** The EONIA forward curve shifted upwards at medium and long maturities (see Chart 6). For the period to early 2019, there is little change to the curve compared with the situation at the end of the last review period, reflecting broadly unchanged market expectations regarding the level of the deposit facility rate over this horizon.

### Chart 6

#### EONIA forward rates

(percentages per annum)



Sources: Thomson Reuters and ECB calculations.

**The EONIA recorded an average of -36 basis points during the review period.**

Excess liquidity increased by about €5 billion to stand at around €1,885 billion. Growth in net autonomous factors was more than offset by the liquidity provided through purchases under the Eurosystem’s asset purchase programme. Liquidity conditions are discussed in more detail in Box 3.

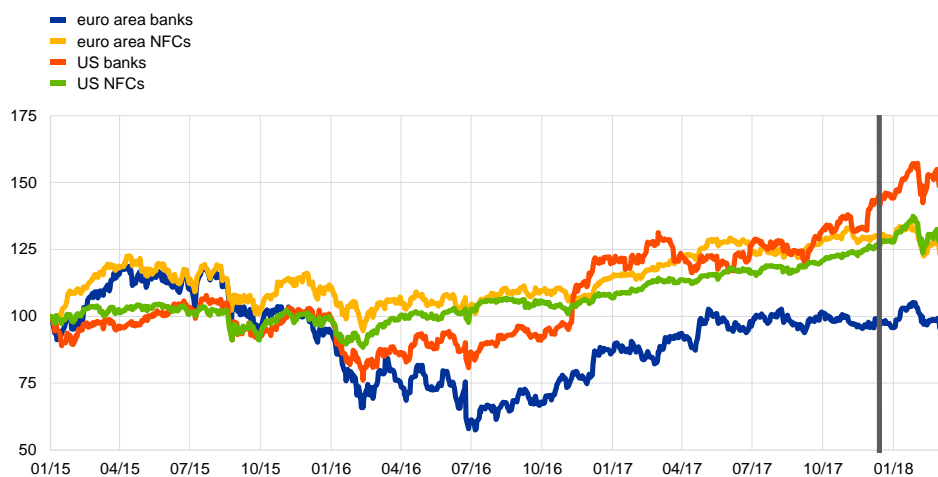
**Equity market volatility increased towards the end of the review period.**

While equity prices increased from mid-December 2017 to the end of January 2018, a relatively sharp price correction and a spike in volatility were observed in early February (see Chart 7). The correction was most likely triggered by market perceptions of rising inflation, especially in the United States, and a corresponding adjustment in monetary policy expectations. Part of the decline in equity prices was subsequently reversed, but uncertainty following announcements regarding US trade policy triggered a renewed decline in stock markets on both sides of the Atlantic in early March. Overall, in the review period the equity prices of euro area non-financial corporations (NFCs) fell by 2.7%, while financial sector equities declined by only 1.5%. In the United States, despite the correction, both financial and non-financial equity indices increased, gaining 6.4% and 3.1% respectively. Overall, euro area stock market developments continued to be driven by solid earnings expectations, while higher risk-free rates and some increases in equity risk premia weighed negatively on equity prices.

**Chart 7**

**Euro area and US equity price indices**

(index: 1 January 2015 = 100)



Sources: Thomson Reuters and ECB calculations.

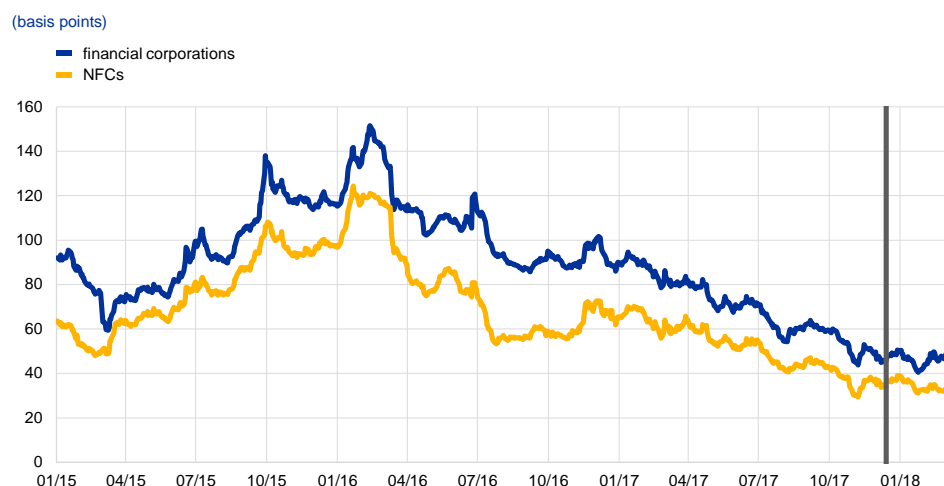
Notes: The vertical grey line denotes the start of the review period on 14 December 2017. The latest observation is for 7 March 2018.

**Spreads on bonds issued by NFCs remained broadly stable during the period under review.**

On 7 March 2018 investment-grade NFC bond spreads (over the corresponding AAA-rated euro area average yield curve) were broadly unchanged compared with mid-December 2017 and around 79 basis points below their levels in March 2016, prior to the announcement of the corporate sector purchase programme (see Chart 8). Spreads on financial sector debt increased marginally, rising by

4 basis points during the review period. The low level of corporate bond spreads is consistent with the ongoing economic expansion.

**Chart 8**  
Euro area corporate bond spreads



Sources: iBoxx indices and ECB calculations.

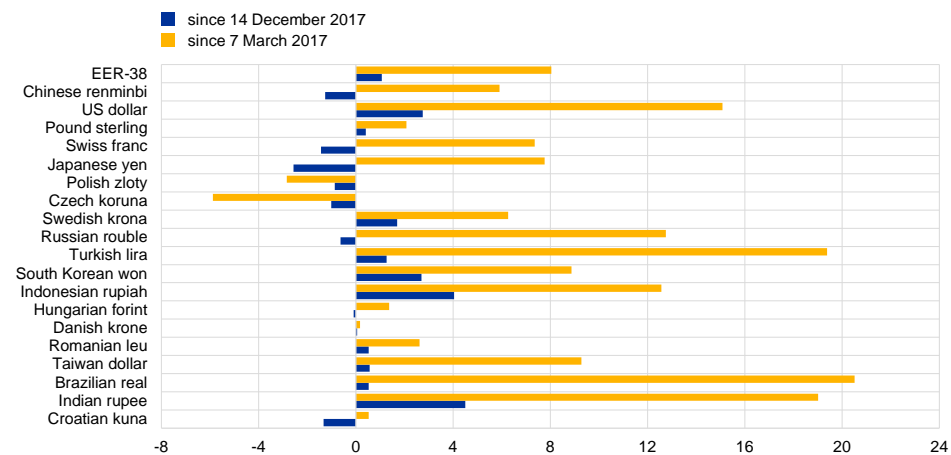
Notes: The vertical grey line denotes the start of the review period on 14 December 2017. The latest observation is for 7 March 2018.

**In foreign exchange markets, the euro has appreciated in nominal effective terms since mid-December 2017.** This largely reflects a strengthening against the US dollar, on account of macroeconomic news (the euro appreciated by 2.8% in the review period, see Chart 9), and a smaller appreciation against the pound sterling. The euro was further supported by a strengthening vis-à-vis the currencies of most major emerging economies, except the Chinese renminbi, against which it depreciated by 1.3%. The euro also depreciated vis-à-vis most other major currencies, including the Swiss franc and the Japanese yen, as well as against the currencies of most other non-euro area EU Member States, further dampening the appreciation of the euro in trade-weighted terms.

### Chart 9

#### Changes in the exchange rate of the euro vis-à-vis selected currencies

(percentages)



Source: ECB.

Notes: EER-38 is the nominal effective exchange rate of the euro against the currencies of 38 of the euro area's most important trading partners. All changes are computed using the exchange rates prevailing on 7 March 2018.



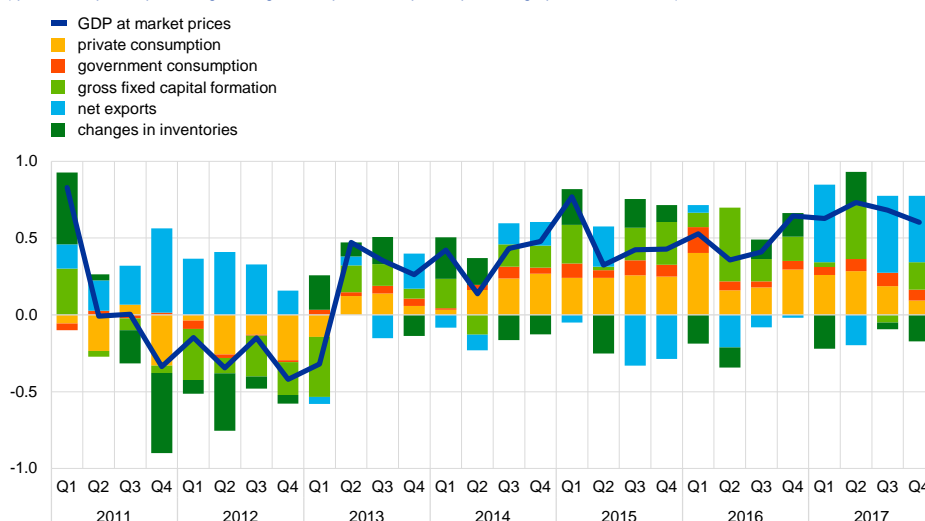
### 3 Economic activity

The euro area economic expansion continues to be strong and broad-based across countries and sectors. Real GDP growth is supported by growth in private consumption and investment as well as exports benefitting from the broad-based global recovery. The latest survey results and incoming data confirm strong and broad-based growth momentum in the euro area economy, which is projected to expand in the near term at a somewhat faster pace than previously expected. Compared with the December 2017 Eurosystem staff macroeconomic projections, the GDP growth outlook for 2018 was revised upwards in the March 2018 ECB staff macroeconomic projections, while the outlook remained unchanged for 2019 and 2020. Euro area real GDP is projected to grow by 2.5% in 2017, 2.4% in 2018, 1.9% in 2019 and 1.7% in 2020.

**Growth remained robust in the fourth quarter of 2017 and continued to be broad-based across countries.** Real GDP increased by 0.6%, quarter on quarter, in the fourth quarter of last year (see Chart 10). Real GDP growth was driven by net trade and domestic demand, particularly fixed investment spending, whereas changes in inventories provided a negative contribution. The second release of GDP data left quarterly real GDP growth in the fourth quarter of 2017 unrevised, confirming that the preliminary flash estimate continues to be a reliable measure (see the box entitled “The reliability of the preliminary flash estimate of euro area GDP” in this issue of the Economic Bulletin). Output growth in the fourth quarter led to a yearly rise in GDP of 2.3% in 2017 (2.5% in working day-adjusted terms). Economic indicators suggest that the pattern of broad and robust growth has continued at the beginning of this year.

**Chart 10**  
Euro area real GDP and its components

(quarter-on-quarter percentage changes and quarter-on-quarter percentage point contributions)

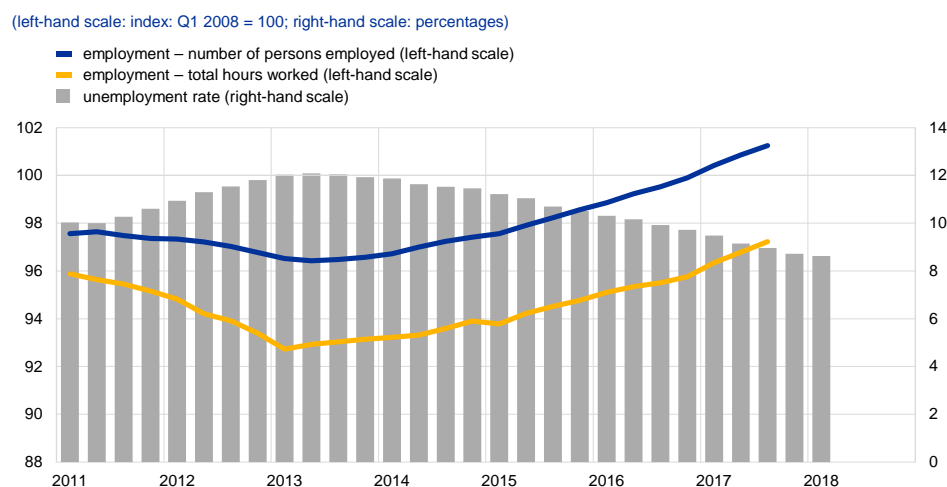


Source: Eurostat.

Note: The latest observations are for the fourth quarter of 2017.

**Euro area labour markets continue to exhibit strong dynamics.** Employment rose further, by 0.4%, quarter on quarter, in the third quarter of 2017, resulting in an annual increase of 1.7%. Employment currently stands 1.2% above the pre-crisis peak recorded in the first quarter of 2008. Total hours worked also continued to recover, although average hours worked per person employed have remained broadly stable since the recovery started. Both full-time and part-time employment have risen during the recovery. In the case of part-time employment, the increase has mainly been in non-underemployed part-time workers, while the number of underemployed part-time workers has declined recently (see the box entitled “Recent developments in part-time employment” in this issue of the Economic Bulletin). The unemployment rate in the euro area stood at 8.6% in January 2018, which is its lowest level since December 2008 (see Chart 11). The decline has been broad-based across age and gender groups. Long-term unemployment (the number of people who have been unemployed for at least 12 months expressed as a percentage of the labour force) has also continued to fall, but remains well above its pre-crisis levels. Survey information points to continued improvements in labour market conditions in the period ahead. At the same time, there are increasing signs of labour shortages in some countries and sectors. Income growth remained strong in the third quarter of 2017.

**Chart 11**  
Developments in the euro area labour market

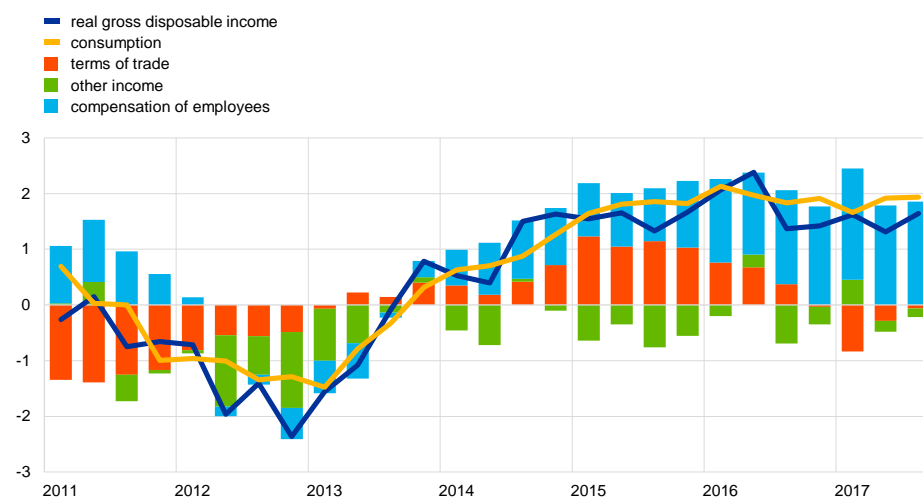


Sources: Eurostat and ECB calculations.  
Note: The latest observations are for the third quarter of 2017 for employment and hours worked and January 2018 for the unemployment rate.

**Improving labour markets continue to support income growth and private spending. Private consumption grew by 0.2% in the fourth quarter of 2017, leading to an annual increase of 1.5%.** The ratio of household saving to disposable income remained low in the third quarter of 2017, reaching its lowest value since 1999, which continues to support private consumption. The ECB’s monetary policy measures, which have eased financing conditions, also remain supportive of household spending. Rising real incomes continue to support private consumption growth as compensation of employees remains the key component of private consumption growth (see Chart 12).

**Chart 12****Real gross disposable income and consumption in the euro area**

(annual percentage changes; percentage point contributions)



Sources: Eurostat and ECB calculations.

Notes: Other income comprises operating surplus, property income, direct taxes and transfers. All income components are deflated with the GDP deflator. The contribution from terms of trade is proxied by the differential in the GDP and consumption deflator. Consumption and disposable income are deflated with the consumption deflator. The latest observations are for the third quarter of 2017.

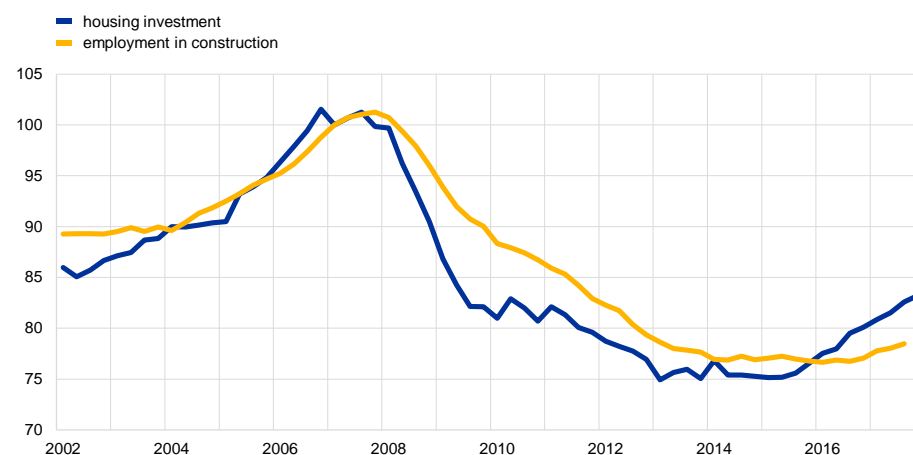
**Growth in construction investment picked up strongly in 2017, and this recovery is expected to continue in 2018.** Construction production plateaued in the fourth quarter of 2017, but increased by 2.2% overall in 2017. Survey indicators on construction activity continue to signal robust growth momentum. Confidence in the building construction segment improved in December 2017 and January 2018. The construction Purchasing Managers' Index (PMI) for January came out at 57.0, up from 53.3 in December. This is the sharpest increase since February 2011. At the same time, in January the European Commission survey indicator on labour shortages in the construction sector rose even further from an already high level.

**From a cyclical perspective, the level of housing investment still remains subdued.** Employment in the construction sector and real residential investment fell sharply following their pre-crisis peaks in the third quarter of 2007 (see Chart 13), and, whilst residential investment has recovered somewhat (by 10% since the second quarter of 2015), the pick-up in construction employment has been much weaker (up 2%). The relatively weak recovery in the volume of housing investment reflects pre-crisis overinvestment in some euro area countries, as well as remaining deleveraging pressures on households. Looking forward, housing investment is expected to increasingly support GDP growth.

**Chart 13**

**Employment in construction and residential investment in the euro area**

(index: Q1 2007 = 100)



Sources: Eurostat and ECB calculations.

Note: The latest observations are for the third quarter of 2017 for employment in construction and for the fourth quarter of 2017 for housing investment.

**Growth in non-construction investment picked up in the fourth quarter of 2017 and this recovery is expected to have continued in early 2018.**

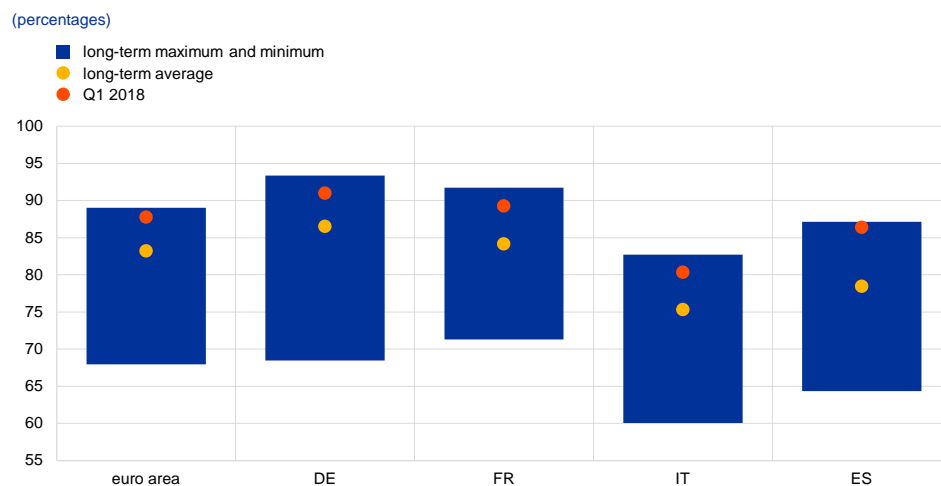
The gross operating surplus accelerated considerably in the third quarter of 2017, according to the sectoral accounts. This is particularly relevant for intangible assets, which rely more on internal financing. The European Commission survey also shows that perceived capacity utilisation in the capital goods producing sector reached close to all-time highs both in the euro area and across the largest euro area countries in the first quarter of 2018 (see Chart 14). According to the same survey, this feature is also reflected in increasing constraints on production in the capital goods producing sector related to both equipment and labour.

**In 2018 as a whole, business investment is expected to continue contributing to output growth.**

Strong demand and earnings growth should continue to support business investment, despite recent volatility in equity markets. Looking more closely at recent equity price developments for euro area non-financial corporations, the recent volatility appears to be related more to higher expected interest rates and risk premia than to a downward revision of earnings expectations. To the extent that a large part of investment is financed with retained earnings, the immediate impact on business investment may not be very significant.

## Chart 14

### Capacity utilisation in the capital goods sector in the euro area and the largest euro area countries



Sources: Eurostat and ECB calculations.  
Note: "Long-term" refers to the period since 1987.

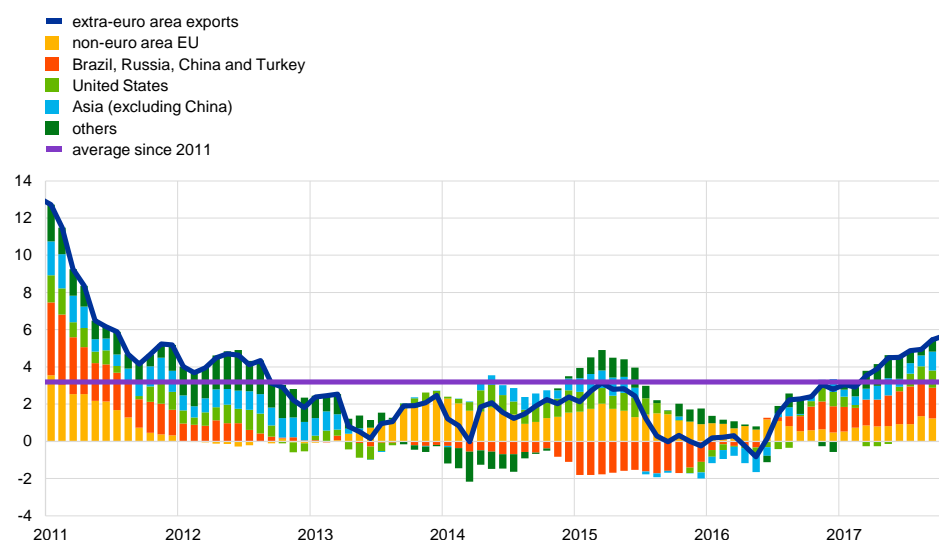
#### **Euro area exports continued on a positive trend and gained further momentum in the fourth quarter of 2017.**

The December figure for euro area exports confirms a robust trend with a further increase in export growth to 5.7%, year on year, in the final quarter of 2017 – the highest level since the third quarter of 2011. Extra-euro area exports were supported in particular by goods exports to countries outside the EU, with positive contributions from all other areas as well (see Chart 15). Extra-euro area export market shares continue to be broadly stable, despite the recent appreciation of the euro. Survey indicators with leading properties point to ongoing robust export dynamics in the near term, although, in spite of continued high levels, export order book levels and global and euro area new manufacturing export orders moderated slightly.

## Chart 15

### Extra-euro area goods exports

(year-on-year percentage changes and percentage point contributions)



Source: Eurostat.

Notes: Latest observations are for December 2017 for exports outside the EU. Exports inside the EU have been proxied with the contribution calculated on data for November 2017. December 2017 total export volumes are based on values and producer price data.

**Overall, the latest economic indicators point to strong growth momentum in the euro area, which is projected to expand in the near term at a somewhat faster pace than previously expected.** Industrial production (excluding construction) increased by 1.5%, quarter on quarter, in the fourth quarter of 2017. More recent survey data also signal solid growth dynamics in the near term. The European Commission's Economic Sentiment Indicator (ESI) and the composite output PMI stood higher on average in the first two months of 2018 than in the fourth quarter of 2017, remaining well above long-run average levels.

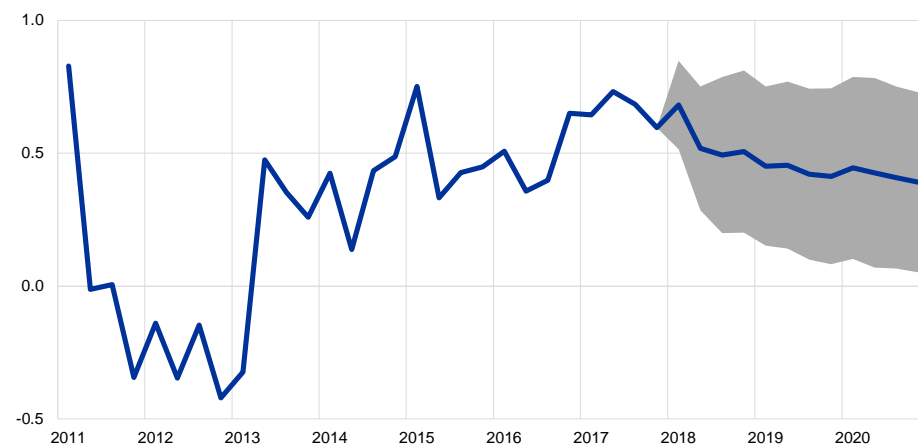
**The ongoing strong and broad-based economic growth is projected to continue. The ECB's monetary policy measures, which have facilitated the deleveraging process, continue to underpin domestic demand.** Private consumption is supported by rising employment, which is also benefiting from past labour market reforms, and by growing household wealth. Business investment continues to strengthen on the back of very favourable financing conditions, rising corporate profitability and solid demand. Housing investment has improved further over recent quarters. In addition, the broad-based global expansion is providing impetus to euro area exports.

**The March 2018 ECB staff macroeconomic projections for the euro area foresee annual real GDP increasing by 2.5% in 2017, 2.4% in 2018, 1.9% in 2019 and 1.7% in 2020 (see Chart 16).** Compared with the December 2017 projections, real GDP growth has been revised up for 2018 and remains unchanged for 2019-20. The risks surrounding the euro area growth outlook are assessed as broadly balanced.

## Chart 16

### Euro area real GDP (including projections)

(quarter-on-quarter percentage changes)



Sources: Eurostat and the article entitled "March 2018 ECB staff macroeconomic projections for the euro area", published on the ECB website on 8 March 2018.

Notes: The ranges shown around the central projections are based on the differences between actual outcomes and previous projections carried out over a number of years. The width of the range is twice the average absolute value of these differences. The method used for calculating the ranges, involving a correction for exceptional events, is documented in *New procedure for constructing Eurosystem and ECB staff projection ranges*, ECB, December 2009, available on the ECB's website.

## 4 Prices and costs

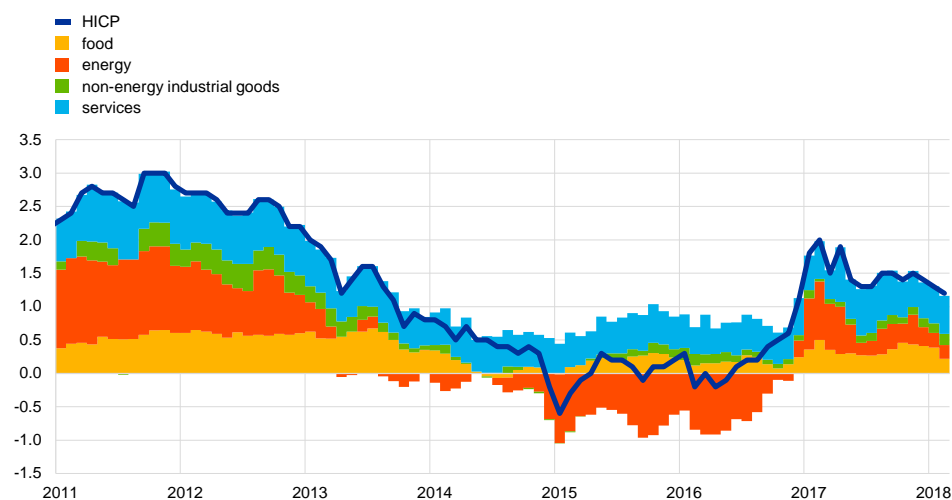
According to Eurostat's flash estimate, euro area annual HICP inflation declined to 1.2% in February 2018, from 1.3% in January. Looking ahead, on the basis of current futures prices for oil, annual rates of headline inflation are likely to hover around 1.5% for the remainder of the year. Measures of underlying inflation remained subdued but are expected to rise gradually over the medium term, supported by the ECB's monetary policy measures, the continuing economic expansion, the corresponding absorption of economic slack and rising wage growth. This assessment is also broadly reflected in the March 2018 ECB staff macroeconomic projections for the euro area, which foresee annual HICP inflation at 1.4% in 2018, 1.4% in 2019 and 1.7% in 2020, and HICP inflation excluding energy and food at 1.1%, 1.5% and 1.8% respectively.

**Headline inflation decreased slightly in February.** According to Eurostat's flash estimate, euro area annual HICP inflation declined to 1.2% in February 2018, from 1.3% in January, remaining below the levels recorded at the end of 2017 (see Chart 17). The February decline reflected mainly lower unprocessed food price inflation, driven largely by base effects.

**Chart 17**

### Contributions of components to euro area headline HICP inflation

(annual percentage changes; percentage point contributions)



Sources: Eurostat and ECB calculations.

Note: The latest observations are for February 2018 (flash estimates).

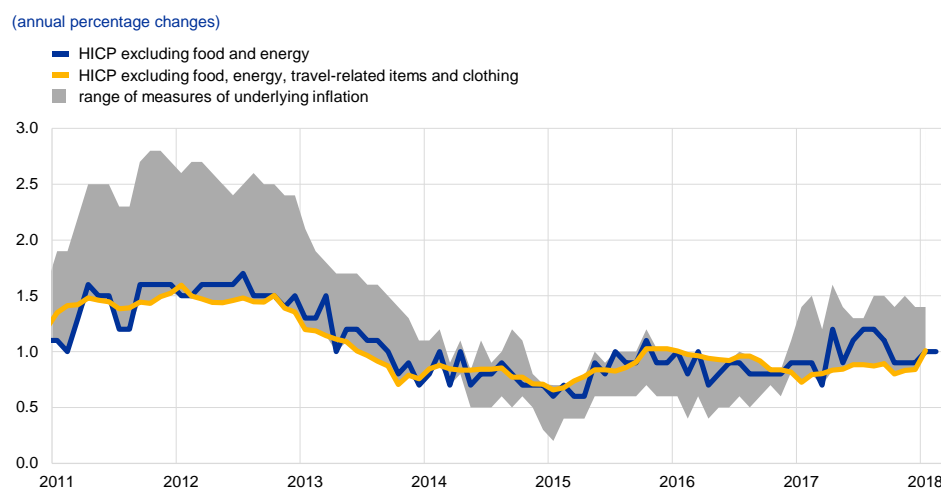
**Measures of underlying inflation stabilised or increased slightly at the start of the year, having moderated in late 2017.** HICP inflation excluding food and energy was 1.0% in February 2018, unchanged from January but up from 0.9% in December 2017 (see Chart 18). The moderation in late 2017 partly reflected the impact of large declines in inflation across a number of services items<sup>1</sup>. A recovery

<sup>1</sup> See also the discussion in the box entitled "The role of seasonality and outliers in HICP inflation excluding food and energy" in this issue of the Economic Bulletin.



was also recorded in HICP inflation excluding food and energy, as well as travel-related and clothing items, which tend to be influenced by calendar effects and by the timing of sales periods respectively. Overall, however, measures of underlying inflation remained subdued and have yet to show more convincing signs of a sustained upward adjustment.

**Chart 18**  
Measures of underlying inflation



Sources: Eurostat and ECB calculations.

Notes: The range of underlying measures consists of the following: HICP excluding energy; HICP excluding unprocessed food and energy; HICP excluding food and energy; HICP excluding food, energy, travel-related items and clothing; the 10% trimmed mean; the 30% trimmed mean; and the median of the HICP. The latest observations are for February 2018 (HICP excluding food and energy – flash estimate) and January 2018 (all other measures).

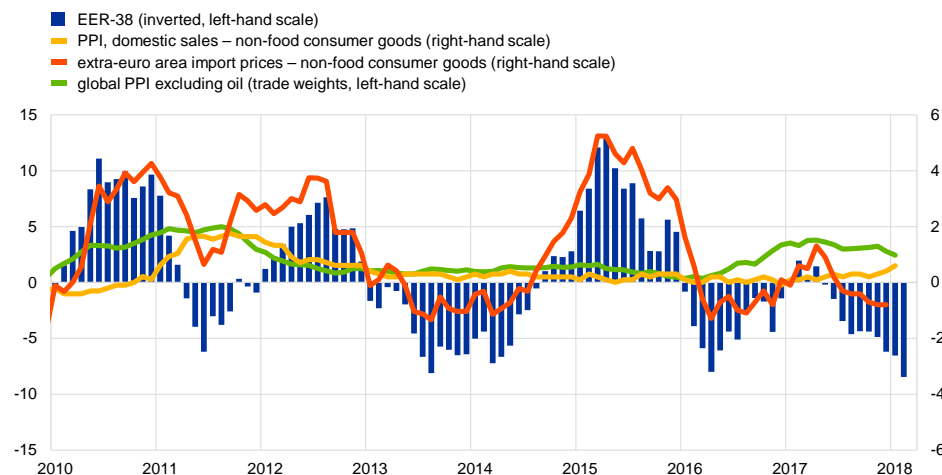
### Price pressures for non-energy industrial goods in the HICP remained subdued overall.

Global non-energy producer price inflation eased somewhat further in January but remained at an elevated level. Recent developments in both oil and raw materials prices in annual terms suggest also an easing of early stage price pressures going forward (see Chart 19). Downward price pressures from the euro's appreciation are, however, so far mainly visible in lower import price inflation. For intermediate goods, import price inflation declined to 2.1% in December 2017 – from 3.1% in November – while, for non-food consumer goods, import price inflation remained at -0.8% – unchanged from November. In the case of domestic sales, developments in producer prices appear thus far unaffected by any appreciation impact associated with cheaper imported inputs. Notably, producer price inflation for non-food consumer goods increased from 0.4% in December 2017 to 0.6% in January 2018, its highest level since December 2012. The same holds true at the level of consumer goods prices: despite downward pressures from lower price inflation for imported final goods, HICP non-energy industrial goods inflation continued to increase. In February 2018 it stood – according to Eurostat's flash release – at 0.7%, after 0.6% in January and 0.5% in December 2017.

## Chart 19

### Exchange rate developments and import and producer prices

(annual percentage changes)



Sources: Eurostat and ECB calculations.

Note: The latest observations are for February 2018 for the nominal effective exchange rate of the euro against 38 of its main trading partners (EER-38), January 2018 for the non-food consumer goods producer price index (PPI) and the global PPI excluding oil, and December 2017 for non-food consumer goods extra-euro area import prices.

**Recent developments support the notion of a gradual upward trend in wage growth and the notion of a gradual built-up in domestic cost pressures.** Annual growth in compensation per employee rose from a low of 1.1% in the second quarter of 2016 to 1.6% in the third quarter of 2017<sup>2</sup>. This increase reflected mainly higher contributions from wage drift, which usually reacts to cyclical developments with a shorter lag than negotiated wages. Annual growth in negotiated wages increased only slightly to 1.6% in the fourth quarter of 2017, from 1.5% in the third quarter, but recent wage settlements in euro area countries point to a pick-up going forward. While recent developments in wage growth are in line with improving labour market conditions, they may still be weighed down by factors such as past low inflation, weak productivity growth and the ongoing impact of labour market reforms implemented in certain countries during the crisis.

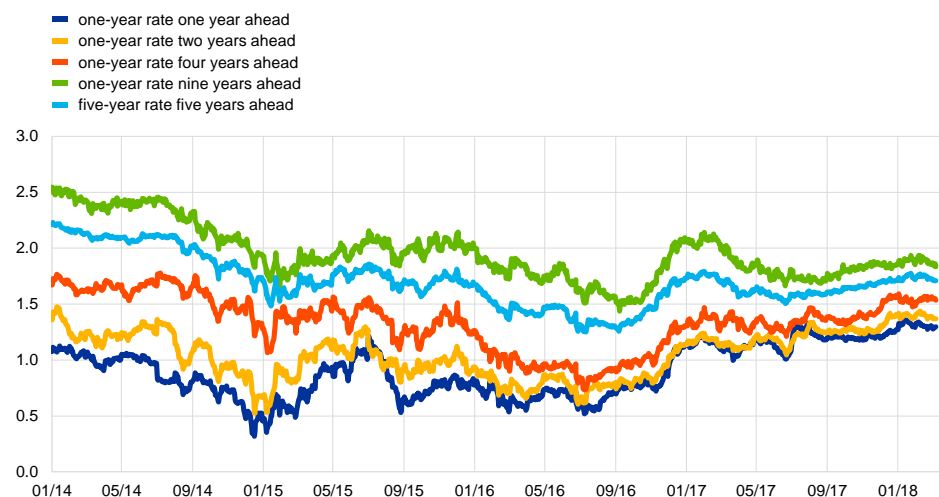
**Both market-based and survey-based measures of longer-term inflation expectations have remained stable.** The five-year forward inflation-linked swap rate five years ahead stood at 1.71% on 7 March 2018, broadly unchanged from mid-December but slightly below the level observed at the end of January (see Chart 20). The forward profile of market-based measures of inflation expectations continues to point to a prolonged period of low inflation, with only a very gradual return to levels below, but close to, 2%. The risk-neutral probability of negative average inflation over the next five years, implied by inflation options markets, is negligible and hence suggests that markets currently consider the risk of deflation to be very small. According to the ECB Survey of Professional Forecasters for the first quarter of 2018, measures of longer-term inflation expectations have remained broadly stable, standing at 1.85%.

<sup>2</sup> The growth rate for the third quarter of 2017 was revised down by 0.1 percentage point with Eurostat's second estimate of quarterly euro area real GDP growth on 7 March 2018.

## Chart 20

### Market-based measures of inflation expectations

(annual percentage changes)



Sources: Thomson Reuters and ECB calculations.  
Note: The latest observations are for 7 March 2018.

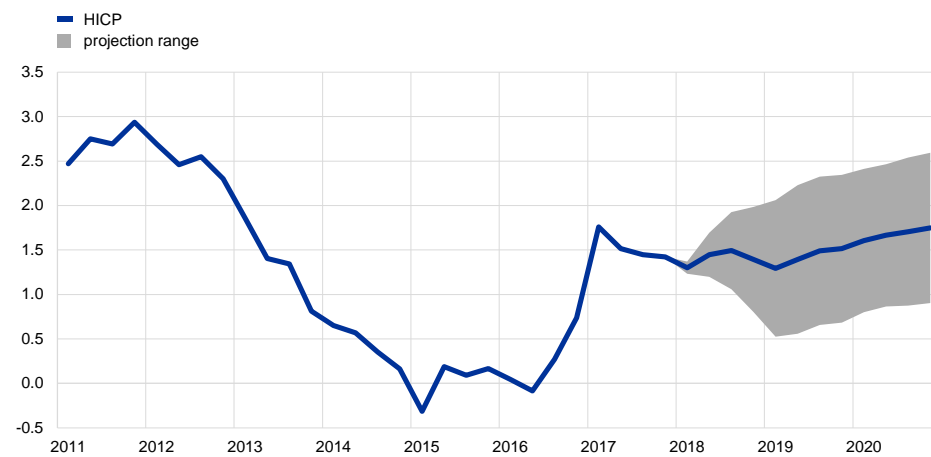
**According to the March 2018 ECB staff macroeconomic projections, HICP inflation is expected to rise only towards the end of the projection horizon.** On the basis of the information available at mid-February, the projections foresee euro area annual HICP inflation at 1.4% in 2018, 1.4 % in 2019 and 1.7% in 2020 (see Chart 21), implying a slight downward revision in 2019 compared with the December 2017 Eurosystem staff macroeconomic projections.<sup>3</sup> Declines in HICP energy inflation in 2018 and 2019 are expected to broadly offset a strengthening in underlying inflation, with HICP inflation excluding energy and food rising from 1.1% in 2018 to 1.5% in 2019 and to 1.8% in 2020. Important factors behind the gradual pick-up in underlying inflation are further improvements in euro area labour market conditions, with increasing labour market tightness and notable labour supply shortages in some parts of the euro area. Although the recent strengthening of the euro exchange rate is expected to have a downward impact on inflation, this should be counterbalanced to some extent by the current strong growth momentum in the euro area, given the related greater pricing power of euro area companies.

<sup>3</sup> See the article entitled "March 2018 ECB staff macroeconomic projections for the euro area", published on the ECB's website on 8 March 2018.

## Chart 21

### Euro area HICP inflation (including projections)

(annual percentage changes)



Sources: Eurostat and the article entitled "March 2018 ECB staff macroeconomic projections for the euro area", published on the ECB's website on 8 March 2018.

## 5 Money and credit

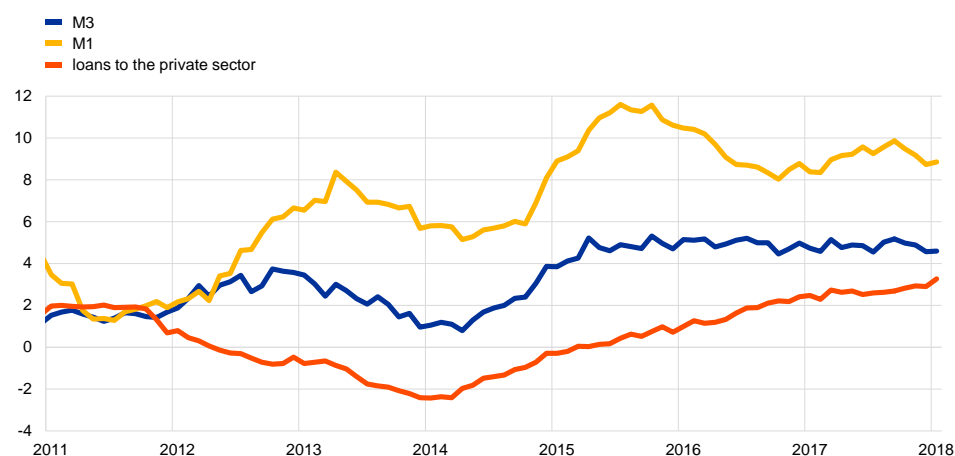
In January 2018 broad money growth continued to expand at the robust pace generally observed since mid-2015. At the same time, the recovery in loan growth to the private sector progressed. The annual flow of total external financing to non-financial corporations (NFCs) is estimated to have strengthened in the fourth quarter of 2017.

**Growth in broad money remained robust at 4.6% in January 2018, in line with the steady pace of monetary expansion since mid-2015 (see Chart 22).** Money growth was supported by the low opportunity cost of holding the most liquid instruments in an environment of very low interest rates, as well as by the impact of the ECB's monetary policy measures. The most liquid components remained the main contributor to broad money growth, with the annual growth rate of M1 edging upwards to 8.9% in January (from 8.7% in December 2017), following a decline in the preceding months.

### Chart 22

#### M3, M1 and loans to the private sector

(annual percentage changes; adjusted for seasonal and calendar effects)



Source: ECB.

Notes: Loans are adjusted for loan sales, securitisation and notional cash pooling. The latest observation is for January 2018.

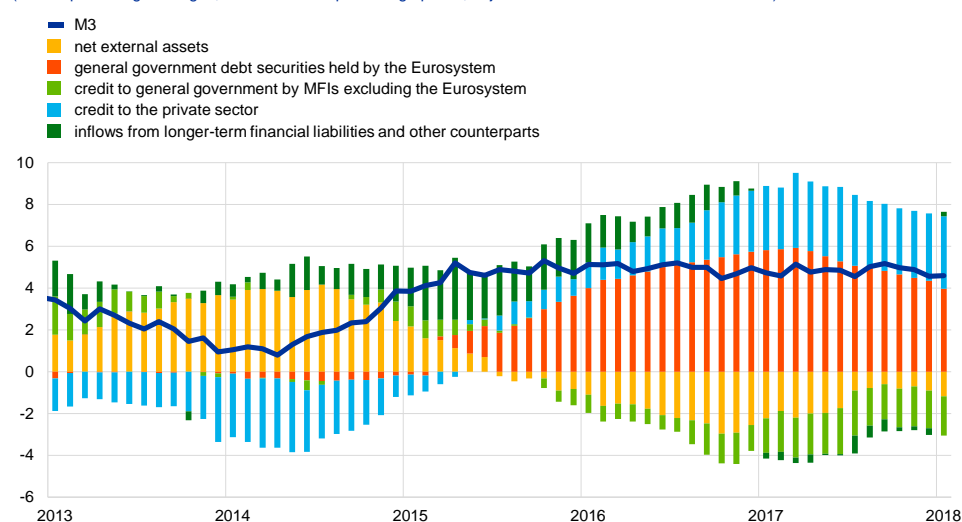
**Overnight deposits continued to be the main driver of M3 growth.** Specifically, the annual growth rate of overnight deposits held by households and NFCs remained robust in January, though continued to moderate. By contrast, the volatile annual growth rate of overnight deposits held by non-monetary financial institutions registered a strong increase in January, supporting M1 growth over the month. The annual growth rate of currency in circulation decreased slightly in January, thereby continuing to indicate no strong tendency on the part of the money-holding sector to substitute deposits with cash in an environment of very low or negative interest rates. Short-term deposits other than overnight deposits (i.e. M2 minus M1) continued to have a negative impact on M3. The annual rate of change of marketable instruments (i.e. M3 minus M2) – a small component of M3 – was again negative in this period. This development was driven by the small negative contribution of money market fund shares/units, reflecting the current low attractiveness of these instruments, as

well as a further decline in monetary financial institutions' (MFIs) issuance of short-term debt securities.

**Domestic sources of money creation remained the main driver of broad money growth (see Chart 23).** From a counterpart perspective, an increased contribution to M3 growth from an increase in credit to the private sector partly compensated for a decline in purchases under the asset purchase programme (APP) as a result of the reduction in net purchases by the Eurosystem of €30 billion per month as of January 2018. The Eurosystem's purchases of general government debt securities (see the red parts of the bars in Chart 23), conducted mainly in the context of the ECB's public sector purchase programme (PSPP), continued to contribute positively to M3 growth, while the ongoing recovery in credit to the private sector (see the blue parts of the bars in Chart 23) increasingly supported M3 growth. The latter includes both MFI loans to the private sector and MFI holdings of debt securities issued by the euro area private non-MFI sector. As such, it also covers the Eurosystem's purchases of non-MFI debt securities under the corporate sector purchase programme (CSPP). The persistent contraction in MFIs' longer-term financial liabilities (excluding capital and reserves) contributed positively to M3 growth (included alongside other counterparts in the dark green parts of the bars in Chart 23). Government bond sales from euro area MFIs excluding the Eurosystem contributed to the negative annual growth of credit to general government by MFIs excluding the Eurosystem and thus dampened M3 growth (see the light green parts of the bars in Chart 23). Finally, MFIs' net external assets (see the yellow parts of the bars in Chart 23) continued to weigh on annual M3 growth.

**Chart 23**  
M3 and its counterparts

(annual percentage changes; contributions in percentage points; adjusted for seasonal and calendar effects)



Source: ECB.

Notes: Credit to the private sector includes MFI loans to the private sector and MFI holdings of debt securities issued by the euro area private non-MFI sector. It thus includes the Eurosystem's holdings of debt securities in the context of the corporate sector purchase programme (CSPP). The latest observation is for January 2018.

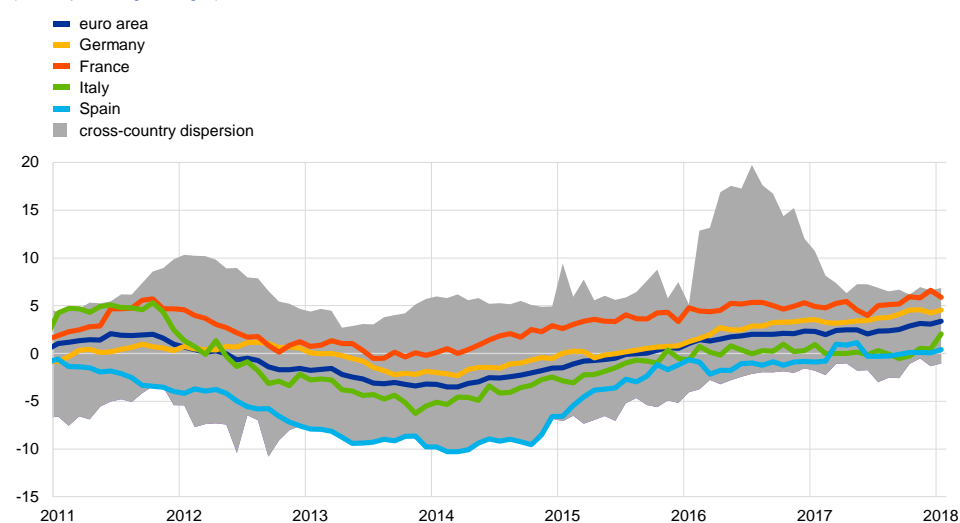
**The recovery in the growth of loans to the private sector, observed since the beginning of 2014, is continuing.** The annual growth rate of MFI loans to the

private sector (adjusted for loan sales, securitisation and notional cash pooling) continued its upward trend in January (see Chart 22). Across sectors, the annual growth of loans to NFCs increased to 3.4% in January, from 3.1% in December (see Chart 24). The growth of loans to NFCs has recovered significantly from its low level in the first quarter of 2014 and the cross-country dispersion of these loans has declined overall. The annual growth rate of loans to households remained unchanged at 2.9% in January (see Chart 25). The significant decrease in bank lending rates seen across the euro area since summer 2014 (notably owing to the ECB's non-standard monetary policy measures) and overall improvements in the supply of, and demand for, bank loans have supported these trends. In addition, banks have made progress in consolidating their balance sheets and reducing non-performing loans, although the level of such loans remains high in some countries and may continue to constrain financial intermediation.<sup>4</sup>

### Chart 24

#### MFI loans to NFCs in selected euro area countries

(annual percentage changes)



Source: ECB.

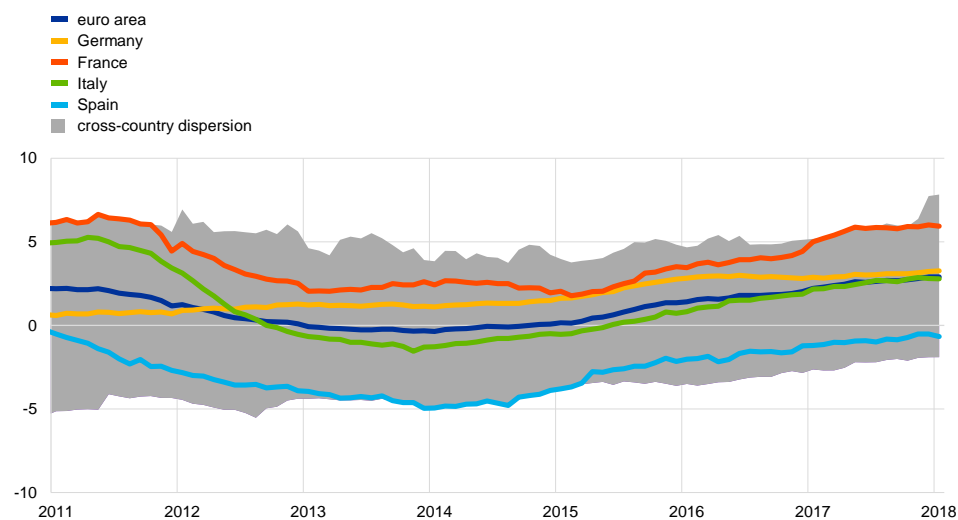
Notes: Adjusted for loan sales, securitisation and notional cash pooling. The cross-country dispersion is calculated on the basis of minimum and maximum values using a fixed sample of 12 euro area countries. The latest observation is for January 2018.

<sup>4</sup> See also Section 3 of *Financial Stability Review*, ECB, November 2017.

## Chart 25

### MFI loans to households in selected euro area countries

(annual percentage changes)



Source: ECB.

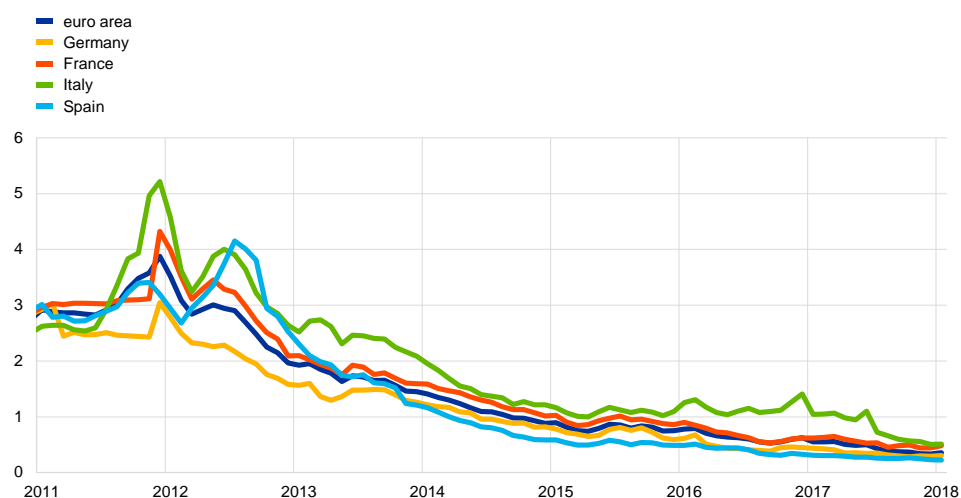
Notes: Adjusted for loan sales, securitisation and notional cash pooling. The cross-country dispersion is calculated on the basis of minimum and maximum values using a fixed sample of 12 euro area countries. The latest observation is for January 2018.

**Banks' funding conditions remained historically low.** Banks' composite cost of debt financing remained broadly unchanged at a historically low level in January (see Chart 26). This was explained by the stable costs of deposits, notwithstanding the small increase in bank bond yields in January. The ECB's accommodative monetary policy stance, the net redemption of MFIs' longer-term financial liabilities, the strengthening of bank balance sheets and receding fragmentation across financial markets have all contributed to favourable bank funding conditions.

## Chart 26

### Banks' composite cost of debt financing

(composite cost of deposit and unsecured market-based debt financing; percentages per annum)



Sources: ECB, Markit Iboxx and ECB calculations.

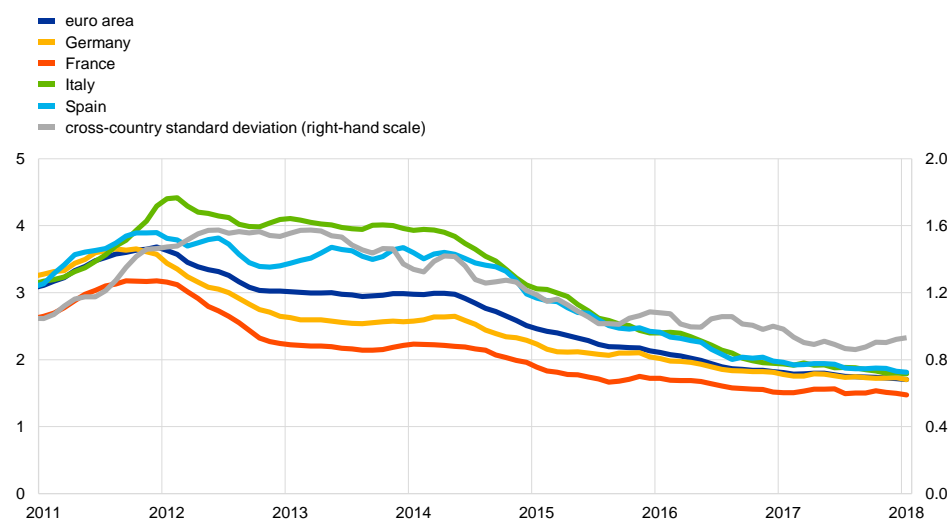
Notes: The composite cost of deposits is calculated as an average of new business rates on overnight deposits, deposits with an agreed maturity and deposits redeemable at notice, weighted by their corresponding outstanding amounts. The latest observation is for January 2018.



**Bank lending rates for NFCs declined to a new historical low.** The composite bank lending rates for NFCs (see Chart 27) declined further to a historical low of 1.67% in January 2018. Composite bank lending rates for loans to households (see Chart 28) remained broadly unchanged at 1.84%, slightly above their historical low of 1.78% in December 2017. Overall, composite bank lending rates for loans to NFCs and households have decreased by significantly more than market reference rates since the ECB's credit easing measures were announced in June 2014. This signals an improvement in the pass-through of monetary policy measures to bank lending rates. The decrease in banks' composite funding costs has supported the decline in composite lending rates. Between May 2014 and January 2018, composite lending rates on loans to NFCs and households fell by 126 basis points and 108 basis points respectively. The reduction in bank lending rates on NFC loans was particularly strong in vulnerable euro area countries, supporting a more homogeneous transmission of monetary policy to such rates across countries. Over the same period, the spread between interest rates charged on very small loans (loans of up to €0.25 million) and those charged on large loans (loans of above €1 million) in the euro area narrowed considerably. This indicates that small and medium-sized enterprises have generally benefited to a greater extent from the decline in bank lending rates than large companies.

**Chart 27**  
Composite lending rates for NFCs

(percentages per annum; three-month moving averages)



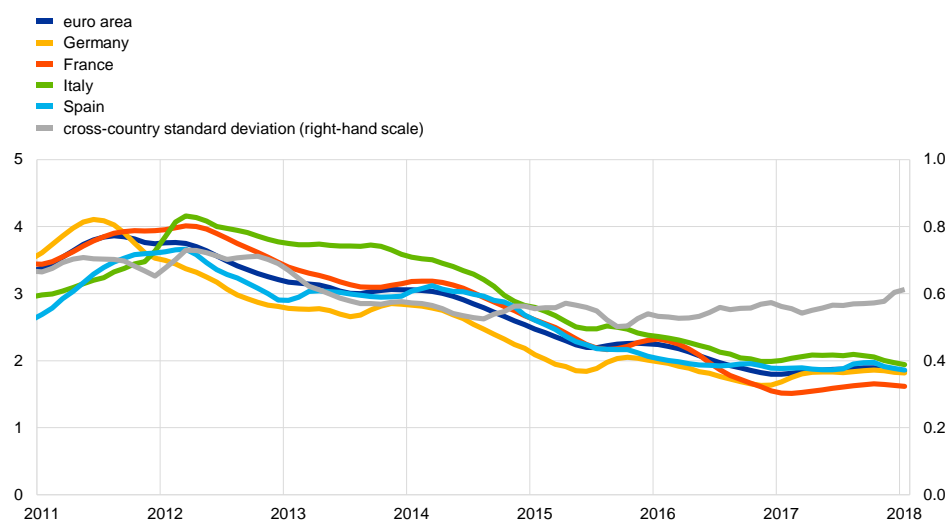
Source: ECB.

Notes: The indicator for the total cost of bank borrowing is calculated by aggregating short and long-term rates using a 24-month moving average of new business volumes. The cross-country standard deviation is calculated using a fixed sample of 12 euro area countries. The latest observation is for January 2018.

## Chart 28

### Composite lending rates for house purchase

(percentages per annum; three-month moving averages)



Source: ECB.

Notes: The indicator for the total cost of bank borrowing is calculated by aggregating short and long-term rates using a 24-month moving average of new business volumes. The cross-country standard deviation is calculated using a fixed sample of 12 euro area countries. The latest observation is for January 2018.

**The annual flow of total external financing to euro area NFCs is estimated to have strengthened in the fourth quarter of 2017.** This reflects further improvements in bank lending dynamics and base effects. Overall, the recovery in NFCs' external financing, observed since early 2014, has been supported by the strengthening of economic activity, further declines in the cost of debt financing, the easing of bank lending conditions and larger numbers of mergers and acquisitions. At the same time, NFCs' record high – and increasing – cash holdings have reduced the need for external financing.

**Net issuance of debt securities by NFCs became more moderate in the fourth quarter of 2017.** Although positive in October and November, net issuance was negative in December. However, market data suggest that issuance activity strengthened again in January and has remained at robust levels in February. Net issuance of listed shares by NFCs remained subdued in the fourth quarter of 2017.

**NFCs' cost of financing has increased slightly since January.** The overall nominal cost of external financing for NFCs, comprising bank lending, debt issuance in the market and equity finance, edged up by around 15 basis points to 4.6% in February, after remaining stable during the previous several months. Most of the increase since January 2018 can be accounted for by the increase in costs of market-based debt and equity financing. While the current cost of external financing is around 50 basis points above the historic low of July 2016, it remains lower than the level seen in mid-2014 when market expectations of the introduction of the public sector purchase programme (PSPP) began to emerge.

## 6 Fiscal developments

According to the March 2018 ECB staff macroeconomic projections, the euro area budget deficit is expected to decline further over the projection horizon (2017-20). The improving fiscal outlook mainly results from favourable cyclical conditions and decreasing interest payments, while discretionary consolidation measures are limited. The aggregate fiscal stance for the euro area is projected to remain on average broadly neutral in 2018-20. Although the euro area government debt-to-GDP ratio will continue to decline, it will still remain elevated. In particular the countries with high debt levels would benefit from rebuilding fiscal buffers.

**The euro area general government budget deficit is projected to decline over the projection horizon.** Based on the March 2018 ECB staff macroeconomic projections,<sup>5</sup> the general government deficit ratio for the euro area is expected to decrease gradually from 1% of GDP in 2017 to 0.3% of GDP in 2020 (see Table 1). The improvement in the fiscal outlook, which is slightly stronger than in the December 2017 projections, is mainly driven by favourable cyclical conditions and declining interest payments.

**Table 1**  
Fiscal developments in the euro area

(percentages of GDP)

	2017	2018	2019	2020
<b>a. Total revenue</b>	46.0	45.6	45.3	45.2
<b>b. Total expenditure</b>	47.0	46.3	45.9	45.5
of which:				
<b>c. Interest expenditure</b>	2.0	1.9	1.8	1.7
<b>d. Primary expenditure (b - c)</b>	45.0	44.5	44.1	43.8
<b>Budget balance (a - b)</b>	-1.0	-0.7	-0.6	-0.3
<b>Primary budget balance (a - d)</b>	1.0	1.1	1.1	1.4
<b>Cyclically adjusted budget balance</b>	-1.1	-1.0	-1.1	-0.9
<b>Structural primary balance</b>	1.0	0.9	0.8	0.9
<b>Gross debt</b>	86.7	84.4	82.1	79.7
<b>Memo item: real GDP (percentage changes)</b>	2.4	2.3	1.9	1.7

Sources: ECB and March 2018 ECB staff macroeconomic projections.

Notes: The data refer to the aggregate general government sector of the euro area. Owing to rounding, figures may not add up.

**The euro area fiscal stance is projected to remain on average broadly neutral in 2018-20.**<sup>6</sup> In 2018 cuts in direct taxes and social security contributions paid by employees are expected to be mostly offset by indirect tax hikes and subdued growth in current government spending. A neutral fiscal stance is also projected for

<sup>5</sup> See the [March 2018 ECB staff macroeconomic projections for the euro area](#).

<sup>6</sup> The fiscal stance reflects the direction and size of the stimulus from fiscal policies on the economy, beyond the automatic reaction of public finances to the business cycle. It is measured as the change in the structural primary balance, i.e. the cyclically adjusted primary balance ratio net of temporary measures, such as government support for the financial sector. For more details on the concept of the euro area fiscal stance, see the article entitled "The euro area fiscal stance", *Economic Bulletin*, Issue 4, ECB, 2016.

2019-20, as the expansionary measures on the revenue side are projected to be entirely offset by further restraint in government spending. This suggests that euro area countries do not envisage making use of the more solid and maturing economic expansion to build up fiscal buffers. As discussed in the box entitled “Fiscal policy stance during past periods of expansion” in this issue of the Economic Bulletin, fiscal policies during good economic times have generally been insufficiently countercyclical in the expansionary phase before the financial crisis.

**The high euro area government debt levels are expected to continue falling.**

The average euro area debt-to-GDP ratio, which peaked in 2014, is projected to decline from 86.7% of GDP in 2017 to 79.7% of GDP by the end of 2020. The reduction in the average euro area debt ratio is supported by ongoing increases in primary surpluses and favourable interest rate-growth rate differentials on account of the overall favourable macroeconomic outlook. Compared to the December projections, the outlook for the average debt ratio has improved, reflecting a downward base effect from 2017 and slightly higher contributions from the interest rate-growth rate differentials. The behaviour of the average euro area debt-to-GDP ratio masks, however, important cross-countries differences. While in the majority of euro area countries the debt ratio is expected to decline, it will increase in a few countries. In particular in the case of high-debt countries, further consolidation efforts – in full compliance with the Stability and Growth Pact – are essential to set the debt ratio firmly on a downward path and to make public finances less vulnerable to any renewed financial market instability or a rapid rebound in interest rates. This is also supported by the analysis of the European Commission in its recently published “[Debt Sustainability Monitor 2017](#)”, which finds fiscal sustainability risks in several Member States in the medium to long term. In this respect, pension reforms are not only helpful for long-term fiscal sustainability, but can generally also help to dampen the potentially adverse long-term macroeconomic effects of ageing, as discussed in the article entitled “The economic impact of population ageing and pension reforms” in this issue of the Economic Bulletin.

# Boxes

## 1 Are the recent oil price increases set to last?

Prepared by Irma Alonso Álvarez and Frauke Skudelny

**Oil prices increased from around USD 45 per barrel at end-June 2017 to about USD 65 per barrel at the beginning of March 2018** (see Chart A). The main drivers of this increase were stronger than expected growth in global demand, the strategy adopted by the Organization of the Petroleum Exporting Countries (OPEC) and some non-OPEC countries to adjust their production – partly offset by rising US production – and geopolitical events. This box analyses these factors, based on a structural vector autoregressive (SVAR) model, and assesses whether they are likely to persist.

### Chart A

#### Brent crude oil prices

(USD per barrel)

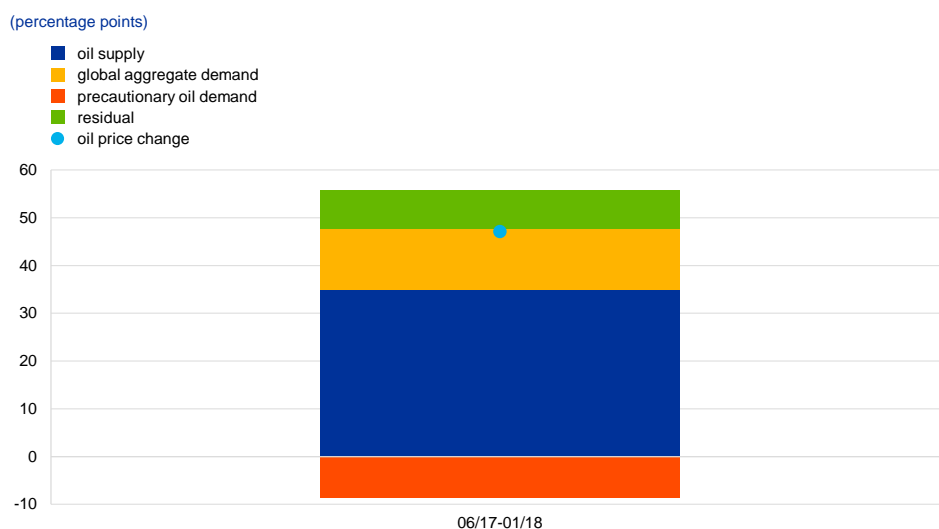


Source: Bloomberg.

**Stronger than expected growth in global demand is one factor behind the increase in oil prices since mid-2017.** Based on a SVAR model similar to that developed by Kilian and Murphy,<sup>7</sup> Chart B shows the contributions of oil supply, aggregate demand and precautionary demand for oil to the change in the price of oil since June 2017. The results indicate that global aggregate demand (yellow bar) helped to drive oil prices over the period concerned. Indeed, global growth expectations for 2017 were revised upwards in the ECB staff projections. However, the model used indicates that supply-side factors, such as the joint OPEC and non-OPEC agreement to reduce production and unexpected outages, played a more relevant role in explaining price dynamics in the second half of 2017.

<sup>7</sup> See Kilian, L. and Murphy D., "The role of inventories and speculative trading in the global market for crude oil", *Journal of Applied Econometrics*, Volume 29, Issue 3, 2014, pp. 454-478.

## Chart B Drivers of oil prices



Sources: International Energy Agency (IEA), U.S. Energy Information Administration (US EIA) and ECB staff calculations.

**A second, even more relevant factor driving the increase in oil prices is the effectiveness of the strategy adopted by OPEC and some non-OPEC countries to curb their production of oil.** In November 2016, OPEC and some non-OPEC countries agreed to restrict their oil production in an effort to put a floor under oil prices. The Declaration of Cooperation initially covered the period up to June 2017 before being extended to March 2018 in May 2017 and to December 2018 in November 2017. The success of this strategy depends mainly on two factors: compliance with the agreement and the reaction of US oil production.

### **Compliance with the agreement was fairly strong in the second half of 2017.**

Chart C shows the change in oil production for OPEC countries (dark blue bars) and non-OPEC countries participating in the agreement (red bars) together with the cuts they each agreed. Compliance was stronger during the second half of 2017, thus boosting the credibility of the agreement and helping to push up oil prices. The higher rate of compliance by OPEC and non-OPEC participants over this period saw production cut by an additional 0.4 mb/d compared with the level observed between January and June 2017. Furthermore, recent developments suggest that these countries will persist with their policy of curbing production, to the end of 2018 and possibly beyond.

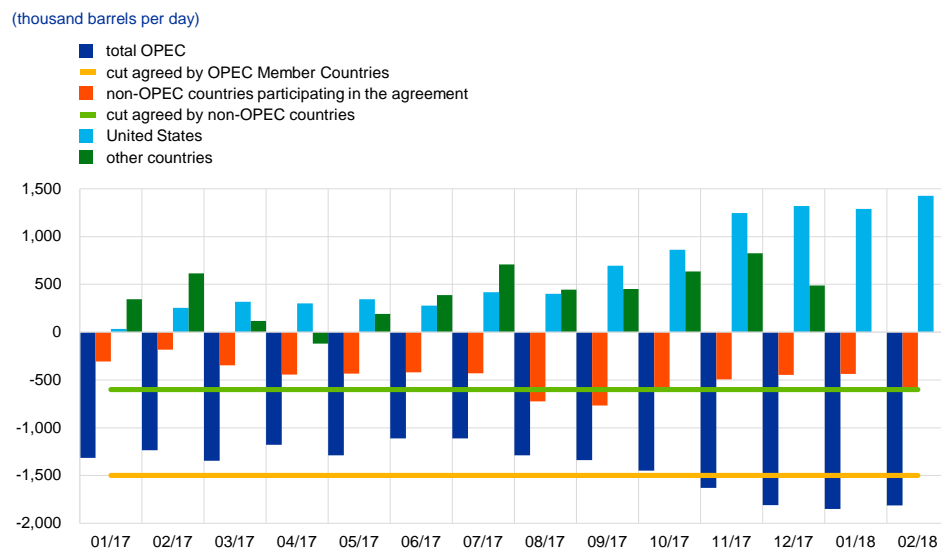
**At the same time, oil production in the United States (light blue bars in Chart C) has picked up, most noticeably in the second half of 2017, partly offsetting the effect of stronger compliance with the agreement.** Other countries have also increased their production since October 2016.<sup>8</sup> According to data from Rystad Energy, investment in the US shale oil industry rose in 2017 and is expected to continue growing over the coming years. As long as the oil price does not fall

<sup>8</sup> In the November 2016 agreement to cut production, October 2016 levels are used as a reference base for the adjustment of crude oil production, except for Angola, for which the baseline is September 2016.

below around USD 50 per barrel, the increase in US production is likely to prove more enduring as shale oil is profitable around this level.<sup>9</sup>

### Chart C

#### Changes in oil production compared with October 2016



Sources: IEA and ECB staff calculations.

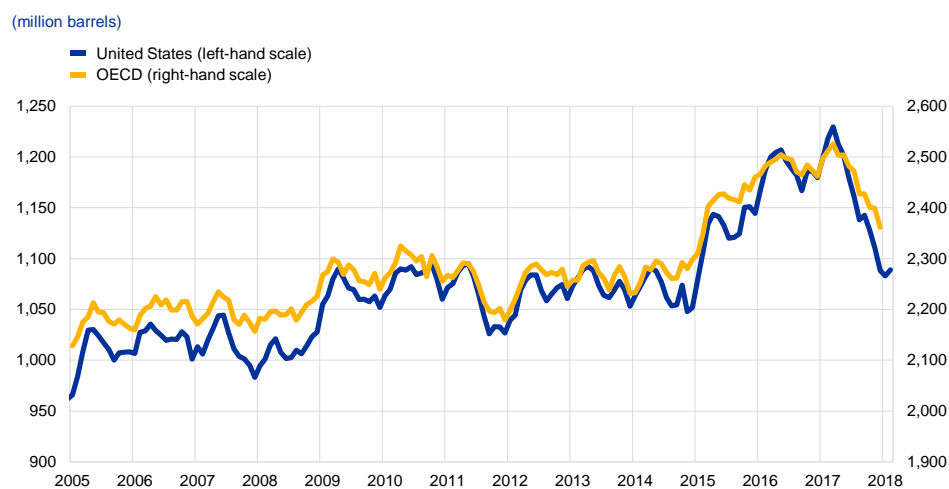
Note: Changes in oil production are calculated using October 2016 as a reference date as set out in the November 2016 agreement. "Other countries" refers to worldwide production excluding production in the United States and the OPEC and non-OPEC countries covered by the agreement.

#### The persistent decline in inventories (see Chart D) suggests that oil markets are becoming tighter, putting further upward pressure on oil prices and explaining why the futures curve has shifted into backwardation.

When inventories are low, the convenience yield (i.e. the benefit of storing oil) is high, causing the spot price, all else being equal, to rise relative to the futures price. This means that in a backwardation scenario the slope of the futures curve tends to be steeper when inventories are low. The crucial role played by inventories explains why markets react so strongly to surprises in inventory data, especially in the United States. For instance, if inventories decline more than the markets anticipate, prices tend to increase owing to expectations of a rebalancing in the market, as occurred in the fourth quarter of 2017.

<sup>9</sup> According to micro data from Rystad Energy, the average break-even price of US shale oil production is close to USD 50.

**Chart D**  
Inventories



Sources: IEA and US EIA.

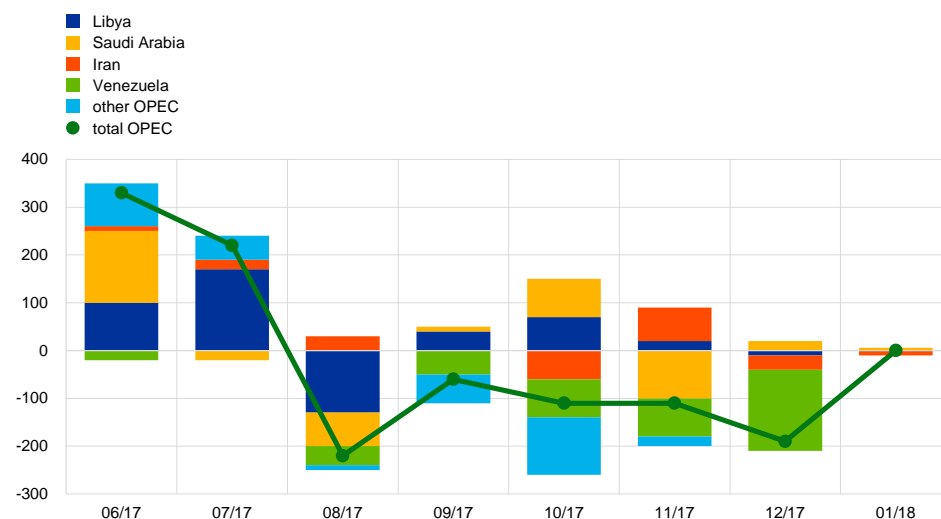
**Turning to the third factor affecting prices, a number of geopolitical events and production outages occurred in the second half of 2017 that helped to push up oil prices.**

Political turmoil in Venezuela, together with a deteriorating oil network and the imposition of US financial sanctions, led to a further decline of around 0.4 mb/d in the country’s production of oil in the second half of 2017 (see Chart E). Iran was also affected by political unrest in December. While this episode was short-lived, and its impact on production was marginal, it raised concerns about the possibility of the United States taking a tougher political stance on Iran and re-imposing sanctions in the medium term. In addition, summer maintenance work reduced oil production in Russia, Mexico and the North Sea. Finally, a pipeline explosion in Libya led to a reduction of 0.1 mb/d in oil production for one week in December, while the closure of the Forties pipeline in the North Sea for repairs reduced oil supply by about 0.25 mb/d from mid-December to mid-January. These geopolitical factors and production outages, most of which are presumably temporary in nature, are reflected in the positive contribution of oil supply to the increase in oil prices shown in Chart B. Looking ahead, the uncertain geopolitical situations in Venezuela and Iran may affect oil prices and cause volatility to spike slightly in the short term.



## Chart E OPEC oil production

(monthly change in thousand barrels per day)



Sources: IEA and ECB staff calculations.

**Overall, while some of the drivers of the oil price increase since mid-2017 appear to be temporary in nature, other factors are expected to have more lasting effects, in particular shale oil production and the agreement reached by OPEC and non-OPEC producers to tighten the market.** Oil prices declined slightly in February as temporary factors, such as the shutdown of pipelines and political unrest in Iran, receded. An unexpected increase in US crude oil inventories and an upward revision of projected US crude oil production for the next few years have cast doubt on the ability of demand to keep pace with increasing supply. Against this background, the success of OPEC's strategy will depend on not only the commitment of its members, which proved to be pretty strong over the second half of 2017, but also the speed with which oil production in non-participating countries reacts. In particular, this concerns the United States, where the average break-even price is around USD 50 per barrel.

## 2 Euro area sovereign bond market liquidity since the start of the PSPP

Prepared by Linas Jurkšas, Daniel Kapp, Ken Nyholm and Julian Von Landesberger

The liquidity of euro area sovereign bond markets is important for the transmission of the ECB's monetary policy. In particular, a high degree of liquidity fosters the link between the ECB's monetary policy decisions, the yield curve, financial asset prices in general, and the overall cost and flow of finance in the economy. The liquidity of sovereign bond markets needs to be monitored more closely since the implementation of the ECB's public sector purchase programme (PSPP), under which a significant share of outstanding euro area sovereign bonds has been bought. Against this background, this box presents some of the market liquidity indicators that the ECB monitors regularly. Overall, the indicators suggest that liquidity conditions in sovereign bond markets have not deteriorated since the start of the PSPP (on 9 March 2015).

**A liquid market is typically characterised as one in which the execution of a standard transaction has a limited impact on prices.** In other words, a liquid market has “deep” order books, which are quickly replenished once a trade has been executed. As a result, price changes following a trade would be minimal and temporary. Naturally, if an executed trade is believed to provide new information about the fundamental value of the asset being traded, there would be a commensurate adjustment in ask and bid prices, but the order book around the new levels would still remain deep.

**Market liquidity indicators commonly focus on one or more aspects of the cost of transactions, market depth and/or resiliency.** The simplest indicator is the quoted bid-ask spread, which provides information on how costly a transaction can be expected to be. More informative indicators can be constructed by combining spread information with, for example, order book depth, which is a gauge for the volume of transactions that the market can absorb at a given point in time. Measures of market depth are typically based on information obtained from limit order books,<sup>10</sup> which are the volume and price schedules available to traders. Resiliency is a function of market dynamics, such as how long it takes for order books to be refilled after a trade has been executed, i.e. it focuses on the time dimension of market liquidity.

**In this box we analyse euro area sovereign bond market liquidity based on three indicators: the Amihud indicator, an order book liquidity indicator and an execution-based liquidity indicator.** Although these three indicators are based on different sets of market data (respectively actual transactions executed in the market, limit order books and quotes), they mainly focus on the cost and depth dimensions of liquidity.

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<sup>10</sup> A limit order book is a trading system in which bids and asks submitted by market participants are stored in a queue and executed in a pre-defined sequence.

**The Amihud indicator is widely used. It works by comparing absolute price changes with traded volumes.**<sup>11</sup> It is defined for a given bond as the ratio between the absolute price change and the traded volume over a certain interval of time. A practical problem encountered when applying the Amihud indicator to government bonds is that most trades take place in the over-the-counter (OTC) market, therefore, price and volume data on transactions are difficult to obtain, especially on an intraday basis. Moreover, the indicator does not account for the fact that bond prices may, of course, change for reasons other than a lack of liquidity. To overcome these issues, for the variant considered in this box it is assumed that the daily traded volume (on which data are readily available) is spread evenly throughout the day, and the observed absolute price change is adjusted to eliminate the effect of the general market trend. As this indicator focuses on two dimensions of liquidity (i.e. cost and depth), it is often useful for determining which aspect is the driver of liquidity developments in particular time periods. The euro area aggregate indicator is calculated by first averaging the values of Amihud indicators for all PSPP-eligible sovereign bonds of a particular country and then weighting the composite country indicators by the respective GDP sizes.

**The order book liquidity indicator is based on data on bid-ask spreads and quoted quantities obtained from limit order books.** There is thus no need for data on actual transactions. However, this indicator is dependent on how representative the limit order book is of the market. It is calculated for a particular bond as the sum of the five best quotes on both the ask side and the bid side of the order book, divided by the sum of the corresponding quoted volumes. This is illustrated by the following equation:

$$\text{Order book illiquidity score}_{t,5\text{best}} = \frac{\text{SPREAD}_{t,5\text{best}}}{\text{QUANTITIES}_{t,5\text{best}}} = \frac{\frac{1}{5} \sum_{j=1}^5 P_{t,\text{Ask}(j)} - \frac{1}{5} \sum_{j=1}^5 P_{t,\text{Bid}(j)}}{\sum_{j=1}^5 Q_{t,\text{Ask}(j)} + \sum_{j=1}^5 Q_{t,\text{Bid}(j)}}$$

where “t” is the time at which the limit order book is “frozen” for calculation purposes, “P” is the price, and “Ask” and “Bid” indicate on which side of the order book the price is observed. The variable “Q” is the quantity that can be traded at a given quoted price and “j” denotes the order of priority of the offers in the limit order book (from the first to the fifth best ask and bid prices with the corresponding quantities). The indicator is calculated for the second-most recently issued ten-year sovereign bond of each country and the results are then weighted by the GDP sizes of the respective countries to obtain a euro area aggregate indicator.

**The execution-based liquidity indicator uses information provided by quotes for transactions under the PSPP.** When implementing PSPP trades in the OTC market, firm price and volume quotes are obtained from several counterparties. The differences between these quotes contain information on the degree of market liquidity. For a given bond, this indicator is defined as the spread between the two best quotes, divided by the duration of the bond. Only quotes that actually result in

<sup>11</sup> See Amihud Y., “Illiquidity and stock returns: cross-section and time-series effects”, *Journal of Financial Markets*, Vol. 5(1), pp. 31-56, 2002.

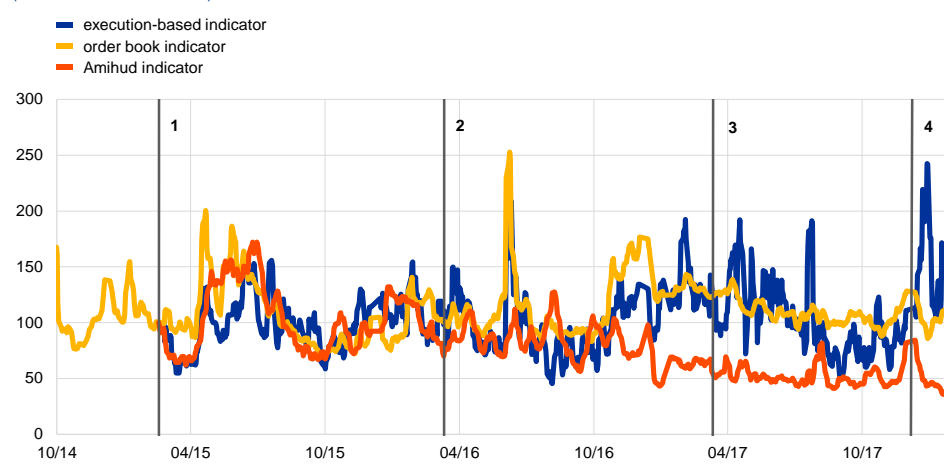
transactions are considered. A euro area-wide indicator is calculated as a volume-weighted average across all traded sovereign bonds.

**These three indicators suggest that the liquidity situation in euro area sovereign bond markets has not deteriorated since the start of the PSPP (see Chart A).** While all three indicators have displayed some volatility since the start of the PSPP, they have not recorded an upward trend, and the Amihud indicator has in fact tended to decline. This confirms that market liquidity has not deteriorated, despite the build-up of PSPP holdings over time. In the same vein, the indicators have not displayed a marked reaction to changes in the amount of monthly purchases under the PSPP, with only the execution-based indicator displaying increased volatility when the net monthly volume was reduced – especially following the reduction at the start of 2018.

### Chart A

#### Sovereign bond market liquidity indicators since the start of the PSPP

(index: 100 = 9 March 2015)



Sources: Bloomberg, EuroMTS Ltd and ECB calculations.

Notes: The chart shows the five-day moving average of the indicators. An increase (decrease) in these indicators implies a deterioration (improvement) in the liquidity situation. They are normalised to 100 on 9 March 2015 when purchases under the PSPP began. The vertical lines denote the following volume changes of asset purchases under the PSPP: 1) the start of the programme, with a monthly pace of €60 billion (9 March 2015); 2) the increase in net monthly purchases to €80 billion (1 April 2016); 3) the decrease in net monthly purchases to €60 billion (3 April 2017); and 4) the decrease in net monthly purchases to €30 billion (2 January 2018). The latest observation is for 20 February 2018.

#### **These indicators tend to spike around political and economic events**

**associated with an expected deterioration in market liquidity.** For instance, spikes were observed during the “Bund tantrum” period (commencing on 29 April 2015) and in a period of heightened concern about a potential significant slowdown in China’s economic growth (in the first quarter of 2016). The UK referendum on European Union membership (23 June 2016) and the presidential elections in the United States (8 November 2016) and France (23 April 2017) were also marked by illiquidity spikes (see Chart A). Moreover, liquidity usually deteriorates during the summer and around the year-end. However, the spikes observed in the Amihud indicator around these periods are more muted than those seen in the order book indicator. Movements in the execution-based indicator

resemble those seen in the order book indicator, but appear to reflect relatively more noise. This may suggest that monitoring should focus on the order book indicator.<sup>12</sup>

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<sup>12</sup> This could be justified for several reasons: first, the amount of submitted limit orders far exceeds the number of executed transactions in bond markets, enabling the order book indicator to react faster and more smoothly to market developments. Second, trade volume-based indicators may underestimate market depth since traded quantities are usually smaller than the maximum quantity that could have been traded at a particular price.

### 3 Liquidity conditions and monetary policy operations in the period from 1 November 2017 to 30 January 2018

Prepared by Alaoíshe Luskin and Olivier Vergote

**This box describes the ECB's monetary policy operations during the seventh and eighth reserve maintenance periods of 2017, which ran from 1 November to 19 December 2017 and from 20 December 2017 to 30 January 2018 respectively.** During this period, the interest rates on the main refinancing operations (MROs), the marginal lending facility and the deposit facility remained unchanged at 0.00%, 0.25% and -0.40% respectively.

During this review period, the Eurosystem continued to purchase public sector securities, covered bonds, asset-backed securities, and corporate sector securities as part of its asset purchase programme (APP), with a target of €60 billion of purchases on average per month until December 2017. The pace of purchases was reduced to €30 billion on average per month from January 2018, and will continue at this pace until September 2018, or beyond, if necessary, until the Governing Council sees a sustained adjustment in the path of inflation consistent with its inflation aim.

#### Liquidity needs

**In the period under review, the average daily liquidity needs of the banking system, defined as the sum of net autonomous factors and reserve requirements, stood at €1,272.7 billion, representing an increase of €60.3 billion compared with the previous review period (i.e. the fifth and sixth maintenance periods of 2017).** This increase in liquidity needs was attributable to an increase in average net autonomous factors, which rose by €59.3 billion to €1,149.5 billion during the review period, while minimum reserve requirements increased by €1 billion to €123.3 billion.

**The growth in net autonomous factors, which implies an absorption of liquidity, mainly resulted from a decrease in liquidity-providing factors.** The main contribution came from a decline in net assets denominated in euro, which fell by €54.4 billion to €251.8 billion on average in the review period. Average net foreign assets also decreased, by €2 billion compared with the previous review period, to €635.0 billion.

**Liquidity-absorbing autonomous factors increased slightly over the review period, adding to the growth in net autonomous factors.** The main contribution came from banknotes in circulation, which increased by €9.3 billion to €1,151.9 billion, and other autonomous factors, which increased by €5.3 billion to €695.6 billion. A decrease in government deposits of €11.8 billion had a counterbalancing effect on the level of liquidity-absorbing autonomous factors.

**Table A****Eurosystem liquidity conditions**

	1 November 2017 to 30 January 2018		26 July 2017 to 31 October 2017		Eighth maintenance period		Seventh maintenance period	
<b>Liabilities – liquidity needs (averages; EUR billions)</b>								
<b>Autonomous liquidity factors</b>	<b>2,035.9</b>	<b>(+2.8)</b>	<b>2,033.1</b>	<b>2,040.8</b>	<b>(+9.1)</b>	<b>2,031.7</b>	<b>(-15.0)</b>	
Banknotes in circulation	1,151.9	(+9.3)	1,142.7	1,158.2	(+11.6)	1,146.6	(+3.8)	
Government deposits	188.3	(-11.8)	200.1	188.1	(-0.4)	188.5	(-29.8)	
Other autonomous factors	695.6	(+5.3)	690.3	694.5	(-2.1)	696.6	(+11.0)	
<b>Current accounts</b>	<b>1,293.7</b>	<b>(+45.7)</b>	<b>1,248.0</b>	<b>1,275.2</b>	<b>(-34.5)</b>	<b>1,309.7</b>	<b>(+56.4)</b>	
<b>Monetary policy instruments</b>	<b>808.8</b>	<b>(+56.9)</b>	<b>752.0</b>	<b>812.9</b>	<b>(+7.5)</b>	<b>805.4</b>	<b>(+35.0)</b>	
Minimum reserve requirements	123.3	(+1.0)	122.2	123.8	(+0.9)	122.9	(+0.6)	
Deposit facility	685.6	(+55.8)	629.8	689.2	(+6.6)	682.5	(+34.4)	
Liquidity-absorbing fine-tuning operations	0.0	(+0.0)	0.0	0.0	(+0.0)	0.0	(+0.0)	
<b>Assets – liquidity supply (averages; EUR billions)</b>								
<b>Autonomous liquidity factors</b>	<b>886.8</b>	<b>(-56.4)</b>	<b>943.2</b>	<b>843.6</b>	<b>(-80.2)</b>	<b>923.8</b>	<b>(-13.2)</b>	
Net foreign assets	635.0	(-2.0)	637.0	635.7	(+1.2)	634.5	(-0.5)	
Net assets denominated in euro	251.8	(-54.4)	306.1	207.9	(-81.4)	289.3	(-12.7)	
<b>Monetary policy instruments</b>	<b>3,128.8</b>	<b>(+160.9)</b>	<b>2,968.0</b>	<b>3,161.9</b>	<b>(+61.4)</b>	<b>3,100.4</b>	<b>(+89.0)</b>	
Open market operations	3,128.6	(+160.9)	2,967.7	3,161.7	(+61.5)	3,100.2	(+89.0)	
Tender operations	765.2	(-7.8)	773.0	763.5	(-3.1)	766.7	(-5.3)	
MROs	2.9	(-3.2)	6.1	2.9	(-0.1)	3.0	(-3.8)	
Three-month LTROs	7.8	(-0.6)	8.4	7.8	(-0.2)	7.9	(-0.4)	
TLTRO-I operations	14.9	(-3.7)	18.6	13.4	(-2.7)	16.1	(-1.1)	
TLTRO-II operations	739.6	(-0.4)	740.0	739.5	(-0.1)	739.7	(-0.1)	
Outright portfolios	2,363.4	(+168.7)	2,194.7	2,398.2	(+64.6)	2,333.5	(+94.4)	
First covered bond purchase programme	6.1	(-1.1)	7.2	6.1	(-0.0)	6.1	(-0.9)	
Second covered bond purchase programme	4.8	(-0.1)	4.9	4.7	(-0.0)	4.8	(-0.1)	
Third covered bond purchase programme	240.5	(+10.7)	229.8	242.5	(+3.6)	238.8	(+6.1)	
Securities Markets Programme	89.0	(-2.1)	91.1	89.1	(+0.2)	88.9	(-1.6)	
Asset-backed securities purchase programme	25.1	(+0.5)	24.6	25.1	(+0.0)	25.1	(+0.5)	
Public sector purchase programme	1,867.8	(+141.6)	1,726.2	1,897.3	(+54.7)	1,842.6	(+79.3)	
Corporate sector purchase programme	130.1	(+19.3)	110.9	133.4	(+6.1)	127.3	(+11.0)	
Marginal lending facility	0.2	(-0.0)	0.3	0.2	(-0.1)	0.2	(+0.0)	
<b>Other liquidity-based information (averages; EUR billions)</b>								
Aggregate liquidity needs	1,272.7	(+60.3)	1,212.5	1,321.3	(+90.2)	1,231.1	(-1.2)	
Autonomous factors <sup>1</sup>	1,149.5	(+59.3)	1,090.2	1,197.6	(+89.3)	1,108.3	(-1.8)	
Excess liquidity	1,855.8	(+100.6)	1,755.3	1,840.4	(-28.7)	1,869.1	(+90.2)	
<b>Interest rate developments (averages; percentages)</b>								
MROs	0.00	(+0.00)	0.00	0.00	(+0.00)	0.00	(+0.00)	
Marginal lending facility	0.25	(+0.00)	0.25	0.25	(+0.00)	0.25	(+0.00)	
Deposit facility	-0.40	(+0.00)	-0.40	-0.40	(+0.00)	-0.40	(+0.00)	
EONIA	-0.351	(+0.006)	-0.357	-0.359	(-0.014)	-0.345	(+0.014)	

Source: ECB.

Notes: Since all figures in the table are rounded, in some cases the figure indicated as the change relative to the previous period does not equal the difference between the rounded figures provided for these periods (and may differ by €0.1 billion).

1) This overall value of autonomous factors also includes "items in course of settlement".

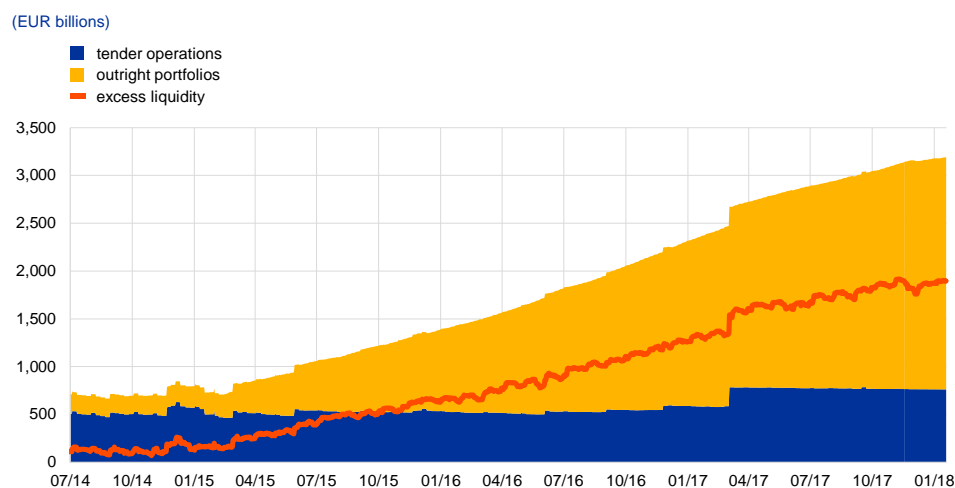
**The day-to-day volatility of autonomous factors remained elevated in the review period and was broadly unchanged from the previous review period.** The volatility primarily reflected fluctuations in government deposits and net assets denominated in euro.

## Liquidity provided through monetary policy instruments

**During the review period, the average amount of liquidity provided through open market operations – both tender operations and APP purchases – increased by €160.9 billion to €3,128.6 billion (see Chart A).** This increase was fully attributable to the APP, while demand in tender operations decreased marginally further.

### Chart A

Evolution of open market operations and excess liquidity



Source: ECB.

**The average amount of liquidity provided through tender operations declined slightly over the review period, by €7.8 billion to €765.2 billion.** This decrease was primarily due to a lower average outstanding amount of targeted longer-term refinancing operations (TLTROs), which decreased by €4.1 billion, largely as a consequence of voluntary early repayments of funds borrowed via those operations. The average liquidity provided through MROs decreased by €3.2 billion and the average amount of liquidity provided through three-month longer-term refinancing operations (LTROs) fell by €0.6 billion.

**Liquidity provided through the Eurosystem's monetary policy portfolios increased by €168.7 billion to €2,363.4 billion on average, on the back of the APP purchases.** Average liquidity provided by the public sector purchase programme (PSPP), the third covered bond purchase programme, the asset-backed securities purchase programme, and the corporate sector purchase programme rose on average by €141.6 billion, €10.7 billion, €0.5 billion and €19.3 billion respectively. The reduction in liquidity owing to redemptions of bonds held under the Securities



Markets Programme and the previous two covered bond purchase programmes totalled €3.3 billion.

## Excess liquidity

**As a consequence of the developments detailed above, average excess liquidity in the period under review rose by €100.6 billion compared with the previous period, reaching €1,855.8 billion (see Chart A).** As mentioned above, the increase largely reflects the liquidity provided through the APP, with a monthly target of €60 billion until December 2017 and €30 billion as of January 2018. This was partially offset by an increase in liquidity needs coming mainly from autonomous factors. A more detailed analysis of the period under review shows that the dampening impact of autonomous factors on the rise in excess liquidity occurred mainly in the eighth maintenance period. In particular, the eighth maintenance period saw a decrease in excess liquidity of €28.7 billion, as the liquidity injected via the APP was offset by lower liquidity-providing autonomous factors arising from lower net assets denominated in euro, coupled with higher aggregate liquidity needs of the banking sector, mainly driven by a greater demand for banknotes. By contrast, in the seventh maintenance period, excess liquidity grew by €90.2 billion on account of the APP purchases and a modest decrease in liquidity-absorbing autonomous factors, mainly as a result of lower government deposits.

The increase in excess liquidity over the review period corresponded to higher average current account holdings, which rose by €45.7 billion to stand at €1,293.7 billion, while the average recourse to the deposit facility increased by a further €55.8 billion to stand at €685.6 billion.

## Interest rate developments

**Overnight money market rates remained close to the deposit facility rate, even falling below it for specific collateral baskets in the secured segments.** In the unsecured market, the euro overnight index average (EONIA) averaged  $-0.351\%$ , compared with an average of  $-0.357\%$  in the previous review period. The EONIA fluctuated between a high of  $-0.241\%$  on the last day of November 2017 and a low of  $-0.370\%$  at the beginning of January 2018.

In the secured market, average overnight repo rates in the GC Pooling market declined for both the standard collateral basket and the extended collateral basket relative to the previous review period. The average overnight repo rate stood at  $-0.447\%$  for the standard collateral basket, reaching a low of  $-0.756\%$  at the year-end, while the average overnight repo rate for the extended collateral basket stood at  $-0.415\%$ .

The 2017 year-end decline in core repo rates was less pronounced than the 2016 year-end decline. This suggests that market participants have adopted more efficient

collateral management practices. Moreover, this development also suggests positive effects from the PSPP securities lending facility.

## Recent developments in part-time employment

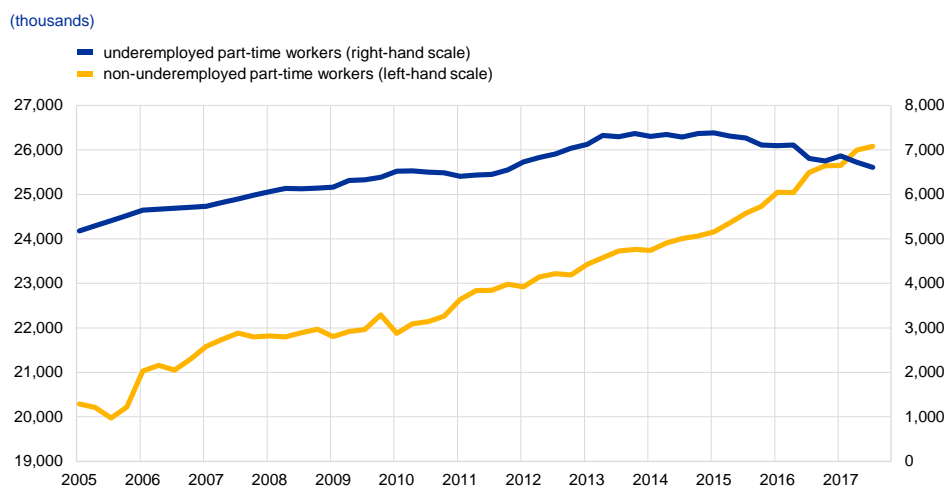
Prepared by Katalin Bodnár

**In the euro area, there has been an increasing reliance on part-time work.** The share of part-time workers is now about 22% of total employment, and part-time work has accounted for about one quarter of net employment growth over the euro area labour market recovery (starting in the second quarter of 2013). This box examines the latest developments and the characteristics of the two main groups of part-time workers: underemployed and non-underemployed part-time workers.

**The number of underemployed part-time workers increased during the crisis, but has declined recently.** In the European Union Labour Force Survey, it is possible to distinguish between part-time workers who are seeking to work more hours and those who are not. The first group are called “underemployed”.<sup>13</sup> Although those included in this group are employed, they are usually regarded as partly unemployed or underutilised, meaning that the number of hours that they would like to work exceeds the number of hours demanded by their employers. Underemployment in the euro area increased both in the first phase of the Great Recession and in the wake of the sovereign debt crisis. It has been declining recently, but still remains above its pre-crisis levels (Chart A). This cyclical pattern is similar to that of unemployment.

### Chart A

Number of underemployed and non-underemployed part-time workers in the euro area



Sources: Eurostat and ECB staff calculations.

Notes: Corrected for the estimated impact of methodological changes in the time series. Data for 2005-2008 are based on ECB staff estimates.

<sup>13</sup> See the Eurostat Statistics Explained page on “[Underemployment and potential additional labour force statistics](#)”. Involuntary part-time employment refers to a concept similar to underemployment, with some differences: involuntary part-time workers are those who work part-time because they are unable to find full-time work. See also the Eurostat page entitled “[EU labour force survey – methodology](#)”.

**Non-underemployed part-time work increased both during the crisis and during the recovery.**

The second group, those part-timers who are not seeking to work more hours, typically work in part-time positions for family, health or other reasons (e.g. because they are students). This group makes up the largest share of part-time workers: four in five part-time workers in the euro area are satisfied with the hours they work. This category of part-time employment has displayed no cyclical pattern in recent years; instead it has increased steadily over both the crisis and the recovery (Chart A). This pattern suggests that this category of part-time work is influenced primarily by structural factors.

**The number of non-underemployed part-time workers has been increasing mainly in Germany, while the largest contributions to the changes in underemployment in the euro area are accounted for by Spain (Chart B).**

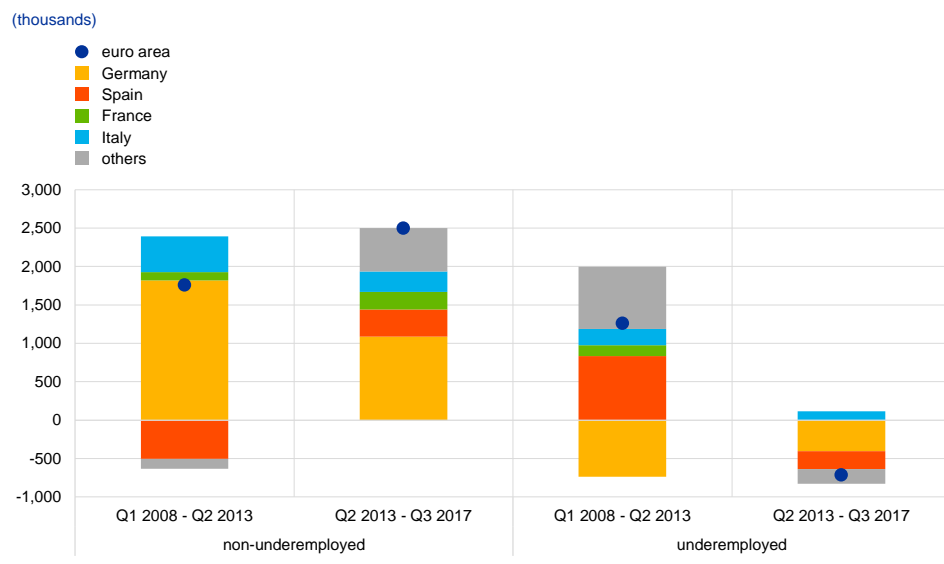
Among the four largest euro area countries, the share of part-time work in total employment is highest in Germany. This is also the country where the highest share of part-time workers are satisfied with the hours they work and where the recent increases in part-time working have not been associated with underemployment. In contrast, underemployment increased particularly strongly in Spain and Italy during the crisis. In Spain, there has been an inflow into underemployment from unemployment, full-time employment and non-underemployed part-time employment.<sup>14</sup> The considerable increase in underemployment during the crisis probably reflects changes in the regulation of part-time work as well as the impact of the crisis on income and wealth during the downturn, resulting in an increase in labour supply in terms of hours. In Italy, underemployment may have been influenced by the Government's measures to support a reduction in hours. Despite having declined recently, underemployment remains above pre-crisis levels in both Italy and Spain, while it is well below pre-crisis levels in Germany.

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<sup>14</sup> See also the box entitled "Alternative measures of unemployment for the Spanish Economy", *Economic Bulletin*, Issue 2, Banco de España, 2017.

## Chart B

Change in number of underemployed and non-underemployed part-time workers in the euro area during the crisis and the recovery by country



Sources: Eurostat and ECB staff calculations.

Note: Corrected for the estimated impact of methodological changes in the time series.

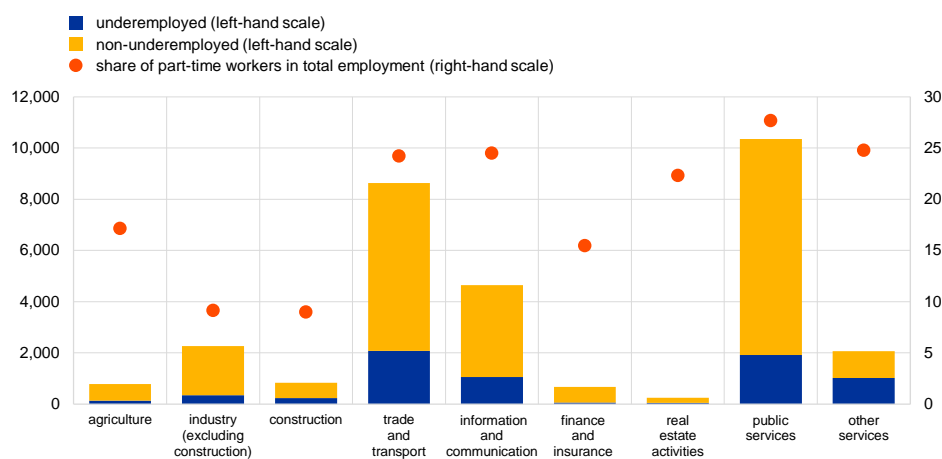
### Both categories of part-time work are more prevalent in the services sectors and among women.

Part-time workers in the euro area are concentrated in three sectors: 1) the public services sector; 2) the trade, transport, accommodation and food sector; and 3) the information and communication sector. As a consequence, both categories of part-time work are also concentrated in these sectors (Chart C). In terms of personal characteristics, prime age and older women make up the vast majority of part-time workers (Chart D). The distribution of part-time work between underemployed and non-underemployed part-time work is somewhat different across sectors and personal characteristics. Underemployed part-time workers account for the highest share of total part-time employment in other services (including arts, entertainment and recreation, other service activities and activities of household and extra-territorial organisations and bodies), followed by the construction, trade and transport and information and communication sectors. Underemployed part-time work is also high among prime-age males and the young. Finally, underemployed part-time workers tend to work somewhat fewer hours than non-underemployed part-time workers.

### Chart C

Number of underemployed and non-underemployed part-time workers and share of part-time workers in total employment by sector in the euro area in 2016

(left-hand scale: thousands; right-hand scale: percentages)

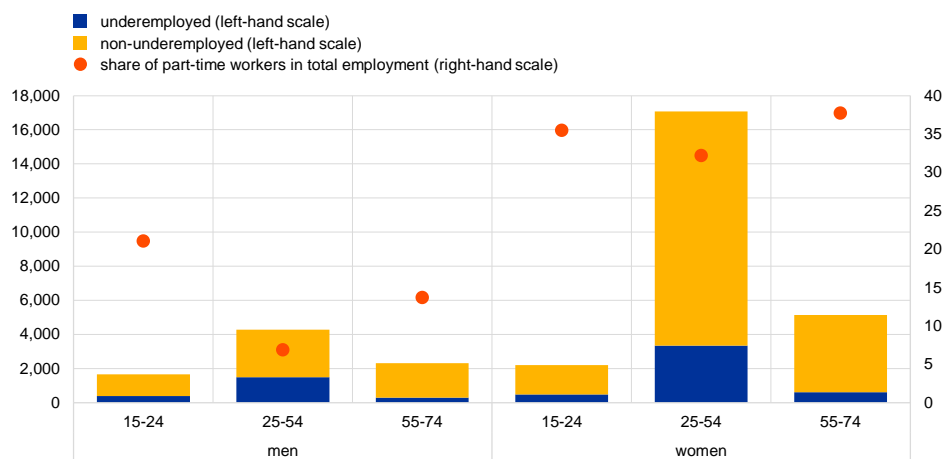


Sources: Eurostat and ECB staff calculations.

### Chart D

Number of underemployed and non-underemployed part-time workers and share of part-time workers in total employment by gender and age in the euro area in the third quarter of 2017

(left-hand scale: thousands; right-hand scale: percentages)



Sources: Eurostat and ECB staff calculations.

### The extent to which underemployed part-time workers represent precarious work and/or spare capacity in the economy remains an important question.

The empirical literature finds that underemployed part-time workers tend to have less job security, lower job satisfaction<sup>15</sup> and lower wages<sup>16</sup> than non-underemployed

<sup>15</sup> See, for example, Vaalavuo, M., "Part-time work: A divided Europe", *Evidence in focus*, European Commission, 2016; and Kauhanen, M. and Nätti, J., "Involuntary temporary and part-time work, job quality and well-being at work", *Working Papers*, No 272, Labour Institute for Economic Research, Helsinki, 2011.

ones. Underemployed part-time work may thus be regarded as precarious in some cases. However, the extent to which underemployed part-time workers are actually available to work more hours and can thus be regarded as underutilised labour is also an open question.<sup>17</sup> At the same time, non-underemployed part-time work may be regarded as an opportunity for many to enter or stay in the labour market, and may frequently result in job satisfaction.<sup>18</sup> Part-time workers in this category seem less likely to represent spare capacity or precarious work. All of this suggests that the recent declines in underemployed part-time work and the continuing increase in non-underemployed part-time work may be regarded as enhancing overall welfare.

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<sup>16</sup> Veliziotis, M., Matsaganis, M. and Karakitsios, A., "Involuntary part-time employment: perspectives from two European labour markets", *Working Papers*, No 15/02, ImPRovE, January 2015.

<sup>17</sup> See, for example, Weale, M., "[Slack and the labour market](#)", speech at the Thames Valley Chamber of Commerce, 20 March 2014.

<sup>18</sup> Gallie, D. et al., "Quality of work and job satisfaction: comparing female part-time work in four European countries", *International Review of Sociology*, Vol. 26, No 3, 2016, pp. 457-481.

## 5 The reliability of the preliminary flash estimate of euro area GDP

Prepared by Magnus Forsells and Stanimira Kosekova

**Timely and reliable statistics are essential for economic analysis.** This box reviews and assesses the reliability of Eurostat's preliminary flash estimate of quarterly GDP growth for the euro area, which was introduced at the beginning of 2016. The euro area's single monetary policy is dependent on timely, reliable and comparable indicators that accurately reflect economic developments. In this respect, national accounts provide a comprehensive and consistent picture of the economy, making them a cornerstone of monetary policy analysis. The introduction of a preliminary GDP flash estimate was therefore a welcome development in terms of the continuous efforts to improve Europe's statistical landscape. Importantly, however, increased timeliness should ideally be achieved without any loss of reliability, which is defined here as the closeness of that initial estimate to subsequent estimates. Information about reliability can help us to interpret initial estimates in terms of uncertainty surrounding data releases or help us to guess the direction of any future revisions. If economic indicators provide misleading signals regarding economic developments, which are later corrected by revisions, this may have adverse consequences for economic analysis.

**The introduction of the preliminary flash estimate brought the euro area's first GDP data release in respect of each reference period forward by some 15 days, with initial estimates being produced 30 – rather than 45 – days after the end of the reference quarter.** Eurostat, in cooperation with the EU Member States, introduced the preliminary flash estimate of euro area and EU GDP on 29 April 2016 following a feasibility study.<sup>19</sup> In most countries, estimates at t+30 are largely based on the same methods that are used at t+45. However, owing to limited availability of data sources, the third month of the quarter is usually estimated or partially estimated by applying statistical modelling techniques that make use of available monthly information (e.g. short-term statistics, business surveys, price statistics and preliminary estimates of source data).<sup>20</sup> The preliminary flash estimate for the euro area is based on (i) national estimates for six countries (Belgium, Spain, France, Latvia, Lithuania and Austria – which account for some 40% of euro area GDP) which are publicly available at t+30 and (ii) national estimates for other countries that are provided to Eurostat on a confidential basis for the calculation of these European aggregates. Four euro area countries (Ireland, Luxembourg, Malta and Slovenia – which account for almost 4% of euro area GDP) do not produce estimates at t+30 or t+45, publishing their national accounts 60 days or more after the end of the reference quarter. The inclusion of data for those countries at a later stage and the incorporation of revised data for countries that have already submitted preliminary

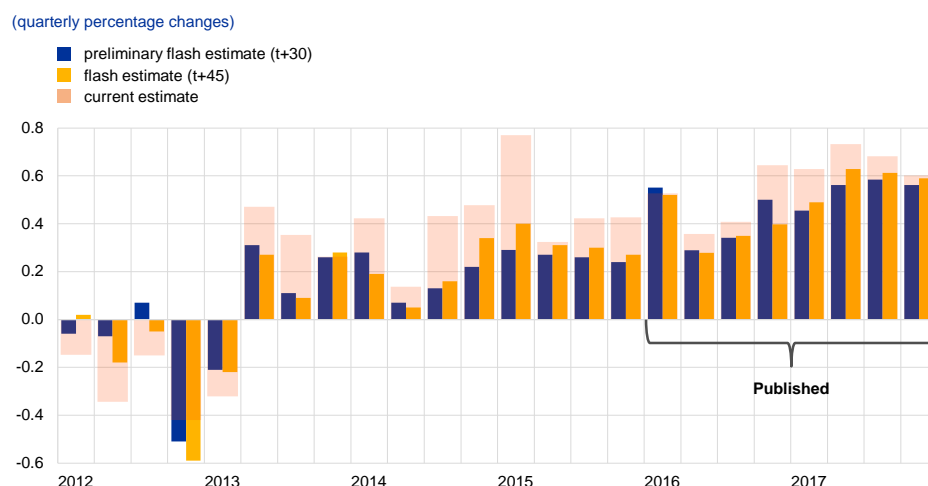
<sup>19</sup> See also [Eurostat's website](#) and the box entitled "Improved timeliness of the euro area quarterly GDP flash estimate: first experiences", *Economic Bulletin*, Issue 4, ECB, 2016.

<sup>20</sup> The precise estimation methods vary from country to country, but may include autoregressive distributed lags, dynamic factor models, temporal disaggregation techniques, forecasting models and multivariate models as shown in the Eurostat publications "[Euro area and European Union GDP flash estimates at t+30](#)" and "[Overview of GDP flash estimation methods](#)".



national estimates may have an impact on the final estimate for the reference quarter and therefore lead to its revision. Revisions may also reflect changes in the composition of the euro area and/or methodological improvements (such as the transition to the European System of National and Regional Accounts (ESA 2010) in September 2014).

**Chart A**  
Estimates of euro area GDP



Source: Eurostat.

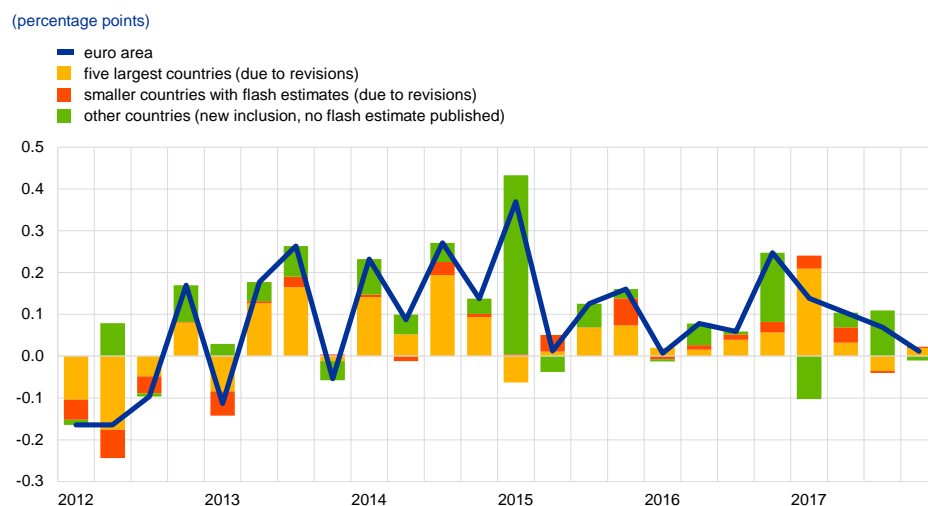
Notes: Eurostat's first preliminary flash estimate was published on 29 April 2016 and referred to the first quarter of 2016. Preliminary flash estimates for earlier periods are taken from the Eurostat publication "Euro area and European Union GDP flash estimates at 30 days". For the purposes of this analysis, estimates to two decimal places are used. "Current estimate" denotes the most recent data available in the ECB's Statistical Data Warehouse as at 7 March 2018. Flash estimates are based on the composition of the euro area at the relevant time, while the current estimate is based on the current composition of the euro area.

**The preliminary flash estimate (at t+30) has performed well in comparison with the flash estimate (at t+45).** Looking at the period from the first quarter of 2012 to the fourth quarter of 2017, there is no difference, on average, between the preliminary flash estimate and the flash estimate (see Chart A). Furthermore, even looking at individual quarters, there is no evidence of particularly large differences between the two estimates. This suggests that, despite the earlier release date, the reliability of the first estimate has been maintained. Ultimately, of course, the preliminary flash estimate and the flash estimate both need to be compared with the latest available GDP data, and the two perform equally well in this respect, with both estimates averaging 0.1 percentage point less than the latest available figures. As one would expect, the bulk of this revision stems from the five largest countries, given that they account for more than 80% of euro area GDP (see Chart B). However, smaller countries also have a role to play in this regard, either (i) as a result of revisions to their own flash estimates, or (ii) because countries that do not produce any data until 60 days or more after the end of the reference quarter are included in the euro area aggregate. Indeed, the four smaller countries that do not produce estimates at t+30 or t+45 made relatively large contributions to the revisions

that were made at euro area level, particularly in respect of the first quarter of 2015, the fourth quarter of 2016 and the third quarter of 2017.<sup>21</sup>

### Chart B

#### Contributions to differences between the flash estimate at t+45 and the latest available data



Sources: Eurostat and ECB calculations.

Note: The five largest countries in terms of GDP are Germany, Spain, France, Italy and the Netherlands.

#### Euro area statistics have improved over the years, but a number of challenges still remain.

The introduction of the preliminary GDP flash estimate at t+30 is one of the most significant improvements in the national accounts in recent years, bringing the first estimate forward without any losses in terms of reliability. The ECB regularly uses such estimates in its analysis and macroeconomic projections, benefiting from the improved timeliness of data. Other euro area countries are expected to start publishing preliminary flash estimates of GDP in the coming years,<sup>22</sup> but the number of countries publishing national estimates or detailed expenditure breakdowns at t+30 may not, in the short term, be sufficient to support a more thorough analysis of macroeconomic developments at euro area level so soon after the end of the reference quarter. In addition, the economic statistics that are used in conjunction with preliminary flash estimates are still less complete and less timely at euro area level than they are in a number of individual euro area countries and major trading partners outside the euro area (such as the United States). It is therefore important that the development of relevant euro area and country-level statistics continues and is prioritised accordingly. It is also important to enhance the quality of the source data that are used as inputs for preliminary flash estimates (e.g. short-term statistics

<sup>21</sup> The revisions for those quarters were largely caused by the incorporation of Irish data in the euro area aggregate. The very significant role that is played by multinational companies in Ireland and the way that their holdings in terms of intellectual property products (intangible assets) are recorded have led to increased volatility in GDP growth rates in recent years.

<sup>22</sup> According to [Istat's release calendar](#), Italy will publish its first preliminary flash estimate of GDP on 2 May 2018.

on services)<sup>23</sup>. These improvements will ultimately increase the reliability of preliminary flash estimates and make them more useful, thereby facilitating more detailed economic analysis.

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<sup>23</sup> See also the [ECB Opinion](#) on a proposal for a regulation of the European Parliament and of the Council on European business statistics amending Regulation (EC) No 184/2005 and repealing 10 legal acts in the field of business statistics (CON/2018/1), 2.1.2018.

## 6 The role of seasonality and outliers in HICP inflation excluding food and energy

Prepared by Eliza Lis and Mario Porqueddu

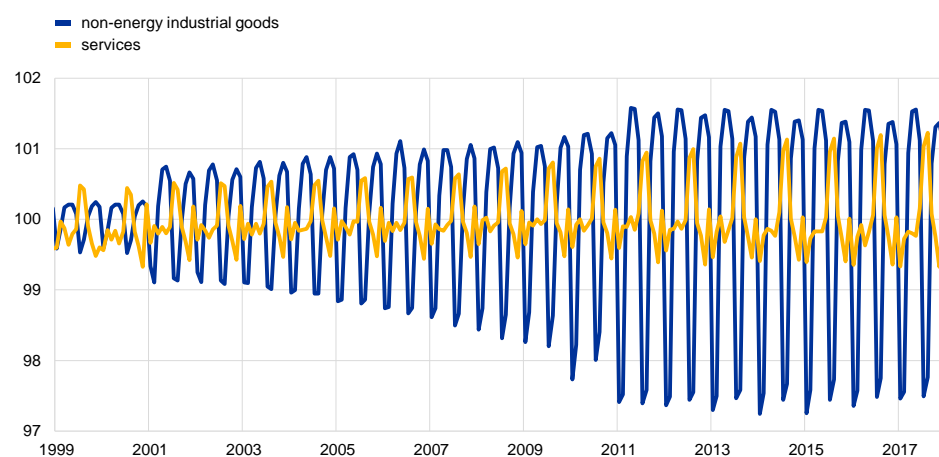
**Measures of underlying inflation provide a means of looking beyond short-term volatility in price developments.** An example of this is the exclusion of the highly volatile food and energy components from the HICP. However, HICP inflation excluding food and energy can still be subject to short-term volatility. This box reviews two possible sources – changes in seasonality and idiosyncratic price changes (henceforth “outliers”) – and assesses to what extent they can explain recent short-term volatility in the profile of euro area HICP inflation excluding food and energy.

**Seasonal fluctuations in the euro area HICP excluding food and energy have become more pronounced over time.** Seasonal fluctuations per se have no impact on annual inflation rates, but changes in the seasonal factor do. A considerable part of the increased seasonality is due to methodological changes, although some of it also appears to reflect a more general development.<sup>24</sup> The increased seasonality is visible in both the HICP for non-energy industrial goods and the HICP for services (see Chart A).

### Chart A

#### Seasonal factor for the euro area HICP for non-energy industrial goods and services

(index: no impact of seasonality on HICP = 100)



Sources: Eurostat and ECB calculations.

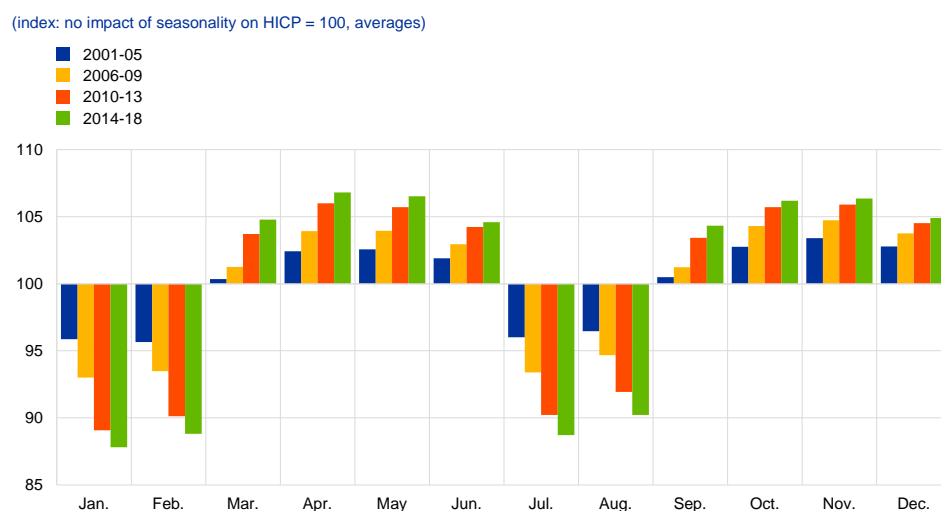
Notes: The seasonal factor is calculated as the ratio between the non-seasonally adjusted series and the seasonality-adjusted series. A number above (below) 100 means a positive (negative) impact of seasonality on the euro area HICP for non-energy industrial goods and services.

**The impact of seasonality on the HICP for non-energy industrial goods and on the HICP for services is related mainly to prices for clothing and travel-related services respectively.** Seasonal sales of clothing usually take place in the winter months of January and February and in the summer months of July and August (see

<sup>24</sup> For a definition of “seasonality”, see the box entitled “Harmonised Index of Consumer Prices – Easter effects and improved seasonal adjustment”, *Economic Bulletin*, Issue 3, ECB, 2016.

Chart B).<sup>25</sup> An earlier (later) start to the sales period can then imply a stronger (weaker) month-on-month price change than in the previous year and hence a strong, temporary decrease (increase) in the annual inflation rate. The seasonality impact on clothing prices has become substantially larger since 2001, not least due to enhanced price collection, improvements in methods for compiling price changes in winter and summer clothing and, since 2010, the introduction of the regulation on the treatment of seasonal products.<sup>26</sup> Seasonality in the prices of travel-related services (e.g. package holidays, accommodation and air transport) implies strong price changes mainly in the summer and winter months (see Chart C).<sup>27</sup> Given the relative high weight of clothing and travel-related services in the HICP excluding food and energy (about 12%), deviations from the usual seasonal pattern can have a strong impact on annual inflation.

**Chart B**  
Seasonal factor for the euro area HICP for clothing



Sources: Eurostat and ECB staff calculations.  
Notes: For clothing prices, reference is made to the garments price index in the HICP. The period 2014-18 includes data up to and including January 2018. The seasonal factor is calculated as the ratio between the non-seasonally adjusted series and the seasonally-adjusted series. The authors use the X12-regArima procedure to seasonally adjust the series.

<sup>25</sup> Italy and Spain drive the strong seasonality in clothing prices, while Germany and France exhibit a less pronounced seasonal pattern.

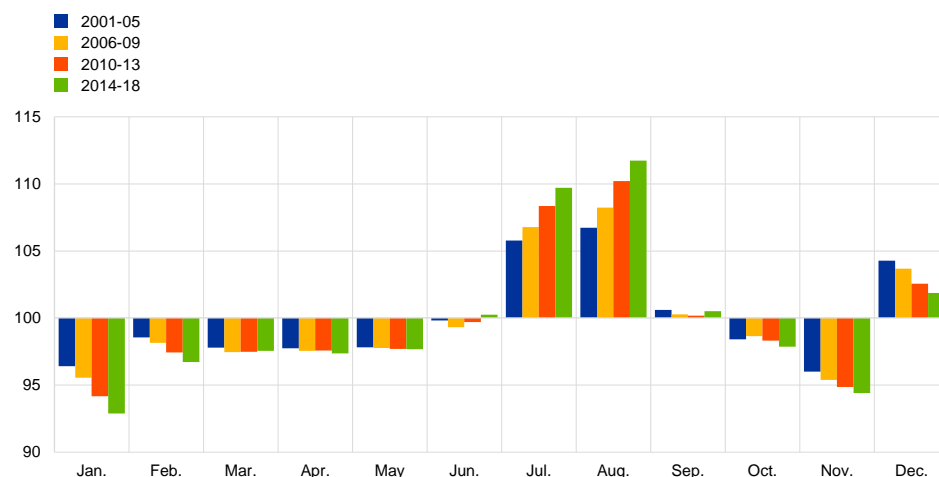
<sup>26</sup> See the box entitled “Methodological changes in the compilation of the HICP and their impact on recent data”, *Monthly Bulletin*, ECB, April 2011.

<sup>27</sup> With respect to travel-related services, seasonality is dominated by France in the summer months and Germany throughout the year, which in the case of Germany reflects mainly a distinct seasonal pattern for package holidays. The exact timing of summer holiday periods may change from one year to the next. By definition, the impact of this change would not be captured by the seasonal factor.

## Chart C

### Seasonal factor for the euro area HICP for travel-related items

(index: no impact of seasonality on HICP = 100, averages)



Sources: Eurostat and ECB staff calculations.

Notes: Travel-related items include package holidays, accommodation services and air transport. The period 2014-18 includes data up to and including January 2018. The seasonal factor is calculated as the ratio between the non-seasonally adjusted series and the seasonality-adjusted series. The authors use the X12-regArima procedure to seasonally adjust the series.

### The profile of HICP inflation excluding food and energy is also affected by

**outliers.** Outliers can be defined as unusual price changes that are statistically significantly above or below the average change in a given month (after controlling for seasonal and calendar effects) and that are usually related to specific events.<sup>28</sup>

Prominent examples of such events are a change in the VAT rate or an administrative measure, but also organised international events, such as world fairs (Expo) or the Olympic Games. Chart D shows a decomposition of the impact of outliers defined in this way.<sup>29</sup> In 2017 the contribution of outliers to HICP inflation excluding food and energy was around  $-0.1$  percentage point, the strongest net negative contribution in the sample 2001-17. This was a result of a reduction in social security contributions in Germany in January 2017, a broadening of the exemption from payment of university fees in Italy in October 2017 and a reduction in transport insurance premiums in Germany in October 2017.

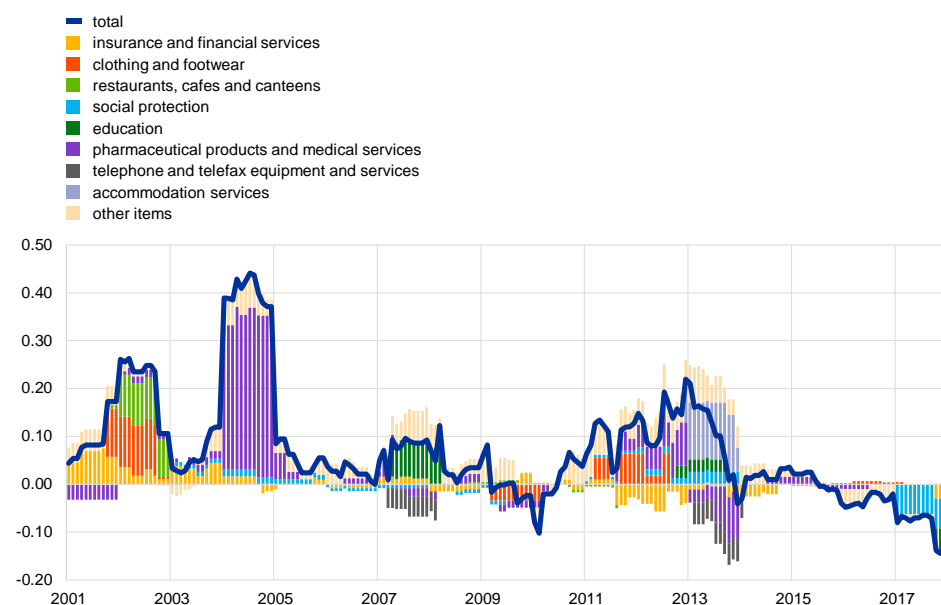
<sup>28</sup> For this box, outliers were identified by means of autoregressive integrated moving average (ARIMA) models (according to X13-regArima). Only the impact of level shift outliers is shown, as there is a certain likelihood that identified additive outliers may not be sufficiently distinguishable from changes in seasonality. For items with no seasonality, outliers have been identified as month-on-month changes that are three standard deviations away from the average, which is close to the critical value applied in the regArima procedure.

<sup>29</sup> The outliers are identified individually for the 72 items in the euro area HICP excluding food and energy. The aggregation of these outliers may differ from that implied in the ECB's seasonal and calendar adjustments of the euro area HICP excluding food and energy and of the services and non-energy industrial goods components. This is due to the increased likelihood of having outliers at a more disaggregated level of prices.

## Chart D

### Contribution of outliers to annual HICP inflation excluding food and energy

(percentage points)



Sources: Eurostat and ECB staff calculations.

**The impact of outliers on annual inflation rates is usually short-lived.** The impact of an unusual price change compared with the previous month will affect inflation rates for a period of one year, unless the impact is relatively quickly reabsorbed in the subsequent month(s), possibly then implying outliers in the other direction. One example is a very mild winter with no snow in the ski resort regions, implying less demand for accommodation services and lower price increases compared with the usual profile. However, the frequency of price-setting for most of the items considered in Chart D is usually low, especially for administered prices, making the outlier price change mostly a true level shift with an impact on inflation that disappears only after one year.

#### **Increasing seasonality and outliers raise the potential for inflation surprises.**

The detection and assessment of unusual changes in seasonal patterns and outliers is important for short-term forecasting in order to disentangle short-lived shocks from cyclical fluctuations and medium to long-term trends. In practice, owing to their unexpected and one-off nature, outliers are often mechanically incorporated when updating the short-term inflation forecast path – keeping the month-on-month profile for subsequent months unchanged compared with the previous forecast. This bears the risk of overlooking that the outlier might be a first step in a change in trend, or that it might unwind very quickly via a countermovement.

## 7 Fiscal policy stance during past periods of expansion

Prepared by Maria Grazia Attinasi, Alessandra Anna Palazzo and Beatrice Pierluigi

**Economic activity in the euro area and in most of its member countries has recovered to pre-crisis levels and is currently expanding.** Over the past four years the gradual move towards a broad-based and self-sustained expansion has been accompanied by a broadly neutral fiscal stance for the euro area aggregate. In other words, discretionary policies neither provided a significant impulse to the economy, nor did they act as a drag on growth for the euro area as a whole. As the expansion is becoming more solid and mature, a more countercyclical stance may become appropriate for the euro area. Arguments in favour of a countercyclical fiscal policy put forward in the literature<sup>30</sup> essentially hinge on the need to improve fiscal positions during good economic times and to use the resulting fiscal space to support the economy during recessions, without hampering debt sustainability. In the euro area, the important role that automatic stabilisers play in ensuring counter-cyclical policy requires countries to conduct their policies in line with their commitments under the Stability and Growth Pact (SGP). This will allow countries to rebuild fiscal buffers, reduce debt ratios and keep fiscal policies on a sustainable path.

**Against this background, this box looks at the fiscal policy stance during past expansionary periods and the extent to which good economic times have been used to build fiscal buffers.** For the purposes of this box, an expansion is the period of time after the level of GDP has returned to its pre-contraction peak and until it reaches the next peak.<sup>31</sup> This part of the cycle is often called an expansion, as opposed to the recovery phase, i.e., the period of GDP returning from a cyclical trough to the previous peak (see Chart A). An alternative metric used to characterise expansions consists of identifying periods where the output gap is positive and the pace of actual GDP growth is higher than the growth of potential GDP.

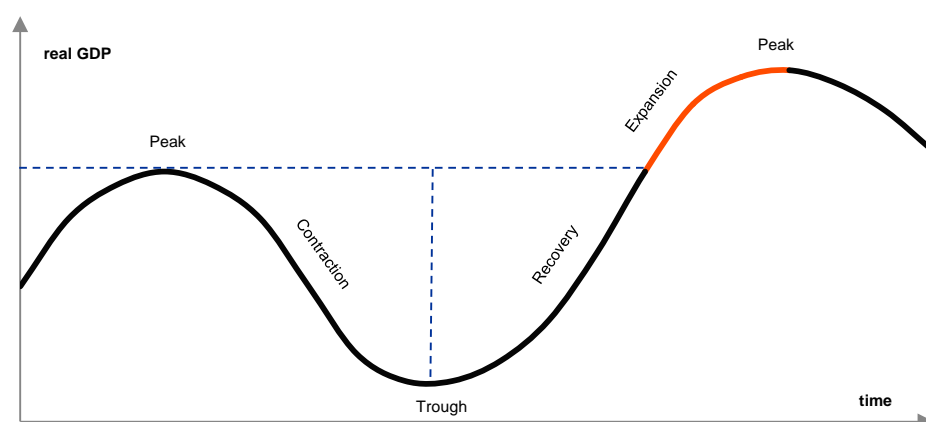
<sup>30</sup> See, among others, Taylor, John B., "Reassessing Discretionary Fiscal Policy", *The Journal of Economic Perspectives*, Vol. 14, No 3, 2000, pp. 21-36 and, for a more recent discussion, "Now is the time: Fiscal policies for sustainable growth", *Fiscal Monitor*, IMF, Washington, April 2015.

<sup>31</sup> To determine cyclical peaks and troughs, the Bry-Boschan procedure for quarterly real GDP frequency is used. For more details, see Harding and Pagan, "Dissecting the cycle: a methodological investigation", *Journal of Monetary Economics*, Vol. 49, Issue 2, 2002, pp. 365-381.



## Chart A

### Stylised representation of the business cycle



Notes: The expansion segment in red delineates the period between the point in time when the level of real GDP is back to its previous peak and continues to grow until the next peak is reached. A contraction is defined as a period with at least two consecutive quarters of negative GDP growth.

**Between 1996 and 2007 the euro area experienced a long period of expansion (see Table A).** During this period euro area real GDP grew by 2.4% per year on average. Among the five largest countries, France, Spain and the Netherlands experienced a long period of expansion, with Spain and the Netherlands recording average GDP growth significantly higher than that recorded in France. In the case of Germany and Italy, the very long period of expansion was interrupted in the early 2000s, only to resume around the mid-2000s and last until 2007. Of the five largest euro area countries, Italy recorded the lowest average real GDP growth rate during the period of expansion preceding the great recession. In more recent years, Germany has been the only country for which a short-lived expansion was identified in the immediate aftermath of the 2008-09 financial and economic crisis.

**Table A****Fiscal stance and fiscal developments during expansionary periods**

Expansionary periods	Average annual fiscal stance	Cyclically adjusted primary balance		General government debt		Primary balance	Real GDP growth	Output gap
		beginning	end	beginning	end			
	(% of GDP)						Average (%)	
<b>euro area</b>								
Q1 1996-Q1 2008	0.0	0.5	0.7	70.8	64.9	1.4	2.4	0.6
<b>Germany</b>								
Q1 1996-Q2 2001	0.6	0.4	3.3	54.8	58.9	1.3	1.9	0.0
Q2 2005-Q1 2008	0.6	0.0	1.8	64.8	63.7	1.1	2.6	-0.1
Q1 2011-Q3 2012	1.5	-0.6	1.2	80.9	79.8	1.9	2.5	0.5
<b>France</b>								
Q1 1996-Q1 2008	-0.1	-0.7	-1.7	55.8	64.3	0.2	2.3	0.8
<b>Italy</b>								
Q1 1996-Q1 2001	0.0	3.9	4.0	116.9	105.1	5.0	2.0	0.3
Q4 2003-Q1 2008	0.1	1.5	1.9	100.5	99.8	1.4	1.5	1.4
<b>Spain</b>								
Q1 1996-Q2 2008	0.2	-0.8	1.9	61.7	35.6	2.0	3.8	1.7
<b>Netherlands</b>								
Q1 1996-Q2 2008	0.3	-2.8	0.8	73.6	42.7	2.4	3.0	0.0

Sources: European Commission, Eurostat and ECB calculations.

Notes: Expansionary periods denote the quarters after the level of GDP has returned to its pre-contraction peak and until it reaches the next peak. The annual average fiscal stance is calculated as the average annual change in the cyclically adjusted primary balance (CAPB). Since data for the CAPB are available as of 1995, and thus data on the fiscal stance as of 1996, the start of the first expansionary phase is set to the first quarter of 1996. However, real GDP for the euro area reached the pre-crisis peak in the second quarter of 1994. The indicators refer to end-of-year data, when the end of the expansion is dated from the third quarter onwards. For Germany and the euro area, the CAPB in 1995 is corrected for the large one-off impact of the inclusion, in the German Federal Budget, of the Treuhandanstalt (i.e. a trust agency established to privatise companies in the former German Democratic Republic).

### In the period preceding the financial crisis, the fiscal stance in the euro area was on average neutral.<sup>32</sup>

Across countries, the fiscal stance, defined as the change in the cyclically adjusted primary balance (CAPB), was broadly neutral in Spain, Italy and France, mildly contractionary in the Netherlands and more countercyclical in Germany<sup>33</sup> (see Table A). Given that GDP growth was also strong, the debt ratio declined significantly in Spain and the Netherlands. By contrast, it increased in France not least on the back of a persistently negative CAPB over the entire expansionary period. It should be noted that Italy ran somewhat sizeable

<sup>32</sup> The fiscal stance measures the effect of government policy on the budget balance. The cyclically adjusted primary balance (i.e. the headline balance net of interest payments and the cyclical component) is the main metric used to measure this effect. It could nonetheless be an imperfect measure of government effort, given the uncertainty surrounding the measurement of the output gap and the fact that the metric itself could be influenced by factors outside the government's control. Such factors include government revenues and social contributions that depend on bases which often evolve somewhat differently from GDP, such that standard tax elasticities do not hold. Recently, the assessment of fiscal effort has come to be supplemented by a "bottom-up" analysis, which provides a more detailed quantification of government effort in terms of revenues and expenditure measures. For more details, see the article entitled "The assessment of fiscal effort", *Monthly Bulletin*, ECB, October 2014.

<sup>33</sup> A fiscal stance of between -0.2% and 0.2% of GDP is generally regarded as broadly neutral. The analysis carried out in this box uses ex post data. It should be noted that, compared with the real-time data, ex post data show a deterioration in the CAPB in the euro area countries as a result of ex post downward revisions of potential output during the 1996-2007 expansionary period. This means that real-time data would have shown a more countercyclical stance than its ex post realisation.

primary surpluses during the 1996-2000 period of expansion, resulting in a substantial reduction in its debt ratio. However, this performance was not repeated in the subsequent expansionary period of 2003-07, when average real GDP growth was slightly weaker and the size of the primary surplus was significantly lower. Germany stands out as the country with the consistently highest degree of counter-cyclicality during expansionary phases.

**A simple “fiscal reaction function” approach makes it possible to identify the major factors driving discretionary policies.** According to the relevant literature,<sup>34</sup> when choosing which fiscal stance to take, policymakers may be influenced by (i) the level of debt, as high debt ratios may call for consolidations to ensure sustainability; (ii) the starting level of the primary balance, as the higher the starting level of the primary surplus, the lesser is the need to build fiscal buffers; (iii) electoral considerations, as fiscal policies may be used to gain electoral support during elections; and (iv) the business cycle, as governments may build fiscal buffers during economic good times to counter the effects of a subsequent recession.

**The estimated fiscal reaction function appears consistent with the descriptive evidence presented in Table A.** Chart B shows the relative impact on the predicted fiscal stance of the statistically significant explanatory variables, as obtained on the basis of the fiscal reaction function estimates.<sup>35</sup> They confirm the findings of the literature, namely that the overall fiscal stance has been influenced positively (i.e. in the sense of a tighter fiscal stance) by the level of debt, and negatively (i.e. in the sense of a looser fiscal stance) by the starting level of the primary balance. Furthermore, Chart B shows that during periods of economic expansion, as defined in this box, the fiscal stance also tends to be relatively tighter.

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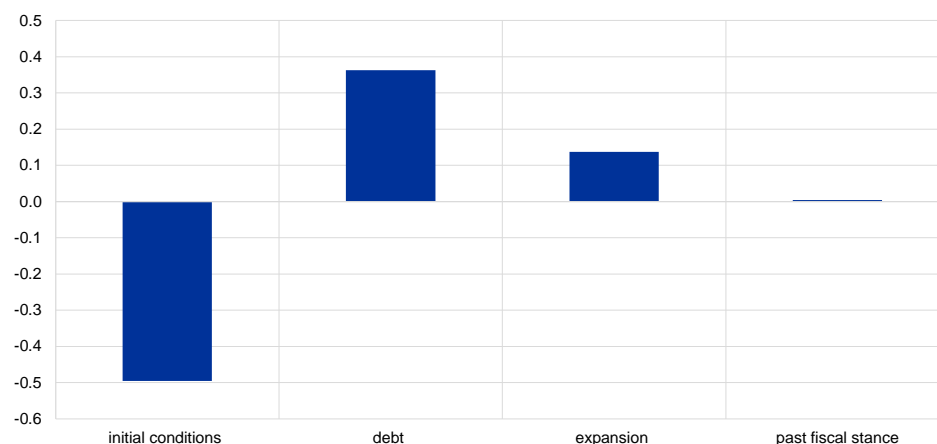
<sup>34</sup> See Turrini, A., “Fiscal policy and the cycle in the Euro Area: The role of government revenue and expenditure”, *Economic Papers*, No 323, 2008; Checherita-Westphal, C. and Ždársek, V., “Fiscal reaction function and fiscal fatigue: evidence for the euro area”, *Working Paper Series*, No 2036, ECB, 2017; and Golinelli, R., Mammi I., Momigliano, S. and Rizza, P., “The Cyclicity of Fiscal Policy in the Euro Area over the Crisis” in *Proceedings of the 19th Workshop on Public Finance*, Banca d’Italia, 2017, mimeo.

<sup>35</sup> According to the fiscal reaction function approach, the fiscal stance (i.e. the change in the CAPB) is estimated as a function of: (i) the lagged fiscal stance; (ii) the lagged level of the CAPB; (iii) the lagged debt level; and (iv) a dummy variable equal to 1 during years of economic expansion (as defined in Chart A above), and 0 otherwise. This relationship is estimated for a sample of the five largest euro area countries during the period 1996-2017. The estimation methods consist of fixed-effects panel data and instrumental variable techniques to account for potential endogeneity issues. Further robustness checks include estimation by the dynamic generalised method of moments.

## Chart B

### Contributions to the fiscal stance (1996-2017)

(percentage points)



Notes: The bars represent the relative impact of each explanatory variable considered in the fiscal reaction function estimates on the fiscal stance (i.e. change in the cyclically adjusted primary balance – CAPB). For each variable the relative impact is calculated as the product of the estimated coefficient and the average value of that variable, taken as a ratio of the predicted value of the fiscal stance. Coefficient estimates have been obtained by means of panel fixed-effects techniques of a fiscal reaction function (see footnote 35). Further robustness checks include estimation by dynamic generalised method of moments to account for potential endogeneity due to inclusion of the lagged dependent variable among the regressors. The instruments used are lagged values of the endogenous variables. Results are robust to the various specifications. Observations = 100. The initial conditions include the lagged level of the CAPB and the constant.

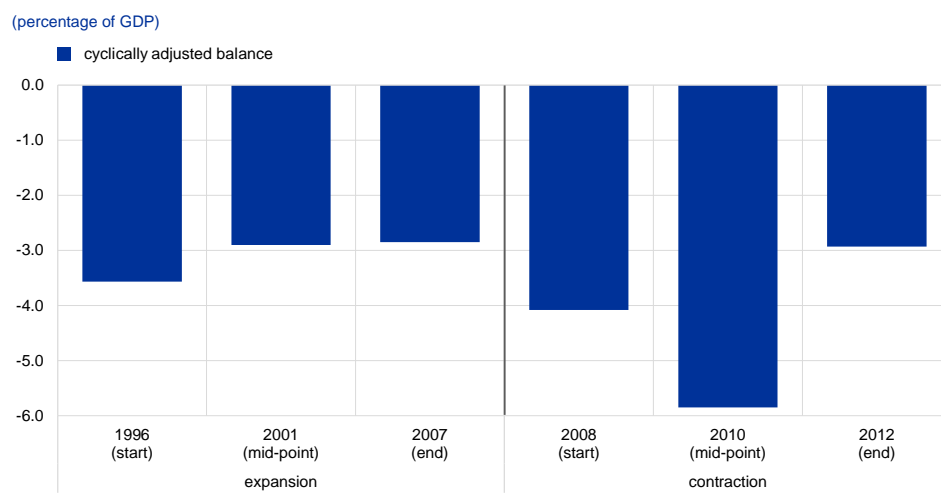
**The mildly countercyclical or broadly neutral stance that prevailed during the expansionary phase before the financial crisis was not sufficient to build adequate buffers for the following recession.** Within the EU fiscal governance framework, all EU countries need to achieve sustainable debt levels while ensuring that their budgets have enough room to manoeuvre and a safety margin against breaching the EU's fiscal rules in the event of negative shocks.<sup>36</sup> During the very long expansionary period before the 2008-09 financial and economic crises, the euro area failed to build sufficient fiscal buffers. This was because it recorded a persistently negative cyclically adjusted budget balance (i.e. the headline budget balance net of the cyclical component – see Chart C). The euro area entered the crisis with a cyclically adjusted budget balance of -2.8%. In the subsequent 2008-10 period the cyclically adjusted budget balance deteriorated further by almost 3 percentage points of GDP (reaching -5.8% in 2010), and the debt-to-GDP ratio increased by almost 20 percentage points of GDP, according to data from the European Commission. Based on this experience and in view of the legacy debt accumulated during the double-dip recession, there seems to be good reason for the euro area countries to take advantage of the current favourable economic conditions to rebuild sufficient fiscal buffers, in line with the SGP. In this context, it is worthwhile recalling the Eurogroup's observation in November 2017 that the limited structural fiscal adjustment expected in 2018 in some Member States was a matter of concern,

<sup>36</sup> Since 2005 this requirement has been operationalised by requiring that countries converge towards their medium-term objective, that is, the budget needs to be in, or close to, balance in structural terms. As this analysis starts before the introduction of the structural balance, the level of the cyclically adjusted budget balance at the end of each expansion is used as a proxy of the degree to which countries have built fiscal buffers.

in particular when coupled with high sustainability risks.<sup>37</sup> The Eurogroup invited all Member States deemed by the Commission to be at risk of not complying with the requirements of the SGP to consider in a timely manner the necessary additional budgetary measures to ensure compliance in 2018.

### Chart C

#### Euro area cyclically adjusted budget balance in the previous expansion and contraction



Source: European Commission.

Notes: See the note to Chart A for the definition of expansion and contraction. The mid-point refers to the year in the middle of the expansion and contraction period.

<sup>37</sup> See the box entitled “An assessment of the review of draft budgetary plans based on the 2018 exercise”, *Economic Bulletin*, Issue 8, ECB, 2017.

## 8 The European Commission's 2018 assessment of macroeconomic imbalances and progress on reforms

Prepared by Nico Zorell

**The European Commission's 2018 assessment of macroeconomic imbalances and progress on reforms provides confirmation that greater efforts are needed in many EU Member States in order to advance economic growth and resilience on a more sustainable basis.**

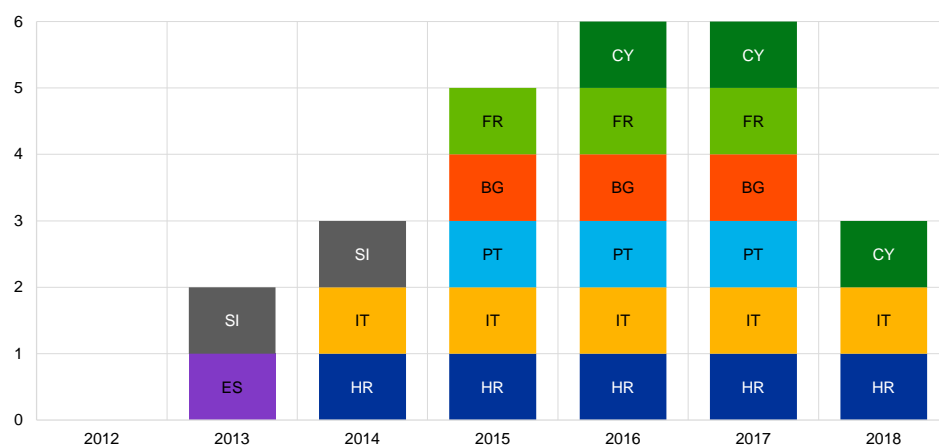
**The Commission's assessment, published on 7 March 2018, is an integral part of the European Semester and its macroeconomic imbalance procedure (MIP).**

The European Semester provides a framework for the coordination of economic and fiscal policies across the EU. Within this framework, the MIP aims to prevent the emergence of harmful macroeconomic imbalances in EU Member States and to correct them where they are assessed as excessive. Following a screening exercise in autumn each year on the basis of a standardised scoreboard, the European Commission conducts in-depth reviews (IDRs) of the selected countries. If imbalances are found to exist, the Member State concerned receives policy recommendations under the preventive arm of the MIP. For imbalances that are found to be excessive, the Commission may step up the procedure by initiating the excessive imbalance procedure (EIP) with a recommendation to the Council of the European Union. Under this corrective arm of the procedure, a corrective action plan must be provided by the Member State concerned and financial sanctions can be imposed.

**The Commission's 2018 assessment points to a gradual unwinding of macroeconomic imbalances across EU Member States.** The number of countries identified by the Commission as experiencing excessive imbalances has declined for the first time since the introduction of the MIP in 2011. Only three Member States (Croatia, Italy and Cyprus) now remain in this group (see Chart A). For the past three years Bulgaria, France and Portugal were also included; however, following improvements, they are now assessed by the Commission as experiencing imbalances (rather than excessive imbalances) (see Table A). The same classification remains in place in respect of Germany, Ireland, Spain, the Netherlands and Sweden, despite recent progress in reducing some of the imbalances in these countries. In the case of Slovenia, the Commission has concluded that the imbalances identified last year no longer exist. Overall, the Commission has found no evidence of macroeconomic imbalances in 16 Member States, namely Slovenia and those that were not selected for an IDR in the first stage of the MIP.

## Chart A

### EU Member States assessed as experiencing excessive imbalances



Source: European Commission.

Notes: The chart shows those countries assessed by the European Commission as experiencing "excessive imbalances" in the years indicated. A country subject to an economic adjustment programme enters the MIP automatically once the programme ends. In 2012 no country was assessed as having excessive imbalances.

## Table A

### The Commission's conclusions on the 2018 macroeconomic imbalance procedure

(1) No imbalances		(2) Imbalances	(3) Excessive imbalances	(4) Excessive imbalances and application of the corrective arm (EIP)
BE	MT	BG	HR	-
CZ	AT	DE	IT	
DK	PL	IE	CY	
EE	RO	ES		
LV	SK	FR		
LT	SI	NL		
LU	FI	PT		
HU	UK	SE		

Source: European Commission.

Notes: The four countries highlighted are those in respect of which the European Commission improved the MIP classification in 2018 (either from "excessive imbalances" to "imbalances" or from "imbalances" to "no imbalances"). Greece is currently not subject to the MIP, as it is under an economic adjustment programme.

**The recent improvement in macroeconomic imbalances has been partly cyclical, driven by the continued economic expansion in the EU.** The stronger growth momentum has provided direct and indirect support to the correction of imbalances. Directly, it has facilitated deleveraging by firms and households, as well as a decline in unemployment. Indirectly, it has helped to reduce stock imbalances, which are usually expressed in relation to national output. As a result, public, private and external indebtedness have continued to decline in the majority of EU Member States. Moreover, total (and in particular, youth) unemployment have continued to fall, facilitated in some countries by labour market reforms undertaken in previous years.

**Despite these improvements, the Commission has explicitly cautioned against the risks stemming from the prevailing high stock imbalances.** In particular,

public, private and external indebtedness remain well above pre-crisis levels in many Member States and are a source of vulnerability to adverse shocks going forward. This calls for continued close monitoring of such countries under the MIP, even where they are no longer assessed as experiencing excessive imbalances.

**Structural reforms are essential to enhance growth and resilience on a sustainable basis, yet over the past year the pace of reform implementation has remained rather limited in many EU Member States.** This follows from the Commission’s annual review of the implementation of the country-specific recommendations (CSRs). A CSR provides policy guidance tailored to an individual EU Member State, and covering a period of around 12 to 18 months, on how to enhance economic growth and resilience while maintaining sound public finances. The current set of CSRs was adopted by the Council of the European Union in July 2017. Similarly to last year, the Commission has concluded that the overwhelming majority – more than 90% – of reform recommendations have been followed by only “some” or “limited” progress in implementation, while just one (of almost 80) of the CSRs has been substantially implemented, and none has been fully implemented (see Table B). Despite their greater vulnerability, the six countries identified last year as having excessive imbalances did not, on average, achieve significantly higher implementation rates than the average EU Member State. This is also the case, on average, for the three countries whose MIP classifications improved from “excessive imbalances” to “imbalances” in the Commission’s 2018 assessment.

**Table B**  
The Commission’s assessment of implementation of the 2017 country-specific recommendations

	BE	BG	CZ	DK	DE	EE	IE	ES	FR	HR	IT	CY	LV	LT	LU	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	
CSR 1*	Not assessed	Some progress	Some progress	Limited progress	Limited progress	Some progress	Some progress	Limited progress	Limited progress	Limited progress	Some progress	Limited progress	Some progress	Some progress	Some progress	Not assessed	Some progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Not assessed
CSR 2	Some progress	Some progress	Some progress	Limited progress	Limited progress	Some progress	Some progress	Limited progress	Limited progress	Limited progress	Some progress	Limited progress	Some progress	Some progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress
CSR 3	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Substantial progress	Limited progress	Limited progress	Limited progress
CSR 4	Limited progress	Some progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress
CSR 5	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress	Limited progress

Source: European Commission.  
Notes: \* CSR 1 assessment excludes compliance with the Stability and Growth Pact which will be assessed by the European Commission in spring 2018.  
“Not assessed” applies to cases in which CSR 1 pertains mostly or exclusively to the Stability and Growth Pact. Greece is subject to an economic adjustment programme and has therefore not received any CSRs.

**Full and effective use of all instruments available under the MIP – including its corrective arm – could help reinvigorate the reform agenda given current favourable economic conditions.** Despite having identified excessive imbalances in three countries in its 2018 assessment, the Commission has not proposed the activation of the excessive imbalance procedure (i.e. the corrective arm of the MIP).



While the piecemeal implementation of the CSRs illustrates the difficulties of improving the implementation of reform using the preventive arm of the MIP, the corrective arm of the procedure offers a well-defined process ensuring greater traction for implementation of the most needed macro-critical reforms. This is particularly relevant for the most vulnerable Member States, in order to enhance their resilience and the functioning of the Economic and Monetary Union. Overall, the MIP has so far been more successful in identifying macroeconomic imbalances than in correcting them. Applying all available tools – including the activation of the corrective arm of the procedure for countries with excessive imbalances – could increase the procedure’s effectiveness. (Such application has also been explicitly called for by the five Presidents in their 2015 report<sup>38</sup> and, more recently, by the European Court of Auditors<sup>39</sup>.) Greater national ownership of the reform programmes submitted under the European Semester could also help increase the effectiveness of the MIP.

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<sup>38</sup> Juncker, J.-C. et al., *Completing Europe’s Economic and Monetary Union*, June 2015.

<sup>39</sup> European Court of Auditors, *Audit of the Macroeconomic Imbalance Procedure (MIP)*, Special Report No. 3, 2018.

# Articles

## 1 The real effects of credit constraints

Prepared by Miguel García-Posada

*This article reviews the existing literature on financial constraints and their effect on investment. It also provides new evidence on this issue using a large sample of firms from 12 European countries for the period 2014-17. The data come from the ECB and European Commission survey on the access to finance of enterprises (SAFE), which focuses specifically on small and medium-sized enterprises (SMEs). The available evidence suggests that credit constraints play a crucial role in the investment decisions of non-financial corporations.*

### 1 Introduction

**Under certain assumptions, a firm's financing structure does not influence its investment.** The Modigliani-Miller theorem<sup>40</sup>, which is the cornerstone of the corporate finance literature, states that, under certain conditions, a firm's capital structure is irrelevant to its value. This implies that, in perfect capital markets, a firm's financing decisions are independent from its investment decisions. In that case, internal and external funds are perfect substitutes, and firms' investment decisions are not affected by financial factors such as internal liquidity, debt leverage or dividend payments.

**In practice, however, several factors mean that external funds are generally more costly than internally generated cash flows.** Factors such as transaction costs, tax advantages, costs of financial distress, agency costs and asymmetric information cause the Modigliani-Miller theorem to break down.<sup>41</sup> In this context, internal and external funds are imperfect substitutes, which leads to the emergence of an external finance premium. Financial constraints may thus have important (negative) effects on real variables and, as a consequence, the availability of external finance may affect investment decisions.

**This article reviews the existing literature and provides new evidence on this issue.** Section 2 reviews the empirical evidence on the impact of financial constraints on corporate investment. Section 3 provides new evidence using the ECB and European Commission survey on the access to finance of enterprises

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<sup>40</sup> Modigliani, F. and Miller, M.H., "The Cost of Capital, Corporation Finance and the Theory of Investment," *American Economic Review*, Vol. 48, 1958, pp. 261-297.

<sup>41</sup> For a review of the theoretical research in this area see Schiantarelli, F., "Financial Constraints and Investment: Methodological Issues and International Evidence", *Oxford Review of Economic Policy*, Vol. 12, No 2, 1996, pp. 70-89.

(SAFE),<sup>42</sup> complemented by information from the euro area bank lending survey.<sup>43</sup> Section 4 concludes.

## 2 Literature review

**This section summarises micro-econometric evidence on the effects of credit constraints on the real economy.** It highlights the most noteworthy studies in the literature that follow a micro-econometric approach<sup>44</sup> to provide a context for the new evidence presented in Section 3.

### 2.1 Early research: investment-cash flow sensitivities and financial statement data

**Early research on financial constraints was based on firms' financial statement data and indirect measures of financial constraints.** In this literature, the standard approach was to use indirect measures of financial constraints such as dividend payout behaviour, association with business groups, size, age, ownership form and credit ratings to test whether the sensitivity of investment to cash flows was greater in types of firm that were more likely to be financially constrained.<sup>45</sup>

**The seminal work of Fazzari et al.<sup>46</sup> found that investment was more sensitive to cash flows in financially constrained firms.** According to the authors, low-dividend firms were more likely to be financially constrained because firms might pay low dividends, when they require investment finance that exceeds their internal cash flows, in order to retain all of the low-cost internal funds they can generate. The presence of financial constraints could be tested by analysing the sensitivity of investment to cash flows. The intuition is that, if the cost disadvantage of external finance is small (i.e. no financial constraints), firms can use external funds to smooth investment when internal finance fluctuates. By contrast, if the cost disadvantage is significant (i.e. financial constraints are relevant), firms may have no alternative low-cost source of finance, and their investment is likely to be driven by fluctuations in cash flows. In line with this hypothesis, the authors found that investment by low-dividend firms was more sensitive to fluctuations in cash flows than investment by high-dividend firms.

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<sup>42</sup> The regular reports on the SAFE survey can be found on the ECB's website.

<sup>43</sup> For more information about the banking lending survey see Köhler-Ulbrich, P., Hempell, H. and Scopel, S., "The euro area bank lending survey. Role, development and use in monetary policy preparation", *Occasional Paper Series*, No 179, ECB, 2016.

<sup>44</sup> There is also a large body of macro literature that studies the effects of financial friction on long-run growth and business cycles. For instance, Aghion et al. (Aghion, P., Angeletos, G., Banerjee, A. and Manova, K., "Volatility and growth: Credit constraints and the composition of investment", *Journal of Monetary Economics*, Vol. 57, No 3, 2010, pp. 246-265) show that, through their effect on the cyclical composition of investment, credit constraints can lead to both higher output volatility and lower mean growth.

<sup>45</sup> For a review of this literature see Schiantarelli, F., op. cit.

<sup>46</sup> Fazzari, S.M., Hubbard, R.G. and Petersen, B.C., "Financing Constraints and Corporate Investment", *Brookings Papers on Economic Activity*, Vol. 1988, No 1, 1988, pp. 141-206.

**A standard criticism of this approach is that cash flows may proxy for other, unobservable determinants of investment, such as investment opportunities.**

Cash flows may capture the current and expected profitability of investment: high cash flows signal that the firm has done well and is likely to continue doing well.<sup>47</sup> Thus, more liquid firms have better investment opportunities, and accordingly they tend to invest more. One way around this problem is to control for the expected profitability of investment when estimating investment-cash flow sensitivities. This can be done by using Tobin's average  $q$ <sup>48</sup> (the ratio of the market value of the firm to the replacement cost of its assets), as it contains forward-looking information on profitability. Theory predicts that, if financial constraints are unimportant, Tobin's  $q$  should be the only determinant of investment. However, Tobin's  $q$  is difficult to measure in practice and may well differ from the marginal  $q$ <sup>49</sup>, which is the relevant measure for firms' investment decisions, unless very stringent conditions are satisfied. Hence, when Tobin's  $q$  is not a good measure of investment opportunities, the significance of cash flows may simply reflect the fact that they contain information about future profitability.

**In addition, this strand of the literature has been challenged by Kaplan and Zingales,<sup>50</sup> who provide empirical evidence that a greater sensitivity of investment to cash flows is not a reliable measure of financing constraints.**

The authors undertake an in-depth analysis of the low-dividend firms that Fazzari et al. identify as financially constrained according to the investment-cash flow criterion. In particular, they examine managers' views on their firms' access to credit gleaned from comments on the firms' annual reports or "10-K" reports<sup>51</sup>, complemented by additional quantitative information. On this basis, they rank the extent to which the firms are likely to be financially constrained. Strikingly, firms classified as less financially constrained exhibit significantly greater investment-cash flow sensitivity than those classified as more financially constrained, which implies that investment-cash flow sensitivities do not always increase with the degree of financing constraints.

**Another study that highlights the limitations of these methodologies is by Farre-Mensa and Ljungqvist.<sup>52</sup>** The authors, using a large sample of US publicly-listed firms for the period between 1989 and 2011, find that firms typically classified

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<sup>47</sup> For instance, in Fazzari et al., op. cit., cash flows equal income after interest and taxes plus depreciation and amortisation, and it is divided by the capital stock. This variable is likely to be highly correlated with a return on assets ratio (net income over total assets).

<sup>48</sup> See Tobin, J., "A General Equilibrium Approach to Monetary Policy", *Journal of Money, Credit and Banking*, Vol. 1, No 1, 1969, pp. 15-29.

<sup>49</sup> Tobin's marginal  $q$  is the ratio of the market value of an additional unit of capital to its replacement cost.

<sup>50</sup> Kaplan, S. N. and Zingales, L., "Do Investment-Cash Flow Sensitivities Provide Useful Measures of Financing Constraints?", *Quarterly Journal of Economics*, Vol. 112, No 1, 1997, pp. 169-215.

<sup>51</sup> 10-K is an annual report required by the US Securities and Exchange Commission that gives a comprehensive summary of a company's financial performance.

<sup>52</sup> Farre-Mensa, J. and Ljungqvist, A., "Do Measures of Financial Constraints Measure Financial Constraints?", *Review of Financial Studies*, Vol. 29, No 2, 2016, pp. 272-308.

as constrained<sup>53</sup> do not actually behave as such. In particular, these firms have no difficulty raising debt when tax rates increase (as an increase in tax rates raises the value of tax shields) and they use the proceeds from equity issues to increase payouts to shareholders, which indicates that they do not face an inelastic supply of equity curve. According to the authors, traditional measures of credit constraints identify young and fast-growing firms that obtain financing primarily from the equity and loan markets, rather than capturing actual financial constraints.

## 2.2 Survey-based indicators of financial constraints and firm performance

**Given the limitations of previous studies based on investment-cash flow sensitivities and financial statement data, a new strand of the literature attempts to assess the impact of financial constraints on real variables using survey data.** The key idea is to obtain direct measures of financial constraints by asking firms about problems in their access to credit markets.

**Campello et al.**<sup>54</sup> **use a worldwide survey to assess the impact of the 2008 financial crisis on spending plans.** They do so with a sample of very large corporations from the United States, Europe and Asia surveyed in 2008. They find that constrained firms planned, on average, deeper cuts in technology expenditure, capital expenditure, marketing expenditure and employment. The inability to obtain external funds also caused many constrained firms to forgo attractive investment opportunities.

**Ferrando and Mulier**<sup>55</sup> **analyse the effect of being a discouraged borrower (i.e. a firm that needs external finance but does not apply for a bank loan because it fears that its application will be rejected) on firm investment and growth.** They do so by combining the answers to the SAFE survey with financial statement data for nine euro area countries for 2010-14. The discouraged borrowers in the survey tend to be riskier and lower quality firms than non-discouraged borrowers, as suggested by, among other things, their lower Altman Z-scores<sup>56</sup> and their low interest coverage ratios.<sup>57</sup> Using instrumental variables to take into account

<sup>53</sup> On the basis of not having a credit rating or paying low dividends, or on linear combinations of observable characteristics such as size, age or leverage as in the Kaplan-Zingales, Hadlock-Pierce and Whited-Wu indices. The actual Kaplan-Zingales index comes from Lamont, O., Polk, C., and Saa-Requejo, J., "Financial Constraints and Stock Returns", *Review of Financial Studies*, Vol. 14, No 2, 2001, pp. 529-554. The Hadlock-Pierce index comes from Hadlock, C. and Pierce, J., "New Evidence on Measuring Financial Constraints: Moving Beyond the KZ Index", *Review of Financial Studies*, Vol. 23, No 5, 2010, pp. 1909-1940. The Whited-Wu index comes from Whited, T. and Wu, G., "Financial Constraints Risk", *Review of Financial Studies*, Vol. 19, No 2, 2006, pp. 531-559.

<sup>54</sup> Campello, M., Graham, J.R and Harvey, C., "The real effects of financial constraints: Evidence from a financial crisis", *Journal of Financial Economics*, Vol. 97, No 3, 2010, pp. 470-487.

<sup>55</sup> Ferrando, A. and Mulier, K., "The real effects of credit constraints: evidence from discouraged borrowers in the euro area", *Working Paper Series*, No 1842, ECB, 2015.

<sup>56</sup> The Z-score is a linear combination of five common business ratios, weighted by coefficients. The formula is used to predict the probability that a firm will go into bankruptcy within two years. See Altman, E.I., "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy", *Journal of Finance*, Vol. 23, No 4, 1968, pp. 589-609.

<sup>57</sup> The interest coverage ratio is defined as earnings over interest payments, with earnings measured before interest, taxes, depreciation and amortisation (EBITDA).

the endogeneity between discouragement and investment (as discouraged borrowers are likely to have worse investment opportunities) the authors show that discouragement has large negative effects on investment, employment and asset growth. They argue that this negative impact is due to the lack of access to bank finance implied by discouragement.

**A different approach is taken by Buca and Vermeulen,<sup>58</sup> who examine the negative impact of bank credit tightening on aggregate investment.** They use information on banks' credit standards (i.e. loan approval criteria) from the euro area bank lending survey to construct tightening indices for six European countries<sup>59</sup> for the period 2004-09. Tighter credit standards are likely to lead to a higher proportion of credit-constrained firms, and may thus have effects on the real economy. In particular, the authors find that, following a tightening of bank credit, bank-dependent borrowers (i.e. firms with a high percentage of bank debt over total assets) reduced investment to a much larger extent than non-bank dependent borrowers. As tightening of bank credit standards was substantial in the last financial crisis, they argue that this phenomenon may explain a significant proportion of the drop in aggregate investment by non-financial corporations during that period.

**Nevertheless, a caveat of all these studies is the potential endogeneity of financial constraints.** The fact that the unobserved component of investment opportunities may be correlated with the indicator of credit constraints, and one can only control imperfectly for investment opportunities and investment demand, undermines a causal interpretation of the estimates. For instance, firms with weak balance sheets may have both low investment opportunities and a high probability of being financially constrained, so the relationship between these two variables may be endogenous.

### 2.3 The real effects of the sovereign debt crisis

**Finally, another strand of the literature studies the real effects of the sovereign debt crisis.** In particular, the euro area sovereign debt crisis in 2010-12 may have caused a credit crunch and have negatively affected firms' investment and job creation through credit rationing by banks in difficulties because of the sovereign-debt crisis, the so-called sovereign-bank nexus.

**Ferrando et al.<sup>60</sup> find that the euro area sovereign debt crisis caused a large reduction in credit access.** The authors, who use data from the SAFE survey on 11 countries for the period 2009-12, find that the euro area sovereign debt crisis caused a large supply-driven reduction in credit access because of the sovereign-bank nexus. In particular, after the sovereign debt crisis started, and controlling for

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<sup>58</sup> Buca, A. and Vermeulen, P., "Corporate investment and bank-dependent borrowers during the recent financial crisis," *Journal of Banking & Finance*, Vol. 78, May 2017, pp. 164-180.

<sup>59</sup> Belgium, Germany, Spain, France, Italy and Portugal.

<sup>60</sup> Ferrando, A., Popov, A. and Udell, G.F., "Sovereign stress and SMEs' access to finance: Evidence from the ECB's SAFE survey," *Journal of Banking & Finance*, Vol. 81, Issue C, 2017, pp. 65-80.

borrower quality, firms in stressed countries<sup>61</sup> became more likely to be denied credit, to be credit-rationed and to face higher loan rates.

**In addition, Acharya et al.<sup>62</sup> find that the European debt crisis had strong negative effects on the real economy through the bank lending channel.**

According to this study of the European syndicated loan market for the period 2006--12, the credit crunch that followed the European debt crisis had strong negative effects on the real economy, as the contraction in lending by banks affected by the crisis depressed the investment, job creation and sales growth of firms associated with these banks. The authors' estimates suggest that the credit crunch explained between one-fifth and half of the overall negative real effects suffered by European borrowing firms during the crisis. This was primarily associated with banks from distressed countries facing losses on their domestic sovereign debt holdings and the resulting incentives for weakly-capitalised banks from those countries to engage in risk-shifting behaviour by buying even more domestic sovereign bonds, which crowded out corporate lending.

### 3 The impact of financial constraints on investment: new survey-based evidence

**This section provides new evidence on the relationship between a firm's financial constraints and investment.<sup>63</sup>** The findings suggest that financial constraints have a strong negative impact on corporate investment.

#### 3.1 Sample and descriptive statistics

**The analysis is based on data from the SAFE survey covering 12 European countries for 2014-17.** The sample contains only non-financial firms and excludes firms in agriculture and public administration. Most of the firms are interviewed only once, but there is a small rotating panel of enterprises that are surveyed in successive rounds.<sup>64</sup> The sample is limited to rounds 11 to 16 of the survey (from April-September 2014 to October 2016-March 2017) because of the availability of some key variables. The sample has 7,506 observations corresponding to 4,863 firms from 12 European countries.<sup>65</sup>

**The key variable is a measure of overall credit constraints.** Credit constraints are assessed in bank financing (bank loans and credit lines), trade credit and other

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<sup>61</sup> Ireland, Greece, Spain, Italy and Portugal.

<sup>62</sup> Acharya, V., Eisert, T., Eufinger, C. and Hirsch, C., "Real Effects of the Sovereign Debt Crisis in Europe: Evidence from Syndicated Loans", *CEPR Discussion Paper*, No DP10108, 2014.

<sup>63</sup> A complementary analysis of the effect of financial constraints on investment using SAFE data can be found in the box entitled "Recent business investment developments from the perspective of firm-level survey data", *Economic Bulletin*, Issue 7, ECB, 2016.

<sup>64</sup> See the report "[Survey on the access to finance of enterprises. Methodological information on the survey and user guide for the anonymised micro dataset](#)".

<sup>65</sup> Belgium, Germany, Ireland, Greece, Spain, France, Italy, the Netherlands, Austria, Portugal, Slovakia and Finland.

financing (equity and debt securities, leasing, factoring, intercompany loans, etc.) A firm is considered to be financially constrained if it is constrained in any financing source. In particular, the credit constraint variable equals 1 if, for some type of financing, any of the following circumstances applies: a) a firm's application for external financing was rejected; b) a firm received only a limited part (i.e. less than 75%) of the financing it applied for (i.e. quantity rationing); c) a firm refused the lender's offer of external financing because the borrowing costs were too high (i.e. price rationing); d) a firm did not apply for external financing because it feared its application would be rejected (i.e. discouraged borrower).<sup>66</sup> The variable equals 0 (i.e. unconstrained) if the firm successfully applied for external financing. Firms that did not apply for external financing are excluded from the sample. According to this indicator, 24% of the sample firms are constrained in some source of financing.<sup>67</sup>

**The distribution of constrained firms differs across firm categories, highlighting the role of information asymmetries and credit risk.** Charts 1-3 show the percentage of constrained firms across several categories. In line with previous literature, there is a negative relationship between the probability of experiencing financial constraints and size (Chart 1a).<sup>68</sup> Also in line with previous studies,<sup>69</sup> the proportion of mature firms (ten or more years) that are constrained is much lower than that of relatively young firms (less than five years), although the proportion of very young firms that are constrained is also slightly lower (Chart 1b). Consistently with the literature that suggests that belonging to a business group relaxes financial constraints,<sup>70</sup> the proportion of constrained firms among subsidiaries or branches is significantly lower than that among autonomous enterprises (Chart 2a). Ownership structure also matters, as sole traders and family businesses are more likely to be constrained than publicly listed firms (Chart 2b). There is also a significant proportion of constrained firms among those owned by venture capital enterprises, as venture capital tends to fund new and risky projects for which conventional finance is often not available. Exporting firms are less likely to be financially constrained than non-exporting firms, because the former tend to be more competitive and productive (Chart 3a).<sup>71</sup> Finally, the proportion of credit-

<sup>66</sup> Similar indicators have been constructed in previous literature but focused on bank credit only. See, for instance, Ferrando, A., Popov, A. and Udell, G.F., "Do SMEs Benefit from Unconventional Monetary Policy and How? Micro-evidence from the Eurozone", *Journal of Money, Credit and Banking*, 2018, forthcoming; Ferrando, A. and Mulier, K., "Firms' Financing Constraints: Do Perceptions Match the Actual Situation?", *Economic and Social Review*, Vol. 46, No 1, 2015, pp. 87-117.

<sup>67</sup> This figure is much higher than the figures presented in ECB's reports on the SAFE survey. There are two reasons for the discrepancy. First, the indicator in the reports focuses on bank loans only. Second, it uses as a denominator all SMEs for which bank loans are relevant, while the indicator in this article uses as a denominator only the firms that applied for external financing.

<sup>68</sup> See Beck, T., Demirgüç-Kunt, A. and Maksimovic, V., "Financial and Legal Constraints to Growth: Does Firm Size Matter?", *Journal of Finance*, Vol. 60, No 1, pp. 137-177; Beck, T., Demirgüç-Kunt, A., Laeven, L. and Maksimovic, V., "The determinants of financing obstacles", *Journal of International Money and Finance*, Vol. 25, No 6, 2006, pp. 932-952; Artola, C. and Genre, V., "Euro Area SMEs under Financial Constraints: Belief or Reality?", *CESifo Working Paper*, No 3650, 2011.

<sup>69</sup> Ferrando, A. and Griesshaber, N., "Financing obstacles among euro area firms: Who suffers the most?", *Working Paper Series*, No 1293, ECB, 2011. Ferrando, A. and Mulier, K., "Firms' Financing Constraints: Do Perceptions Match the Actual Situation?", op. cit..

<sup>70</sup> See, for instance, Hoshi, T., Kashyap, A. and Scharfstein, D., "Corporate Structure, Liquidity, and Investment: Evidence from Japanese Industrial Groups", *Quarterly Journal of Economics*, Vol. 106, No 1, 1991, pp. 33-60.

<sup>71</sup> Correa-López, M. and Doménech, R., "The Internationalisation of Spanish Firms", *BBVA Research Working Papers*, No 12/30, 2012.

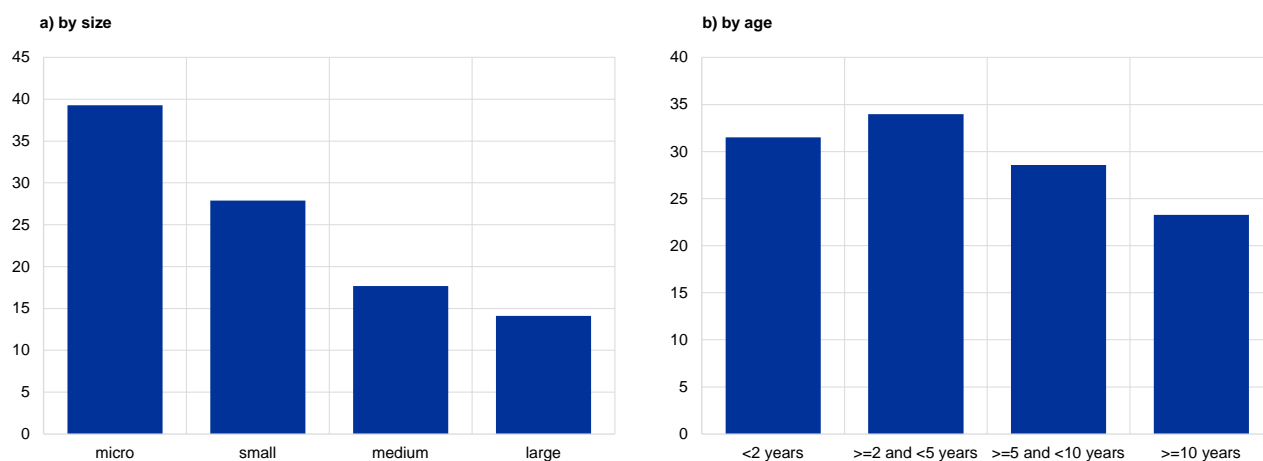


constrained firms is higher in countries vulnerable to economic and financial shocks than in less vulnerable countries<sup>72</sup> (Chart 3b).

## Chart 1

### Percentage of constrained firms by size and by age

(weighted percentages)



Source: ECB and European Commission survey on the access to finance of enterprises.

Notes. A firm is constrained if any of the following circumstances apply: a) its application for external financing was rejected; b) it received only a limited part (i.e. less than 75%) of the financing it applied for; c) it refused the lender's offer of external financing because the borrowing costs were too high; d) it did not apply for external financing because it feared its application would be rejected. The following financing instruments are considered: bank loans, credit lines, trade credit, other financing (equity and debt securities, leasing, factoring, intercompany loans, etc.)

Observations are weighted using sampling weights. The weights restore the proportions of the economic weight (in terms of number of employees) of each size class, economic activity and country. The number of observations is 7,506.

Countries: Belgium, Germany, Ireland, Greece, Spain, France, Italy, the Netherlands, Austria, Portugal, Slovakia and Finland.

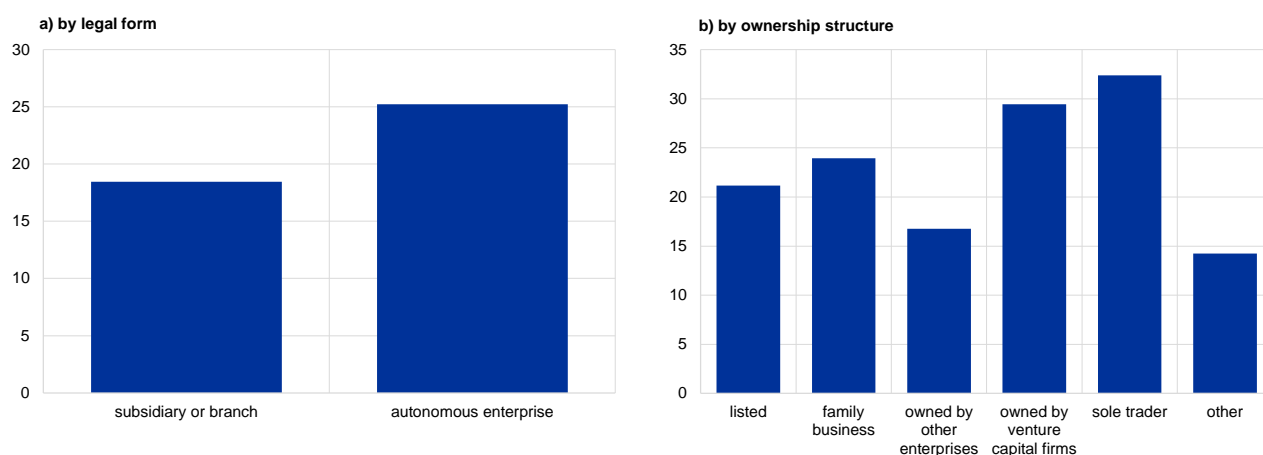
Period: rounds 11 to 16 of the SAFE survey (from April-September 2014 to October 2016-March 2017).

Size classes based on number of employees are as follows. micro: less than 10, small: between 10 and 49, medium: between 50 and 249, large: 250 or more.

## Chart 2

### Percentage of constrained firms by legal form and by ownership structure

(weighted percentages)



Source: ECB and European Commission survey on the access to finance of enterprises.

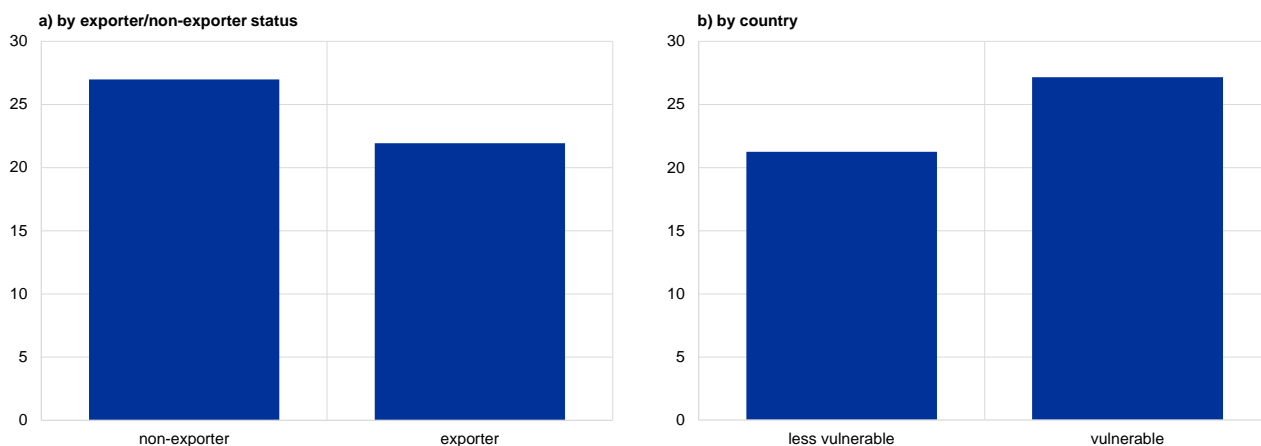
Notes: See Chart 1.

<sup>72</sup> "Vulnerable countries" refers to Ireland, Greece, Spain, Italy, Portugal and Slovakia, "less vulnerable countries" refers to the remaining countries in the sample.

### Chart 3

#### Percentage of constrained firms by exporter/non-exporter status and by country

(weighted percentages)



Source: ECB and European Commission survey on the access to finance of enterprises.

Notes: See Chart 1. "Vulnerable countries" refers to Ireland, Greece, Spain, Italy, Portugal and Slovakia, "less vulnerable countries" refers to the remaining countries in the sample.

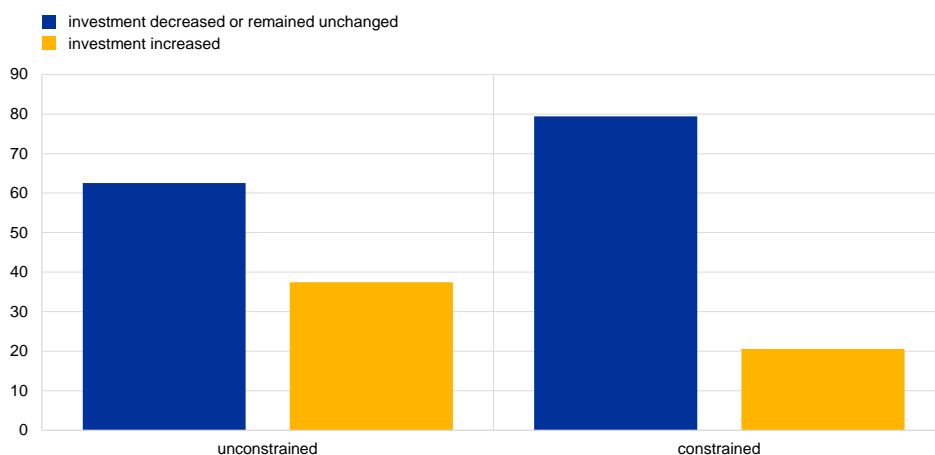
#### Descriptive evidence suggests a negative relationship between financial constraints and corporate investment.

In the survey firms are asked whether their investment has decreased, remained unchanged or increased over the past six months. To investigate a possible link between financial constraints and investment, Chart 4 shows the distribution of investment for constrained and unconstrained firms. The percentage of firms reporting that investment decreased or remained unchanged is substantially larger (about 15 percentage points) in the group of financially constrained firms.<sup>73</sup>

### Chart 4

#### Investment and credit constraints

(weighted percentages)



Source: ECB and European Commission survey on the access to finance of enterprises.

Notes: See Chart 1.

<sup>73</sup> The difference is statistically significant at 1%.

## 3.2 Econometric analysis

**A more formal test of the effects of credit constraints on investment can be carried out through regression analysis.** The analysis uses linear probability models. The dependent variable is *investment*, a dummy variable that equals 1 if investment has increased and 0 if it has decreased or remained unchanged. This variable is regressed on the credit constraint indicator, a large set of firm-level and country-level controls and country and time-fixed effects.

**The key identification challenge is omitted variable bias.** Firms with poor investment opportunities tend to invest less and are likely to have a higher probability of being credit-constrained. Hence, the coefficient on the credit constraint indicator may be affected by endogeneity.

**To tackle this problem, the analysis follows two approaches, one that uses proxies for investment opportunities and another that uses instrumental variable methods.** The first approach relies on the use of ordinary least squares (OLS) and a large set of covariates to control for firms' investment opportunities. The main measure of investment opportunities is an indicator for changes in the enterprise-specific outlook, as in Ferrando and Mulier.<sup>74</sup> In particular, the firm is asked to assess the evolution of its own outlook, with respect to sales and profitability or business plan, over the past six months. The analysis also includes an indicator for changes in a firm's turnover as a proxy for growth opportunities, as in Gomes.<sup>75</sup> Regarding the remaining firm-level controls, size and age, together with the firm's sector of activity, are traditional determinants of investment opportunities (see Petersen and Rajan<sup>76</sup>).<sup>77</sup>

**Nevertheless, as one cannot perfectly control for firms' investment opportunities, instrumental variables are also used.** The instrumental variables approach is aimed at removing any remaining correlation of the error term in the regression with the credit constraint indicator. The proposed instruments, *adjusted credit standards*, are two variables that measure the level of (adjusted) credit standards in each country, as applied to large firms and SMEs respectively. The variables, which come from the euro area bank lending survey, measure the supply-only component of banks' credit standards (i.e. banks' loan approval criteria), as influenced by factors such as their cost of funds, competitive pressures and risk tolerance.<sup>78</sup> Adjusted credit standards should be uncorrelated with demand factors such as the macroeconomic and industry-specific outlook, borrowers' creditworthiness and risks related to the collateral demanded. However, to rule out the possibility that

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<sup>74</sup> Ferrando, A. and Mulier, K., "The real effects of credit constraints: evidence from discouraged borrowers in the euro area", *op. cit.*

<sup>75</sup> Gomes, J.F., "Financing Investment", *American Economic Review*, Vol. 91, No 5, 2001, pp. 1263-1285.

<sup>76</sup> Petersen, M.A. and Rajan, R.G., "The Benefits of Lending Relationships: Evidence from Small Business Data", *Journal of Finance*, Vol. 49, No 1, 1994, pp. 3-37.

<sup>77</sup> Other firm-level controls are also included. See notes to Table 1.

<sup>78</sup> To construct these two variables, credit standards are regressed on the demand factors "general economic situation", "industry or firm-specific situation/borrower's creditworthiness" and "risk related to the collateral demanded". The residuals of those regressions are the adjusted credit standards variables. For further details on the construction of the variables, see García-Posada, M., "Credit constraints, firm investment and growth: evidence from survey data," *Working Paper Series*, ECB, forthcoming.

the instrument is just capturing the economic cycle and in turn the economy-wide investment opportunities, macroeconomic controls have been included: real GDP, the consumer confidence indicator and the ten-year government bond yield.

**The results suggest that financial constraints have a large effect on investment.**

Table 1 presents the results of linear probability models estimated by OLS and two-stage least squares (2SLS), in which the dependent variable is *investment*.<sup>79</sup> Column 1, estimated by OLS, shows a negative and strong correlation between the endogenous regressor, *constrained*, and the dependent variable *investment*. However, to establish a causal relationship one needs to make use of the instrumental variables. First, a single instrumental variable, the adjusted credit standards in loans to SMEs, is used (column 2). According to these estimates, the presence of credit constraints reduces the probability of increasing investment by 67 percentage points, but the effect is estimated imprecisely and is only statistically significant at 10%. To increase the precision of the estimates, a second instrumental variable is used, namely the adjusted credit standards in loans to large firms.<sup>80</sup> The result, displayed in column 3, is a very strong and precise effect: credit constraints reduce the probability of an increase in investment by 92 percentage points, and the coefficient is significant at 5%.<sup>81</sup>

**Table 1**  
Impact of credit constraints on investment

	1	2	3
<b>Constrained</b>	-0.096*** (0.019)	-0.668* (0.387)	-0.917** (0.360)
<b>Estimator</b>	OLS	2SLS	2SLS
<b>Instruments</b>		credit standards SME	credit standards SME credit standards large
<b>F-test (first stage)</b>		11.711	11.510

Sources: ECB and European Commission survey on the access to finance of enterprises and ECB calculations.  
Notes: The dependent variable is *investment*, a dummy that equals 1 if investment has increased and 0 if it has decreased or remained unchanged.  
*Constrained* is a dummy that equals 1 if the firm is credit-constrained and 0 otherwise.  
The instrumental variables are adjusted credit standards in loans to SMEs and adjusted credit standards in loans to large firms.  
All specifications include country dummies, time dummies, macro controls, firm controls and other firm controls.  
Macro controls are detrended real GDP, a consumer confidence indicator and the ten-year government bond yield.  
Firm controls are dummies for sector, size (in terms of employment and turnover), age, legal form, ownership structure and exporter/non-exporter status.  
Other firm controls are dummies for increase/decrease in turnover, profits, labour costs, other costs, the debt-to-assets ratio and interest expenses and dummies for improvement/deterioration in the enterprise-specific outlook, enterprise's own capital and enterprise's credit history.  
All time-varying controls are lagged once (t-1).  
Cluster-robust standard errors in parentheses. Cluster level: country-wave. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1  
F-test (first stage) is the Kleibergen-Paap Wald rk F statistic.  
OLS is ordinary least squares. 2SLS is two-stage least squares. Estimations are weighted using sampling weights. The weights restore the proportions of the economic weight (in terms of number of employees) of each size class, economic activity and country.  
The number of observations is 7,506.  
Countries: Belgium, Germany, Ireland, Greece, Spain, France, Italy, the Netherlands, Austria, Portugal, Slovakia and Finland.  
Period: rounds 11 to 16 of the SAFE survey (from April-September 2014 to October 2016-March 2017).

<sup>79</sup> All time-varying controls are lagged one period, while the endogenous regressor, *constrained*, and the adjusted credit standards instruments are included contemporaneously.

<sup>80</sup> Notice also that the instruments do not seem to be weak, as the first-stage F-statistic is above 10, the reference value suggested by the literature. The specification also passes the Sargan-Hansen J test (p-value = 0.291), i.e. we cannot reject the null of validity of the over-identifying restrictions.

<sup>81</sup> This average effect may hide important heterogeneity, as the impact of credit constraints may be very strong for some types of firm and weak or inexistent for other types. In particular, using the same sample, García-Posada, M., op. cit., finds that most of the causal impact of credit constraints on firm investment is driven by old SMEs.

**The analysis abstracts from other potentially relevant channels such as the extensive margin.** The results are conservative measures of the total impact of credit constraints in the real economy, as the analysis ignores the extensive margin, i.e. businesses that shut down because of a lack of credit and firms that do not enter the market because they do not obtain financing to undertake their investment projects.

## 4 Conclusions

**It is not clear a priori that credit constraints should affect corporate investment.** In frictionless perfect capital markets, the Modigliani-Miller theorem implies that a firm's financing decisions are independent from its investment decisions because internal and external funds are perfect substitutes. In practice, however, several factors mean that they are imperfect substitutes, so financial constraints may have important effects on corporate investment. This article has reviewed the existing literature and provided new evidence based on a large sample of European firms.

**The available evidence suggests that financial constraints have important effects on the investment decisions of non-financial corporations, highlighting the important role of monetary policy in alleviating them.** In the face of the recent financial crisis, central banks around the globe took unprecedented measures to repair the transmission mechanism of monetary policy and thereby reduced the financial constraints faced by households and firms.<sup>82</sup> These actions, in turn, may have spurred investment through the credit channel and their effect on the external finance premium paid by firms. Nevertheless, conclusions on the macroeconomic implications of the above studies, which are based on micro-econometric evidence, should be drawn with caution, as the studies rely on partial equilibrium analyses and often use qualitative survey-based data.

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<sup>82</sup> The proportion of financially constrained firms in the euro area has declined since 2012. See the box entitled "Recent business investment developments from the perspective of firm-level survey data", *Economic Bulletin*, Issue 7, ECB, 2016.

## 2 The economic impact of population ageing and pension reforms

Prepared by Carolin Nerlich and Joachim Schroth

*This article examines the macroeconomic and fiscal implications of population ageing in the euro area and looks at how pension reforms can help to address these challenges. According to Eurostat's latest projections, population ageing is set to continue and even intensify in the euro area over the next few decades. This ongoing process, which stems from increases in life expectancy and low fertility rates, is widely expected to lead to a decline in the labour supply and productivity losses, as well as behavioural changes, and is likely to have an adverse effect on potential growth. Moreover, by causing increases in precautionary savings, ageing can be expected to have a dampening impact on interest rates over an extended period of time. Population ageing also entails changes in relative prices, mainly owing to shifts in demand, with demand for services rising. Furthermore, euro area countries are also projected to experience further upward pressure on public spending on pensions, health care and long-term care as their populations age.*

*Although many euro area countries implemented pension reforms following the sovereign debt crisis, further reforms appear to be necessary in order to ensure fiscal sustainability in the long run. In this respect, measures that increase the retirement age can be expected to dampen the adverse macroeconomic effects of ageing, as they will have a favourable impact on the labour supply and domestic consumption. In contrast, increasing the contribution rate or reducing the benefit ratio could have less favourable macroeconomic implications.*

### 1 Introduction

#### **Population ageing in the euro area poses a number of economic challenges.**

This ongoing process is widely expected to exert downward pressure on potential growth, the labour supply and the equilibrium interest rate. At the same time, ageing economies are expected to face higher age-related fiscal costs, which could pose risks to fiscal sustainability. Since consumption patterns are likely to change as populations age, this could also affect relative prices – which could, in turn, have implications for the transmission of monetary policy. The combination of all of these various effects adds to the challenges for monetary policy.

#### **This article analyses a number of important macroeconomic implications of population ageing and looks at how pension reforms could help to cushion that impact.**

It starts by looking at Eurostat's latest demographic projections and their main drivers, before going on to discuss the macroeconomic implications of ageing for potential growth, looking specifically at the labour supply, capital formation and total factor productivity. The adverse impact on growth is also examined using a highly stylised model framework. The article also discusses the effect on fiscal balances and debt sustainability, while the impact on relative prices via changes in consumption patterns is discussed in a dedicated box. The final section looks at the

role of pension reforms and their macroeconomic effects and includes a box featuring model simulations. The implications for monetary policy, particularly via changes to the equilibrium real interest rate, are also discussed in a separate box.

## 2 Demographic developments in the euro area

**Euro area countries are facing significant demographic challenges, which are expected to have major economic implications.** The total population of the euro area is projected to rise from 340 million in 2016 to around 352 million in 2040, before falling to 345 million in 2070, according to Eurostat's 2015 population projections.<sup>83</sup> In addition, the age structure of the euro area's population is also set to change, with population ageing expected to continue and intensify further. Those developments will be driven mainly by low birth rates, as well as further increases in life expectancy, while net migration flows will, on average, only partially mitigate the impact of ageing populations. There will also be major cohort effects, with the whole of the "baby boomer generation" (i.e. the significant numbers of people who were born in the 1950s and 1960s) entering retirement over the next 20 years. It should be noted, however, that population ageing is not restricted to the euro area. Indeed, it is a worldwide phenomenon affecting advanced economies (and some emerging market economies) around the globe. Population ageing is most advanced in Japan.<sup>84</sup>

**Population ageing is being driven by a number of demographic trends.** The average fertility rate in the euro area currently stands at 1.6, which is significantly below the natural replacement level (i.e. the level that is thought to be necessary in order to keep the total population constant), which is around 2.1. Although Eurostat expects birth rates to increase slightly, they are forecast to remain well below the replacement level on average. Consequently, young people are set to account for a smaller percentage of the total population in the future (see Chart 1). Life expectancy is expected to continue rising, albeit more slowly than in the last few decades.<sup>85</sup> By 2070, remaining life expectancy at the age of 65 will average 23.6 years for men and 26.9 years for women – i.e. around 5 years more than today. Increases in life expectancy, combined with cohort effects due to the ageing of the baby boomer generation, will contribute to a strong increase in the size of the old-age cohort (i.e. the number of people aged 65 or over), as shown in Chart 1. The size of that old-age cohort is expected to peak in absolute terms in around 2050. At the level of the euro area as a whole, net migration flows are projected to only partially offset the decline in the working-age population. Their impact is expected to diminish further

<sup>83</sup> See [Eurostat's 2015 population projections](#). Eurostat's projections for the euro area are comparable to the latest UN population projections, although the UN's forecasts are slightly more adverse in terms of the degree of population ageing.

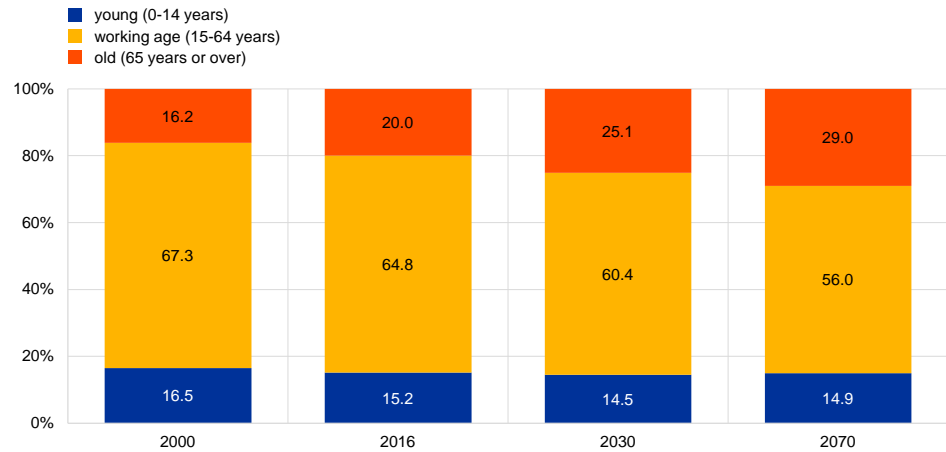
<sup>84</sup> See OECD, *Pensions at a Glance 2017*, 2017. In the case of Japan, the fiscal adjustment that is needed to stabilise government debt is estimated at 30-40% of total consumption. See also Hansen, G. and Imrohoroglu, S., "Fiscal reform and government debt in Japan: A neoclassical perspective", *Review of Economic Dynamics*, Vol. 21, 2016.

<sup>85</sup> For more detailed information on these demographic projections, see European Commission, "The 2018 Ageing Report – Underlying Assumptions & Projection Methodologies", Institutional Paper 65, November 2017.

over time, reflecting a decline in net migration relative to the total population, as well as the ageing of current migrants.

**Chart 1**  
Age cohorts in the euro area

(as a percentage of the total population)



Sources: Eurostat and ECB calculations.

**The euro area's old-age dependency ratio, which is defined as the number of people aged 65 or over as a percentage of the working-age population (i.e. people aged 15 to 64), is projected to be significantly higher by 2070.** On the basis of Eurostat's 2015 projections, the average old-age dependency ratio in the euro area is expected to increase strongly, rising from slightly above 30% in 2016 to around 52% by 2070 (see Chart 2). An increase in this ratio means a decline in the number of workers that are potentially available to take care of each pensioner, in the absence of any changes to the statutory retirement age.<sup>86</sup> This will entail a significant fiscal burden for the countries concerned in terms of their public pension systems.

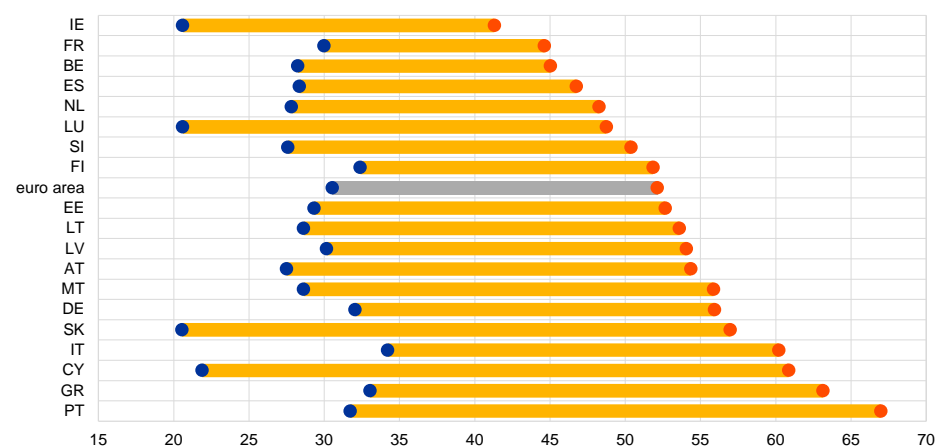
<sup>86</sup> The old-age dependency ratio that is used in this article relates to demographic dependency. This is different from the concept of economic dependency, which also takes account of other factors, such as the employment of older workers and differences in income patterns across age cohorts. When interpreting this old-age dependency ratio, it is important to bear in mind that a country's effective retirement age may be higher or lower than 65.



**Chart 2**

**Old-age dependency ratios in 2016 and 2070**

(percentages)



Sources: Eurostat and ECB calculations.

Note: This chart shows old-age dependency ratios – defined as the number of people aged 65 or over as a percentage of the working-age population (i.e. people aged 15 to 64) – for 2016 (blue dots) and 2070 (orange dots).

**While all euro area countries will experience population ageing, the size of that demographic challenge will vary considerably across countries.** The countries

with the highest old-age dependency ratios are currently Germany, Greece, Italy, Portugal and Finland (see Chart 2). Old-age dependency ratios are projected to increase by more than 35 percentage points by 2070 in Cyprus, Portugal and Slovakia, with Portugal ending up with a ratio of 67% – the highest in the euro area. Ratios of 60% or more are also projected for Greece, Italy and Cyprus. In contrast, Ireland is forecast to have the lowest ratio in the euro area by 2070, while Belgium, Spain and France are projected to experience the smallest increases.

**The projected drivers of population ageing also differ across countries.** The question of whether – and to what extent – ageing is driven by low fertility rates and/or increases in life expectancy has important consequences for the dynamics of population ageing and its economic and fiscal implications. According to Eurostat, life expectancy is forecast to increase in all euro area countries. However, the expected increases tend to be larger in those countries where life expectancy is currently lower, with the largest increases expected in Latvia and Slovakia. Moreover, Eurostat expects the fertility rate to improve slightly in all countries except France (which will, however, continue to have the highest rate in the euro area). Projections regarding net migration show a high degree of cross-country heterogeneity. For a few countries, those projections even show net migration outflows, which can be expected to further amplify the ageing problem.

**That being said, caution is required when assessing long-term demographic trends.** Population projections are strongly dependent on the underlying assumptions regarding fertility rates, life expectancy and migration flows. While all three components are surrounded by a certain degree of uncertainty, the uncertainty relating to migration flows is by far the highest. Consequently, population projections

have historically been subject to large forecasting errors and frequent revision.<sup>87</sup> Methodological changes have also contributed to the revision of such forecasts. In order to at least partly address the problem of uncertainty, population projections are often complemented by sensitivity analysis.<sup>88</sup>

### 3 The economic impact of ageing

#### 3.1 Implications for potential growth

**Population ageing stemming from increases in life expectancy and low fertility rates has the potential to exert downward pressure on all components of potential growth.** However, behavioural changes and public choices in relation to ageing could serve to counteract those effects to some extent.

**Ageing can be expected to reduce the labour supply over time, since fewer young workers will be entering the labour force and older workers will tend to have lower participation rates.** Low fertility rates reduce the size of younger cohorts, which can ultimately be expected to reduce the labour supply and GDP per capita.<sup>89</sup> Having fewer dependent children initially leads, in relative terms, to an increase in the working-age population as a percentage of the total population. However, once those smaller cohorts reach working age, there will be a downward impact on the working-age population, both in absolute terms and as a percentage of the total population. An increase in life expectancy will lead to larger numbers of people reaching retirement age, which will increase the old-age dependency ratio.<sup>90</sup> Ageing-related changes in the population structure also affect the labour component of potential output via differences in age-specific participation rates. Indeed, in 2016 the participation rate for “prime-agers” in the euro area (defined as people between the ages of 25 and 54) stood at around 85%, significantly higher than the equivalent rates for older people between the ages of 55 and 64 (around 60%) and younger people under the age of 25 (around 40%). The impact that these factors have on the aggregate labour supply is expected to vary over time and be strongly dependent on the population structure. In the euro area, large cohorts of prime-agers are set to become older people over the next ten years and reduce their participation, while small cohorts of young people will become prime-agers (see Chart 3). Consequently,

<sup>87</sup> See Maddaloni, A. et al., “Macroeconomic implications of demographic developments in the euro area”, *Occasional Paper Series*, No 51, ECB, August 2006, as well as Clements, B. et al., “The fiscal consequences of shrinking populations”, *Staff Discussion Notes*, No 15/21, IMF, October 2015.

<sup>88</sup> See, for example, European Commission, “[The 2018 Ageing Report – Underlying Assumptions & Projection Methodologies](#)”, op. cit., which includes sensitivity analysis for all three components (fertility rates, life expectancy and migration flows) when projecting long-term potential growth.

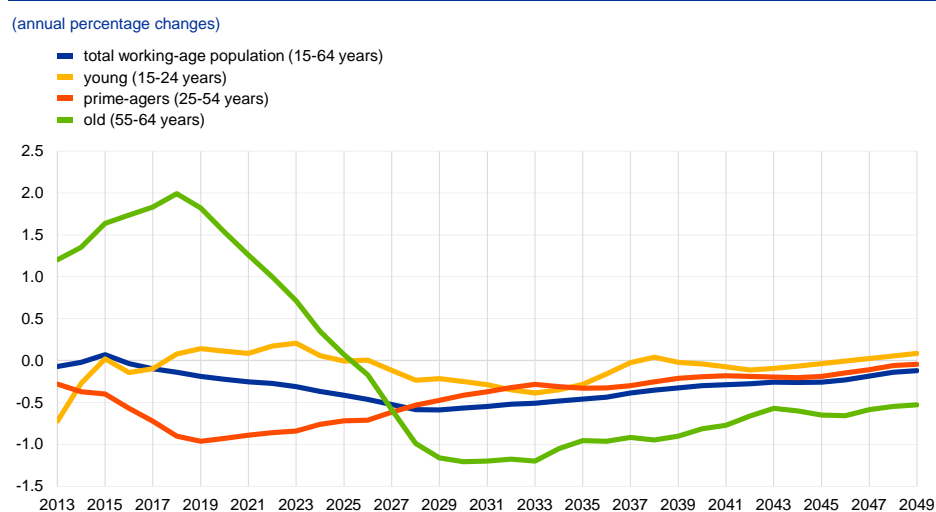
<sup>89</sup> In contrast, the strength of young cohorts entering the labour market was one of the factors that contributed to the “growth miracle” in emerging Asia over the period 1965-1990. See Bloom, D. and Williamson, J., “Demographic Transitions and Economic Miracles in Emerging Asia”, *The World Bank Economic Review*, Vol. 12, Issue 3, September 1998.

<sup>90</sup> Strictly speaking, declining mortality rates for working-age cohorts have, ceteris paribus, an upward impact on the working-age population. However, in the euro area, mortality rates for working-age cohorts are already at very low levels, so positive effects on the working-age population will be very limited going forward.

prime-agers will account for a significantly smaller percentage of the working-age population, while older people will make up a larger percentage. In the absence of changes to age-specific participation rates, this will exert downward pressure on the labour supply. This is also broadly in line with the results set out in Box 1, which uses a stylised model framework to show the impact that population ageing has on various macroeconomic variables (such as employment). Net migration, which has in the past consisted mainly of people of working age, can be expected to mitigate that downward impact to some extent.

### Chart 3

#### Projected changes to working-age population by age group



Sources: European Commission and ECB calculations.

### Box 1

#### Stylised macroeconomic implications of ageing based on an overlapping generations model

Prepared by João Domingues Semeano and Carolin Nerlich

**This box illustrates a number of stylised macroeconomic implications of ageing on the basis of the overlapping generations (OLG) model developed by Baksa and Munkacsi, which has been parameterised for the euro area.**<sup>91</sup> This model explicitly takes account of the compositional effects of ageing – i.e. changes in the population structure owing to declining fertility rates and increases in life expectancy, which have important implications for the labour supply, private consumption and public debt. The advantage of this model is that it allows an evaluation of the impact that population ageing will have on a large set of macroeconomic variables in a general equilibrium framework, as well as an assessment of the implications of various kinds of pension reform (which will be discussed in Section 4).

<sup>91</sup> OLG models are well suited to capturing demographic developments and interaction between generations. For a detailed description of Baksa and Munkacsi's model, see Baksa, D. and Munkacsi, Z., "A detailed description of OGRE, the OLG model", *Working Paper Series*, No 31/2016, Lietuvos bankas, 2016. "OGRE" stands for "overlapping generations and retirement". That original model took account of informality, which is not included in this analysis in the interests of simplicity. The data used in this box cover the period 2009-16.

**The main characteristics of Baksa and Munkacsi’s model can be summarised as follows:** The model is a dynamic general equilibrium OLG model with an infinite time horizon. It is a closed-economy model with price and labour market rigidities, and monetary policy is characterised by a Taylor rule.

**Demography and nature of the ageing shock:** The total population in each period is the sum of the working-age cohort (i.e. people between the age of 20 and the retirement age) and the pensioner cohort (i.e. people who have reached the retirement age).<sup>92</sup> The total population changes over time, with workers being born and pensioners passing away on the basis of certain probabilities, which follow a predetermined path. Ageing is introduced in the form of a permanent 10 percentage point increase in the old-age dependency ratio, phased in over a 30-year period, after which fertility and mortality rates are assumed to remain constant. The increase in the old-age dependency ratio is modelled in such a way that the relative importance of the fertility and mortality rates as driving factors resembles Eurostat’s 2015 population projections for the euro area (see Section 2). The “long-term” steady state values discussed below relate to a 50-year period.

**Household sector:** Households’ economic activity is divided into two phases: the working phase and the retirement phase. During the working phase, households either work (in which case, they receive income and pay income tax) or are unemployed (in which case, they receive unemployment benefits). They use their net incomes and benefits for consumption and precautionary saving. During the retirement phase, households do not work and instead receive pension benefits. Depending on the probability of dying in the next period of the model, they will also spend some or all of their savings on consumption.

**Production sector and labour market rigidities:** The model includes two types of firm, producing physical capital goods and consumption goods respectively. Those goods-producing firms hire workers and use physical capital, subject to an exogenous technological process (assuming a Cobb-Douglas production function). Firms take account of price adjustment costs when setting prices. Moreover, the model assumes labour market rigidities owing to hiring costs and wage bargaining, which influence the level of unemployment.

**Fiscal sector:** The fiscal sector includes various kinds of public revenue (personal income tax, social security contributions, VAT, etc.) and public expenditure (pension benefits, unemployment benefits and government consumption). In order to account for the diversity in euro area countries’ pension systems, it is assumed that three-quarters of pension benefits are based on the pay-as-you-go principle and one-quarter is based on a fully funded scheme. In the initial steady state without population ageing, the pension system is assumed to be in balance. The government is able to issue bonds to balance the government budget.

**The long-term results for the euro area suggest that ageing mainly affects the economy via the labour market and changes to consumption and savings.** Table A presents the stylised long-term steady state results of an ageing shock under the assumption that no consolidation measures are adopted to counteract that shock’s impact on public debt (reference scenario with no consolidation). Following that ageing shock (i.e. the 10 percentage point rise in the old-age

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<sup>92</sup> This model does not take account of people below the age of 20. The demographic part of the model is based on Gertler, M., “Government debt and social security in a life-cycle economy”, *Carnegie-Rochester Conference Series on Public Policy*, 1999, pp. 61-110. It combines the perpetual youth model with life-cycle elements, such as the probability of retiring and dying, which can be aggregated.

dependency ratio), the ratio of workers to pensioners declines. As comparatively fewer people are in work, the labour supply and employment decline. Moreover, private consumption per capita also declines, as workers in particular reduce their consumption. Instead, workers increase their precautionary savings by investing in government bonds, in order to smooth their consumption over a longer period in retirement. Pensioners dissave more gradually in view of their rising life expectancy. Private investment declines only marginally. Overall, the ageing shock results in GDP per capita declining by 4.7%. The real interest rate falls as the ratio of capital to labour increases on account of the shortage of labour supply. Total pension costs rise owing to an increase in the number of pensioners, while revenue from VAT declines on account of a fall in consumption. In the reference scenario, fiscal instruments are kept constant, so the additional spending on pensions is financed entirely via debt. Thus, the ageing shock results in the government debt-to-GDP ratio rising almost 60 percentage points in the long run (reaching unsustainable levels in the absence of policy adjustments). Variations of this scenario will be discussed in Section 4.

**Nonetheless, when interpreting these results, one has to remember that the model is based on a number of simplifying assumptions.** It assumes, for example, that the economy is closed, that there are only two types of cohort and that only two types of good are produced. Moreover, this model looks at the euro area as a whole and does not, therefore, account for any cross-country heterogeneity. Thus, these results are not a suitable basis on which to make concrete recommendations at country level.

**Table A**

Stylised long-term economic effects of ageing (reference scenario)

(percentage changes or percentage point changes)	
Indicator	Change due to ageing shock
GDP per capita (%)	-4.7
Total consumption per capita (%)	-5.6
Ratio of workers' consumption to total consumption (pp)	-3.6
Employment (%)	-5.1
Ratio of workers' savings to GDP (pp)	41.7
Ratio of private investment to GDP (pp)	-0.3
Ratio of capital to labour (pp)	2.3
Ratio of public debt to GDP (pp)	59.3
Ratio of pension expenditure to GDP (pp)	2.3

Source: ECB calculations.

Note: Based on the model developed by Baksa and Munkacsi, calibrated for the euro area.

**Ageing may also have an adverse effect on aggregate total factor productivity, and thus on output per worker.** Several studies have found significant negative effects on aggregate labour productivity as a result of an ageing workforce.<sup>93</sup> One

<sup>93</sup> See, for example, Nagarajan, R. et al., "The Impact of Population Ageing on Economic Growth: An In-depth Bibliometric Analysis", *FEP Working Papers*, No 505, University of Porto, 2013, as well as Maestas, N. et al., "The Effect of Population Aging on Economic Growth, the Labor Force and Productivity", *NBER Working Papers*, No 22452, 2016, which estimates for the United States that two-thirds of the age-related slowdown in growth is accounted for by lower productivity, with one-third stemming from a reduction in the labour supply.

effect of ageing could materialise via weaker growth in total factor productivity, which captures underlying productivity growth derived from more efficient production processes and technological progress. This may be explained by the hump-shaped distribution of average productivity across cohorts that has been found by some studies, which may be related to a slowdown in the adoption of the latest technology as age increases (with statistics showing, for example, a reduction in workers' participation in training with increasing age) or a deterioration in the health of some older workers.<sup>94</sup>

**However, there may also be countervailing forces mitigating any adverse effects on productivity.** Low fertility rates may, for example, allow for stronger investment in human capital per child. Furthermore, the scarcity of labour could increase the return to investment in human capital and thus incentivise training in the course of a person's working life (i.e. "lifelong learning"), particularly when accompanied by increases in the retirement age. Finally, for white-collar occupations, the benefits of accumulated experience and expertise may continue to develop throughout a person's working life. Thus, structural shifts towards knowledge-based sectors, in which high productivity levels can be maintained throughout people's working lives, could limit the downward impact that ageing has on future productivity.

**The impact that ageing has on private savings can be expected to vary over time in line with the population structure, but it will also be dependent on how households and firms react to an ageing society.** The life-cycle hypothesis of savings states that people will smooth consumption over their lifetimes by accumulating savings during their working lives and then running those savings down during their retirement. Changes to the population structure will thus have a mechanical impact on aggregate savings via differences in age-specific savings ratios. In the euro area, the expected increase in the number of pensioners as a percentage of the total population between now and 2070 implies a shift from savers to dissavers, which suggests that this will have a downward impact on aggregate savings in the long run. Over the next ten years, however, this effect on savings might not be visible as a result of the sizeable baby boomer generation becoming elderly workers. Since this age group is the one with the highest savings rate, per capita savings are likely to increase in the short term. In addition to these shifts in age cohorts, ageing may also cause households to change their saving behaviour. As life expectancy increases, households may save more during their working lives, anticipating that those savings will have to see them through a longer period in retirement. This is also supported by the model results in Box 1. Low fertility rates may also have a positive effect on the savings of the working-age population by

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<sup>94</sup> See, for example, European Commission, *Population Ageing in Europe – Facts, Implications and Policies*, 2014. See also Aiyar, S. and Ebeke, C., "The Impact of Workforce Aging on European Productivity", *IMF Working Papers*, No 16/238, 2016, which takes some of these factors into account and estimates that ageing may reduce aggregate total factor productivity growth in the EU by 0.2 percentage point per year over the next 20 years. The estimated drag on GDP growth varies across countries depending on the population structure. For example, it is small in Germany, where a series of large cohorts are about to retire, and it is large in Spain, where the number of prime-age workers is set to decline strongly over the next 20 years as a percentage of the total working-age population.

reducing consumption needs relating to the raising of children.<sup>95</sup> Fiscal policies and the type of underlying pension system may also have a role to play by encouraging people to save more during their working lives.

**The impact on investment and capital accumulation will depend, inter alia, on the responsiveness of return rates, the openness of the economy and the relative ageing profiles of the various countries.** The downward pressure that ageing exerts on the labour force can be expected to reduce the price of capital relative to labour. Assuming that capital and labour are substitutes (at least to some extent), this will lead to capital deepening and result in investment being affected less negatively than the labour force (as can also be seen from the simulation in Box 1). This could, for example, be a result of declines in the size of households as a consequence of ageing, which will see the number of households and the need for housing investment remaining broadly unchanged.<sup>96</sup> Such capital deepening will exert downward pressure on returns to capital. However, in open economies with no capital controls, savings do not have to be invested domestically and can be absorbed by capital exports, which will reduce the pressure on domestic returns to capital.<sup>97</sup> Indeed, several studies have found evidence of capital flows from “older” countries to countries with more favourable demographics.<sup>98</sup> Box 4 provides a more detailed model-based discussion looking at the amount of downward pressure on the euro area’s equilibrium real interest rate that can probably be attributed to demographic factors and pension reforms for the period up to 2030.

### 3.2 Fiscal balances and sustainability

**Population ageing will place further upward pressure on the already elevated levels of age-related public spending.** The European Commission’s 2015 Ageing Report anticipates public expenditure on pensions, health care and long-term care rising from 21% of GDP in 2013 to 23% of GDP in 2060 (see Chart 4).<sup>99</sup> These projections take account of the future impact of past reforms in the areas of pensions, health care and long-term care, so they are not directly comparable with the results of the stylised model presented in Box 1.

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<sup>95</sup> See, for example, Prskawetz, A. and Lindh, T. (eds.), “The Relationship between Demographic Change and Economic Growth in the EU”, Research Report 32, Vienna Institute of Demography, 2007.

<sup>96</sup> See, for example, Goodhart, C. and Pradhan, M., “Demographics will reverse three multi-decade global trends”, *BIS Working Papers*, No 656, August 2017.

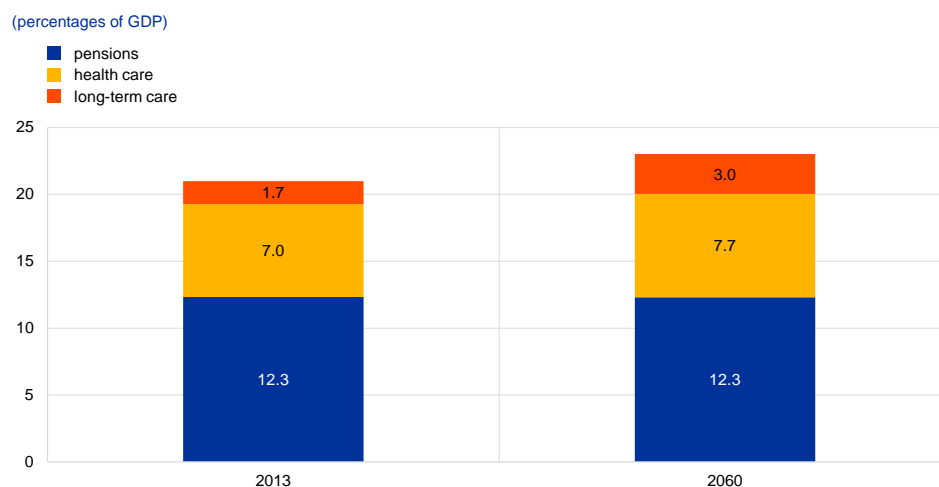
<sup>97</sup> See Leibfritz, W. and Röger, W., “The Effects of Aging on Labor Markets and Economic Growth”, in Hamm, I. et al. (eds.), *Demographic Change in Germany*, 2008.

<sup>98</sup> See, for example, Börsch-Supan, A., Ludwig, A. and Winter, J., “Aging, Pension Reform, and Capital Flows: A Multi-country Simulation Model”, *NBER Working Papers*, No 11850, December 2005.

<sup>99</sup> See European Commission, “[The 2015 Ageing Report – Economic and budgetary projections for the 28 EU Member States \(2013-2060\)](#)”, *European Economy*, No 3, 2015. Although the 2018 Ageing Report will become available in the next few months, those updated projections are unlikely to substantially alter the assessment of fiscal sustainability risks for the euro area as a whole.

## Chart 4

### Ageing-related public spending in the euro area



Sources: 2015 Ageing Report and ECB calculations.

**Pay-as-you-go pension schemes will be particularly affected.** As populations age, the number of beneficiaries of public pension schemes will increase, while the number of contributors is expected to decline, resulting in deficits unless parameters are adjusted. In fact, demographic effects alone are projected to raise pension expenditure by an average of 7.6% of GDP in the euro area over the period 2013-60 (see Chart 5). This effect is, however, expected to be almost entirely offset by changes to other important drivers of pension expenditure, such as declines in the coverage ratio or the benefit ratio.<sup>100</sup> While these changes reflect reform measures in a number of euro area countries, they are also driven by favourable underlying macroeconomic assumptions.<sup>101</sup> At euro area level, pension expenditure is projected to remain at its current high level of more than 12% of GDP in the long run, notwithstanding considerable cross-country heterogeneity.<sup>102</sup>

<sup>100</sup> The coverage ratio is defined as the number of pensioners relative to the number of people aged 65 or over. The coverage ratio could, for example, be reduced by restricting eligibility for early retirement. The benefit ratio, meanwhile, is defined as the average pension relative to the average wage. The benefit ratio declines as pension entitlements become less generous.

<sup>101</sup> The projections in the 2015 Ageing Report are based on fairly optimistic underlying macroeconomic assumptions. For example, they assume that countries' structural unemployment rates will converge with the EU average, which implies huge declines in some cases. Moreover, they also assume that annual growth in total factor productivity will rise to 1% of GDP in all EU countries. For a critical assessment of those underlying assumptions, see the box entitled "The 2015 Ageing Report: How costly will ageing in Europe be?", *Economic Bulletin*, Issue 4, ECB, 2015. The macroeconomic assumptions underlying the 2015 Ageing Report are very different from those contained in the model that was presented in Box 1.

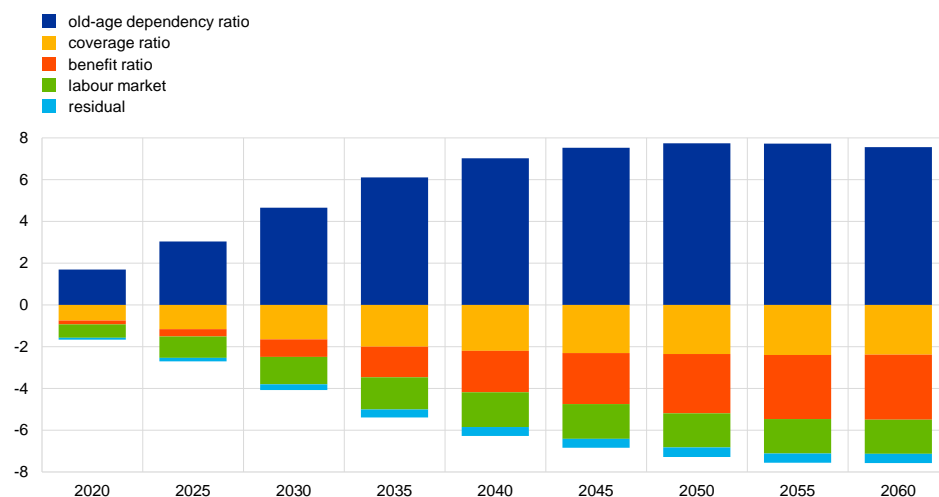
<sup>102</sup> According to the 2015 Ageing Report, some countries, such as Germany, Luxembourg, Malta, Slovenia and Slovakia, are projected to experience significant pressure on pension spending, while pressures are projected to weaken considerably in France, Italy and Latvia.



## Chart 5

### Drivers of changes in pension expenditure

(percentage points of GDP; changes relative to 2013)



Sources: 2015 Ageing Report and ECB calculations.

### Population ageing will also increase spending on health care and long-term care.

According to the projections in the 2015 Ageing Report, spending on health care and long-term care as a percentage of GDP is projected to rise by an average of 0.7 and 1.3 percentage points respectively over the period 2013-60 (see Chart 6). Indeed, older people are more likely to make use of healthcare services, which in Europe are predominantly provided by the public sector. It should be noted, however, that population ageing is only one factor driving healthcare costs – and not necessarily the most important.<sup>103</sup> Meanwhile, spending on long-term care is also expected to rise, as such care is increasingly being provided by professional suppliers, rather than via intra-family support, partly as a result of increases in female labour market participation. Finally, public spending on education is expected to decline as the number of young people gradually falls as a percentage of the total population, partially offsetting the rising expenditure discussed above.<sup>104</sup>

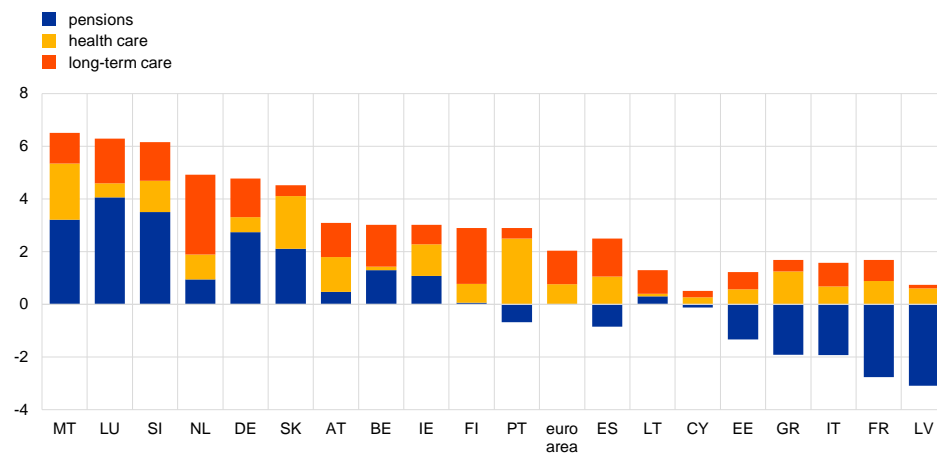
<sup>103</sup> Healthcare costs are driven, inter alia, by technological progress, demand for higher-quality healthcare services and growth in GDP per capita (assuming that the income elasticity of demand for healthcare services is higher than one). See also European Commission, “[The 2015 Ageing Report – Economic and budgetary projections for the 28 EU Member States \(2013-2060\)](#)”, op. cit.

<sup>104</sup> At the same time, in the presence of a limited labour force, governments could conceivably come under pressure to invest more in education and lifelong learning. See Maddaloni, A. et al., “[Macroeconomic implications of demographic developments in the euro area](#)”, op. cit. In this case, spending on education might not decline.

## Chart 6

### Changes in ageing-related public spending

(percentage points of GDP; changes over the period 2013-60)



Sources: 2015 Ageing Report and ECB calculations.

Note: The data in this chart contain updated information for Belgium that became available after the publication of the 2015 Ageing Report.

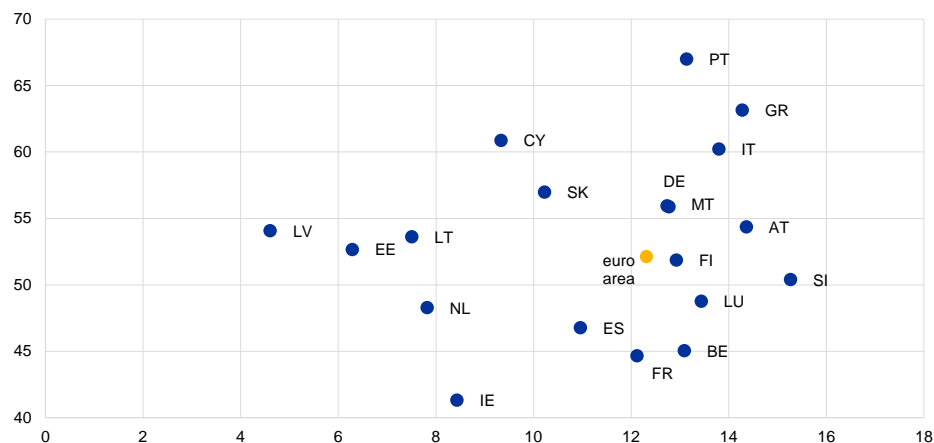
**The projected increase in age-related public spending varies across countries and is subject to considerable uncertainty.** The projected changes to the various age-related public expenditure items vary depending on the underlying generosity of the public systems in question and the relevant coverage ratios. For public pension expenditure, the effective retirement age is a decisive parameter. Chart 7 provides a rough illustration of the relative generosity of the various countries' pension systems by comparing their pension costs and old-age dependency ratios. Taking the euro area average as a benchmark, the countries in the bottom right-hand corner can be considered to have fairly generous pension systems, given their relatively small old-age populations.

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## Chart 7

### Projected old-age dependency ratios and public pension costs in 2060

(x-axis: pension costs as a percentage of GDP; y-axis: old-age dependency ratio)



Sources: Eurostat, 2015 Ageing Report and ECB calculations.

**The impact of ageing on public revenues is inconclusive, owing to the different time profiles and the fact that the effects on the various tax bases partially offset one another.** On the one hand, revenue from personal income tax is likely to decline as the labour force shrinks, assuming that tax rates remain unchanged. Revenue from VAT is also expected to decline, as population ageing is likely to have an adverse impact on private consumption.<sup>105</sup> Moreover, as is pointed out in Box 2 on relative prices, ageing may result in a shift towards higher demand for specific services. If these services benefit from tax exemptions, as is currently the case for healthcare services in several countries, revenue from VAT is likely to fall even further as a result of ageing. On the other hand, an increased propensity to save owing to increases in life expectancy (or in the case of a shift towards fully funded pension systems) can be expected to boost revenue from capital taxes. The economic relevance of changes to tax revenues caused by dissaving after retirement is, however, more difficult to predict and requires closer examination of country-specific tax provisions.

**Overall, population ageing is expected to place a burden on fiscal sustainability.** Higher age-related primary deficits are expected to contribute to higher government debt-to-GDP ratios. Converting the projected additional age-related spending into a net present value provides an indication of the implicit liability that is caused by ageing and the fiscal adjustment that is needed in order to fulfil the intertemporal adjustment constraint.<sup>106</sup> In other words, additional public savings are needed in order to prevent government debt levels from increasing on account of ageing. Moreover, debt dynamics hinge crucially on the interest-rate-growth differential. To the extent that ageing has an unfavourable impact on real GDP growth, as was suggested in the previous section, public debt levels will become harder to sustain. If, however, ageing also contributes to a decline in the equilibrium real interest rate, as is suggested in Box 4, this will, instead, help to support debt sustainability. Thus, the overall impact of ageing depends on which of these opposing effects prevails. Ageing could make it more difficult to ensure debt sustainability if interest rates decline by less than real economic growth.

## Box 2

### Population ageing and relative prices

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Prepared by Eliza Lis

**There is evidence that the consumption patterns of the elderly differ from those of younger cohorts.** Thus, population ageing has the potential to affect the relative prices of goods and services, particularly if changes in relative consumption demand do not result in corresponding changes in relative supply. Changes in relative prices are typically regarded as steering the allocation of resources and may therefore play a key role in structural changes in the different sectors of the economy.

<sup>105</sup> See also Table A in Box 1.

<sup>106</sup> According to the European Commission's [Debt Sustainability Monitor 2017](#), euro area countries require a structural adjustment totalling 0.4% of GDP per annum on account of population ageing in order to achieve a debt-to-GDP ratio of 60% in the medium term (the "S1 indicator") and an adjustment totalling 1.3% of GDP in order to ensure that public debt stabilises permanently at the current level (the "S2 indicator").

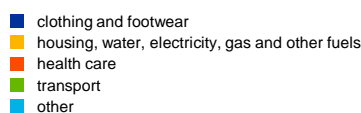
**Empirical evidence suggests that the elderly spend more, in relative terms, on services (particularly non-tradable services) than younger cohorts.**<sup>107</sup> Chart A shows how the structure of household consumption expenditure differs across age groups in the euro area, showing that the elderly spend more on housing and healthcare services and less on clothing and transport.<sup>108 109</sup>

Such changes in consumption patterns can reflect both passive consumption behaviour (for instance, if housing-related expenditure remains unchanged post-retirement and accounts for a larger share of consumption on account of a decline in disposable income) and active changes in consumption demand (for instance, if transport costs fall because a person is no longer commuting to work or if more health care is needed as a result of the ageing process itself). More generally, changes in the composition of consumption demand will depend on items' income-elasticities, which may well change as consumers get older. For instance, health care may become more of a necessity as people get older (reduction in elasticity), while transport may become more of a luxury (increase in elasticity).

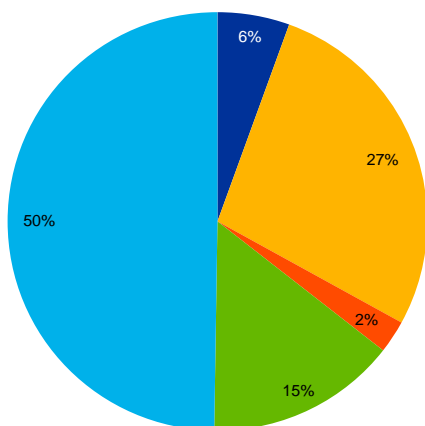
### Chart A

#### Structure of consumption expenditure by age group

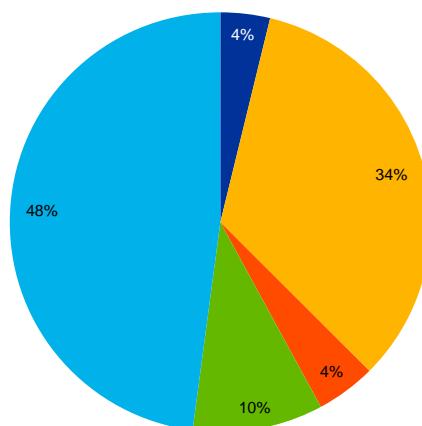
(percentages)



a) People below the age of 60



b) People aged 60 or over



Sources: Eurostat and ECB calculations.

Notes: Data are based on Eurostat's 2010 household budget survey (the latest available) and represent weighted euro area averages. The figures in the left-hand chart are simple averages of the data reported for the various age categories below the age of 60. "Other" comprises items where there is no marked difference between the two age groups.

<sup>107</sup> See, for example: Lührmann, M., "Population aging and the demand for goods & services", *MEA Discussion Papers*, No 95-2005, University of Mannheim, 2005; Börsch-Supan, A., "Labor market effects of population aging", *Labour*, Vol. 17, Supplement S1, 2003, pp. 5-44; and van Ewijk, C. and Volkerink, M., "Will ageing lead to a higher real exchange rate for the Netherlands?", *De Economist*, Vol. 160, 2012, pp. 59-80.

<sup>108</sup> This chart may vary across individual euro area countries, depending on cultural preferences, economic performance, and policy and institutional frameworks. It is noticeable that, in contrast with the findings in the literature, expenditure on household furnishings and equipment does not vary much across age groups in the euro area.

<sup>109</sup> Aggregate household data may not cover all changes to consumption patterns, as they do not account for the substantial public spending on health care and long-term care. See Groneck, M. and Kaufmann, C., "Determinants of Relative Sectoral Prices: The Role of Demographic Change", *Oxford Bulletin of Economics and Statistics*, Vol. 79, 2017, pp. 319-347.

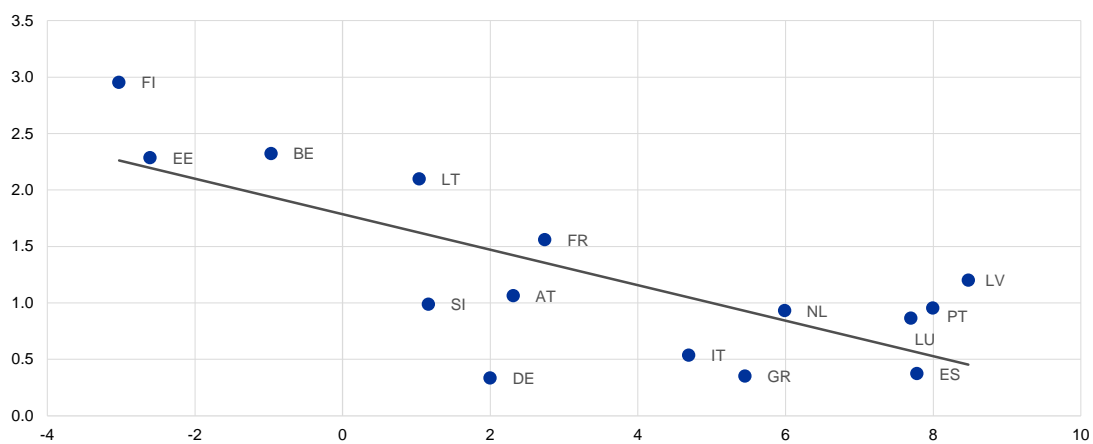
If ageing entails an increase in the overall consumption of services relative to goods, this could have an impact on the output prices of services sectors relative to industry. Indeed, the relative price of services will increase if supply does not rise in line with demand. This, in turn, will depend on how elastic supply is in reacting to price changes, which will be determined, inter alia, by how readily available or mobile the necessary factors of production are. Ultimately, therefore, it will be the interaction between the age-elasticity of demand and the price-elasticity of supply that determines where relative prices end up.

Looking purely at observed data, Chart B shows that the price of services relative to industry has increased on average since 1995 in most euro area countries, following an increase in the share of services in total value added in those economies.<sup>110</sup> Chart C shows that increases in the output prices of the services sector relative to industry have coincided with increases in the old-age dependency ratio in some euro area countries. These simple correlations do not control for other factors, such as differential impacts on services and industry prices as a result of secular change and international competition, but they are in line with recent findings in the literature. Groneck and Kaufmann,<sup>111</sup> for example, control for various explanatory variables in their estimations and show that an increase in the old-age dependency ratio leads to an increase in the relative price of non-tradables.

## Chart B

### Relative prices and shares of services, 1995-2016

(x-axis: percentage point change in share of services; y-axis: average annual percentage change in price of services relative to industry)



Sources: Eurostat and ECB calculations.

Notes: The price of services relative to industry is the ratio of the deflator for services to the deflator for industry excluding construction. Those deflators are calculated as the ratio of value added in current prices to value added in constant prices. The share of services relates to the share of services in total value added.

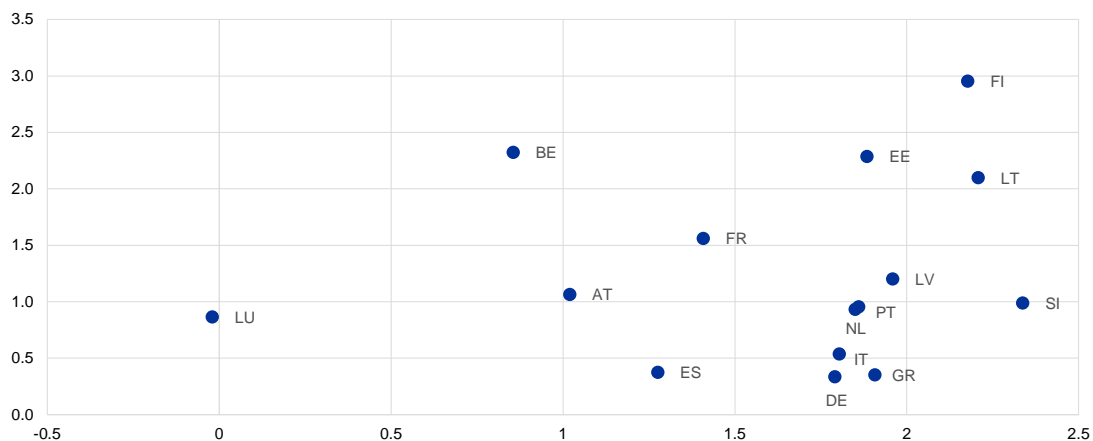
<sup>110</sup> Ideally, consumer prices should be used, rather than output prices. However, in order to be able to use longer time series, output prices are used here. The same approach is adopted in other literature on this topic.

<sup>111</sup> See Groneck, M. and Kaufmann, C., "Determinants of Relative Sectoral Prices: The Role of Demographic Change", op. cit.

## Chart C

### Relative prices and old-age dependency ratios, 1995-2016

(x-axis: average annual percentage change in old-age dependency ratio; y-axis: average annual percentage change in price of services relative to industry)



Sources: Eurostat and ECB calculations.

Notes: The price of services relative to industry is the ratio of the deflator for services to the deflator for industry excluding construction. Those deflators are calculated as the ratio of value added in current prices to value added in constant prices.

**The euro area has generally seen services prices in the HICP rise more rapidly than non-energy industrial goods prices over the last few decades.** At the same time, services also account for a growing share of the economy. While there may be a number of reasons for these developments, such as differentials in terms of sectoral productivity trends or the impact of global competition, they may also reflect an increase in relative demand owing to population ageing.<sup>112</sup> With population ageing expected to intensify, these trends may strengthen in the years to come.

## 4 The role of pension reforms

### 4.1 Pension reforms in the euro area

#### **Many euro area countries have implemented pension reforms in recent years.**

The sovereign debt crisis and rises in public debt levels have increased the need to reform public pension systems.<sup>113</sup> Pension reforms have been particularly substantial in countries that have been subject to adjustment programmes, such as Greece, Spain, Cyprus and Portugal. Those reforms have involved a wide range of measures, affecting pension system rules as well as pension parameters. In general, recent parametric pension reforms have sought mainly to lift the effective retirement age, while several countries have also reduced the generosity of their pension systems. For example, countries have introduced less generous valuation rules for

<sup>112</sup> See the box entitled "Why is services inflation higher than goods inflation in the euro area?", *Monthly Bulletin*, ECB, January 2009.

<sup>113</sup> Public pension systems comprise all schemes that are statutory in nature and administered by the general government sector, in line with the definition used in the Ageing Reports. Accordingly, public pension expenditure affects the national accounts.

transforming pensionable earnings into pension entitlements, increased the required number of working years when calculating pensionable earnings, or shifted from wage to price indexation of pensions.<sup>114</sup> Some countries have also implemented automatic adjustment mechanisms linking key pension parameters to increases in life expectancy in order to make their public pension systems more sustainable. However, systemic pension reforms foreseeing a full or partial shift from pay-as-you-go schemes to fully funded schemes have been fairly limited among euro area countries over the last decade.<sup>115</sup>

**Despite recent progress, there is a risk of complacency.** Those recent reforms to public pension systems may not be sufficient to fully address euro area countries' ageing-related challenges. While they have certainly been helpful in terms of improving the financial sustainability of public pension systems, further efforts are indispensable in order to contain or further reduce the relatively high levels of pension expenditure in GDP terms. However, the pace of reform seems to have slowed of late. One possible explanation for this is the fact that, with an economic recovery under way and the impact of the sovereign debt crisis subsiding, governments are now under less pressure to implement pension reforms.<sup>116</sup> Indeed, there is empirical evidence supporting the view that business cycle developments, rather than concerns about the financial sustainability of pension systems, are the most important drivers of pension reforms.<sup>117</sup> Because of the considerable political costs in the short term, governments seem to have less appetite for implementing pension reforms during economic good times. Against this background, countries would be well advised to give themselves a buffer. There is no room for complacency in this regard, as pension pressures could turn out to be stronger than expected – e.g. if economic developments turn out to be less favourable than pension cost projections assume (see also Section 3.2). Thus, euro area countries should use today's improved economic environment to implement better long-term policies in order to address the challenges posed by population ageing.<sup>118</sup>

**The reform needs in the euro area vary considerably across countries.**

Differences relate both to the size of those reform needs and to the specific type of adjustment that is needed in each country. Identifying the reform measures that would be most appropriate for the various countries would involve taking account of the variety and complexity of countries' pension arrangements and lies outside the scope of this article. Euro area averages could serve as a rough benchmark for

<sup>114</sup> For a detailed overview of recent pension reforms in the EU, see Carone, G. et al., "Pension Reforms in the EU since the Early 2000's: Achievements and Challenges Ahead", *European Commission Discussion Papers*, No 42, 2016. For details of pension reforms in OECD countries, see OECD, *Pensions at a Glance 2017*, op. cit.

<sup>115</sup> In the early 2000s, several eastern European countries introduced mandatory private pension schemes, most of which have been abandoned in the meantime.

<sup>116</sup> See also OECD, *Pensions at a Glance 2017*, op. cit.

<sup>117</sup> See Beetsma, R., Romp, W. and van Maurik, R., "What drives pension reform measures in the OECD? Evidence based on a new comprehensive dataset and theory", *CEPR Discussion Papers*, No 12313, September 2017.

<sup>118</sup> The ECB has stressed the importance of pension reforms on several occasions. See, for example: the article entitled "Population ageing and fiscal policy in the euro area", *Monthly Bulletin*, ECB, July 2000; the article entitled "The need for comprehensive reforms to cope with population ageing", *Monthly Bulletin*, ECB, April 2003; and the article entitled "Challenges to fiscal sustainability in the euro area", *Monthly Bulletin*, ECB, February 2007.

individual measures. However, as the various pension parameters are strongly interlinked, it is important to adopt a much broader perspective when it comes to designing specific reforms. For example, reducing pension entitlements via cuts in pension valuation or indexation rules could be advisable in the case of a very generous pension system relative to the euro area average. However, such a policy could be less relevant if there are already other provisions seeking to ensure fiscal sustainability (e.g. a high effective retirement age). It is clear, therefore, that the decision as to which type of pension reform is best is highly country-specific. This also limits the usefulness of ranking such measures in terms of their potential impact on public finances when making country-specific recommendations.

**Political economy considerations highlight the role of social acceptance of pension reforms and the timing of their adoption.** While the benefits of pension reforms will only become visible with a lag, their political costs have to be borne immediately. Thus, in order to ensure broad support for those reforms, countries are advised not to place the full adjustment burden on a single feature, but to carry out the necessary adjustment by combining several reform elements. If, for example, adjustment needs were met solely by means of abrupt cuts to pension entitlements, this could, in extreme cases, potentially endanger pension adequacy. By adopting a more balanced approach, adjustment costs can be spread more widely across society, allowing older and younger generations to share that burden more equally. Moreover, the political costs of pension reforms tend to increase the later they are implemented. As the median voter is ageing, the political cost of adopting pension reforms is likely to increase over time<sup>119</sup> – as will the adjustment burden for the younger generation.

## 4.2 The macroeconomic effects of pension reforms

**Pension reforms are not only necessary for long-term fiscal sustainability, they can generally also help to dampen the adverse macroeconomic effects of ageing.** The concrete impact that public pension reforms have on macroeconomic variables such as the labour force, employment or public debt is strongly dependent on the reform measures adopted. Consequently, it is possible to compare the various reform options on the basis of their respective macroeconomic implications, while ignoring country-specific structural differences.<sup>120</sup> Box 3 presents the main results of

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<sup>119</sup> See, for example, Sinn, H.-W. and Uebelmesser, S., "Pensions and the path to gerontocracy in Germany", *European Journal of Political Economy*, Vol. 19, Issue 1, 2003. For a review of key literature, see Tepe, M. and Vanhuyse, P., "Are aging OECD welfare states on the path to gerontocracy?: evidence from 18 democracies, 1980-2002", *Journal of Public Policy*, Vol. 29, Issue 1, 2009.

<sup>120</sup> Empirical studies find evidence that the macroeconomic implications of pension reforms are more favourable if various types of feature are combined. This is supported by the results of OLG models for Luxembourg, Portugal and Finland, which are summarised in Dieppe, A. and Guarda, P. (eds.), "Public debt, population ageing and medium-term growth", *Occasional Paper Series*, No 165, ECB, 2015. See also Karam, P.D. et al., "Macroeconomic effects of public pension reforms", *IMF Working Papers*, No 10/297, 2010, which finds evidence of positive spillover effects for pension reforms. Thus, the positive impact on growth could increase significantly if several countries adopted such pension reforms in parallel.



a model simulation exercise with three different kinds of pension reform, which is based on the stylised model framework introduced in Box 1.

**Lifting the statutory and effective retirement ages, in line with increases in life expectancy, is expected to have a strongly positive impact on the labour supply and economic growth.** Lengthening people's working lives (for example, by reducing early retirement or increasing the statutory retirement age) effectively increases the size of the active labour force relative to the number of pensioners.<sup>121</sup> Moreover, if that increase in the retirement age is complemented by appropriate labour market measures, the additional older workers will be unlikely to crowd out younger workers.<sup>122</sup> Longer expected working lives will also increase incentives for lifelong learning and the accumulation of human capital, both of which are growth-enhancing. Moreover, longer working lives can also be expected to reduce the financing pressures on public pension systems through increases in pension contributions. While this will also imply increased pension entitlements for the next generation, it can be expected to contribute to improvements in pension adequacy.

**Increases in contribution rates are assumed to have less favourable economic implications.** Raising contribution rates may improve the financing of pay-as-you-go pension systems. However, such measures actually have the potential to exacerbate the macroeconomic effects of population ageing, rather than dampening them. In particular, the distortionary effects of higher contribution rates on the labour supply and employment can result in weaker economic growth.<sup>123</sup>

**Likewise, cutting the benefit ratio is, ceteris paribus, also potentially less favourable than lifting the retirement age.** Cutting pension entitlements can have detrimental macroeconomic effects via reductions in domestic demand. Pensioners are likely to respond to reduced pension transfers by cutting back on consumption. The working-age population may, in turn, increase precautionary savings in view of the reduction in future pension entitlements.

### Box 3

#### Stylised macroeconomic effects of public pension reforms

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Prepared by João Domingues Semeano and Carolin Nerlich

**The OLG model developed by Baksa and Munkacsi which was presented in Box 1 can be used to show the long-term macroeconomic effects of pension reforms.** To this end, Table A indicates the outcomes of a number of variations on the benchmark scenario (which involved an ageing shock and an absence of consolidation measures) in terms of the euro area average. The size of the various reform measures is, ceteris paribus, determined by the objective of preventing population ageing from having an adverse impact on public debt, as established in Box 1. This

<sup>121</sup> The positive economic impact of prolonging people's working lives is stronger if those additional working years are spent in good health.

<sup>122</sup> Carta, F., D'Amuri, F. and von Wachter, T., "Aging workforce, pension reform, and firm's dynamics", mimeo, 2017, finds that the recent pension reforms in Italy have not had a negative impact on youth employment.

<sup>123</sup> Increases in contribution rates have also been found to adversely affect external imbalances. See, for example, Castro, G. et al., "Aging and fiscal sustainability in a small euro area economy", *Macroeconomic Dynamics*, Vol. 21, Issue 7, October 2017.

exercise seeks to provide a general indication of the potential long-term macroeconomic effects of three different kinds of public pension reform, assessing them one at a time. It does not, however, address the question of which type of reform measure is most appropriate for which euro area country, given that this issue is highly country-specific. The three types of pension reform under assessment involve changes to the retirement age, the contribution rate and the benefit ratio. In addition, this exercise also considers an increase in personal income tax to compensate for the impact that ageing has on public debt.

**The results of this exercise point to considerable differences in terms of the macroeconomic effects of the three pension reforms.** These simulations suggest that raising the retirement age has the potential to considerably reduce the adverse impact that ageing has on growth. In concrete terms, this means that GDP per capita declines by 3.6% less than in the reference scenario (see Table A).<sup>124</sup> In contrast, simply increasing contribution rates or personal income taxes results in the adverse macroeconomic impact strengthening, rather than weakening, relative to the reference scenario. This is driven largely by stronger negative effects on consumption per capita and employment. Finally, reducing the benefit ratio such that the ageing-related adverse impact on debt is avoided results in GDP per capita falling only marginally less than in the reference scenario. Thus, on the basis of this stylised model framework, we can conclude that pension reforms that seek to prolong people’s working lives appear to be at least partly able to address the adverse macroeconomic effects of ageing.

**Table A**

Stylised long-term macroeconomic effects of different public pension reforms and other government measures

(percentage changes)

Consolidation measure	GDP per capita	Consumption per capita	Employment
	change relative to reference scenario		
Increase in retirement age	3.6	4.1	3.8
Reduction in benefit ratio	0.1	-0.1	0.0
Increase in employer’s contribution rate	-0.3	-0.3	-0.3
Increase in personal income tax	-0.6	-0.8	-0.8
Memo item: Reference scenario	-4.7	-5.6	-5.1

Source: ECB calculations.

Note: Based on the model developed by Baksa and Munkacsi, calibrated for the euro area.

**Moving from a pay-as-you-go pension system to a fully funded system can help to make pension arrangements more sustainable, but involves risks for household finances.** Fully funded systems still play only a limited role in the euro area, with the Netherlands being a notable exception in this regard. In fact, pension payments derived from private pension funds only account for around 6% of total

<sup>124</sup> In broad terms, this result is also supported by other empirical studies using different model specifications. See, for example, Karam, P.D. et al., “Macroeconomic effects of public pension reforms”, op. cit.; and Vogel, E. et al., “Aging and Pension Reform: Extending the Retirement Age and Human Capital Formation”, *MEA Discussion Papers*, No 06-2012, University of Mannheim, June 2012.

pension expenditure in the euro area.<sup>125</sup> Moving to a fully funded pension scheme would make pension shortfalls more transparent. This could encourage increases in domestic savings, which could also turn out to be beneficial for asset markets. However, a move towards higher levels of mandatory funding generally entails a double burden for those generations who are continuing to contribute to the pay-as-you-go system for existing pensioners while simultaneously having to build up their own pension savings. Moreover, fully funded pension schemes can pose risks to household finances in an environment of low or negative asset returns, for example in the presence of low equilibrium interest rates.<sup>126</sup> Administration costs and risky investment strategies can further erode the benefits of funded arrangements.

**Finally, forces relating to ageing and pension reforms can be expected to play a significant role in respect of monetary policy.** As was stressed in previous sections, these forces will influence the euro area's equilibrium real interest rate for the foreseeable future. Moreover, they may also affect central bank objectives. Box 4 discusses aspects that are relevant from a monetary policy perspective.

## Box 4

### Monetary policy implications of population ageing and pension reforms

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Prepared by Leopold von Thadden

**Forces relating to population ageing and the reform of pension systems matter for monetary policy from both a positive and a normative perspective, as they may affect the margin for interest rate changes, as well as the objectives of central banks.** This box provides an overview of the various aspects that are relevant in this regard.<sup>127</sup>

**Forces relating to population ageing and pension reforms are a slow-moving driver of the equilibrium real interest rate, a variable that is important when judging the monetary policy stance for any given inflation objective.**<sup>128</sup> As various studies have pointed out, past and projected future demographic forces place slow-moving downward pressure on the euro area's equilibrium real interest rate, in line with the developments observed in many other jurisdictions. On the basis of a small-scale New Keynesian model enriched with a demographic structure, Kara and Thadden offer model-based long-term simulations for the euro area (starting in 2008 and running until 2030) which allow likely effects to be broken down into those attributable to "pure" demographic forces and those related to various pension system designs.<sup>129</sup> That study confirms that two major demographic forces, namely the declining growth rate of the working-age population and increases in life expectancy, are contributing independently to declines in the equilibrium real

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<sup>125</sup> See OECD, *Pensions at a Glance 2017*, op. cit.

<sup>126</sup> See also Boeri, T. et al., *Dealing with the New Giants: Rethinking the Role of Pension Funds*, 2006.

<sup>127</sup> For an overview of relevant aspects, see Bean, C., "Global demographic change: some implications for central banks", FRB Kansas City Annual Symposium, Jackson Hole, Wyoming, 2004.

<sup>128</sup> For a detailed discussion of this concept, see the box entitled "Real interest rates in the euro area: a longer-term perspective", *Monthly Bulletin*, ECB, July 2014.

<sup>129</sup> See Kara, E. and von Thadden, L., "Interest rate effects of demographic changes in a New Keynesian life-cycle framework", *Macroeconomic Dynamics*, Vol. 20, Issue 1, 2016, pp. 120-164. That paper uses an OLG model that is similar in structure to the model used by Baksa and Munkacsi, with similar quantitative predictions. The model offers a tractable closed-economy extension of a New Keynesian monetary policy framework, enriched with a demographic structure allowing for a working-age population and retirement, similar to Gertler, M., "Government debt and social security in a life-cycle economy", op. cit.

interest rate.<sup>130</sup> The first force is consistent with long-term predictions by standard growth models,<sup>131</sup> while the second operates through life-cycle effects on savings and consumption, as typically addressed by OLG models.<sup>132</sup> The study shows that the strength of the second force depends critically on how pension systems respond to demographic changes, since pension arrangements – both existing and expected future arrangements – interact directly with life-cycle motives for savings. These insights are quantified in two polar scenarios.<sup>133</sup> First, the cumulative long-term effect on the equilibrium real interest rate will be most pronounced in a scenario in which the rise in the old-age dependency ratio encourages additional private savings by workers, assuming an unchanged retirement age and a ceiling on the amount of tax-financed redistribution from workers to pensioners. In this scenario (which strengthens privately funded elements), the cumulative decline in the period to 2030 totals around 110 basis points. In contrast, this effect would be significantly reduced in a second scenario where it was assumed that pensions would continue to be funded via a pay-as-you-go system, leading to an increase in tax-financed redistribution from workers to pensioners. In this alternative scenario (which reduces, *ceteris paribus*, incentives for workers to save), the cumulative decline totals around 50 basis points.<sup>134</sup>

**Besides forces relating to ageing and pension reforms, equilibrium interest rates are also affected by a wide range of other factors.** Recent literature points to a number of complementary structural channels which can explain the decline in equilibrium interest rates from a general equilibrium perspective. The evidence documented in the literature emphasises, *inter alia*, productivity-driven aspects of secular stagnation, slow balance sheet repair in the aftermath of the financial crisis, and the scarcity of safe assets. Moreover, the openness of an economy is relevant for the quantitative strength of all of these channels.<sup>135</sup>

<sup>130</sup> Given the focus on long-term developments, the equilibrium interest rate is driven by changes in the ratio of capital to labour.

<sup>131</sup> In the same vein, the Solow growth model predicts that, in a steady-state comparison, a decline in population growth will lead, *ceteris paribus*, to a decline in the equilibrium real interest rate.

<sup>132</sup> The second force tends to support a degree of recovery in the equilibrium interest rate when dissaving effects start to dominate, before fading away if demographic variables settle again at new stable long-term values. Adopting a global perspective, this reversal effect was emphasised, in particular, in Goodhart, C. and Pradhan, M., “Demographics will reverse three multi-decade global trends”, *op. cit.*

<sup>133</sup> The quantitative findings summarised in this box are similar in magnitude to those reported in: Miles, D., “Modelling the impact of demographic change upon the economy”, *The Economic Journal*, Vol. 109, 1999, pp. 1-36; Börsch-Supan, A. et al., “Ageing, pension reform and capital flows: a multi-country simulation model”, *Economica*, Vol. 73, 2006, pp. 625-658; and Krueger, D. and Ludwig, A., “On the consequences of demographic change for rates of returns to capital, and the distribution of wealth and welfare”, *Journal of Monetary Economics*, Vol. 54, 2007, pp. 49-87. All of these studies draw on OLG models in order to assess the combined effect of demographic changes and various pension reforms on equilibrium interest rates. For estimates from a dynamic panel model that are consistent with these findings, see Ferrero, G. et al., “On secular stagnation and low interest rates: demography matters”, *Working Paper Series*, No 2088, ECB, 2017. For broad-based analysis of demographic changes from a structural general equilibrium perspective with a focus on US developments, see, in particular, Gagnon, E. et al., “Understanding the New Normal: The Role of Demographics”, *Finance and Economics Discussion Series*, No 80, Board of Governors of the Federal Reserve System, 2016.

<sup>134</sup> The study also looks at intermediate policy options in terms of pension design. For example, in the first scenario, the effect would be mitigated if the retirement age were to increase, commensurate with the increase in life expectancy, offsetting the life-cycle effect supporting additional private savings.

<sup>135</sup> For representative discussions, see: Eggertsson, G. and Mehrotra, N., “A model of secular stagnation”, *NBER Working Papers*, No 20574, 2014; Rogoff, K., “Debt supercycle, not secular stagnation”, in *Progress and Confusion: The State of Macroeconomic Policy*, MIT Press, 2016, pp. 19-28; Summers, L., “Reflections on the new secular stagnation hypothesis”, in *Secular stagnation: facts, causes and cures*, Vox, 2014, pp. 27-40; and Caballero, R. and Farhi, E., “The Safety Trap”, *Review of Economic Studies*, forthcoming.

**The above-mentioned cumulative impact on equilibrium real interest rates will play out slowly over time, given the slow-moving nature of demographic changes.** Nevertheless, it is important that this impact is recognised by monetary policymakers. By way of illustration, Kara and Thadden consider an environment with sticky prices in which the reaction function of monetary policy is characterised by a Taylor rule. If that rule fails to incorporate the downward pressure on the equilibrium rate in a sufficiently timely manner, there is a risk of an overly tight monetary policy stance and downward pressure on inflation. However, in line with the long-term neutrality of money, the study also shows that such pressure disappears in the presence of flexible prices, an assumption that is typically used when characterising the long-term developments discussed in this box.<sup>136</sup>

**If equilibrium real interest rates were to stay at low levels for a protracted period of time, this would have implications for the conduct of monetary policy.** With an unchanged inflation objective, monetary policy would be likely to face challenges arising from the lower bound constraint on nominal interest rates more often. This would naturally mean that other monetary policy tools, such as forward guidance and non-standard measures, would have to complement the conventional interest rate channel more frequently than in the past.<sup>137</sup> Moreover, macro-prudential tools could gain in importance in the event that frequently used non-standard monetary policy tools were regarded as being conducive to risks to financial stability that needed to be contained.

**As regards normative aspects, a central bank's objectives can be shaped by the age structure of the economy and its interaction with pension system design.** It has traditionally been acknowledged that “older” societies attach more weight to price stability than to the stabilisation of output and employment – both in terms of the preferred long-term level of the price stability objective and in terms of the adjustment speed when returning to this level in response to shocks. This finding reflects the fact that cohorts may well express differing degrees of aversion to inflation over their lifetimes, for example because of age-specific exposure to labour market incomes. More nuanced findings emerge if one also considers the role of cohort-specific portfolio compositions and recognises that people typically rely more on returns from asset accumulation as they get older. Thus, ageing societies typically develop a more pronounced preference for financial

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<sup>136</sup> The study confirms that, consistent with the long-term neutrality of money, downward pressure on inflation can emerge in an environment characterised by sticky prices (as opposed to flexible prices). Moreover, it will disappear if the central bank can correctly identify the decline in the equilibrium rate in real time. The study shows numerically how, in the absence of such identification, that pressure can be addressed by responding more strongly to deviations of observed inflation from the central bank's inflation objective. For details of related work which identifies a downward bias in inflation if central banks learn about the impact that demographic processes have on the equilibrium interest rate over time, see Bielecki, M. et al., “The demographic transition and monetary policy in a small open economy”, mimeo, 2018. Moreover, a number of empirical studies have emerged more recently which, deviating from the long-term neutrality of money, suggest that there might be links between ageing and inflation in the long run. However, these studies point in opposing directions in terms of the impact on aggregate inflation, depending on the country and time period in question. For instance, both Yoon, J.-W. et al., “Impact of demographic changes on inflation and the macroeconomy”, *IMF Working Papers*, No 14/210, 2014, and Bobeica, E. et al., “Demographics and inflation”, *Working Paper Series*, No 2006, ECB, 2017, find a relationship between population ageing and deflationary pressures. Meanwhile, Juselius, M. and Takats, E., “Can demography affect inflation and monetary policy?”, *BIS Working Papers*, No 485, 2015, finds a link with inflationary pressures. Those differing results could, of course, stem from a variety of different factors, such as the samples, definitions or controls employed.

<sup>137</sup> See the article entitled “The ECB's forward guidance”, *Monthly Bulletin*, ECB, April 2014, and the article entitled “The transmission of the ECB's recent non-standard monetary policy measures”, *Economic Bulletin*, Issue 7, ECB, 2015.

stability, particularly where the ageing process has been accompanied by a strengthening of privately funded elements of pension systems.<sup>138</sup>

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## 5 Conclusions

**This article finds that population ageing will have major macroeconomic and fiscal implications for the euro area.** In particular, ageing will lead to a decline in the labour supply and is likely to have adverse effects on productivity, while the implications for savings and investment will vary over time, depending on the relative size of the various cohorts and behavioural changes. Model simulations broadly support these findings. Population ageing will also entail changes to relative prices, mainly owing to shifts in demand, with demand for services rising. There will also be additional upward pressure on public spending on pensions, health care and long-term care. This will make it challenging for euro area countries to reduce their sizeable debt burdens and ensure fiscal sustainability in the long run.

**Against this background, many countries implemented pension reforms following the sovereign debt crisis, although the pace of reform has slowed of late.** Further reforms in this area would seem to be essential and should not be delayed, also in view of political economy considerations.

**While pension reforms will help to contain the fiscal impact of population ageing, their precise macroeconomic implications may vary considerably depending on the specific nature of those reform measures.** In particular, increasing the retirement age can be expected to reduce the adverse macroeconomic effects of ageing, thanks to a favourable impact on the labour supply and domestic consumption. In contrast, reducing the benefit ratio will tend to do very little to tackle those macroeconomic effects, while increasing the contribution rate will actually tend to exacerbate them. These findings are supported by model simulations. That being said, these results are, by construction, merely a general assessment of the macroeconomic effects of pension reforms and do not allow conclusions to be drawn regarding the reform agendas of specific countries. At the same time, forces relating to population ageing and pension reforms are a slow-moving determinant of the equilibrium real interest rate and need to be taken into account by a price stability-oriented monetary policy.

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<sup>138</sup> For a more detailed discussion, see Miles, D., "Should monetary policy be different in a greyer world?", in Auerbach, A. and Herrmann, H. (eds.), *Ageing, financial markets and monetary policy*, Springer, 2002.

# Statistics

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## Further information

ECB statistics can be accessed from the Statistical Data Warehouse (SDW):	<a href="http://sdw.ecb.europa.eu/">http://sdw.ecb.europa.eu/</a>
Data from the statistics section of the Economic Bulletin are available from the SDW:	<a href="http://sdw.ecb.europa.eu/reports.do?node=1000004813">http://sdw.ecb.europa.eu/reports.do?node=1000004813</a>
A comprehensive Statistics Bulletin can be found in the SDW:	<a href="http://sdw.ecb.europa.eu/reports.do?node=1000004045">http://sdw.ecb.europa.eu/reports.do?node=1000004045</a>
Methodological definitions can be found in the General Notes to the Statistics Bulletin:	<a href="http://sdw.ecb.europa.eu/reports.do?node=10000023">http://sdw.ecb.europa.eu/reports.do?node=10000023</a>
Details on calculations can be found in the Technical Notes to the Statistics Bulletin:	<a href="http://sdw.ecb.europa.eu/reports.do?node=10000022">http://sdw.ecb.europa.eu/reports.do?node=10000022</a>
Explanations of terms and abbreviations can be found in the ECB's statistics glossary:	<a href="http://www.ecb.europa.eu/home/glossary/html/glossa.en.html">http://www.ecb.europa.eu/home/glossary/html/glossa.en.html</a>

## Conventions used in the tables

-	data do not exist/data are not applicable
.	data are not yet available
...	nil or negligible
(p)	provisional
s.a.	seasonally adjusted
n.s.a.	non-seasonally adjusted

# 1 External environment

## 1.1 Main trading partners, GDP and CPI

	GDP <sup>1)</sup> (period-on-period percentage changes)						CPI (annual percentage changes)						
	G20	United States	United Kingdom	Japan	China	Memo item: euro area	OECD countries		United States	United Kingdom (HICP)	Japan	China	Memo item: euro area <sup>2)</sup> (HICP)
							Total	excluding food and energy					
	1	2	3	4	5	6	7	8	9	10	11	12	13
2015	3.5	2.9	2.3	1.4	6.9	2.1	0.6	1.7	0.1	0.0	0.8	1.4	0.0
2016	3.2	1.5	1.9	0.9	6.7	1.8	1.1	1.8	1.3	0.7	-0.1	2.0	0.2
2017	.	2.3	1.7	1.6	6.9	2.3	2.3	1.8	2.1	2.7	0.5	1.6	1.5
2017 Q1	0.9	0.3	0.2	0.3	1.4	0.6	2.4	1.8	2.5	2.1	0.3	1.4	1.8
Q2	1.0	0.8	0.3	0.6	1.9	0.7	2.1	1.8	1.9	2.7	0.4	1.4	1.5
Q3	1.0	0.8	0.5	0.6	1.8	0.7	2.2	1.8	2.0	2.8	0.6	1.6	1.4
Q4	.	0.6	0.4	0.1	1.6	0.6	2.3	1.9	2.1	3.0	0.6	1.8	1.4
2017 Sep.	-	-	-	-	-	-	2.3	1.8	2.2	3.0	0.7	1.6	1.5
Oct.	-	-	-	-	-	-	2.2	1.9	2.0	3.0	0.2	1.9	1.4
Nov.	-	-	-	-	-	-	2.4	1.8	2.2	3.1	0.6	1.7	1.5
Dec.	-	-	-	-	-	-	2.3	1.9	2.1	3.0	1.0	1.8	1.4
2018 Jan.	-	-	-	-	-	-	.	.	2.1	3.0	1.4	1.5	1.3
Feb. <sup>3)</sup>	-	-	-	-	-	-	.	.	.	.	.	.	1.2

Sources: Eurostat (col. 3, 6, 10, 13); BIS (col. 9, 11, 12); OECD (col. 1, 2, 4, 5, 7, 8).

1) Quarterly data seasonally adjusted; annual data unadjusted.

2) Data refer to the changing composition of the euro area.

3) The figure for the euro area is an estimate based on provisional national data, as well as on early information on energy prices.

## 1.2 Main trading partners, Purchasing Managers' Index and world trade

	Purchasing Managers' Surveys (diffusion indices; s.a.)						Merchandise imports <sup>1)</sup>					
	Composite Purchasing Managers' Index					Memo item: euro area	Global Purchasing Managers' Index <sup>2)</sup>			Global	Advanced economies	Emerging market economies
	Global <sup>2)</sup>	United States	United Kingdom	Japan	China		Manufacturing	Services	New export orders			
	1	2	3	4	5	6	7	8	9	10	11	12
2015	53.1	55.8	56.2	51.4	50.4	53.8	51.8	53.7	50.4	1.1	3.6	-0.5
2016	51.6	52.4	53.4	50.5	51.4	53.3	51.8	52.0	50.2	1.0	1.1	1.0
2017	53.3	54.3	54.7	52.5	51.8	56.4	53.9	53.8	52.8	5.2	3.1	6.6
2017 Q1	53.3	54.3	54.6	52.5	52.3	55.6	53.4	53.2	51.9	1.9	1.1	2.3
Q2	53.1	53.6	54.8	53.0	51.3	56.6	52.5	53.2	51.6	0.3	1.6	-0.6
Q3	53.3	54.9	54.1	51.8	51.9	56.0	52.7	53.5	51.9	1.6	1.0	2.0
Q4	53.4	54.6	55.2	52.6	51.9	57.2	53.5	53.4	52.1	1.4	1.6	1.3
2017 Sep.	53.2	54.8	54.1	51.7	51.4	56.7	52.9	53.3	51.5	1.6	1.0	2.0
Oct.	53.6	55.2	55.8	53.4	51.0	56.0	52.7	53.9	51.7	0.8	0.3	1.1
Nov.	53.2	54.5	55.0	52.2	51.6	57.5	53.7	53.1	52.2	1.2	0.8	1.5
Dec.	53.4	54.1	54.9	52.2	53.0	58.1	54.3	53.1	52.5	1.4	1.6	1.3
2018 Jan.	53.6	53.8	53.4	52.8	53.7	58.8	54.6	53.2	53.2	.	.	.
Feb.	54.3	55.8	54.5	52.2	53.3	57.1	53.9	54.5	52.5	.	.	.

Sources: Markit (col. 1-9); CPB Netherlands Bureau for Economic Policy Analysis and ECB calculations (col. 10-12).

1) Global and advanced economies exclude the euro area. Annual and quarterly data are period-on-period percentages; monthly data are 3-month-on-3-month percentages. All data are seasonally adjusted.

2) Excluding the euro area.



## 2 Financial developments

### 2.1 Money market interest rates

(percentages per annum; period averages)

	Euro area <sup>1)</sup>					United States	Japan
	Overnight deposits (EONIA)	1-month deposits (EURIBOR)	3-month deposits (EURIBOR)	6-month deposits (EURIBOR)	12-month deposits (EURIBOR)	3-month deposits (LIBOR)	3-month deposits (LIBOR)
	1	2	3	4	5	6	7
2015	-0.11	-0.07	-0.02	0.05	0.17	0.32	0.09
2016	-0.32	-0.34	-0.26	-0.17	-0.03	0.74	-0.02
2017	-0.35	-0.37	-0.33	-0.26	-0.15	1.26	-0.02
2017 Aug.	-0.36	-0.37	-0.33	-0.27	-0.16	1.31	-0.03
Sep.	-0.36	-0.37	-0.33	-0.27	-0.17	1.32	-0.03
Oct.	-0.36	-0.37	-0.33	-0.27	-0.18	1.36	-0.04
Nov.	-0.35	-0.37	-0.33	-0.27	-0.19	1.43	-0.03
Dec.	-0.34	-0.37	-0.33	-0.27	-0.19	1.60	-0.02
2018 Jan.	-0.36	-0.37	-0.33	-0.27	-0.19	1.73	-0.03
Feb.	-0.36	-0.37	-0.33	-0.27	-0.19	1.87	-0.06

Source: ECB.

1) Data refer to the changing composition of the euro area, see the General Notes.

### 2.2 Yield curves

(End of period; rates in percentages per annum; spreads in percentage points)

	Spot rates					Spreads			Instantaneous forward rates			
	Euro area <sup>1), 2)</sup>					Euro area <sup>1), 2)</sup>	United States	United Kingdom	Euro area <sup>1), 2)</sup>			
	3 months	1 year	2 years	5 years	10 years	10 years - 1 year	10 years - 1 year	10 years - 1 year	1 year	2 years	5 years	10 years
	1	2	3	4	5	6	7	8	9	10	11	12
2015	-0.45	-0.40	-0.35	0.02	0.77	1.17	1.66	1.68	-0.35	-0.22	0.82	1.98
2016	-0.93	-0.82	-0.80	-0.47	0.26	1.08	1.63	1.17	-0.78	-0.75	0.35	1.35
2017	-0.78	-0.74	-0.64	-0.17	0.52	1.26	0.67	0.83	-0.66	-0.39	0.66	1.56
2017 Aug.	-0.78	-0.77	-0.73	-0.35	0.38	1.15	0.89	0.92	-0.75	-0.62	0.48	1.52
Sep.	-0.76	-0.75	-0.70	-0.26	0.52	1.27	1.04	0.98	-0.73	-0.54	0.65	1.68
Oct.	-0.79	-0.79	-0.74	-0.32	0.44	1.23	0.95	0.87	-0.78	-0.60	0.55	1.61
Nov.	-0.78	-0.76	-0.70	-0.28	0.44	1.20	0.79	0.88	-0.73	-0.52	0.56	1.52
Dec.	-0.78	-0.74	-0.64	-0.17	0.52	1.26	0.67	0.83	-0.66	-0.39	0.66	1.56
2018 Jan.	-0.63	-0.64	-0.52	0.05	0.71	1.35	0.81	1.07	-0.59	-0.21	0.96	1.60
Feb.	-0.66	-0.68	-0.57	0.01	0.71	1.39	0.80	0.81	-0.64	-0.26	0.96	1.65

Source: ECB.

1) Data refer to the changing composition of the euro area, see the General Notes.

2) ECB calculations based on underlying data provided by EuroMTS and ratings provided by Fitch Ratings.

### 2.3 Stock market indices

(index levels in points; period averages)

	Dow Jones EURO STOXX indices												United States	Japan
	Benchmark		Main industry indices										Standard & Poor's 500	Nikkei 225
	Broad index	50	Basic materials	Consumer services	Consumer goods	Oil and gas	Financials	Industrials	Technology	Utilities	Telecoms	Health care		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
2015	356.2	3,444.1	717.4	261.9	628.2	299.9	189.8	500.6	373.2	278.0	377.7	821.3	2,061.1	19,203.8
2016	321.6	3,003.7	620.7	250.9	600.1	278.9	148.7	496.0	375.8	248.6	326.9	770.9	2,094.7	16,920.5
2017	376.9	3,491.0	757.3	268.6	690.4	307.9	182.3	605.5	468.4	272.7	339.2	876.3	2,449.1	20,209.0
2017 Aug.	375.1	3,451.3	727.5	266.5	681.4	288.8	187.3	596.2	467.4	284.4	340.3	861.1	2,456.2	19,670.2
Sep.	380.7	3,507.1	750.1	261.2	701.2	298.1	185.9	615.8	480.3	288.2	331.8	883.8	2,492.8	19,924.4
Oct.	391.7	3,614.7	791.0	267.8	724.9	306.3	190.2	636.2	501.1	290.1	330.9	895.9	2,557.0	21,267.5
Nov.	391.7	3,601.4	802.3	269.2	727.7	315.4	188.3	640.6	508.6	294.8	317.3	854.9	2,593.6	22,525.1
Dec.	389.7	3,564.7	796.2	274.9	719.0	313.5	189.1	641.2	491.3	291.3	316.1	839.7	2,664.3	22,769.9
2018 Jan.	398.4	3,612.2	822.3	276.1	731.7	323.4	196.3	661.2	504.6	284.9	312.6	848.1	2,789.8	23,712.2
Feb.	380.6	3,426.7	783.7	264.7	703.6	306.9	190.1	629.7	488.3	263.2	291.3	792.0	2,705.2	21,991.7

Source: ECB.

## 2 Financial developments

### 2.4 MFI interest rates on loans to and deposits from households (new business) <sup>1), 2)</sup>

(Percentages per annum; period average, unless otherwise indicated)

	Deposits				Revolving loans and overdrafts	Extended credit card credit	Loans for consumption			Loans to sole proprietors and unincorporated partnerships	Loans for house purchase				Composite cost-of-borrowing indicator	
	Over-night	Redeemable at notice of up to 3 months	With an agreed maturity of:				By initial period of rate fixation		APRC <sup>3)</sup>		By initial period of rate fixation					APRC <sup>3)</sup>
			Up to 2 years	Over 2 years			Floating rate and up to 1 year	Over 1 year			Floating rate and up to 1 year	Over 1 and up to 5 years	Over 5 and up to 10 years	Over 10 years		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
2017 Feb.	0.07	0.48	0.40	0.77	6.38	16.69	5.09	5.72	6.17	2.42	1.77	1.89	1.84	1.81	2.29	1.85
Mar.	0.06	0.47	0.40	0.74	6.38	16.70	4.99	5.62	6.08	2.41	1.74	1.88	1.85	1.81	2.25	1.85
Apr.	0.06	0.47	0.39	0.73	6.33	16.70	4.83	5.58	5.96	2.39	1.73	1.89	1.91	1.85	2.26	1.87
May	0.06	0.46	0.39	0.81	6.32	16.70	5.09	5.78	6.22	2.46	1.73	1.90	1.90	1.87	2.23	1.87
June	0.05	0.46	0.38	0.77	6.30	16.82	4.68	5.74	6.19	2.43	1.69	1.89	1.91	1.89	2.22	1.87
July	0.05	0.45	0.38	0.76	6.26	16.81	4.95	5.84	6.28	2.38	1.75	1.91	1.90	1.90	2.22	1.88
Aug.	0.05	0.44	0.35	0.75	6.23	16.80	5.33	5.89	6.34	2.38	1.75	2.00	1.92	1.94	2.21	1.91
Sep.	0.05	0.45	0.35	0.74	6.27	16.80	5.07	5.71	6.21	2.37	1.70	1.93	1.96	1.96	2.20	1.89
Oct.	0.05	0.44	0.35	0.75	6.23	16.80	4.92	5.68	6.15	2.43	1.68	1.91	1.93	1.96	2.18	1.88
Nov.	0.05	0.45	0.33	0.75	6.21	16.80	4.73	5.69	6.14	2.38	1.67	1.92	1.95	1.94	2.17	1.87
Dec.	0.05	0.44	0.33	0.73	6.09	16.84	4.47	5.39	5.80	2.31	1.69	1.86	1.92	1.87	2.15	1.83
2018 Jan. <sup>(a)</sup>	0.04	0.44	0.35	0.72	6.15	16.88	5.07	6.02	6.45	2.30	1.67	1.87	1.92	1.90	2.14	1.84

Source: ECB.

1) Data refer to the changing composition of the euro area.

2) Including non-profit institutions serving households.

3) Annual percentage rate of charge (APRC).

### 2.5 MFI interest rates on loans to and deposits from non-financial corporations (new business) <sup>1), 2)</sup>

(Percentages per annum; period average, unless otherwise indicated)

	Deposits			Revolving loans and overdrafts	Other loans by size and initial period of rate fixation									Composite cost-of-borrowing indicator
	Over-night	With an agreed maturity of:			up to EUR 0.25 million			over EUR 0.25 and up to 1 million			over EUR 1 million			
		Up to 2 years	Over 2 years		Floating rate and up to 3 months	Over 3 months and up to 1 year	Over 1 year	Floating rate and up to 3 months	Over 3 months and up to 1 year	Over 1 year	Floating rate and up to 3 months	Over 3 months and up to 1 year	Over 1 year	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	
2017 Feb.	0.06	0.10	0.53	2.63	2.57	2.79	2.36	1.77	1.76	1.71	1.18	1.32	1.53	1.76
Mar.	0.06	0.08	0.58	2.58	2.51	2.79	2.36	1.76	1.79	1.72	1.30	1.63	1.57	1.82
Apr.	0.05	0.10	0.40	2.55	2.54	2.68	2.35	1.79	1.78	1.71	1.34	1.50	1.64	1.81
May	0.05	0.10	0.43	2.51	2.49	2.77	2.38	1.76	1.73	1.72	1.20	1.47	1.63	1.76
June	0.05	0.06	0.43	2.50	2.46	2.68	2.34	1.74	1.71	1.67	1.27	1.42	1.55	1.76
July	0.05	0.11	0.35	2.45	2.45	2.76	2.36	1.74	1.75	1.72	1.23	1.33	1.66	1.74
Aug.	0.04	0.10	0.36	2.43	2.49	2.71	2.41	1.74	1.78	1.78	1.24	1.44	1.58	1.75
Sep.	0.04	0.07	0.44	2.42	2.44	2.73	2.39	1.71	1.68	1.73	1.19	1.46	1.58	1.73
Oct.	0.04	0.11	0.40	2.39	2.39	2.69	2.36	1.70	1.66	1.70	1.23	1.35	1.60	1.73
Nov.	0.04	0.08	0.30	2.36	2.43	2.60	2.35	1.70	1.61	1.69	1.23	1.32	1.56	1.72
Dec.	0.04	0.06	0.32	2.35	2.40	2.45	2.29	1.70	1.66	1.66	1.34	1.27	1.52	1.71
2018 Jan. <sup>(a)</sup>	0.04	0.06	0.47	2.35	2.39	2.51	2.33	1.65	1.61	1.73	1.11	1.38	1.61	1.67

Source: ECB.

1) Data refer to the changing composition of the euro area.

2) In accordance with the ESA 2010, in December 2014 holding companies of non-financial groups were reclassified from the non-financial corporations sector to the financial corporations sector.

## 2 Financial developments

### 2.6 Debt securities issued by euro area residents, by sector of the issuer and initial maturity

(EUR billions; transactions during the month and end-of-period outstanding amounts; nominal values)

	Outstanding amounts							Gross issues <sup>1)</sup>						
	Total	MFIs (including Euro- system)	Non-MFI corporations		General government		Total	MFIs (including Euro- system)	Non-MFI corporations		General government			
			Financial corporations other than MFIs	FVCs	Non- financial corporations	Central govern- ment			Other general govern- ment	Financial corporations other than MFIs	FVCs	Non- financial corporations	Central govern- ment	Other general govern- ment
1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Short-term														
2014	1,320	543	131	.	59	538	50	410	219	34	.	38	93	25
2015	1,269	517	147	.	62	478	65	347	161	37	.	33	82	34
2016	1,241	518	136	.	59	466	62	349	161	45	.	31	79	33
2017 July	1,296	515	152	.	87	477	66	386	177	57	.	44	77	32
Aug.	1,302	516	155	.	85	474	72	359	169	57	.	29	80	25
Sep.	1,314	530	161	.	81	478	65	378	162	69	.	37	82	29
Oct.	1,287	529	156	.	84	457	62	372	175	45	.	41	74	36
Nov.	1,276	527	148	.	80	460	61	344	159	38	.	34	87	25
Dec.	1,222	519	138	.	70	439	57	285	137	33	.	30	55	29
Long-term														
2014	15,129	4,048	3,161	.	993	6,285	643	226	65	49	.	16	86	10
2015	15,247	3,785	3,288	.	1,056	6,481	637	217	68	47	.	13	81	9
2016	15,399	3,695	3,235	.	1,185	6,643	641	220	62	53	.	18	79	8
2017 July	15,400	3,616	3,237	.	1,152	6,762	633	269	74	93	.	22	76	4
Aug.	15,326	3,590	3,178	.	1,148	6,776	634	127	29	35	.	3	54	5
Sep.	15,364	3,568	3,181	.	1,176	6,804	634	233	56	64	.	17	90	5
Oct.	15,338	3,579	3,160	.	1,182	6,777	640	242	76	50	.	21	85	10
Nov.	15,369	3,595	3,125	.	1,187	6,819	643	222	55	56	.	23	79	8
Dec.	15,343	3,560	3,135	.	1,187	6,819	642	198	52	72	.	14	54	6

Source: ECB.

1) For the purpose of comparison, annual data refer to the average monthly figure over the year.

### 2.7 Growth rates and outstanding amounts of debt securities and listed shares

(EUR billions; percentage changes)

	Debt securities							Listed shares			
	Total	MFIs (including Eurosystem)	Non-MFI corporations		General government		Total	MFIs	Financial corporations other than MFIs	Non- financial corporations	
			Financial corporations other than MFIs	FVCs	Non- financial corporations	Central government					Other general government
1	2	3	4	5	6	7	8	9	10	11	
Outstanding amount											
2014	16,449.3	4,590.6	3,291.5	.	1,051.5	6,822.7	693.0	6,016.3	591.3	850.5	4,574.6
2015	16,516.5	4,301.8	3,435.1	.	1,117.9	6,959.2	702.4	6,814.3	584.3	985.2	5,244.9
2016	16,639.8	4,213.3	3,371.1	.	1,243.8	7,108.1	703.5	7,089.5	537.6	1,097.8	5,454.1
2017 July	16,696.1	4,130.2	3,389.2	.	1,239.2	7,238.8	698.8	7,718.2	663.1	1,197.5	5,857.6
Aug.	16,627.8	4,105.8	3,333.3	.	1,233.0	7,250.5	705.2	7,638.4	630.8	1,174.6	5,832.9
Sep.	16,678.6	4,098.0	3,341.8	.	1,257.2	7,282.0	699.6	7,937.7	657.7	1,237.3	6,042.6
Oct.	16,625.6	4,108.4	3,315.2	.	1,265.8	7,233.9	702.3	8,168.2	649.6	1,301.3	6,217.3
Nov.	16,644.9	4,121.8	3,272.5	.	1,267.3	7,279.9	703.5	8,010.7	638.4	1,257.5	6,114.8
Dec.	16,565.9	4,078.8	3,273.3	.	1,256.4	7,257.5	699.8	7,959.5	628.5	1,251.2	6,079.8
Growth rate											
2014	-0.6	-8.0	1.1	.	5.3	3.2	1.1	1.5	7.2	1.9	0.7
2015	0.3	-7.0	5.7	.	4.7	1.8	0.6	1.1	4.2	1.6	0.6
2016	0.3	-3.0	-1.7	.	7.5	2.1	-0.1	0.5	1.2	0.9	0.4
2017 July	1.8	-1.1	3.6	.	9.5	1.8	-0.9	0.8	6.1	1.4	0.1
Aug.	1.6	-1.5	2.2	.	9.2	2.0	-0.3	0.8	6.1	1.4	0.2
Sep.	1.4	-1.5	1.3	.	7.7	2.3	-0.4	0.9	6.1	2.0	0.2
Oct.	1.0	-1.0	-0.5	.	7.3	1.9	-0.4	0.9	6.0	2.8	0.1
Nov.	1.1	-0.8	-0.2	.	6.6	1.8	0.4	1.0	6.1	2.8	0.1
Dec.	1.2	-0.6	0.0	.	6.4	2.1	0.5	1.1	6.1	2.8	0.3

Source: ECB.

## 2 Financial developments

### 2.8 Effective exchange rates <sup>1)</sup>

(period averages; index: 1999 Q1=100)

	EER-19						EER-38	
	Nominal	Real CPI	Real PPI	Real GDP deflator	Real ULCM <sup>2)</sup>	Real ULCT	Nominal	Real CPI
	1	2	3	4	5	6	7	8
2015	91.7	87.6	88.6	82.8	80.7	88.3	105.7	86.9
2016	94.4	89.5	90.8	84.9	80.0	89.5	109.7	89.2
2017	96.6	91.4	92.0	.	.	.	112.0	90.5
2017 Q1	93.8	89.1	89.6	83.4	79.5	88.3	108.6	88.1
Q2	95.3	90.3	91.0	84.7	79.1	89.3	110.1	89.0
Q3	98.6	93.2	93.8	87.7	81.3	92.1	114.5	92.3
Q4	98.6	93.1	93.5	.	.	.	115.0	92.5
2017 Sep.	99.0	93.6	94.0	-	-	-	115.0	92.7
Oct.	98.6	93.1	93.6	-	-	-	114.8	92.4
Nov.	98.5	93.0	93.4	-	-	-	115.0	92.5
Dec.	98.8	93.3	93.6	-	-	-	115.3	92.6
2018 Jan.	99.4	93.9	93.9	-	-	-	116.1	93.2
Feb.	99.6	93.9	93.9	-	-	-	117.3	94.1
	<i>Percentage change versus previous month</i>							
2018 Feb.	0.2	0.1	0.0	-	-	-	1.0	0.9
	<i>Percentage change versus previous year</i>							
2018 Feb.	6.6	5.7	5.1	-	-	-	8.5	7.2

Source: ECB.

1) For a definition of the trading partner groups and other information see the General Notes to the Statistics Bulletin.

2) ULCM-deflated series are available only for the EER-18 trading partner group.

### 2.9 Bilateral exchange rates

(period averages; units of national currency per euro)

	Chinese renminbi	Croatian kuna	Czech koruna	Danish krone	Hungarian forint	Japanese yen	Polish zloty	Pound sterling	Romanian leu	Swedish krona	Swiss franc	US Dollar
	1	2	3	4	5	6	7	8	9	10	11	12
2015	6.973	7.614	27.279	7.459	309.996	134.314	4.184	0.726	4.4454	9.353	1.068	1.110
2016	7.352	7.533	27.034	7.445	311.438	120.197	4.363	0.819	4.4904	9.469	1.090	1.107
2017	7.629	7.464	26.326	7.439	309.193	126.711	4.257	0.877	4.5688	9.635	1.112	1.130
2017 Q1	7.335	7.467	27.021	7.435	309.095	121.014	4.321	0.860	4.5217	9.506	1.069	1.065
Q2	7.560	7.430	26.535	7.438	309.764	122.584	4.215	0.861	4.5532	9.692	1.084	1.102
Q3	7.834	7.426	26.085	7.438	306.418	130.349	4.258	0.898	4.5822	9.557	1.131	1.175
Q4	7.789	7.533	25.650	7.443	311.597	132.897	4.232	0.887	4.6189	9.793	1.162	1.177
2017 Sep.	7.826	7.464	26.075	7.440	308.368	131.924	4.269	0.895	4.5992	9.533	1.147	1.191
Oct.	7.789	7.509	25.766	7.443	309.951	132.763	4.263	0.891	4.5895	9.614	1.155	1.176
Nov.	7.772	7.551	25.538	7.442	311.891	132.392	4.227	0.888	4.6347	9.848	1.164	1.174
Dec.	7.807	7.539	25.645	7.443	313.163	133.638	4.203	0.883	4.6348	9.937	1.169	1.184
2018 Jan.	7.840	7.436	25.452	7.445	309.269	135.255	4.163	0.883	4.6491	9.820	1.172	1.220
Feb.	7.807	7.440	25.320	7.446	311.735	133.293	4.165	0.884	4.6559	9.938	1.154	1.235
	<i>Percentage change versus previous month</i>											
2018 Feb.	-0.4	0.1	-0.5	0.0	0.8	-1.5	0.1	0.1	0.1	1.2	-1.5	1.2
	<i>Percentage change versus previous year</i>											
2018 Feb.	6.7	-0.1	-6.3	0.1	1.0	10.9	-3.3	3.7	3.2	4.9	8.3	16.0

Source: ECB.

## 2 Financial developments

### 2.10 Euro area balance of payments, financial account

(EUR billions, unless otherwise indicated; outstanding amounts at end of period; transactions during period)

	Total <sup>1)</sup>			Direct investment		Portfolio investment		Net financial derivatives	Other investment		Reserve assets	Memo: Gross external debt
	Assets	Liabilities	Net	Assets	Liabilities	Assets	Liabilities		Assets	Liabilities		
	1	2	3	4	5	6	7	8	9	10	11	12
<i>Outstanding amounts (international investment position)</i>												
2016 Q4	23,995.3	24,798.1	-802.8	10,690.9	8,633.5	7,864.0	10,583.9	-56.3	4,789.0	5,580.6	707.6	13,795.5
2017 Q1	25,224.7	25,780.6	-555.9	11,113.0	8,955.8	8,256.5	10,868.6	-61.5	5,190.3	5,956.2	726.6	14,252.2
Q2	24,681.2	25,242.2	-560.9	10,845.7	8,841.2	8,198.2	10,636.9	-46.7	5,001.4	5,764.1	682.7	13,826.2
Q3	24,507.7	25,014.4	-506.8	10,552.7	8,562.7	8,354.3	10,665.4	-58.8	4,984.6	5,786.3	674.8	13,700.9
<i>Outstanding amounts as a percentage of GDP</i>												
2017 Q3	221.5	226.1	-4.6	95.4	77.4	75.5	96.4	-0.5	45.1	52.3	6.1	123.8
<i>Transactions</i>												
2017 Q1	655.0	585.6	69.4	204.8	206.7	174.8	75.5	23.2	254.6	303.4	-2.3	-
Q2	195.6	133.2	62.4	27.2	18.4	171.4	145.4	-2.3	0.9	-30.6	-1.6	-
Q3	91.2	-71.1	162.2	-139.9	-155.8	190.9	42.5	-10.7	50.2	42.2	0.5	-
Q4	38.0	-80.5	118.5	-2.8	19.5	85.2	-26.1	-1.1	-45.3	-73.9	2.0	-
2017 July	-2.1	-58.8	56.7	-163.0	-168.4	68.4	39.7	-2.7	100.4	69.9	-5.2	-
Aug.	61.8	24.3	37.5	9.6	17.2	73.9	-16.1	-5.1	-15.9	23.2	-0.7	-
Sep.	31.4	-36.6	68.0	13.5	-4.5	48.7	18.9	-2.9	-34.2	-50.9	6.4	-
Oct.	183.2	145.9	37.3	33.2	4.9	22.9	-23.8	-0.2	130.0	164.7	-2.7	-
Nov.	58.5	22.9	35.6	-0.4	16.8	50.9	18.1	0.5	1.1	-12.0	6.3	-
Dec.	-203.6	-249.2	45.6	-35.6	-2.1	11.5	-20.5	-1.4	-176.4	-226.6	-1.6	-
<i>12-month cumulated transactions</i>												
2017 Dec.	979.8	567.3	412.6	89.4	88.8	622.3	237.4	9.0	260.4	241.1	-1.3	-
<i>12-month cumulated transactions as a percentage of GDP</i>												
2017 Dec.	8.8	5.1	3.7	0.8	0.8	5.6	2.1	0.1	2.3	2.2	0.0	-

Source: ECB.

1) Net financial derivatives are included in total assets.

## 3 Economic activity

### 3.1 GDP and expenditure components

(quarterly data seasonally adjusted; annual data unadjusted)

	GDP											
	Total	Domestic demand							External balance <sup>1)</sup>			
		Total	Private consumption	Government consumption	Gross fixed capital formation			Changes in inventories <sup>2)</sup>	Total	Exports <sup>1)</sup>	Imports <sup>1)</sup>	
					Total construction	Total machinery	Intellectual property products					
1	2	3	4	5	6	7	8	9	10	11	12	
<i>Current prices (EUR billions)</i>												
2015	10,515.6	10,030.7	5,753.8	2,169.4	2,078.3	1,016.3	638.3	418.0	29.3	484.9	4,847.0	4,362.1
2016	10,789.7	10,312.7	5,891.5	2,220.1	2,190.4	1,052.1	674.9	457.8	10.7	477.0	4,937.2	4,460.2
2017	11,165.5	10,674.8	6,073.2	2,272.4	2,298.0	1,112.1	712.7	467.8	31.2	490.6	5,276.5	4,785.9
2017 Q1	2,748.2	2,632.1	1,504.4	562.3	560.7	273.2	172.2	113.9	4.8	116.2	1,296.8	1,180.6
Q2	2,781.3	2,662.8	1,515.3	565.9	572.1	275.9	175.2	119.7	9.4	118.5	1,308.9	1,190.3
Q3	2,809.6	2,677.0	1,522.2	570.1	572.8	279.8	179.6	111.9	12.0	132.6	1,325.4	1,192.9
Q4	2,834.0	2,693.5	1,531.8	574.0	580.5	283.9	182.1	113.0	7.2	140.6	1,357.0	1,216.5
<i>as a percentage of GDP</i>												
2017	100.0	95.6	54.4	20.4	20.6	10.0	6.4	4.2	0.3	4.4	-	-
<i>Chain-linked volumes (prices for the previous year)</i>												
<i>quarter-on-quarter percentage changes</i>												
2017 Q1	0.6	0.1	0.5	0.2	0.2	1.4	0.7	-3.5	-	-	1.3	0.2
Q2	0.7	1.0	0.5	0.4	1.7	0.5	1.6	4.9	-	-	1.2	1.8
Q3	0.7	0.2	0.3	0.4	-0.2	0.9	2.4	-6.7	-	-	1.6	0.6
Q4	0.6	0.2	0.2	0.3	0.9	0.7	1.3	0.6	-	-	1.9	1.1
<i>annual percentage changes</i>												
2015	2.1	2.0	1.8	1.3	3.3	0.5	5.4	7.2	-	-	6.4	6.7
2016	1.8	2.4	2.0	1.8	4.6	2.5	5.5	8.4	-	-	3.4	4.8
2017	2.3	2.0	1.6	1.2	3.5	3.3	5.2	1.4	-	-	4.9	4.4
2017 Q1	2.1	1.9	1.6	1.0	4.1	3.3	3.6	7.0	-	-	4.7	4.7
Q2	2.4	2.3	1.9	1.1	3.4	4.0	4.3	1.1	-	-	4.5	4.5
Q3	2.7	2.0	1.9	1.3	2.4	3.3	5.8	-4.3	-	-	5.8	4.4
Q4	2.7	1.5	1.5	1.4	2.5	3.6	6.2	-5.0	-	-	6.1	3.7
<i>contributions to quarter-on-quarter percentage changes in GDP; percentage points</i>												
2017 Q1	0.6	0.1	0.3	0.1	0.0	0.1	0.0	-0.2	-0.2	0.5	-	-
Q2	0.7	0.9	0.3	0.1	0.4	0.0	0.1	0.2	0.2	-0.2	-	-
Q3	0.7	0.2	0.2	0.1	-0.1	0.1	0.2	-0.3	0.0	0.5	-	-
Q4	0.6	0.2	0.1	0.1	0.2	0.1	0.1	0.0	-0.2	0.4	-	-
<i>contributions to annual percentage changes in GDP; percentage points</i>												
2015	2.1	2.0	1.0	0.3	0.6	0.0	0.3	0.3	0.0	0.1	-	-
2016	1.8	2.2	1.1	0.4	0.9	0.2	0.3	0.3	-0.1	-0.4	-	-
2017	2.3	1.9	0.9	0.2	0.7	0.3	0.3	0.1	0.1	0.4	-	-
2017 Q1	2.1	1.8	0.9	0.2	0.8	0.3	0.2	0.3	-0.1	0.2	-	-
Q2	2.4	2.2	1.0	0.2	0.7	0.4	0.3	0.0	0.3	0.2	-	-
Q3	2.7	1.9	1.0	0.3	0.5	0.3	0.4	-0.2	0.1	0.8	-	-
Q4	2.7	1.4	0.8	0.3	0.5	0.3	0.4	-0.2	-0.2	1.3	-	-

Sources: Eurostat and ECB calculations.

1) Exports and imports cover goods and services and include cross-border intra-euro area trade.

2) Including acquisitions less disposals of valuables.

## 3 Economic activity

### 3.2 Value added by economic activity

(quarterly data seasonally adjusted; annual data unadjusted)

	Gross value added (basic prices)											Taxes less subsidies on products
	Total	Agriculture, forestry and fishing	Manufacturing energy and utilities	Const- ruction	Trade, transport, accom- modation and food services	Informa- tion and commu- nica- tion	Finance and insurance	Real estate	Professional, business and support services	Public ad- ministration, education, health and social work	Arts, enter- tainment and other services	
	1	2	3	4	5	6	7	8	9	10	11	12
<b>Current prices (EUR billions)</b>												
2015	9,443.4	153.9	1,900.3	468.6	1,782.2	433.1	464.0	1,073.1	1,026.1	1,811.6	330.4	1,072.2
2016	9,680.3	151.6	1,936.9	489.1	1,830.9	451.3	454.0	1,100.6	1,071.0	1,857.5	337.5	1,109.4
2017	10,010.5	164.4	2,001.8	513.5	1,906.9	467.5	451.8	1,132.1	1,121.5	1,905.6	345.3	1,155.0
2017 Q1	2,464.5	40.5	490.8	125.8	469.1	115.1	112.7	279.7	275.0	470.6	85.2	283.7
Q2	2,493.8	40.8	498.2	127.9	476.1	116.7	112.7	282.0	278.9	474.5	86.0	287.5
Q3	2,519.6	41.3	504.6	129.5	479.6	117.8	113.6	284.6	283.0	478.8	86.9	290.1
Q4	2,540.6	41.9	510.9	131.5	483.5	118.6	112.9	286.0	285.9	482.1	87.4	293.4
<i>as a percentage of value added</i>												
2017	100.0	1.6	20.0	5.1	19.0	4.7	4.5	11.3	11.2	19.0	3.4	-
<b>Chain-linked volumes (prices for the previous year)</b>												
<i>quarter-on-quarter percentage changes</i>												
2017 Q1	0.7	1.6	0.0	1.3	1.3	1.2	-0.1	0.5	1.5	0.2	0.1	0.4
Q2	0.7	0.0	1.1	0.9	0.7	0.9	0.6	0.2	1.0	0.5	0.4	0.9
Q3	0.7	0.2	1.5	0.4	0.4	1.3	0.1	0.5	0.8	0.5	0.7	0.3
Q4	0.6	0.3	1.2	1.1	0.6	0.7	0.2	0.3	0.8	0.3	0.2	0.4
<i>annual percentage changes</i>												
2015	1.9	3.1	3.9	0.4	1.8	3.3	-0.3	0.7	2.9	0.9	1.1	3.3
2016	1.7	-1.2	1.9	1.7	2.0	2.9	0.2	1.0	2.8	1.3	1.2	2.8
2017	2.3	1.0	2.8	2.6	2.9	4.4	0.1	1.4	3.5	1.3	1.0	2.6
2017 Q1	2.0	0.5	1.8	2.4	2.8	4.9	-0.5	1.2	3.5	1.1	0.8	2.6
Q2	2.4	0.4	3.0	3.1	3.3	5.1	0.1	1.2	3.1	1.3	0.8	3.0
Q3	2.7	0.9	3.9	3.0	3.3	4.5	0.3	1.6	4.0	1.5	1.3	2.6
Q4	2.7	2.1	3.8	3.7	3.1	4.2	0.9	1.6	4.0	1.4	1.4	2.0
<i>contributions to quarter-on-quarter percentage changes in value added; percentage points</i>												
2017 Q1	0.7	0.0	0.0	0.1	0.2	0.1	0.0	0.1	0.2	0.0	0.0	-
Q2	0.7	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	-
Q3	0.7	0.0	0.3	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	-
Q4	0.6	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	-
<i>contributions to annual percentage changes in value added; percentage points</i>												
2015	1.9	0.1	0.8	0.0	0.3	0.2	0.0	0.1	0.3	0.2	0.0	-
2016	1.7	0.0	0.4	0.1	0.4	0.1	0.0	0.1	0.3	0.2	0.0	-
2017	2.3	0.0	0.6	0.1	0.5	0.2	0.0	0.2	0.4	0.3	0.0	-
2017 Q1	2.0	0.0	0.4	0.1	0.5	0.2	0.0	0.1	0.4	0.2	0.0	-
Q2	2.4	0.0	0.6	0.2	0.6	0.2	0.0	0.1	0.3	0.2	0.0	-
Q3	2.7	0.0	0.8	0.2	0.6	0.2	0.0	0.2	0.4	0.3	0.0	-
Q4	2.7	0.0	0.8	0.2	0.6	0.2	0.0	0.2	0.4	0.3	0.0	-

Sources: Eurostat and ECB calculations.

## 3 Economic activity

### 3.3 Employment <sup>1)</sup>

(quarterly data seasonally adjusted; annual data unadjusted)

	Total	By employment status		By economic activity									
		Employees	Self-employed	Agriculture, forestry and fishing	Manufacturing, energy and utilities	Construction	Trade, transport, accommodation and food services	Information and communication	Finance and insurance	Real estate	Professional, business and support services	Public administration, education, health and social work	Arts, entertainment and other services
	1	2	3	4	5	6	7	8	9	10	11	12	13
Persons employed													
<i>as a percentage of total persons employed</i>													
2014	100.0	85.0	15.0	3.4	15.0	6.1	24.7	2.7	2.7	1.0	13.1	24.3	7.1
2015	100.0	85.2	14.8	3.3	14.9	6.0	24.8	2.7	2.6	1.0	13.3	24.3	7.1
2016	100.0	85.5	14.5	3.2	14.8	5.9	24.9	2.8	2.6	1.0	13.5	24.3	7.0
<i>annual percentage changes</i>													
2014	0.6	0.7	0.1	0.1	-0.4	-1.3	0.7	0.7	-0.9	0.2	2.3	1.0	0.7
2015	1.0	1.2	-0.3	-1.2	0.2	0.0	1.3	1.4	-0.2	1.4	2.8	1.0	0.5
2016	1.3	1.6	-0.3	-0.5	0.6	-0.2	1.7	2.4	0.0	1.9	2.8	1.3	1.1
2016 Q4	1.3	1.6	-0.1	0.1	0.6	0.4	1.7	2.6	0.0	2.6	2.8	1.3	0.5
2017 Q1	1.6	1.8	0.2	1.0	0.8	1.5	1.7	3.2	-0.5	1.9	3.2	1.2	1.1
Q2	1.6	2.0	-0.3	0.6	1.1	1.5	1.8	3.4	-0.8	2.0	3.3	1.1	1.8
Q3	1.7	2.0	-0.1	-0.2	1.3	2.2	2.0	3.1	-0.9	2.0	3.2	1.1	2.0
Hours worked													
<i>as a percentage of total hours worked</i>													
2014	100.0	80.3	19.7	4.4	15.6	6.8	25.6	2.9	2.7	1.0	12.8	22.0	6.3
2015	100.0	80.5	19.5	4.3	15.5	6.8	25.6	2.9	2.7	1.0	13.0	22.0	6.3
2016	100.0	80.8	19.2	4.2	15.4	6.7	25.7	2.9	2.7	1.0	13.2	22.0	6.2
<i>annual percentage changes</i>													
2014	0.6	0.8	-0.4	-0.3	-0.1	-0.9	0.4	0.6	-1.0	0.0	2.4	1.2	0.1
2015	1.1	1.4	-0.2	-0.3	0.6	0.6	0.9	2.4	-0.1	1.8	2.9	1.0	0.8
2016	1.2	1.6	-0.1	-0.4	0.7	-0.1	1.6	1.9	0.6	2.1	2.8	1.0	0.9
2016 Q4	1.0	1.4	-0.3	-1.1	0.8	0.0	1.3	2.0	0.2	2.4	2.5	0.9	0.1
2017 Q1	1.3	1.7	-0.4	-0.6	1.0	1.6	1.3	2.9	-0.2	2.3	2.9	0.9	1.1
Q2	1.5	1.9	-0.2	-0.5	1.4	1.7	1.7	3.1	-1.4	1.8	2.8	1.0	1.7
Q3	1.8	2.2	0.0	-0.2	1.7	2.4	2.0	2.5	-0.8	2.0	3.1	1.0	2.3
Hours worked per person employed													
<i>annual percentage changes</i>													
2014	0.0	0.1	-0.5	-0.4	0.3	0.4	-0.3	-0.1	-0.1	-0.3	0.1	0.3	-0.5
2015	0.1	0.1	0.1	0.9	0.3	0.5	-0.4	1.0	0.1	0.3	0.1	0.0	0.3
2016	-0.1	-0.1	0.1	0.0	0.1	0.2	-0.2	-0.4	0.6	0.2	0.0	-0.2	-0.1
2016 Q4	-0.3	-0.2	-0.2	-1.1	0.2	-0.4	-0.4	-0.6	0.1	-0.1	-0.2	-0.4	-0.3
2017 Q1	-0.3	-0.1	-0.6	-1.6	0.2	0.1	-0.4	-0.3	0.2	0.4	-0.3	-0.3	0.0
Q2	-0.1	-0.1	0.1	-1.1	0.3	0.2	0.0	-0.4	-0.6	-0.2	-0.4	-0.1	-0.1
Q3	0.1	0.2	0.1	0.0	0.5	0.2	0.1	-0.6	0.2	0.0	-0.1	-0.1	0.3

Sources: Eurostat and ECB calculations.

1) Data for employment are based on the ESA 2010.



## 3 Economic activity

### 3.4 Labour force, unemployment and job vacancies

(seasonally adjusted, unless otherwise indicated)

	Labour force, millions <sup>1)</sup>	Under-employment, % of labour force <sup>1)</sup>	Unemployment											Job vacancy rate <sup>2)</sup>
			Total		Long-term unemployment, % of labour force <sup>1)</sup>	By age				By gender				
			Millions	% of labour force		Adult		Youth		Male		Female		
						Millions	% of labour force	Millions	% of labour force	Millions	% of labour force	Millions	% of labour force	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	
% of total in 2016			100.0		81.7		18.3		52.2		47.8			
2015	160.600	4.6	17.472	10.9	5.6	14.305	9.8	3.167	22.3	9.263	10.7	8.208	11.1	1.5
2016	161.877	4.3	16.252	10.0	5.0	13.290	9.0	2.962	20.9	8.483	9.7	7.770	10.4	1.7
2017	.	.	14.773	9.1	.	12.096	8.1	2.677	18.8	7.648	8.7	7.125	9.5	1.9
2017 Q1	161.635	4.3	15.384	9.5	4.8	12.611	8.5	2.773	19.6	7.960	9.1	7.424	9.9	1.9
Q2	162.214	4.2	14.862	9.1	4.5	12.159	8.2	2.703	19.1	7.688	8.8	7.174	9.6	1.9
Q3	163.330	4.0	14.602	9.0	4.2	11.957	8.0	2.645	18.6	7.574	8.6	7.028	9.3	1.9
Q4	.	.	14.243	8.7	.	11.657	7.8	2.585	18.1	7.368	8.4	6.875	9.1	2.0
2017 Aug.	-	-	14.607	9.0	-	11.961	8.0	2.646	18.5	7.590	8.7	7.017	9.3	-
Sep.	-	-	14.487	8.9	-	11.846	8.0	2.641	18.5	7.502	8.5	6.985	9.3	-
Oct.	-	-	14.364	8.8	-	11.743	7.9	2.621	18.3	7.431	8.5	6.933	9.2	-
Nov.	-	-	14.243	8.7	-	11.662	7.8	2.581	18.1	7.362	8.4	6.881	9.1	-
Dec.	-	-	14.121	8.6	-	11.567	7.8	2.554	17.9	7.311	8.3	6.810	9.0	-
2018 Jan.	-	-	14.111	8.6	-	11.577	7.8	2.535	17.7	7.312	8.3	6.799	9.0	-

Sources: Eurostat and ECB calculations.

1) Not seasonally adjusted.

2) The job vacancy rate is equal to the number of job vacancies divided by the sum of the number of occupied posts and the number of job vacancies, expressed as a percentage.

### 3.5 Short-term business statistics

	Industrial production					Construction production	ECB indicator on industrial new orders	Retail sales				New passenger car registrations	
	Total (excluding construction)		Main Industrial Groupings					Total	Food, beverages, tobacco	Non-food	Fuel		
	Manufacturing	Intermediate goods	Capital goods	Consumer goods	Energy								
1	2	3	4	5	6	7	8	9	10	11	12	13	
% of total in 2010 <sup>1)</sup>	100.0	86.0	33.6	29.2	22.5	14.7	100.0	100.0	100.0	40.4	52.5	7.1	100.0
annual percentage changes													
2015	2.1	2.4	1.0	3.6	2.6	0.8	-0.9	3.6	3.0	1.7	4.0	2.4	8.8
2016	1.5	1.6	1.9	1.7	1.2	0.2	2.2	0.3	1.6	1.0	2.2	1.4	7.2
2017	3.0	3.2	4.1	3.6	1.6	0.8	2.6	7.7	2.4	1.5	3.3	1.0	5.6
2017 Q1	1.3	1.2	2.2	1.3	-0.5	1.9	1.9	5.5	2.1	1.3	2.7	1.9	4.8
Q2	2.7	2.8	3.8	2.4	1.7	1.6	3.6	6.7	2.7	2.4	3.3	1.6	6.0
Q3	3.7	4.0	4.9	4.7	2.0	0.6	3.0	9.1	2.6	1.4	4.1	0.4	5.5
Q4	4.2	5.0	5.5	5.9	3.1	-1.0	1.9	9.6	2.0	0.9	3.0	0.1	6.3
2017 Aug.	3.9	4.3	5.3	5.1	2.6	0.7	2.1	9.0	1.8	0.9	3.3	-0.3	6.9
Sep.	3.4	3.9	4.6	4.5	2.3	-1.0	3.6	10.7	3.9	2.3	5.7	0.5	5.3
Oct.	3.9	4.6	5.3	3.5	5.3	-2.0	2.3	8.8	0.3	-0.3	0.5	-0.2	5.9
Nov.	3.7	4.5	4.7	6.7	0.4	-1.9	2.9	10.6	3.7	1.8	5.6	0.4	8.7
Dec.	5.2	5.9	6.6	7.6	3.6	0.6	0.5	9.3	2.1	1.2	3.0	0.1	4.4
2018 Jan.	.	.	.	.	.	.	.	.	2.3	0.8	3.8	0.2	6.4
month-on-month percentage changes (s.a.)													
2017 Aug.	1.5	1.7	1.2	3.4	0.3	0.8	-0.1	3.0	-0.2	-0.2	0.1	-0.9	2.9
Sep.	-0.5	-0.5	-0.4	-1.6	0.2	-1.0	0.3	1.1	1.0	1.2	0.8	-0.1	1.5
Oct.	0.4	0.3	0.3	-0.2	0.2	0.1	-0.4	0.3	-1.1	-1.5	-1.3	-0.4	-3.1
Nov.	1.3	1.5	1.1	3.5	0.2	0.8	0.2	1.7	2.0	1.2	2.8	0.8	5.2
Dec.	0.4	0.2	1.4	-1.1	0.9	1.3	0.1	2.0	-1.0	-0.4	-1.4	-0.5	0.4
2018 Jan.	.	.	.	.	.	.	.	.	-0.1	-0.2	-0.3	0.1	0.1

Sources: Eurostat, ECB calculations, ECB experimental statistics (col. 8) and European Automobile Manufacturers Association (col. 13).

1) For retail sales, refers to 2015.

## 3 Economic activity

### 3.6 Opinion surveys (seasonally adjusted)

	European Commission Business and Consumer Surveys (percentage balances, unless otherwise indicated)							Purchasing Managers' Surveys (diffusion indices)				
	Economic sentiment indicator (long-term average = 100)	Manufacturing industry		Consumer confidence indicator	Construction confidence indicator	Retail trade confidence indicator	Service industries		Purchasing Managers' Index (PMI) for manufacturing	Manufacturing output	Business activity for services	Composite output
		Industrial confidence indicator	Capacity utilisation (%)				Services confidence indicator	Capacity utilisation (%)				
	1	2	3	4	5	6	7	8	9	10	11	12
1999-14	99.6	-6.0	80.7	-12.7	-14.5	-8.3	6.8	-	51.1	52.4	52.9	52.7
2015	103.6	-3.1	81.4	-6.2	-22.5	1.6	9.2	88.4	52.2	53.4	54.0	53.8
2016	104.3	-2.6	81.9	-7.7	-16.5	1.5	11.1	89.1	52.5	53.6	53.1	53.3
2017	110.7	4.5	83.3	-2.5	-4.0	3.3	14.6	89.8	57.4	58.5	55.6	56.4
2017 Q1	107.5	1.1	82.6	-5.5	-10.7	2.0	13.2	89.4	55.6	56.9	55.1	55.6
Q2	109.5	3.3	82.9	-2.8	-4.9	3.2	13.4	89.8	57.0	58.3	56.0	56.6
Q3	111.5	5.4	83.5	-1.5	-2.1	2.9	14.9	89.9	57.4	58.0	55.3	56.0
Q4	114.3	8.3	84.1	-0.2	1.8	5.3	16.9	89.9	59.7	60.7	56.0	57.2
2017 Sep.	112.5	6.7	-	-1.2	-1.5	3.0	15.4	-	58.1	59.2	55.8	56.7
Oct.	113.5	8.0	83.8	-1.1	0.5	5.5	16.2	89.6	58.5	58.8	55.0	56.0
Nov.	114.0	8.1	-	0.0	1.7	4.3	16.4	-	60.1	61.0	56.2	57.5
Dec.	115.3	8.8	-	0.5	3.1	6.0	18.0	-	60.6	62.2	56.6	58.1
2018 Jan.	114.9	9.0	84.4	1.4	4.7	5.2	16.8	90.2	59.6	61.1	58.0	58.8
Feb.	114.1	8.0	-	0.1	4.2	4.3	17.5	-	58.6	59.6	56.2	57.1

Sources: European Commission (Directorate-General for Economic and Financial Affairs) (col. 1-8) and Markit (col. 9-12).

### 3.7 Summary accounts for households and non-financial corporations (current prices, unless otherwise indicated; not seasonally adjusted)

	Households							Non-financial corporations						
	Saving ratio (gross) <sup>1)</sup>	Debt ratio	Real gross disposable income	Financial investment	Non-financial investment (gross)	Net worth <sup>2)</sup>	Housing wealth	Profit share <sup>3)</sup>	Saving ratio (net)	Debt ratio <sup>4)</sup>	Financial investment	Non-financial investment (gross)	Financing	
	Percentage of gross disposable income (adjusted)		Annual percentage changes				Percentage of net value added	Percentage of GDP	Annual percentage changes					
	1	2	3	4	5	6	7	8	9	10	11	12	13	
2014	12.7	94.3	1.0	1.9	1.3	2.7	0.9	32.1	4.6	131.8	2.7	7.2	1.6	
2015	12.4	93.6	1.6	1.9	1.4	3.3	2.6	32.6	6.0	133.9	4.2	4.8	2.2	
2016	12.1	93.3	1.8	1.8	5.9	4.3	4.5	33.2	8.0	133.9	3.9	6.0	1.9	
2016 Q4	12.1	93.3	1.4	1.8	6.5	4.3	4.5	33.2	8.0	133.9	3.9	5.5	1.9	
2017 Q1	12.1	93.0	1.6	1.8	10.2	4.6	4.6	33.4	7.6	133.6	4.4	9.5	2.2	
Q2	12.1	93.1	1.3	2.0	5.4	4.9	4.8	33.1	6.9	132.8	4.1	10.0	2.2	
Q3	12.0	93.0	1.6	2.1	6.2	5.0	5.4	33.3	7.0	131.4	4.2	4.1	2.3	

Sources: ECB and Eurostat.

1) Based on four-quarter cumulated sums of both saving and gross disposable income (adjusted for the change in the net equity of households in pension fund reserves).

2) Financial assets (net of financial liabilities) and non-financial assets. Non-financial assets consist mainly of housing wealth (residential structures and land). They also include non-financial assets of unincorporated enterprises classified within the household sector.

3) The profit share uses net entrepreneurial income, which is broadly equivalent to current profits in business accounting.

4) Based on the outstanding amount of loans, debt securities, trade credits and pension scheme liabilities.

## 3 Economic activity

### 3.8 Euro area balance of payments, current and capital accounts

(EUR billions; seasonally adjusted unless otherwise indicated; transactions)

	Current account											Capital account <sup>1)</sup>	
	Total			Goods		Services		Primary income		Secondary income		Credit	Debit
	Credit	Debit	Net	Credit	Debit	Credit	Debit	Credit	Debit	Credit	Debit		
1	2	3	4	5	6	7	8	9	10	11	12	13	
2017 Q1	959.3	868.2	91.1	558.6	479.3	206.1	188.4	167.6	143.9	27.0	56.6	7.4	17.7
Q2	965.0	884.1	80.9	559.9	477.3	207.8	190.4	170.8	146.1	26.4	70.3	7.0	17.2
Q3	991.0	866.9	124.2	575.7	477.1	210.8	184.6	177.9	139.2	26.7	65.9	6.5	8.4
Q4	982.7	887.5	95.2	582.8	495.1	211.5	191.9	161.4	135.6	26.9	64.8	11.6	7.7
2017 July	326.1	288.1	38.0	188.0	159.0	69.8	61.5	59.4	44.9	8.9	22.7	2.5	2.7
Aug.	333.0	289.5	43.5	191.6	159.5	70.2	61.2	62.1	48.3	9.1	20.6	1.9	2.6
Sep.	331.9	289.3	42.7	196.0	158.7	70.8	61.9	56.4	46.1	8.7	22.6	2.1	3.1
Oct.	317.4	287.0	30.3	187.7	161.4	69.2	62.3	52.1	42.5	8.3	20.8	3.0	1.6
Nov.	329.4	294.5	35.0	195.5	165.0	70.0	64.6	55.3	42.7	8.7	22.1	2.8	1.8
Dec.	335.9	306.0	29.9	199.7	168.7	72.3	65.0	54.1	50.4	9.8	21.8	5.9	4.4
<i>12-month cumulated transactions</i>													
2017 Dec.	3,898.0	3,506.6	391.4	2,277.0	1,928.9	836.2	755.3	677.7	564.9	107.0	257.6	32.6	51.0
<i>12-month cumulated transactions as a percentage of GDP</i>													
2017 Dec.	34.9	31.4	3.5	20.4	17.3	7.5	6.8	6.1	5.1	1.0	2.3	0.3	0.5

1) The capital account is not seasonally adjusted.

### 3.9 Euro area external trade in goods<sup>1)</sup>, values and volumes by product group<sup>2)</sup>

(seasonally adjusted, unless otherwise indicated)

	Total (n.s.a.)		Exports (f.o.b.)					Imports (c.i.f.)					
	Exports	Imports	Total			Memo item: Manufacturing	Total			Memo items:			
			Intermediate goods	Capital goods	Consumption goods		Intermediate goods	Capital goods	Consumption goods	Manufacturing	Oil		
	1	2	3	4	5	6	7	8	9	10	11	12	13
<i>Values (EUR billions; annual percentage changes for columns 1 and 2)</i>													
2017 Q1	11.0	13.9	539.5	258.7	110.1	161.2	449.2	486.0	279.1	78.5	120.4	344.4	59.8
Q2	5.4	9.9	544.7	257.0	112.6	162.7	455.6	486.7	275.3	80.6	123.3	353.1	52.2
Q3	6.0	7.8	547.0	256.8	114.1	164.3	459.5	484.8	272.7	80.3	122.8	354.2	48.3
Q4	6.2	7.2	562.9	.	.	.	471.6	498.0	.	.	.	357.3	.
2017 July	5.9	9.1	178.7	83.9	36.8	53.8	149.7	161.2	90.5	26.5	40.9	117.6	15.8
Aug.	6.9	9.0	183.3	86.1	38.1	55.5	154.2	162.4	91.4	27.0	41.1	119.4	16.0
Sep.	5.2	5.5	185.1	86.9	39.2	55.0	155.6	161.2	90.8	26.8	40.8	117.2	16.5
Oct.	9.1	10.4	181.6	86.6	36.5	54.1	152.0	162.4	92.2	26.5	41.3	118.7	17.6
Nov.	8.5	8.6	189.0	90.2	38.6	56.4	158.2	167.0	94.8	26.9	42.2	119.6	19.5
Dec.	1.0	2.5	192.3	.	.	.	161.4	168.5	.	.	.	119.0	.
<i>Volume indices (2000 = 100; annual percentage changes for columns 1 and 2)</i>													
2017 Q1	6.5	3.2	121.0	121.4	118.8	124.4	120.5	110.3	111.3	108.3	110.2	112.3	109.4
Q2	1.6	2.2	122.5	121.3	121.7	125.5	122.1	112.6	112.7	111.9	114.1	115.8	104.5
Q3	3.8	3.4	124.1	122.1	124.5	128.1	124.2	114.4	114.1	114.7	114.4	117.7	100.2
Q4	.	.	.	.	.	.	.	.	.	.	.	.	.
2017 June	1.8	1.8	122.9	120.8	122.1	125.3	122.5	112.5	112.2	109.9	114.8	115.1	106.3
July	3.4	3.8	121.2	119.5	119.5	125.6	120.8	113.6	113.5	111.6	113.8	116.1	101.8
Aug.	4.9	5.1	124.9	122.5	125.5	129.9	125.1	115.5	115.3	117.3	114.7	119.6	100.6
Sep.	3.2	1.4	126.2	124.2	128.5	128.8	126.6	114.1	113.4	115.2	114.8	117.4	98.3
Oct.	7.2	7.3	123.5	123.1	120.4	126.4	123.4	114.4	114.4	113.7	115.5	118.8	102.5
Nov.	7.0	3.7	128.1	127.2	125.7	132.9	128.2	114.9	114.1	113.1	117.1	118.0	104.8

Sources: ECB and Eurostat.

1) Differences between ECB's b.o.p. goods (Table 3.8) and Eurostat's trade in goods (Table 3.9) are mainly due to different definitions.

2) Product groups as classified in the Broad Economic Categories.

## 4 Prices and costs

### 4.1 Harmonised Index of Consumer Prices <sup>1)</sup>

(annual percentage changes, unless otherwise indicated)

	Total					Total (s.a.; percentage change vis-à-vis previous period) <sup>2)</sup>						Memo item: Administered prices	
	Index: 2015 = 100	Total		Goods	Services	Total	Processed food	Unpro- cessed food	Non-energy industrial goods	Energy (n.s.a.)	Services	Total HICP excluding administered prices	Adminis- tered prices
		Total excluding food and energy											
	1	2	3	4	5	6	7	8	9	10	11	12	13
% of total in 2018	100.0	100.0	70.7	55.6	44.4	100.0	12.1	7.5	26.3	9.7	44.4	86.6	13.4
2015	100.0	0.0	0.8	-0.8	1.2	-	-	-	-	-	-	-0.1	1.0
2016	100.2	0.2	0.9	-0.4	1.1	-	-	-	-	-	-	0.2	0.3
2017	101.8	1.5	1.0	1.7	1.4	-	-	-	-	-	-	1.6	1.0
2017 Q1	101.0	1.8	0.8	2.3	1.1	0.7	0.3	2.0	0.1	3.3	0.3	2.0	0.5
Q2	102.0	1.5	1.1	1.5	1.6	0.1	0.7	-1.2	0.1	-1.4	0.5	1.6	1.3
Q3	101.8	1.4	1.2	1.4	1.5	0.2	0.7	0.4	0.2	-0.9	0.3	1.5	1.1
Q4	102.4	1.4	0.9	1.6	1.2	0.4	0.5	1.1	0.1	2.6	0.0	1.5	1.2
2017 Sep.	102.1	1.5	1.1	1.6	1.5	0.1	0.1	0.1	0.0	1.0	0.1	1.6	1.0
Oct.	102.2	1.4	0.9	1.5	1.2	0.1	0.1	0.8	0.0	0.7	-0.1	1.4	1.1
Nov.	102.3	1.5	0.9	1.8	1.2	0.2	0.2	0.0	0.1	1.5	0.1	1.6	1.2
Dec.	102.7	1.4	0.9	1.5	1.2	0.1	0.2	0.2	0.1	0.1	0.1	1.4	1.2
2018 Jan.	101.8	1.3	1.0	1.4	1.2	0.3	0.3	0.1	0.1	1.8	0.1	1.2	1.8
Feb. <sup>3)</sup>	102.0	1.2	1.0	.	1.3	0.1	0.0	-0.3	0.1	-0.3	0.2	.	.

	Goods						Services						
	Food (including alcoholic beverages and tobacco)			Industrial goods			Housing	Transport	Communi- cation	Recreation and personal care	Miscel- laneous		
	Total	Processed food	Unpro- cessed food	Total	Non-energy industrial goods	Energy	Rents						
	14	15	16	17	18	19	20	21	22	23	24	25	
% of total in 2017	19.6	12.1	7.5	35.8	26.3	9.5	10.7	6.5	7.3	3.2	15.1	8.2	
2015	1.0	0.6	1.6	-1.8	0.3	-6.8	1.2	1.1	1.3	-0.8	1.5	1.2	
2016	0.9	0.6	1.4	-1.1	0.4	-5.1	1.1	1.1	0.8	0.0	1.4	1.2	
2017	1.8	1.6	2.2	1.6	0.4	4.9	1.3	1.2	2.1	-1.5	2.1	0.7	
2017 Q1	2.0	0.9	4.0	2.4	0.3	8.2	1.3	1.2	1.7	-1.1	1.4	0.7	
Q2	1.5	1.4	1.6	1.5	0.3	4.6	1.3	1.3	2.6	-1.4	2.3	0.8	
Q3	1.6	2.0	0.9	1.3	0.5	3.4	1.3	1.2	2.3	-1.8	2.4	0.8	
Q4	2.2	2.1	2.3	1.3	0.4	3.5	1.2	1.2	1.7	-1.7	2.0	0.4	
2017 Sep.	1.9	2.0	1.5	1.4	0.5	3.9	1.3	1.2	2.1	-1.8	2.4	0.9	
Oct.	2.3	2.1	2.8	1.1	0.4	3.0	1.3	1.2	1.5	-1.8	2.1	0.4	
Nov.	2.2	2.1	2.4	1.6	0.4	4.7	1.3	1.2	1.7	-1.6	2.0	0.4	
Dec.	2.1	2.2	1.9	1.2	0.5	2.9	1.2	1.2	1.9	-1.7	1.9	0.4	
2018 Jan.	1.9	2.5	1.1	1.0	0.6	2.2	1.3	1.2	1.5	-1.0	1.6	1.2	
Feb. <sup>3)</sup>	1.1	2.4	-0.9	.	0.7	2.1	.	.	.	.	.	.	

Sources: Eurostat and ECB calculations.

1) Data refer to the changing composition of the euro area.

2) In May 2016 the ECB started publishing enhanced seasonally adjusted HICP series for the euro area, following a review of the seasonal adjustment approach as described in Box 1, *Economic Bulletin*, Issue 3, ECB, 2016 (<https://www.ecb.europa.eu/pub/pdf/ecbu/eb201603.en.pdf>).

3) Estimate based on provisional national data, as well as on early information on energy prices.

## 4 Prices and costs

### 4.2 Industry, construction and property prices

(annual percentage changes, unless otherwise indicated)

	Industrial producer prices excluding construction <sup>1)</sup>										Con- struction	Residential property prices <sup>2)</sup>	Experimental indicator of commercial property prices <sup>2)</sup>
	Total (index: 2015 = 100)	Total	Industry excluding construction and energy						Energy				
			Manu- facturing	Total	Intermedi- ate goods	Capital goods	Consumer goods						
							Total	Food, beverages and tobacco		Non- food			
1	2	3	4	5	6	7	8	9	10	11	12	13	
% of total in 2015	100.0	100.0	77.2	72.1	28.9	20.7	22.5	16.5	5.9	27.9			
2015	100.0	-2.8	-2.4	-0.5	-1.3	0.7	-0.6	-0.9	0.2	-8.6	0.4	1.6	3.2
2016	97.7	-2.3	-1.5	-0.6	-1.7	0.4	0.0	0.0	0.1	-7.1	0.6	3.2	5.3
2017	100.7	3.1	3.1	2.2	3.2	0.9	1.9	2.8	0.2	5.9	.	.	.
2017 Q1	100.7	4.2	4.1	2.0	3.1	0.8	1.7	2.5	0.1	10.7	2.0	3.8	3.5
Q2	100.2	3.4	3.1	2.4	3.5	0.9	2.3	3.4	0.2	6.2	2.0	3.9	5.2
Q3	100.4	2.4	2.7	2.2	3.0	1.0	2.2	3.1	0.3	3.2	2.1	4.3	5.4
Q4	101.6	2.5	2.6	2.1	3.3	0.9	1.6	2.0	0.3	3.6	.	.	.
2017 Aug.	100.4	2.6	2.7	2.2	3.0	1.0	2.2	3.2	0.3	3.4	-	-	-
Sep.	100.8	2.9	3.0	2.3	3.2	1.0	2.2	3.0	0.3	4.4	-	-	-
Oct.	101.2	2.5	2.6	2.3	3.5	0.9	1.8	2.4	0.2	3.1	-	-	-
Nov.	101.8	2.8	3.0	2.1	3.2	1.0	1.6	2.1	0.3	5.1	-	-	-
Dec.	101.9	2.2	2.2	1.9	3.0	0.9	1.4	1.7	0.4	2.7	-	-	-
2018 Jan.	102.3	1.5	2.0	1.9	2.8	1.1	1.2	1.3	0.6	0.5	-	-	-

Sources: Eurostat, ECB calculations, and ECB calculations based on MSCI data and national sources (col. 13).

1) Domestic sales only.

2) Experimental data based on non-harmonised sources (see [https://www.ecb.europa.eu/stats/ecb\\_statistics/governance\\_and\\_quality\\_framework/html/experimental-data.en.html](https://www.ecb.europa.eu/stats/ecb_statistics/governance_and_quality_framework/html/experimental-data.en.html) for further details).

### 4.3 Commodity prices and GDP deflators

(annual percentage changes, unless otherwise indicated)

	GDP deflators						Oil prices (EUR per barrel)	Non-energy commodity prices (EUR)							
	Total (s.a.; index: 2010 = 100)	Total	Domestic demand					Exports <sup>1)</sup>	Imports <sup>1)</sup>	Import-weighted <sup>2)</sup>			Use-weighted <sup>2)</sup>		
			Total	Private consump- tion	Govern- ment consump- tion	Gross fixed capital formation				Total	Food	Non-food	Total	Food	Non-food
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
% of total								100.0	45.4	54.6	100.0	50.4	49.6		
2015	106.0	1.4	0.4	0.3	0.5	0.8	0.3	-2.0	47.1	0.0	4.2	-4.5	2.9	7.0	-2.7
2016	106.8	0.8	0.4	0.4	0.6	0.8	-1.5	-2.5	39.9	-3.5	-3.9	-3.2	-7.3	-10.3	-2.9
2017	108.0	1.1	1.5	1.4	1.1	1.4	1.9	2.8	48.1	5.9	-3.3	16.3	5.5	-3.1	17.2
2017 Q1	107.4	0.8	1.5	1.6	1.0	1.3	2.5	4.5	50.8	18.3	5.9	33.2	13.0	0.1	32.4
Q2	107.9	1.2	1.5	1.4	1.1	1.4	2.4	3.2	45.6	6.8	-2.7	18.2	6.7	-2.4	19.9
Q3	108.3	1.3	1.6	1.3	1.2	1.5	1.5	2.0	44.0	1.7	-7.4	11.9	2.4	-5.7	13.0
Q4	108.6	1.2	1.5	1.3	1.2	1.5	1.2	1.7	52.2	-2.4	-8.9	4.4	0.1	-4.7	5.9
2017 Sep.	-	-	-	-	-	-	-	-	46.3	3.1	-7.2	14.7	4.1	-4.8	15.8
Oct.	-	-	-	-	-	-	-	-	49.0	2.6	-6.1	12.0	5.2	-1.2	13.2
Nov.	-	-	-	-	-	-	-	-	53.3	-2.6	-8.3	3.2	0.3	-3.5	4.8
Dec.	-	-	-	-	-	-	-	-	54.2	-6.6	-12.2	-1.2	-4.7	-9.2	0.4
2018 Jan.	-	-	-	-	-	-	-	-	56.6	-7.9	-15.3	-0.5	-6.3	-12.7	1.2
Feb.	-	-	-	-	-	-	-	-	53.0	.	.	.	.	.	.

Sources: Eurostat, ECB calculations and Bloomberg (col. 9).

1) Deflators for exports and imports refer to goods and services and include cross-border trade within the euro area.

2) Import-weighted: weighted according to 2009-11 average import structure; use-weighted: weighted according to 2009-11 average domestic demand structure.

## 4 Prices and costs

### 4.4 Price-related opinion surveys

(seasonally adjusted)

	European Commission Business and Consumer Surveys (percentage balances)					Purchasing Managers' Surveys (diffusion indices)			
	Selling price expectations (for next three months)				Consumer price trends over past 12 months	Input prices		Prices charged	
	Manu- facturing	Retail trade	Services	Construction		Manu- facturing	Services	Manu- facturing	Services
	1	2	3	4	5	6	7	8	9
1999-14	4.4	-	-	-3.0	33.5	57.2	56.5	-	49.8
2015	-2.7	1.3	2.7	-13.3	-0.2	48.9	53.5	49.6	49.0
2016	-0.3	1.7	4.4	-7.2	0.2	49.8	53.9	49.3	49.6
2017	9.1	5.5	6.9	2.6	12.3	64.6	56.3	55.1	51.6
2017 Q1	9.0	5.4	6.4	-3.5	12.9	67.8	56.7	55.0	51.4
Q2	7.9	4.2	5.9	2.0	12.3	62.5	55.9	54.6	51.5
Q3	8.7	4.8	6.8	3.5	10.4	60.4	55.7	54.4	51.4
Q4	10.9	7.6	8.4	8.3	13.8	67.9	56.9	56.3	52.1
2017 Sep.	10.5	6.1	8.0	4.5	11.4	64.0	56.3	55.2	51.8
Oct.	8.7	8.4	8.6	8.1	13.0	66.4	56.7	55.8	52.1
Nov.	11.1	7.5	8.2	8.2	14.7	69.4	56.9	56.8	52.1
Dec.	13.0	6.8	8.3	8.6	13.6	67.9	57.1	56.3	52.0
2018 Jan.	12.4	7.5	9.8	10.8	17.3	70.7	58.4	58.1	53.6
Feb.	12.6	7.0	9.5	10.1	18.3	68.7	56.9	58.4	52.9

Sources: European Commission (Directorate-General for Economic and Financial Affairs) and Markit.

### 4.5 Labour cost indices

(annual percentage changes, unless otherwise indicated)

	Total (index: 2012 = 100)	Total	By component		For selected economic activities		Memo item: Indicator of negotiated wages <sup>1)</sup>
			Wages and salaries	Employers' social contributions	Business economy	Mainly non-business economy	
	1	2	3	4	5	6	7
% of total in 2012	100.0	100.0	74.6	25.4	69.3	30.7	
2015	104.3	1.6	1.9	0.7	1.6	1.6	1.5
2016	105.8	1.5	1.5	1.6	1.4	1.5	1.4
2017	.	.	.	.	.	.	1.5
2017 Q1	100.5	1.4	1.3	1.6	1.3	1.7	1.6
Q2	111.2	1.8	2.1	0.8	1.9	1.4	1.5
Q3	104.2	1.6	1.7	1.6	2.0	0.9	1.5
Q4	.	.	.	.	.	.	1.6

Sources: Eurostat and ECB calculations.

1) Experimental data based on non-harmonised sources (see [https://www.ecb.europa.eu/stats/ecb\\_statistics/governance\\_and\\_quality\\_framework/html/experimental-data.en.html](https://www.ecb.europa.eu/stats/ecb_statistics/governance_and_quality_framework/html/experimental-data.en.html) for further details).

## 4 Prices and costs

### 4.6 Unit labour costs, compensation per labour input and labour productivity

(annual percentage changes, unless otherwise indicated; quarterly data seasonally adjusted; annual data unadjusted)

	Total (index: 2010 =100)	Total	By economic activity									
			Agriculture, forestry and fishing	Manu- facturing, energy and utilities	Con- struction	Trade, transport, accom- modation and food services	Information and commu- nication	Finance and insurance	Real estate	Professional, business and support services	Public ad- ministration, education, health and social work	Arts, enter- tainment and other services
	1	2	3	4	5	6	7	8	9	10	11	12
<b>Unit labour costs</b>												
2014	104.4	0.7	-1.4	-1.0	1.3	0.3	-1.4	3.0	1.7	1.3	1.6	1.6
2015	104.8	0.4	-3.4	-1.8	0.5	1.0	0.9	0.7	2.1	1.6	1.3	1.4
2016	105.6	0.8	2.2	0.0	-0.5	1.1	0.1	2.0	4.3	0.8	1.2	1.3
2016 Q4	106.0	0.8	3.8	-0.5	-0.4	1.0	-0.6	2.4	4.9	1.0	1.2	1.4
2017 Q1	106.3	0.9	0.8	0.4	0.0	0.4	-1.0	1.8	4.2	1.8	1.6	1.8
Q2	106.3	0.8	0.7	-0.4	-0.2	0.0	0.1	0.7	5.9	2.4	1.7	2.3
Q3	106.5	0.7	-0.1	-1.0	-0.2	0.5	1.1	0.0	4.0	2.0	1.3	1.9
<b>Compensation per employee</b>												
2014	106.6	1.4	0.2	2.1	1.6	1.2	2.2	2.0	1.9	1.7	1.1	1.0
2015	108.1	1.4	0.8	1.9	0.9	1.5	2.8	0.7	1.4	1.6	1.2	1.9
2016	109.5	1.2	1.5	1.3	1.4	1.4	0.6	2.2	3.4	0.8	1.2	1.5
2016 Q4	110.2	1.4	1.5	1.4	0.9	1.6	0.6	2.2	3.4	0.9	1.5	1.9
2017 Q1	110.6	1.4	0.2	1.4	0.9	1.4	0.6	1.8	3.5	2.1	1.6	1.5
Q2	111.0	1.6	0.6	1.5	1.4	1.4	1.6	1.6	5.1	2.2	1.8	1.4
Q3	111.5	1.6	1.0	1.5	0.6	1.8	2.4	1.2	3.5	2.8	1.7	1.2
<b>Labour productivity per person employed</b>												
2014	102.1	0.7	1.7	3.1	0.3	0.9	3.6	-0.9	0.2	0.4	-0.5	-0.6
2015	103.2	1.0	4.4	3.7	0.4	0.5	1.9	0.0	-0.7	0.1	-0.1	0.5
2016	103.7	0.5	-0.8	1.3	1.9	0.3	0.6	0.2	-0.9	0.0	0.0	0.1
2016 Q4	103.9	0.6	-2.2	2.0	1.3	0.5	1.2	-0.3	-1.4	-0.1	0.2	0.5
2017 Q1	104.1	0.5	-0.5	0.9	0.9	1.1	1.7	-0.1	-0.6	0.3	-0.1	-0.3
Q2	104.4	0.8	-0.2	1.9	1.6	1.5	1.6	0.9	-0.8	-0.1	0.1	-0.9
Q3	104.7	1.0	1.1	2.6	0.7	1.3	1.3	1.2	-0.5	0.7	0.4	-0.7
<b>Compensation per hour worked</b>												
2014	108.5	1.3	1.1	1.7	1.1	1.4	2.0	2.0	1.7	1.3	0.8	1.4
2015	109.9	1.3	0.7	1.5	0.3	1.6	1.8	0.7	0.6	1.2	1.3	1.8
2016	111.4	1.3	0.9	1.2	1.4	1.4	1.0	1.7	3.5	0.7	1.5	1.6
2016 Q4	112.2	1.6	2.2	1.3	1.2	1.8	1.1	2.2	4.3	1.0	1.8	2.3
2017 Q1	112.4	1.5	0.7	1.2	0.6	1.6	0.8	1.5	3.5	2.0	1.9	1.5
Q2	112.8	1.6	1.8	1.1	1.1	1.6	1.9	2.3	5.5	2.3	2.0	1.2
Q3	113.2	1.4	0.1	1.0	0.0	1.6	2.6	1.0	3.6	2.7	1.8	0.5
<b>Hourly labour productivity</b>												
2014	104.2	0.8	2.0	2.8	-0.1	1.3	3.7	-0.9	0.5	0.3	-0.8	-0.1
2015	105.2	1.0	3.4	3.3	-0.2	0.9	0.9	-0.1	-1.0	0.0	0.0	0.2
2016	105.8	0.6	-0.8	1.2	1.7	0.4	1.0	-0.4	-1.1	0.0	0.3	0.3
2016 Q4	106.2	0.9	-1.1	1.8	1.7	0.9	1.8	-0.4	-1.3	0.1	0.6	0.9
2017 Q1	106.2	0.7	1.0	0.8	0.8	1.5	2.0	-0.3	-1.1	0.6	0.2	-0.3
Q2	106.5	0.9	0.9	1.6	1.4	1.5	1.9	1.5	-0.7	0.3	0.3	-0.9
Q3	106.8	0.9	1.1	2.1	0.6	1.2	1.9	1.0	-0.4	0.8	0.5	-1.0

Sources: Eurostat and ECB calculations.

## 5 Money and credit

### 5.1 Monetary aggregates <sup>1)</sup>

(EUR billions and annual growth rates; seasonally adjusted; outstanding amounts and growth rates at end of period; transactions during period)

	M3											
	M2						M3-M2					
	M1		M2-M1				Repos	Money market fund shares	Debt securities with a maturity of up to 2 years			
	Currency in circulation	Overnight deposits	Deposits with an agreed maturity of up to 2 years	Deposits redeemable at notice of up to 3 months								
1	2	3	4	5	6	7	8	9	10	11	12	
Outstanding amounts												
2015	1,037.7	5,575.8	6,613.5	1,444.1	2,159.7	3,603.8	10,217.2	74.5	485.1	75.6	635.2	10,852.4
2016	1,075.1	6,084.2	7,159.3	1,328.6	2,221.2	3,549.9	10,709.1	70.4	523.2	95.7	689.2	11,398.3
2017	1,112.0	6,636.5	7,748.5	1,193.1	2,261.2	3,454.3	11,202.8	75.8	509.4	75.8	660.9	11,863.8
2017 Q1	1,087.2	6,248.3	7,335.4	1,304.7	2,225.7	3,530.4	10,865.8	74.4	531.6	100.2	706.2	11,572.0
Q2	1,094.9	6,383.7	7,478.6	1,258.1	2,237.4	3,495.6	10,974.2	68.2	513.7	80.1	662.1	11,636.3
Q3	1,103.9	6,532.5	7,636.4	1,222.3	2,251.4	3,473.7	11,110.0	66.6	530.6	80.1	677.4	11,787.4
Q4	1,112.0	6,636.5	7,748.5	1,193.1	2,261.2	3,454.3	11,202.8	75.8	509.4	75.8	660.9	11,863.8
2017 Aug.	1,099.5	6,486.7	7,586.2	1,238.7	2,248.0	3,486.7	11,072.8	70.5	521.0	76.8	668.3	11,741.1
Sep.	1,103.9	6,532.5	7,636.4	1,222.3	2,251.4	3,473.7	11,110.0	66.6	530.6	80.1	677.4	11,787.4
Oct.	1,110.0	6,549.2	7,659.2	1,216.5	2,258.6	3,475.1	11,134.3	68.9	528.1	68.4	665.4	11,799.8
Nov.	1,110.2	6,614.7	7,724.8	1,200.4	2,258.9	3,459.3	11,184.2	78.4	518.8	77.4	674.6	11,858.8
Dec.	1,112.0	6,636.5	7,748.5	1,193.1	2,261.2	3,454.3	11,202.8	75.8	509.4	75.8	660.9	11,863.8
2018 Jan. <sup>(p)</sup>	1,114.5	6,683.1	7,797.6	1,199.4	2,263.7	3,463.2	11,260.8	72.3	513.3	58.7	644.3	11,905.1
Transactions												
2015	66.5	566.9	633.3	-134.5	12.3	-122.2	511.2	-47.4	49.7	-27.2	-25.0	486.1
2016	37.5	541.9	579.5	-105.8	16.0	-89.7	489.7	-4.2	38.0	16.1	49.8	539.6
2017	37.1	586.7	623.8	-112.2	36.3	-75.9	547.9	6.8	-13.7	-22.8	-29.6	518.3
2017 Q1	12.1	166.9	178.9	-21.6	4.4	-17.2	161.7	4.1	8.5	4.0	16.5	178.2
Q2	7.8	154.9	162.7	-36.8	11.3	-25.5	137.2	-5.6	-17.5	-20.8	-44.0	93.2
Q3	9.1	157.6	166.7	-32.7	10.8	-21.9	144.8	-1.1	16.8	2.7	18.4	163.2
Q4	8.2	107.3	115.5	-21.1	9.8	-11.3	104.2	9.5	-21.4	-8.6	-20.6	83.6
2017 Aug.	4.6	62.6	67.2	-6.1	5.0	-1.1	66.1	4.5	2.8	-2.0	5.3	71.4
Sep.	4.4	45.0	49.4	-16.5	3.4	-13.1	36.3	-3.9	9.7	5.5	11.3	47.6
Oct.	6.2	13.6	19.8	-6.9	7.2	0.3	20.1	2.2	-2.6	-11.8	-12.2	7.8
Nov.	0.1	69.3	69.4	-8.0	0.4	-7.6	61.9	9.8	-9.4	5.0	5.5	67.3
Dec.	1.9	24.3	26.2	-6.2	2.3	-4.0	22.2	-2.5	-9.5	-1.8	-13.8	8.4
2018 Jan. <sup>(p)</sup>	2.4	53.7	56.1	8.9	4.2	13.0	69.2	-3.1	3.9	-16.0	-15.2	53.9
Growth rates												
2015	6.8	11.3	10.6	-8.5	0.6	-3.3	5.3	-38.9	11.4	-25.4	-3.8	4.7
2016	3.6	9.7	8.8	-7.4	0.7	-2.5	4.8	-5.7	7.8	21.0	7.8	5.0
2017	3.4	9.7	8.7	-8.5	1.6	-2.1	5.1	9.8	-2.6	-24.0	-4.3	4.6
2017 Q1	3.7	9.9	9.0	-7.6	0.7	-2.6	5.0	-14.5	12.9	3.9	7.9	5.1
Q2	3.8	10.6	9.6	-9.4	1.0	-3.1	5.2	-18.6	5.0	-16.4	-1.0	4.8
Q3	3.5	11.0	9.9	-10.5	1.4	-3.2	5.4	-13.2	5.6	-12.0	1.1	5.2
Q4	3.4	9.7	8.7	-8.5	1.6	-2.1	5.1	9.8	-2.6	-24.0	-4.3	4.6
2017 Aug.	3.5	10.7	9.6	-9.2	1.2	-2.8	5.4	-11.3	6.2	-24.9	-0.6	5.0
Sep.	3.5	11.0	9.9	-10.5	1.4	-3.2	5.4	-13.2	5.6	-12.0	1.1	5.2
Oct.	3.5	10.5	9.5	-9.8	1.7	-2.7	5.4	-6.1	3.5	-24.4	-1.2	5.0
Nov.	3.3	10.2	9.2	-9.4	1.7	-2.5	5.3	10.0	1.4	-23.2	-1.2	4.9
Dec.	3.4	9.7	8.7	-8.5	1.6	-2.1	5.1	9.8	-2.6	-24.0	-4.3	4.6
2018 Jan. <sup>(p)</sup>	3.1	9.9	8.9	-7.9	1.7	-1.9	5.3	-4.7	-1.2	-37.8	-6.6	4.6

Source: ECB.

1) Data refer to the changing composition of the euro area.



## 5 Money and credit

### 5.2 Deposits in M3 1)

(EUR billions and annual growth rates; seasonally adjusted; outstanding amounts and growth rates at end of period; transactions during period)

	Non-financial corporations 2)					Households 3)					Financial corporations other than MFIs and ICPFs 2)	Insurance corporations and pension funds	Other general government 4)
	Total	Overnight	With an agreed maturity of up to 2 years	Redeemable at notice of up to 3 months	Repos	Total	Overnight	With an agreed maturity of up to 2 years	Redeemable at notice of up to 3 months	Repos			
	1	2	3	4	5	6	7	8	9	10	11	12	13
<b>Outstanding amounts</b>													
2015	1,953.2	1,503.9	323.6	117.4	8.3	5,750.7	3,060.7	695.0	1,992.3	2.7	957.9	226.6	365.5
2016	2,082.3	1,617.4	296.2	160.3	8.4	6,051.6	3,401.2	643.8	2,004.7	1.9	989.1	198.2	383.2
2017	2,243.2	1,786.8	287.1	159.8	9.5	6,302.0	3,699.1	560.2	2,042.0	0.6	1,011.1	200.4	409.9
2017 Q1	2,160.4	1,694.9	301.4	157.6	6.5	6,136.0	3,498.1	620.5	2,014.8	2.6	972.9	191.5	392.2
Q2	2,189.9	1,732.0	293.5	158.0	6.4	6,187.6	3,560.6	599.2	2,025.5	2.3	970.3	196.5	403.1
Q3	2,219.8	1,770.4	285.9	158.3	5.3	6,255.7	3,635.2	582.0	2,036.6	2.0	977.1	201.0	419.2
Q4	2,243.2	1,786.8	287.1	159.8	9.5	6,302.0	3,699.1	560.2	2,042.0	0.6	1,011.1	200.4	409.9
2017 Aug.	2,207.1	1,756.5	286.8	158.2	5.7	6,231.9	3,607.2	588.4	2,034.3	2.0	988.4	199.3	417.0
Sep.	2,219.8	1,770.4	285.9	158.3	5.3	6,255.7	3,635.2	582.0	2,036.6	2.0	977.1	201.0	419.2
Oct.	2,231.4	1,786.0	280.5	159.3	5.5	6,293.9	3,675.1	574.4	2,042.2	2.2	946.0	202.7	419.3
Nov.	2,247.7	1,797.9	282.2	159.6	7.9	6,295.3	3,683.7	567.1	2,042.5	2.0	989.3	208.1	412.1
Dec.	2,243.2	1,786.8	287.1	159.8	9.5	6,302.0	3,699.1	560.2	2,042.0	0.6	1,011.1	200.4	409.9
2018 Jan. (p)	2,283.7	1,823.3	291.4	158.5	10.5	6,329.7	3,726.1	554.6	2,047.3	1.7	988.5	202.1	414.7
<b>Transactions</b>													
2015	85.1	124.3	-32.9	4.9	-11.2	194.7	303.8	-109.8	1.2	-0.4	88.3	-0.5	29.6
2016	128.0	151.8	-24.2	0.2	0.2	299.9	333.6	-46.5	13.7	-0.8	30.9	-29.6	18.8
2017	178.8	180.3	-2.6	-0.1	1.1	254.0	304.1	-82.2	33.4	-1.3	53.8	4.1	27.0
2017 Q1	81.1	79.0	6.5	-2.6	-1.9	84.6	97.4	-23.6	10.0	0.7	-14.6	-6.4	9.0
Q2	39.1	43.1	-4.8	0.7	0.0	54.8	65.7	-20.4	9.9	-0.3	14.0	5.3	10.7
Q3	35.2	41.8	-5.8	0.3	-1.1	66.4	75.6	-16.8	8.0	-0.3	12.1	4.8	16.2
Q4	23.5	16.3	1.5	1.5	4.2	48.2	65.4	-21.4	5.5	-1.3	42.3	0.4	-8.9
2017 Aug.	14.4	16.3	-2.3	0.8	-0.4	27.1	28.9	-4.7	3.0	0.0	12.2	4.6	7.7
Sep.	12.1	13.2	-0.7	0.1	-0.5	23.8	28.0	-6.4	2.2	-0.1	-11.7	1.7	2.1
Oct.	9.7	14.3	-5.9	1.0	0.3	37.6	39.4	-7.7	5.6	0.2	-32.8	1.7	0.0
Nov.	18.0	13.1	2.1	0.3	2.4	2.3	9.3	-7.1	0.3	-0.2	52.2	5.6	-6.5
Dec.	-4.2	-11.1	5.3	0.1	1.5	8.3	16.7	-6.7	-0.4	-1.4	22.9	-6.8	-2.3
2018 Jan. (p)	44.6	39.5	5.3	-1.3	1.1	30.7	28.0	-5.1	6.8	1.0	-18.4	1.9	4.8
<b>Growth rates</b>													
2015	4.6	9.0	-9.2	4.4	-57.6	3.5	11.0	-13.6	0.1	-13.2	10.2	-0.2	8.8
2016	6.7	10.1	-7.5	0.2	2.1	5.2	10.9	-6.7	0.6	-29.9	3.1	-13.0	5.2
2017	8.6	11.2	-0.9	0.0	13.8	4.2	8.9	-12.8	1.7	-65.9	5.6	2.1	7.0
2017 Q1	7.8	11.5	-5.4	-1.4	-32.6	5.3	11.4	-10.1	1.0	1.6	1.4	-13.0	4.1
Q2	8.1	11.5	-4.3	-1.6	-21.4	4.8	10.7	-12.4	1.3	-25.3	3.2	-6.2	6.1
Q3	8.1	12.2	-7.3	-1.8	-42.3	4.6	9.9	-12.6	1.6	-25.3	5.7	-2.0	9.0
Q4	8.6	11.2	-0.9	0.0	13.8	4.2	8.9	-12.8	1.7	-65.9	5.6	2.1	7.0
2017 Aug.	8.2	11.7	-5.1	-1.3	-32.2	4.5	9.9	-12.4	1.5	-28.8	6.3	-5.9	8.7
Sep.	8.1	12.2	-7.3	-1.8	-42.3	4.6	9.9	-12.6	1.6	-25.3	5.7	-2.0	9.0
Oct.	8.4	12.2	-7.1	-1.1	-20.0	4.8	10.1	-12.9	1.8	-21.3	4.2	-1.5	7.3
Nov.	8.5	11.9	-5.7	-0.1	-4.9	4.4	9.4	-12.9	1.7	-17.5	6.2	1.1	7.6
Dec.	8.6	11.2	-0.9	0.0	13.8	4.2	8.9	-12.8	1.7	-65.9	5.6	2.1	7.0
2018 Jan. (p)	8.5	10.8	-0.8	0.2	48.5	4.1	8.6	-12.6	1.7	-37.1	7.6	4.2	5.9

Source: ECB.

1) Data refer to the changing composition of the euro area.

2) In accordance with the ESA 2010, in December 2014 holding companies of non-financial groups were reclassified from the non-financial corporations sector to the financial corporations sector. These entities are included in MFI balance sheet statistics with financial corporations other than MFIs and insurance corporations and pension funds (ICPFs).

3) Including non-profit institutions serving households.

4) Refers to the general government sector excluding central government.

## 5 Money and credit

### 5.3 Credit to euro area residents <sup>1)</sup>

(EUR billions and annual growth rates; seasonally adjusted; outstanding amounts and growth rates at end of period; transactions during period)

	Credit to general government			Credit to other euro area residents								
	Total	Loans	Debt securities	Total	Loans					Debt securities	Equity and non-money market fund investment fund shares	
					Total	To non-financial corporations <sup>3)</sup>	To households <sup>4)</sup>	To financial corporations other than MFIs and ICPFs <sup>3)</sup>	To insurance corporations and pension funds			
	1	2	3	4	5	Adjusted loans <sup>2)</sup>	6	7	8	9	10	11
Outstanding amounts												
2015	3,901.3	1,113.5	2,785.4	12,599.8	10,509.6	10,805.0	4,290.2	5,308.7	787.1	123.8	1,307.8	782.4
2016	4,393.6	1,083.3	3,297.1	12,840.2	10,670.8	10,978.6	4,313.6	5,409.8	834.6	112.7	1,385.4	784.0
2017	4,631.1	1,032.5	3,584.7	13,114.3	10,872.9	11,170.0	4,325.0	5,597.9	841.1	108.8	1,439.9	801.5
2017 Q1	4,434.5	1,071.6	3,348.8	12,968.5	10,752.7	11,046.5	4,332.8	5,456.8	850.3	112.9	1,423.2	792.6
Q2	4,463.9	1,064.5	3,385.2	12,966.1	10,731.8	11,049.2	4,301.9	5,485.1	832.1	112.7	1,437.8	796.5
Q3	4,548.3	1,050.5	3,483.7	13,018.5	10,785.6	11,103.7	4,306.3	5,522.6	844.7	111.9	1,438.8	794.1
Q4	4,631.1	1,032.5	3,584.7	13,114.3	10,872.9	11,170.0	4,325.0	5,597.9	841.1	108.8	1,439.9	801.5
2017 Aug.	4,541.5	1,057.1	3,470.0	12,993.7	10,762.9	11,085.5	4,306.1	5,506.8	835.3	114.7	1,440.5	790.4
Sep.	4,548.3	1,050.5	3,483.7	13,018.5	10,785.6	11,103.7	4,306.3	5,522.6	844.7	111.9	1,438.8	794.1
Oct.	4,559.0	1,044.7	3,500.5	13,063.2	10,830.3	11,147.3	4,331.9	5,534.6	851.6	112.1	1,432.6	800.4
Nov.	4,581.9	1,041.6	3,526.4	13,091.1	10,858.4	11,170.0	4,344.6	5,550.7	848.1	115.0	1,426.9	805.8
Dec.	4,631.1	1,032.5	3,584.7	13,114.3	10,872.9	11,170.0	4,325.0	5,597.9	841.1	108.8	1,439.9	801.5
2018 Jan. <sup>(p)</sup>	4,596.9	1,030.7	3,552.0	13,183.6	10,930.9	11,226.8	4,352.6	5,604.1	861.6	112.6	1,450.1	802.6
Transactions												
2015	295.3	-21.0	316.0	82.9	55.9	76.0	-15.0	98.5	-22.0	-5.7	25.6	1.5
2016	488.3	-34.6	522.8	316.5	233.7	258.3	81.6	119.6	43.6	-11.1	78.8	4.1
2017	290.1	-43.4	332.9	367.0	278.1	316.1	80.0	179.6	22.1	-3.6	64.0	25.0
2017 Q1	77.4	-11.1	88.0	143.3	96.4	86.4	26.4	49.2	20.6	0.2	36.7	10.1
Q2	34.6	-5.2	39.8	58.5	27.2	49.6	0.1	37.6	-10.5	0.0	19.4	12.0
Q3	88.7	-10.8	99.6	77.1	78.8	86.8	22.1	42.6	14.8	-0.7	2.1	-3.8
Q4	89.4	-16.3	105.5	88.1	75.7	93.4	31.3	50.2	-2.8	-3.0	5.8	6.7
2017 Aug.	39.3	-1.3	40.5	17.7	33.3	22.4	4.6	23.5	4.6	0.6	-14.4	-1.2
Sep.	16.6	-3.5	20.4	25.4	27.4	27.3	5.9	17.5	6.7	-2.8	-1.5	-0.5
Oct.	4.2	-5.7	9.9	38.3	44.4	44.8	26.2	12.6	5.3	0.2	-8.8	2.7
Nov.	20.8	-1.4	22.2	43.9	35.5	32.9	16.0	18.4	-1.8	2.9	0.3	8.1
Dec.	64.4	-9.1	73.4	6.0	-4.2	15.7	-10.9	19.1	-6.2	-6.2	14.2	-4.1
2018 Jan. <sup>(p)</sup>	-30.0	-1.0	-29.3	77.8	66.9	65.5	32.4	7.5	23.2	3.9	11.1	-0.3
Growth rates												
2015	8.2	-1.8	12.8	0.7	0.5	0.7	-0.3	1.9	-2.7	-4.4	2.0	0.2
2016	12.5	-3.1	18.7	2.5	2.2	2.4	1.9	2.3	5.5	-9.0	6.0	0.5
2017	6.7	-4.0	10.2	2.9	2.6	2.9	1.9	3.3	2.7	-3.2	4.6	3.2
2017 Q1	10.9	-4.2	16.8	3.1	2.4	2.7	1.7	2.5	4.8	3.6	8.2	4.7
Q2	8.2	-3.8	12.6	3.1	2.4	2.5	1.2	3.0	3.7	8.4	7.2	6.4
Q3	8.4	-4.0	12.8	2.8	2.5	2.7	1.5	3.1	3.6	2.0	5.6	2.6
Q4	6.7	-4.0	10.2	2.9	2.6	2.9	1.9	3.3	2.7	-3.2	4.6	3.2
2017 Aug.	8.4	-3.9	12.9	2.8	2.4	2.6	1.4	3.1	3.5	4.0	6.0	2.6
Sep.	8.4	-4.0	12.8	2.8	2.5	2.7	1.5	3.1	3.6	2.0	5.6	2.6
Oct.	7.4	-4.2	11.5	2.8	2.6	2.8	1.7	3.2	3.6	-1.6	4.4	2.8
Nov.	6.8	-3.8	10.5	2.8	2.6	2.9	1.8	3.2	3.2	0.1	3.9	4.4
Dec.	6.7	-4.0	10.2	2.9	2.6	2.9	1.9	3.3	2.7	-3.2	4.6	3.2
2018 Jan. <sup>(p)</sup>	5.4	-4.4	8.7	3.1	3.0	3.3	2.2	3.2	5.5	-1.0	4.5	2.5

Source: ECB.

1) Data refer to the changing composition of the euro area.

2) Adjusted for loan sales and securitisation (resulting in derecognition from the MFI statistical balance sheet) as well as for positions arising from notional cash pooling services provided by MFIs.

3) In accordance with the ESA 2010, in December 2014 holding companies of non-financial groups were reclassified from the non-financial corporations sector to the financial corporations sector. These entities are included in MFI balance sheet statistics with financial corporations other than MFIs and insurance corporations and pension funds (ICPFs).

4) Including non-profit institutions serving households.

## 5 Money and credit

### 5.4 MFI loans to euro area non-financial corporations and households <sup>1)</sup>

(EUR billions and annual growth rates; seasonally adjusted; outstanding amounts and growth rates at end of period; transactions during period)

	Non-financial corporations <sup>2)</sup>					Households <sup>3)</sup>				
	Total	Adjusted loans <sup>4)</sup>	Up to 1 year	Over 1 and up to 5 years	Over 5 years	Total	Adjusted loans <sup>4)</sup>	Loans for consumption	Loans for house purchase	Other loans
	1					2				
<b>Outstanding amounts</b>										
2015	4,290.2	4,272.8	1,043.1	761.8	2,485.2	5,308.7	5,641.5	595.4	3,949.4	763.9
2016	4,313.6	4,313.1	1,002.2	797.7	2,513.6	5,409.8	5,726.5	615.3	4,046.2	748.4
2017	4,325.0	4,365.0	979.3	819.0	2,526.7	5,597.9	5,865.6	650.2	4,222.1	725.6
2017 Q1	4,332.8	4,333.9	1,006.0	802.5	2,524.3	5,456.8	5,767.9	626.6	4,085.7	744.5
Q2	4,301.9	4,316.1	990.8	798.6	2,512.5	5,485.1	5,797.7	635.0	4,112.9	737.1
Q3	4,306.3	4,327.6	978.2	812.4	2,515.8	5,522.6	5,827.3	644.4	4,148.7	729.5
Q4	4,325.0	4,365.0	979.3	819.0	2,526.7	5,597.9	5,865.6	650.2	4,222.1	725.6
2017 Aug.	4,306.1	4,327.9	982.7	804.8	2,518.6	5,506.8	5,818.9	642.6	4,132.0	732.2
Sep.	4,306.3	4,327.6	978.2	812.4	2,515.8	5,522.6	5,827.3	644.4	4,148.7	729.5
Oct.	4,331.9	4,352.6	992.4	816.9	2,522.7	5,534.6	5,840.4	647.4	4,156.5	730.7
Nov.	4,344.6	4,365.8	987.9	822.7	2,534.0	5,550.7	5,853.1	652.0	4,167.2	731.5
Dec.	4,325.0	4,365.0	979.3	819.0	2,526.7	5,597.9	5,865.6	650.2	4,222.1	725.6
2018 Jan. <sup>(p)</sup>	4,352.6	4,386.4	997.0	823.7	2,531.9	5,604.1	5,879.7	655.8	4,222.9	725.3
<b>Transactions</b>										
2015	-15.0	22.8	-62.1	31.9	15.2	98.5	76.9	21.8	80.2	-3.5
2016	81.6	98.8	-17.3	44.2	54.7	119.6	114.4	23.6	105.2	-9.2
2017	80.0	131.7	3.2	34.8	41.9	179.6	166.3	43.7	140.1	-4.1
2017 Q1	26.4	31.4	6.2	6.3	14.0	49.2	43.5	11.2	38.9	-0.8
Q2	0.1	11.3	-1.8	2.3	-0.4	37.6	40.2	10.3	27.9	-0.6
Q3	22.1	34.6	-6.3	17.1	11.4	42.6	34.8	10.7	36.6	-4.7
Q4	31.3	54.4	5.2	9.2	17.0	50.2	47.8	11.5	36.7	1.9
2017 Aug.	4.6	5.3	-1.8	3.3	3.2	23.5	12.0	3.5	20.4	-0.3
Sep.	5.9	8.9	-3.3	8.1	1.2	17.5	10.1	2.4	16.9	-1.7
Oct.	26.2	26.9	14.0	4.7	7.4	12.6	14.0	3.4	7.6	1.6
Nov.	16.0	17.6	-2.5	6.8	11.7	18.4	16.6	5.8	11.4	1.1
Dec.	-10.9	9.9	-6.4	-2.4	-2.1	19.1	17.2	2.3	17.6	-0.8
2018 Jan. <sup>(p)</sup>	32.4	24.4	19.9	6.0	6.6	7.5	17.0	5.7	1.4	0.4
<b>Growth rates</b>										
2015	-0.3	0.5	-5.6	4.4	0.6	1.9	1.4	3.9	2.1	-0.5
2016	1.9	2.3	-1.7	5.8	2.2	2.3	2.0	4.0	2.7	-1.2
2017	1.9	3.1	0.3	4.4	1.7	3.3	2.9	7.1	3.5	-0.6
2017 Q1	1.7	2.4	-2.7	4.9	2.6	2.5	2.4	4.5	2.9	-1.2
Q2	1.2	2.0	-2.5	3.8	2.0	3.0	2.6	6.0	3.3	-1.1
Q3	1.5	2.5	-1.2	4.2	1.7	3.1	2.7	6.8	3.4	-1.3
Q4	1.9	3.1	0.3	4.4	1.7	3.3	2.9	7.1	3.5	-0.6
2017 Aug.	1.4	2.4	-1.8	3.8	1.9	3.1	2.7	6.7	3.3	-1.3
Sep.	1.5	2.5	-1.2	4.2	1.7	3.1	2.7	6.8	3.4	-1.3
Oct.	1.7	2.9	-0.7	4.6	1.9	3.2	2.7	6.7	3.4	-0.9
Nov.	1.8	3.1	-1.0	4.7	2.0	3.2	2.8	7.2	3.3	-0.8
Dec.	1.9	3.1	0.3	4.4	1.7	3.3	2.9	7.1	3.5	-0.6
2018 Jan. <sup>(p)</sup>	2.2	3.4	1.1	4.9	1.8	3.2	2.9	7.3	3.3	-0.6

Source: ECB.

1) Data refer to the changing composition of the euro area.

2) In accordance with the ESA 2010, in December 2014 holding companies of non-financial groups were reclassified from the non-financial corporations sector to the financial corporations sector. These entities are included in MFI balance sheet statistics with financial corporations other than MFIs and insurance corporations and pension funds (ICPFs).

3) Including non-profit institutions serving households.

4) Adjusted for loan sales and securitisation (resulting in derecognition from the MFI statistical balance sheet) as well as for positions arising from notional cash pooling services provided by MFIs.

## 5 Money and credit

### 5.5 Counterparts to M3 other than credit to euro area residents <sup>1)</sup>

(EUR billions and annual growth rates; seasonally adjusted; outstanding amounts and growth rates at end of period; transactions during period)

	MFI liabilities						MFI assets			
	Central government holdings <sup>2)</sup>	Longer-term financial liabilities vis-à-vis other euro area residents					Net external assets	Other		
		Total	Deposits with an agreed maturity of over 2 years	Deposits redeemable at notice of over 3 months	Debt securities with a maturity of over 2 years	Capital and reserves		Total		
								Repos with central counterparties <sup>3)</sup>	Reverse repos to central counterparties <sup>3)</sup>	
1	2	3	4	5	6	7	8	9	10	
<b>Outstanding amounts</b>										
2015	284.7	6,999.1	2,119.4	80.0	2,255.8	2,543.9	1,350.6	284.5	205.9	135.6
2016	314.2	6,920.0	2,054.1	70.9	2,146.7	2,648.4	1,136.9	261.9	205.9	121.6
2017	356.2	6,748.1	1,968.7	59.7	2,016.1	2,703.6	933.1	289.6	143.9	93.6
2017 Q1	308.2	6,881.6	2,031.7	69.3	2,106.5	2,674.2	1,103.9	254.9	183.1	111.8
Q2	305.7	6,767.1	2,002.0	66.8	2,066.4	2,631.9	1,031.3	247.7	154.2	109.7
Q3	365.3	6,701.0	1,977.0	61.5	2,016.2	2,646.3	1,023.9	263.0	140.6	85.4
Q4	356.2	6,748.1	1,968.7	59.7	2,016.1	2,703.6	933.1	289.6	143.9	93.6
2017 Aug.	348.5	6,727.5	1,982.2	62.5	2,036.3	2,646.5	1,030.6	251.2	124.4	69.0
Sep.	365.3	6,701.0	1,977.0	61.5	2,016.2	2,646.3	1,023.9	263.0	140.6	85.4
Oct.	341.8	6,689.9	1,952.8	60.8	2,012.7	2,663.5	965.6	243.5	158.3	109.5
Nov.	308.9	6,666.4	1,934.5	60.1	2,016.2	2,655.6	951.8	209.3	167.6	132.7
Dec.	356.2	6,748.1	1,968.7	59.7	2,016.1	2,703.6	933.1	289.6	143.9	93.6
2018 Jan. <sup>(p)</sup>	316.2	6,729.8	1,957.7	60.4	2,019.5	2,692.2	817.4	353.3	132.3	85.8
<b>Transactions</b>										
2015	8.9	-216.1	-106.3	-13.5	-215.4	119.0	-86.0	-13.3	21.4	-4.0
2016	26.7	-114.4	-70.2	-9.1	-110.4	75.4	-276.2	-76.8	12.8	-12.0
2017	45.6	-72.5	-78.0	-8.7	-71.8	86.0	-103.1	-62.6	-60.8	-27.3
2017 Q1	-7.5	-11.9	-16.3	-1.5	-27.3	33.3	-33.6	-28.2	-21.6	-9.1
Q2	-2.6	-8.1	-22.1	-2.4	-3.2	19.6	-13.7	3.1	-28.9	-2.1
Q3	64.9	-20.3	-22.1	-2.9	-30.0	34.6	23.0	19.0	-13.6	-24.3
Q4	-9.2	-32.2	-17.5	-1.8	-11.3	-1.6	-78.8	-56.5	3.3	8.2
2017 Aug.	23.6	-2.9	-7.8	-0.8	-9.2	14.9	-12.1	47.2	-3.7	-7.5
Sep.	22.3	-12.6	-5.4	-1.0	-22.0	15.9	5.1	10.3	16.2	16.5
Oct.	-23.3	-28.3	-25.1	-0.7	-9.5	6.9	-66.5	-19.8	17.7	24.1
Nov.	-33.0	-3.4	2.3	-0.7	-7.2	2.2	0.0	-33.8	9.3	23.2
Dec.	47.2	-0.5	5.2	-0.5	5.5	-10.6	-12.4	-2.8	-23.7	-39.1
2018 Jan. <sup>(p)</sup>	-39.8	10.5	-9.1	-0.7	17.2	3.0	-29.4	6.3	-11.6	-7.8
<b>Growth rates</b>										
2015	3.5	-3.0	-4.8	-14.4	-8.8	4.8	-	-	11.6	-2.9
2016	9.4	-1.6	-3.3	-11.5	-4.9	2.9	-	-	6.3	-9.0
2017	14.4	-1.1	-3.8	-12.4	-3.4	3.3	-	-	-29.6	-22.6
2017 Q1	-4.3	-1.1	-3.9	-10.1	-4.5	4.4	-	-	-20.8	-25.3
Q2	-7.7	-1.1	-3.9	-10.9	-3.7	3.6	-	-	-30.7	-22.6
Q3	22.0	-0.7	-3.9	-12.5	-3.4	4.3	-	-	-31.2	-33.4
Q4	14.4	-1.1	-3.8	-12.4	-3.4	3.3	-	-	-29.6	-22.6
2017 Aug.	9.0	-0.8	-4.1	-11.8	-2.9	3.9	-	-	-38.2	-48.0
Sep.	22.0	-0.7	-3.9	-12.5	-3.4	4.3	-	-	-31.2	-33.4
Oct.	8.6	-1.3	-5.0	-12.6	-3.7	3.9	-	-	-17.4	-17.6
Nov.	4.0	-1.2	-4.4	-12.7	-3.8	3.6	-	-	-13.1	10.0
Dec.	14.4	-1.1	-3.8	-12.4	-3.4	3.3	-	-	-29.6	-22.6
2018 Jan. <sup>(p)</sup>	5.0	-0.8	-3.8	-12.4	-2.4	3.3	-	-	-25.0	-19.3

Source: ECB.

1) Data refer to the changing composition of the euro area.

2) Comprises central government holdings of deposits with the MFI sector and of securities issued by the MFI sector.

3) Not adjusted for seasonal effects.

## 6 Fiscal developments

### 6.1 Deficit/surplus

(as a percentage of GDP; flows during one-year period)

	Deficit (-)/surplus (+)					Memo item: Primary deficit (-)/ surplus (+)
	Total	Central government	State government	Local government	Social security funds	
	1	2	3	4	5	6
2013	-3.0	-2.6	-0.2	-0.1	-0.1	-0.2
2014	-2.6	-2.2	-0.2	0.0	-0.1	0.1
2015	-2.1	-2.0	-0.2	0.1	-0.1	0.3
2016	-1.5	-1.7	-0.1	0.2	0.0	0.6
2016 Q4	-1.5	.	.	.	.	0.6
2017 Q1	-1.3	.	.	.	.	0.8
Q2	-1.2	.	.	.	.	0.9
Q3	-0.9	.	.	.	.	1.1

Sources: ECB for annual data; Eurostat for quarterly data.

### 6.2 Revenue and expenditure

(as a percentage of GDP; flows during one-year period)

	Revenue						Expenditure						
	Total	Current revenue				Capital revenue	Total	Current expenditure				Capital expenditure	
		Direct taxes	Indirect taxes	Net social contributions				Compensation of employees	Intermediate consumption	Interest	Social benefits		
1	2	3	4	5	6	7	8	9	10	11	12	13	
2013	46.7	46.2	12.6	13.0	15.5	0.5	49.8	45.6	10.4	5.3	2.8	23.0	4.2
2014	46.7	46.2	12.5	13.1	15.4	0.5	49.2	45.3	10.3	5.3	2.6	23.0	3.9
2015	46.2	45.7	12.5	13.0	15.2	0.5	48.3	44.4	10.1	5.2	2.4	22.7	3.9
2016	46.1	45.6	12.6	13.0	15.3	0.5	47.6	44.1	10.0	5.2	2.2	22.7	3.5
2016 Q4	46.1	45.6	12.6	13.0	15.3	0.4	47.6	44.1	10.0	5.2	2.2	22.7	3.5
2017 Q1	46.1	45.6	12.6	13.0	15.3	0.5	47.4	43.9	9.9	5.1	2.2	22.7	3.5
Q2	46.1	45.7	12.7	13.0	15.3	0.4	47.4	43.8	9.9	5.1	2.1	22.7	3.5
Q3	46.1	45.7	12.8	12.9	15.3	0.4	47.1	43.5	9.9	5.1	2.0	22.6	3.6

Sources: ECB for annual data; Eurostat for quarterly data.

### 6.3 Government debt-to-GDP ratio

(as a percentage of GDP; outstanding amounts at end of period)

	Total	Financial instrument			Holder			Original maturity		Residual maturity			Currency	
		Currency and deposits	Loans	Debt securities	Resident creditors	Non-resident creditors	Up to 1 year	Over 1 year	Up to 1 year	Over 1 and up to 5 years	Over 5 years	Euro or participating currencies	Other currencies	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
2013	91.3	2.6	17.5	71.2	45.4	26.4	45.9	10.4	81.0	19.4	32.1	39.9	89.3	2.1
2014	91.8	2.7	17.1	72.0	44.1	25.8	47.7	10.0	81.9	18.8	31.8	41.2	89.7	2.1
2015	89.9	2.8	16.1	71.0	44.3	27.3	45.6	9.3	80.7	17.6	31.2	41.1	87.9	2.1
2016	88.9	2.7	15.4	70.8	46.2	30.7	42.7	8.9	80.0	17.1	29.8	41.9	86.9	2.1
2016 Q4	88.9	2.7	15.4	70.8	.	.	.	.	.	.	.	.	.	.
2017 Q1	89.2	2.6	15.1	71.4	.	.	.	.	.	.	.	.	.	.
Q2	89.0	2.7	14.8	71.5	.	.	.	.	.	.	.	.	.	.
Q3	88.1	2.8	14.6	70.8	.	.	.	.	.	.	.	.	.	.

Sources: ECB for annual data; Eurostat for quarterly data.

## 6 Fiscal developments

### 6.4 Annual change in the government debt-to-GDP ratio and underlying factors <sup>1)</sup>

(as a percentage of GDP; flows during one-year period)

	Change in debt-to-GDP ratio <sup>2)</sup>	Primary deficit (+)/surplus (-)	Deficit-debt adjustment							Interest-growth differential	Memo item: Borrowing requirement	
			Total	Transactions in main financial assets					Revaluation effects and other changes in volume			Other
				Total	Currency and deposits	Loans	Debt securities	Equity and investment fund shares				
	1	2	3	4	5	6	7	8	9	10	11	12
2013	1.9	0.2	-0.3	-0.8	-0.5	-0.4	-0.2	0.4	0.2	0.3	1.9	2.6
2014	0.5	-0.1	-0.1	-0.3	0.2	-0.2	-0.3	0.0	0.1	0.2	0.6	2.4
2015	-1.9	-0.3	-0.9	-0.5	0.2	-0.2	-0.3	-0.1	-0.1	-0.3	-0.8	1.3
2016	-1.0	-0.6	-0.3	0.3	0.3	-0.1	0.0	0.1	-0.3	-0.3	-0.1	1.6
2016 Q4	-1.0	-0.6	-0.3	0.3	0.3	-0.1	0.0	0.1	-0.3	-0.3	-0.1	1.6
2017 Q1	-1.7	-0.8	-0.5	-0.1	0.0	-0.1	0.0	0.2	-0.3	-0.2	-0.3	1.0
Q2	-1.7	-0.9	-0.6	-0.3	-0.2	-0.1	-0.1	0.1	-0.2	-0.1	-0.2	0.8
Q3	-1.6	-1.1	0.2	0.7	0.8	-0.1	-0.1	0.1	-0.1	-0.4	-0.6	1.2

Sources: ECB for annual data; Eurostat for quarterly data.

1) Intergovernmental lending in the context of the financial crisis is consolidated except in quarterly data on the deficit-debt adjustment.

2) Calculated as the difference between the government debt-to-GDP ratios at the end of the reference period and a year earlier.

### 6.5 Government debt securities <sup>1)</sup>

(debt service as a percentage of GDP; flows during debt service period; average nominal yields in percentages per annum)

	Debt service due within 1 year <sup>2)</sup>					Average residual maturity in years <sup>3)</sup>	Average nominal yields <sup>4)</sup>						
	Total	Principal		Interest			Outstanding amounts					Transactions	
		Maturities of up to 3 months	Maturities of up to 3 months	Total	Floating rate		Zero coupon	Fixed rate	Maturities of up to 1 year	Issuance	Redemption		
	1											2	3
2015	14.7	12.8	4.3	1.9	0.5	6.6	2.9	1.4	0.1	3.3	3.0	0.4	1.2
2016	14.1	12.4	4.6	1.7	0.4	6.9	2.6	1.2	-0.1	3.0	2.9	0.2	1.2
2017	13.3	11.6	4.3	1.7	0.4	7.1	2.4	1.1	-0.2	2.8	2.3	0.3	1.1
2016 Q4	14.1	12.4	4.6	1.7	0.4	6.9	2.6	1.2	-0.1	3.0	2.9	0.2	1.2
2017 Q1	14.3	12.6	4.3	1.7	0.4	6.9	2.6	1.2	-0.2	3.0	2.9	0.2	1.1
Q2	14.3	12.6	4.4	1.7	0.4	7.0	2.5	1.2	-0.2	2.9	2.6	0.2	1.2
Q3	13.4	11.7	3.9	1.7	0.4	7.1	2.5	1.1	-0.2	2.9	2.5	0.2	1.1
2017 Aug.	13.7	12.0	4.3	1.7	0.4	7.1	2.5	1.1	-0.2	2.9	2.5	0.2	1.2
Sep.	13.4	11.7	3.9	1.7	0.4	7.1	2.5	1.1	-0.2	2.9	2.5	0.2	1.1
Oct.	13.3	11.6	3.8	1.7	0.4	7.2	2.5	1.1	-0.2	2.8	2.4	0.2	1.2
Nov.	13.3	11.6	4.0	1.7	0.4	7.2	2.4	1.1	-0.2	2.8	2.4	0.2	1.2
Dec.	13.3	11.6	4.3	1.7	0.4	7.1	2.4	1.1	-0.2	2.8	2.3	0.3	1.1
2018 Jan.	13.1	11.4	4.3	1.7	0.4	7.2	2.4	1.1	-0.2	2.8	2.3	0.4	1.2

Source: ECB.

1) At face value and not consolidated within the general government sector.

2) Excludes future payments on debt securities not yet outstanding and early redemptions.

3) Residual maturity at the end of the period.

4) Outstanding amounts at the end of the period; transactions as 12-month average.

## 6 Fiscal developments

### 6.6 Fiscal developments in euro area countries

(as a percentage of GDP; flows during one-year period and outstanding amounts at end of period)

	Belgium 1	Germany 2	Estonia 3	Ireland 4	Greece 5	Spain 6	France 7	Italy 8	Cyprus 9	
Government deficit (-)/surplus (+)										
2013	-3.1	-0.1	-0.2	-6.1	-13.2	-7.0	-4.1	-2.9	-5.1	
2014	-3.1	0.3	0.7	-3.6	-3.6	-6.0	-3.9	-3.0	-8.8	
2015	-2.5	0.6	0.1	-1.9	-5.7	-5.3	-3.6	-2.6	-1.2	
2016	-2.5	0.8	-0.3	-0.7	0.5	-4.5	-3.4	-2.5	0.5	
2016 Q4	-2.5	0.8	-0.3	-0.7	0.5	-4.5	-3.4	-2.5	0.5	
2017 Q1	-2.0	1.0	-0.5	-0.5	1.0	-4.2	-3.4	-2.4	0.5	
Q2	-1.5	0.9	-0.7	-0.6	1.0	-3.6	-3.2	-2.4	0.9	
Q3	-1.1	1.4	-0.7	-0.5	1.2	-3.1	-3.1	-2.3	1.9	
Government debt										
2013	105.5	77.4	10.2	119.4	177.4	95.5	92.4	129.0	102.6	
2014	106.8	74.6	10.7	104.5	179.0	100.4	95.0	131.8	107.5	
2015	106.0	70.9	10.0	76.9	176.8	99.4	95.8	131.5	107.5	
2016	105.7	68.1	9.4	72.8	180.8	99.0	96.5	132.0	107.1	
2016 Q4	105.7	68.1	9.4	72.8	180.8	99.0	96.5	132.0	107.1	
2017 Q1	107.4	66.5	9.2	74.5	177.7	100.0	98.8	134.0	106.2	
Q2	106.1	65.9	8.9	74.0	176.1	99.8	99.3	134.7	106.1	
Q3	107.0	65.1	8.9	72.1	177.4	98.7	98.4	134.1	103.2	
	Latvia 10	Lithuania 11	Luxembourg 12	Malta 13	Netherlands 14	Austria 15	Portugal 16	Slovenia 17	Slovakia 18	Finland 19
Government deficit (-)/surplus (+)										
2013	-1.0	-2.6	1.0	-2.4	-2.4	-2.0	-4.8	-14.7	-2.7	-2.6
2014	-1.2	-0.6	1.3	-1.8	-2.3	-2.7	-7.2	-5.3	-2.7	-3.2
2015	-1.2	-0.2	1.4	-1.1	-2.1	-1.0	-4.4	-2.9	-2.7	-2.7
2016	0.0	0.3	1.6	1.1	0.4	-1.6	-2.0	-1.9	-2.2	-1.7
2016 Q4	0.0	0.3	1.6	1.1	0.4	-1.6	-2.0	-1.9	-2.2	-1.7
2017 Q1	0.0	0.7	0.7	2.2	1.0	-1.2	-1.6	-1.4	-2.0	-1.4
Q2	0.4	0.8	0.7	2.1	1.1	-1.3	-1.3	-1.2	-1.6	-0.7
Q3	0.5	1.0	0.9	3.3	1.2	-1.2	-0.1	-0.8	-1.6	-0.8
Government debt										
2013	39.0	38.8	23.7	68.4	67.8	81.0	129.0	70.4	54.7	56.5
2014	40.9	40.5	22.7	63.8	68.0	83.8	130.6	80.3	53.5	60.2
2015	36.9	42.6	22.0	60.3	64.6	84.3	128.8	82.6	52.3	63.6
2016	40.6	40.1	20.8	57.6	61.8	83.6	130.1	78.5	51.8	63.1
2016 Q4	40.5	40.1	20.8	57.7	61.8	83.6	130.1	78.5	51.8	63.1
2017 Q1	39.4	39.2	23.9	58.2	59.6	81.7	130.5	80.2	53.3	62.7
Q2	40.0	41.7	23.4	56.5	58.7	81.3	132.1	79.8	51.7	61.7
Q3	38.3	39.4	23.4	54.9	57.0	80.4	130.8	78.4	51.3	60.4

Source: Eurostat.

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Postal address                    60640 Frankfurt am Main, Germany  
Telephone                        +49 69 1344 0  
Website                            [www.ecb.europa.eu](http://www.ecb.europa.eu)

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This Bulletin was produced under the responsibility of the Executive Board of the ECB. Translations are prepared and published by the national central banks.

The cut-off date for the statistics included in this issue was 7 March 2018.

ISSN                                2363-3417 (html)  
ISSN                                2363-3417 (pdf)  
DOI                                 10.2866/0073 (html)  
EU catalogue No                QB-BP-18-002-EN-Q (html)  
EU catalogue No                QB-BP-18-002-EN-N (pdf)