EUROPEAN CENTRAL BANK

EUROSYSTEM

Economic Bulletin

Issue 8 / 2017

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Economic and monetary developments

Overview

At its monetary policy meeting on 14 December 2017, the Governing Council concluded that an ample degree of monetary accommodation is still needed to secure a return of inflation towards levels that are below, but close to, 2%. The information that has become available since the previous monetary policy meeting in late October, including the new Eurosystem staff projections, indicates a strong pace of economic expansion and a significant improvement in the growth outlook. The Governing Council assessed that the strong cyclical momentum and the significant reduction of economic slack give grounds for greater confidence that inflation will converge towards its aim. At the same time, domestic price pressures remain muted overall and have yet to show convincing signs of a sustained upward trend. The Governing Council therefore 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. This continued monetary support is provided by the additional net asset purchases that the Governing Council decided on at the October monetary policy meeting, 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 14 December 2017

The Governing Council's economic assessment reflected that the euro area economic expansion continues to be solid and broad-based across countries and sectors. Real GDP growth is supported by growth in private consumption and investment as well as exports benefiting from the broad-based global recovery. The latest survey results and incoming data confirm robust growth momentum. The global economy is also continuing to expand at a solid rate, and the recovery shows signs of synchronisation globally.

Financing conditions in the euro area have remained very favourable. Euro area sovereign bond yields have declined slightly since 7 September. Corporate bond spreads have also fallen, while equity prices of euro area non-financial corporations (NFCs) have increased. At the same time, valuations of corporate bonds and equities have continued to be supported by the robust economic outlook. In foreign exchange markets, the euro has remained broadly unchanged in recent months.

Looking ahead, the December 2017 Eurosystem staff macroeconomic projections for the euro area foresee annual real GDP increasing by 2.4% in 2017, 2.3% in 2018, 1.9% in 2019 and 1.7% in 2020. Compared with the September 2017 ECB staff macroeconomic projections, the outlook for GDP growth

has been revised upwards substantially. The ongoing economic expansion in the euro area is expected to continue to be supported by the ECB's monetary policy measures. Furthermore, private expenditure and consumption growth are supported by lower deleveraging needs and improved labour market conditions. Improvements in corporate profitability and the very favourable financing conditions continue to promote the recovery in business investment, while euro area exporters are benefiting from the ongoing global economic expansion.

Euro area annual HICP inflation was 1.5% in November, up from 1.4% in October, according to Eurostat's flash estimate. At the same time, measures of underlying inflation have moderated somewhat recently, in part owing to special factors. Looking ahead, on the basis of current futures prices for oil, annual rates of headline inflation are likely to moderate in the coming months, mainly reflecting base effects in energy prices, before increasing again. Underlying inflation is 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 December 2017 Eurosystem staff macroeconomic projections for the euro area, which foresee annual HICP inflation at 1.5% in 2017, 1.4% in 2018, 1.5% in 2019 and 1.7% in 2020. Compared with the September 2017 ECB staff macroeconomic projections, the outlook for headline HICP inflation has been revised up, mainly reflecting higher oil and food prices.

The latest staff projections also foresee the euro area budget deficit declining further over the projection horizon, mainly as a result of improving cyclical conditions and decreasing interest payments. The aggregate fiscal stance for the euro area is projected to be broadly neutral. The euro area government debt-to-GDP ratio is expected to continue to decline, albeit from a still high level.

Complementing the economic assessment, the monetary analysis showed that money growth remained robust in October and during the third quarter of 2017. Broad money continued to expand at 5% in October, in line with the steady pace witnessed since mid-2015. The recovery in loan growth to the private sector has also continued. The annual flow of total external financing to NFCs is estimated to have strengthened in the third quarter of 2017, reflecting improvements in both bank lending and debt securities issuance.

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 its intention to continue to make net asset purchases under the asset purchase programme (APP), from January 2018 onwards at a 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. Moreover, the Governing Council reconfirmed that if the outlook became less favourable, or if financial conditions became inconsistent with further progress towards a sustained adjustment in the path of inflation, it would stand ready to increase the APP in terms of size and/or duration. The Governing Council also reiterated that the Eurosystem will reinvest the principal payments from maturing securities purchased under the APP 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 is continuing to expand at a solid rate, with increasing signs of synchronisation. The outlook among advanced economies entails robust expansion, which slows down over the projection horizon as the upturn matures. Among emerging market economies, the outlook is supported by strengthening activity in commodity exporters. Global trade indicators point to a rebound in the third quarter. Global inflation is expected to rise slowly as spare capacity at the global level diminishes.

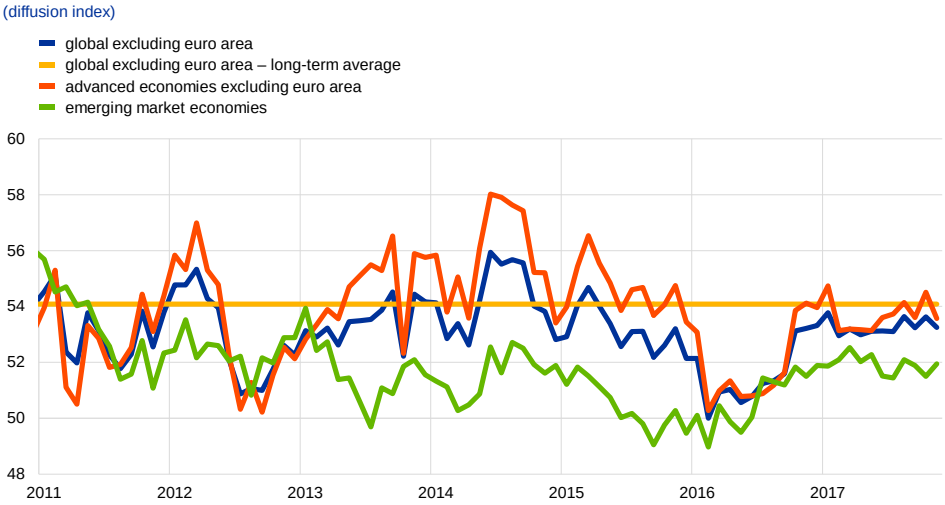
Global economic activity and trade

The sustained pace of expansion of the global economy has become more broad-based and extended into the second half of the year. The recovery shows signs of synchronisation globally, as the share of countries with growth in economic activity above the average of recent years has been increasing since the second half of 2016. Across advanced economies, US economic activity expanded at a solid pace in the third quarter, in spite of the impact of the recent hurricanes. Real GDP growth in Japan also remained robust, while activity in the United Kingdom was relatively muted, partly on account of the negative effect of the depreciation of the pound on real household income and consumption, which more than offset the gains in competitiveness and the positive impetus from the increasingly robust expansion in the euro area. Across emerging economies, activity has been supported by India and China, as well as by the recoveries in Brazil and Russia after their deep recessions, although some loss of dynamism is anticipated in the short term in the latter.

Survey-based indicators and sentiment surveys point to sustained global growth in the near term. The global composite output Purchasing Managers' Index (PMI), excluding the euro area, remained at similar levels in the third quarter to those recorded in the previous two quarters, close to long-run averages, and pointing to a continued steady expansion in global activity (see Chart 1). Sentiment survey indicators have also risen over the past few months.

Chart 1

Global composite output PMI



Sources: Haver Analytics, Markit and ECB staff calculations.
Notes: The latest observations are for November 2017. "Long-term average" refers to the period from January 1999 to November 2017.

Monetary policies show some divergence, but overall global financial conditions remain supportive. Markets continue to expect a very gradual monetary tightening in the United States. The Federal Open Market Committee (FOMC) left policy rates unchanged at its September meeting, but decided to start reducing the Federal Reserve System's balance sheet. In December, in line with market expectations, a rate hike took place. Expectations of tightening in the United Kingdom, confirmed by the rise in the official policy rate, continued to firm following the surge in inflation to above target levels and persistent upward price pressures following the recent depreciation of the pound. In Japan, the Bank of Japan maintained its accommodative stance. In China, in order to curb leverage in the financial system, the People's Bank of China has allowed financial conditions to tighten since the beginning of the year, increasing its open-market interest rates and guiding interbank rates upwards. Other emerging market economies (EMEs), including India and some commodity exporters, lowered policy rates as inflationary pressures subsided and exchange rates firmed. Overall, financial market sentiment has remained strong in advanced economies, with gains in equity markets and a further decline in volatility. Among EMEs, interest rates have declined in various key economies, contributing to a modest easing in financial conditions, and capital inflows have risen strongly.

Looking ahead, economic activity is expected to remain broadly stable at the global level, but developments across countries and regions vary notably. The outlook among advanced economies is for a robust expansion, which slows down over the projection horizon as the recoveries – particularly in the United States and Japan – mature and output gaps gradually close, while growth in the United Kingdom is anticipated to remain muted. Among EMEs, the outlook is supported by the recovery in commodity exporters, particularly Brazil and Russia. In India and China, growth remains solid, but China is expected to transition to a lower growth trajectory

in view of slowing potential growth. Overall, these trends broadly offset each other, leading to a stable global GDP growth outlook.

The growth potential has declined across most advanced and emerging economies in recent years and is expected to stabilise at below pre-crisis levels. In advanced economies, capital contributions have diminished as rates of investment have fallen in the wake of the financial crisis, driven by the ensuing weakened expectations of demand prospects together with tighter financial conditions and heightened uncertainty. Investment was also lower in emerging market economies, in particular in commodity-exporting countries. Waning support from demographics has added to the decline in growth potential in several countries.

In the United States, activity is expected to remain robust on the back of solid domestic demand. The recovery will continue on the back of solid growth in investment and consumption, as tight labour market conditions gradually feed into higher wage growth and favourable financial conditions boost wealth. Moreover, the strengthening of external demand and the recent depreciation of the US dollar also support the US outlook. The tax reform and the associated fiscal package are likely to provide some impetus from next year onwards. However, GDP growth is projected to decelerate gradually in the medium term, returning to its potential.

In the United Kingdom, real GDP growth is expected to remain relatively muted owing to high uncertainty. The recent slowdown in economic activity, led by private consumption as households began to feel the impact of rising inflation and shrinking real wage growth, is expected to extend over the coming quarters. Relatively subdued growth expectations reflect the ongoing impact of high uncertainty and the strong depreciation of the pound in the aftermath of the UK referendum on EU membership.

In Japan, economic expansion is expected to remain firm, supported by domestic and external factors. While waning fiscal support is likely to act as a drag on growth, economic activity is expected to be supported by firming foreign demand, private investment gains associated with high profits and increasing labour and capacity shortages, and favourable financing conditions. The planned VAT hike in October 2019 is, however, expected to have a negative impact on economic activity after its implementation.

In China, activity continues to expand at a robust pace, supported by resilient consumption and a still robust housing market. The near-term outlook is dominated by the authorities' focus on stable growth, given the ongoing political transition, while the assumption over the medium term is that continued structural reforms will gradually be implemented, leading to an orderly slowdown.

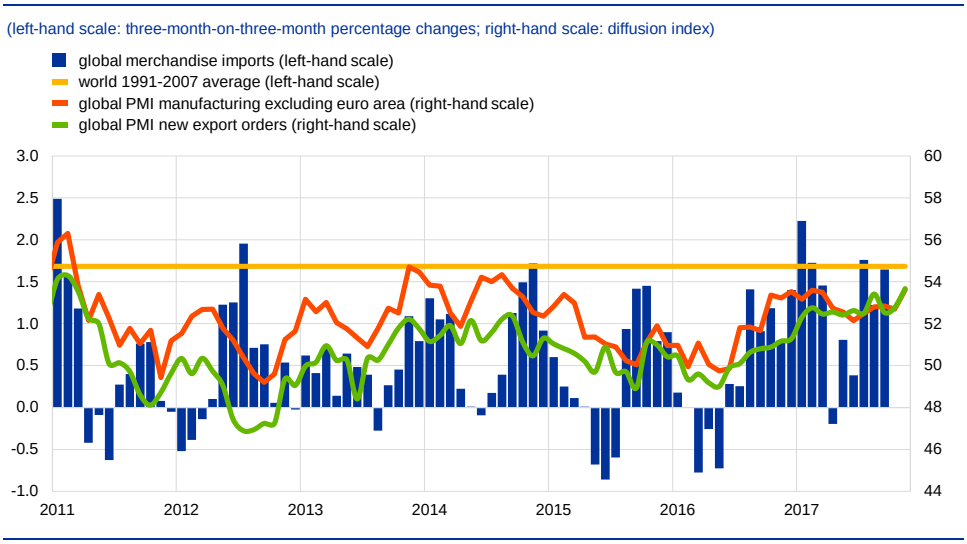
Economic activity in central and eastern European countries is expected to accelerate in the near term, driven by a rebound in investment and strong private consumption. Domestic demand will continue to be the main driver of economic growth looking forward, on the back of improving labour markets and higher absorption of EU funds.

The large commodity-exporting countries are continuing their recovery following deep recessions. In Russia, leading indicators signal a softening of the recovery in the short term, but growth is expected to resume afterwards, supported by higher oil prices, a stronger rouble and declining inflation. Over the medium term, growth is expected to remain mild amid fiscal challenges weighing on the business environment and the lack of fixed investment and structural reforms undermining Russia's supply capacity. In Brazil, although recurring political uncertainties are continuously weighing on business investment and consumer spending, loosening financial conditions alongside increasing monetary accommodation and improving terms of trade will support the economy over the medium term.

Global trade growth remained robust in the second quarter, and prospects remain positive in the near term. Global merchandise import growth momentum suggests continued robust global trade in the third quarter of the year (see Chart 2). The volume of merchandise imports increased by 1.6% in September (in three-month-on-three-month terms), mainly due to a sharp rebound in import growth in EMEs, particularly in Asia and Latin America. In advanced economies, by contrast, September data point to a negative reading for the United States and Japan, confirming the fall in imports (goods and services) in available national accounts releases. Leading indicators seem to confirm robust world trade dynamics, with PMI new export orders remaining at high levels at the start of the fourth quarter.

Chart 2

World trade in goods



Sources: Markit, CPB and ECB calculations.
Note: The latest observations are for November 2017 (global PMI manufacturing), October 2017 (global PMI new export orders) and September 2017 (trade).

Looking further ahead, global trade is expected to continue expanding. The combination of strong trade indicators and surveys and the repeated surprises on the upside could suggest that there is more cyclical momentum in world trade than previously anticipated related to the cyclical upturn and the recovery in investment.

Overall, global growth is projected to remain broadly stable over the projection horizon. According to the December 2017 Eurosystem staff macroeconomic

projections, world real GDP growth (excluding the euro area) is projected to increase from 3.7% in 2017 to 3.9% in 2018, before gradually returning to 3.7% in 2020. This development results from a gradual slowdown over the projection horizon for advanced economies, where the cycle is more mature, which is offset by increased dynamism in EMEs, particularly in Latin America. Growth in euro area foreign demand is forecast to expand by 5.5% in 2017, 4.4% in 2018, 3.8% in 2019 and 3.5% in 2020. Compared with the September 2017 projections, global GDP is only revised marginally upwards in 2017-18. Growth in euro area foreign demand has been revised upwards over the whole projection horizon, reflecting data revisions and a more positive view on medium-term developments.

Risks to the outlook for global activity are on the upside in the short term, but remain skewed to the downside in the medium term. On the upside, there is a possibility that improved sentiment will translate into a faster-than-expected revival in activity. A larger than expected fiscal stimulus along the lines currently being discussed in the US Congress also presents a moderate upside risk to US and global growth. However, medium-term downside risks prevail, such as an increase in trade protectionism, a sudden tightening in global financial conditions (which could affect vulnerable EMEs in particular), disruptions associated with China's reform and liberalisation process, and political and geopolitical uncertainties, including those related to the negotiations on the future relations between the United Kingdom and the European Union.

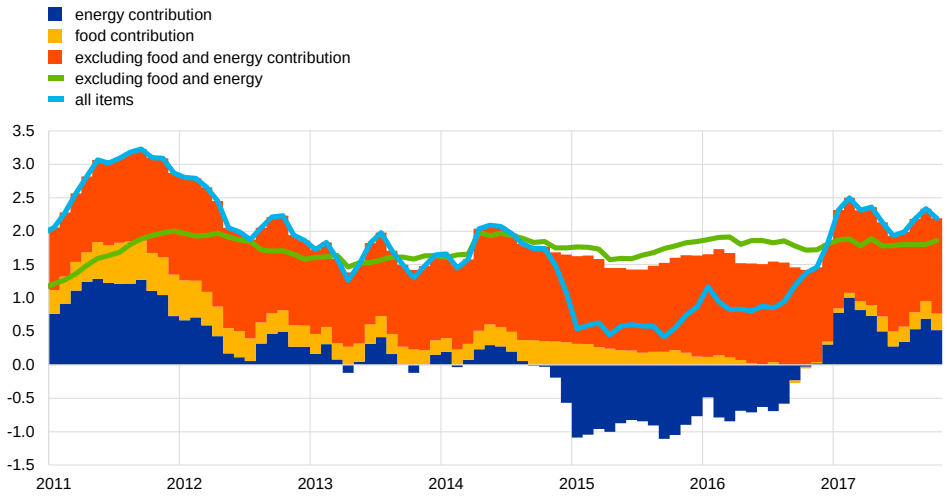
Global price developments

Global consumer price inflation declined slightly in October, as energy prices decelerated. After increasing during the previous few months, as the contribution of energy prices intensified, annual consumer price inflation in the OECD area declined in October, to 2.2% (see Chart 3). However, excluding food and energy, OECD annual inflation increased to 1.9%, after having remained stable at 1.8% for the previous five months.

Chart 3

OECD consumer price inflation

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



Source: OECD.
Note: The latest observation is for October 2017.

Oil prices have continued to increase in recent weeks. Brent crude oil prices rose from USD 50 per barrel in mid-August to over USD 64 per barrel recently. Higher prices were supported by geopolitical tensions in the Middle East and recent developments in Venezuela, firming expectations of an extension of the OPEC/non-OPEC agreement on supply cuts beyond March 2018, confirmed by the actual extension on 30 November 2017 to the end of 2018, and robust oil demand. Oil futures suggest that oil prices will fall below current levels, to around USD 61 per barrel in 2018 and USD 58 per barrel in 2019. By contrast, non-energy commodity prices have fallen slightly in the last few weeks, although iron ore quotations increased. Box 1 analyses the drivers of metal prices in more detail, decomposing them into demand and supply effects.

Looking ahead, global inflation is expected to rise slowly. While the current oil futures curve anticipates a slight decline in oil prices over the projection horizon, pointing to a very limited contribution from energy prices to inflation, the slowly diminishing spare capacity at the global level is expected to support underlying inflation.

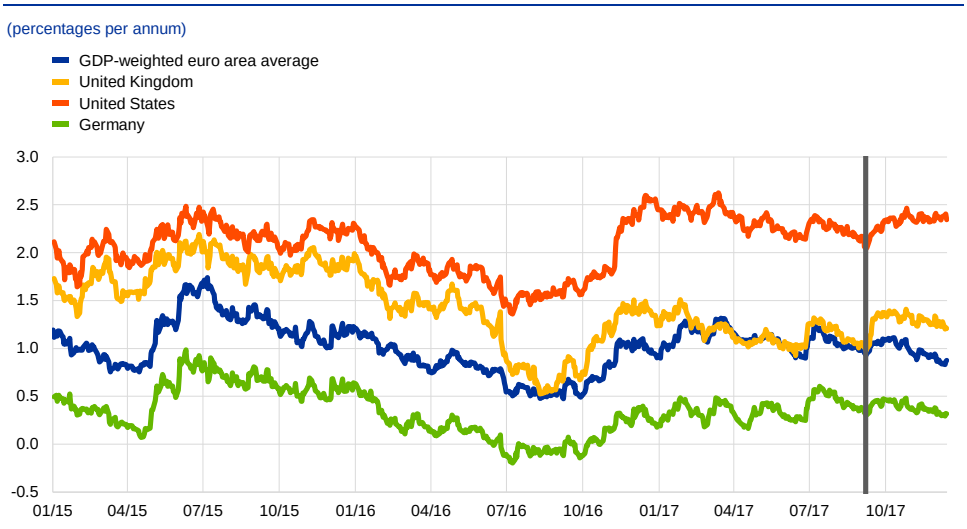
2 Financial developments

Euro area sovereign bond yields have declined slightly since the Governing Council's monetary policy meeting on 7 September. Corporate bond spreads have also fallen, while equity prices of euro area non-financial corporations (NFCs) have increased as perceived geopolitical risks have waned. At the same time, valuations of corporate bonds and equities have continued to be supported by the robust economic outlook. In foreign exchange markets, the euro has remained broadly unchanged.

Long-term euro area government bond yields have declined slightly since early September. During the period under review (from 7 September to 13 December 2017), the ten-year sovereign bond yield in Germany increased by 2 basis points to 0.32% (see Chart 4). However, the GDP-weighted euro area ten-year sovereign bond yield decreased by 5 basis points to 0.88%, owing to idiosyncratic falls in the sovereign bond yields of some euro area countries. In the United States and the United Kingdom, long-term government bond yields increased by 30 basis points and 24 basis points, to 2.34% and 1.21% respectively. Developments in euro area long-term interest rates since early September have been muted overall and have not mirrored increases abroad, owing to market expectations for euro area monetary policy. In the United States, the rise was driven partly by the prospect of reforms to the federal tax code, while in the United Kingdom, a reassessment of the future path of monetary policy was a factor.

Chart 4

Ten-year sovereign bond yields in the euro area, the United States and the United Kingdom



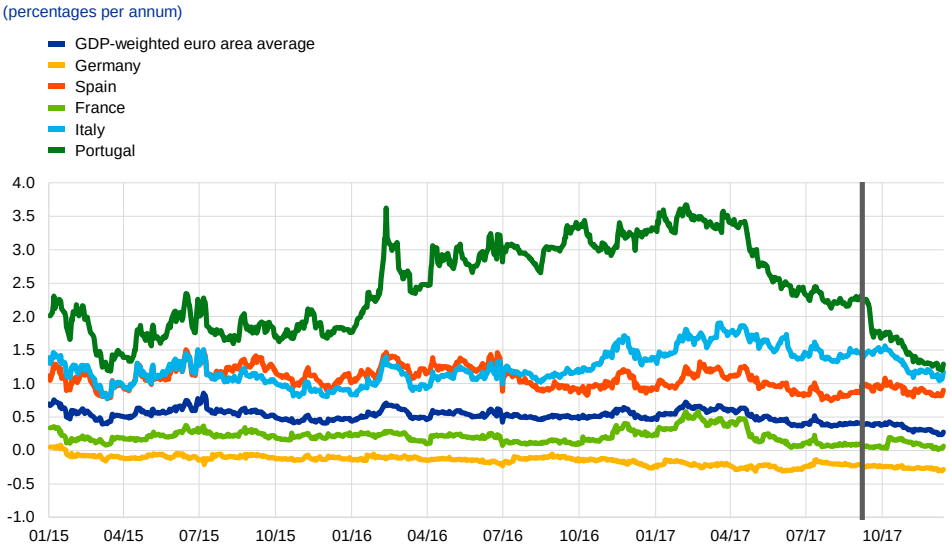
Sources: Bloomberg and ECB.
Notes: The vertical grey line denotes the start of the review period on 7 September 2017. The latest observation is for 13 December 2017.

Sovereign bond spreads vis-à-vis risk-free overnight index swap (OIS) rates fell in a number of euro area countries. The declines ranged from 3 basis points in Germany to 20 basis points in Italy, and around 100 basis points in Portugal (see Chart 5). In the latter two countries, a more favourable assessment of the

sovereign's creditworthiness by some of the major rating agencies contributed to the compression in spreads in line with the overall improvement in the euro area macroeconomic environment. Furthermore, the idiosyncratic falls in Portugal and Italy were largely responsible for the decline in the GDP-weighted euro area ten-year sovereign bond yield, as shown in Chart 4.

Chart 5

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

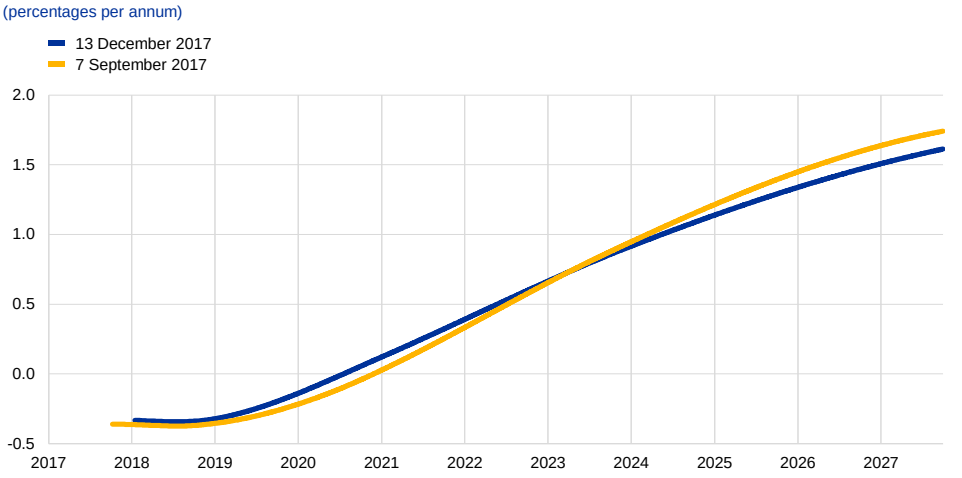


Sources: Thomson Reuters and ECB calculations.
Notes: The spread is calculated by subtracting the ten-year OIS rate from the sovereign yield. The vertical grey line denotes the start of the review period on 7 September 2017. The latest observation is for 13 December 2017.

The euro overnight index average (EONIA) forward curve was broadly unchanged. The EONIA forward curve shifted slightly upwards at short maturities and slightly downwards at longer maturities (see Chart 6). The fact that the curve remains in negative territory until around mid-2020 is consistent with market participants' expectations of a negative rate on the ECB's deposit facility for a prolonged period of time.

Chart 6

EONIA forward rates



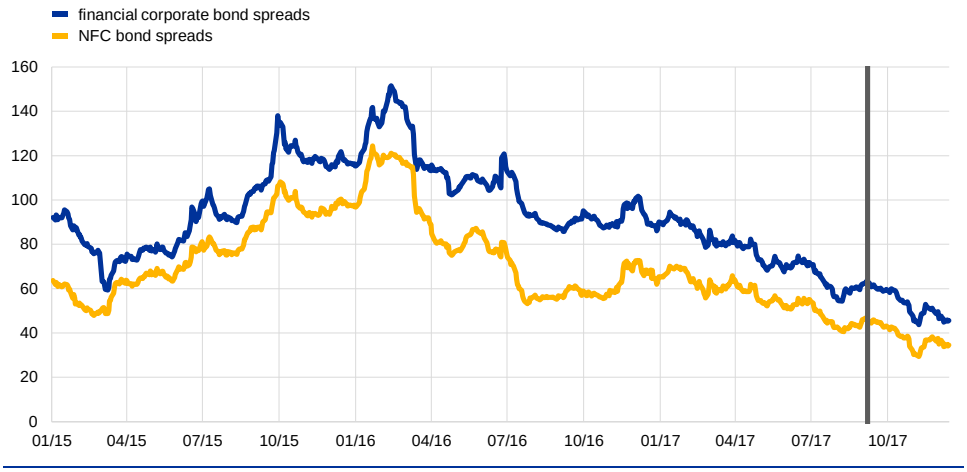
Sources: Thomson Reuters and ECB calculations.

The EONIA stood at an average of -35 basis points. Owing to idiosyncratic factors, the EONIA rose to a high of -24 basis points at the end of November. Excess liquidity increased by about €121 billion, to around €1,898 billion, owing to ongoing purchases under the Eurosystem's asset purchase programme. Liquidity conditions are discussed in more detail in Box 2.

Spreads on corporate bonds declined further during the period under review. On 7 December investment-grade NFC bond spreads (over the corresponding AAA-rated euro area average yield curve) were on average 16 basis points lower than in early September and around 80 basis points below their levels in March 2016, prior to the announcement of the corporate sector purchase programme. Spreads on non-investment-grade and financial sector debt also declined, falling by 11 basis points and 16 basis points respectively (see Chart 7). The low level and further compression of corporate bond spreads is consistent with a strengthening economic recovery.

Chart 7

Euro area corporate bond spreads

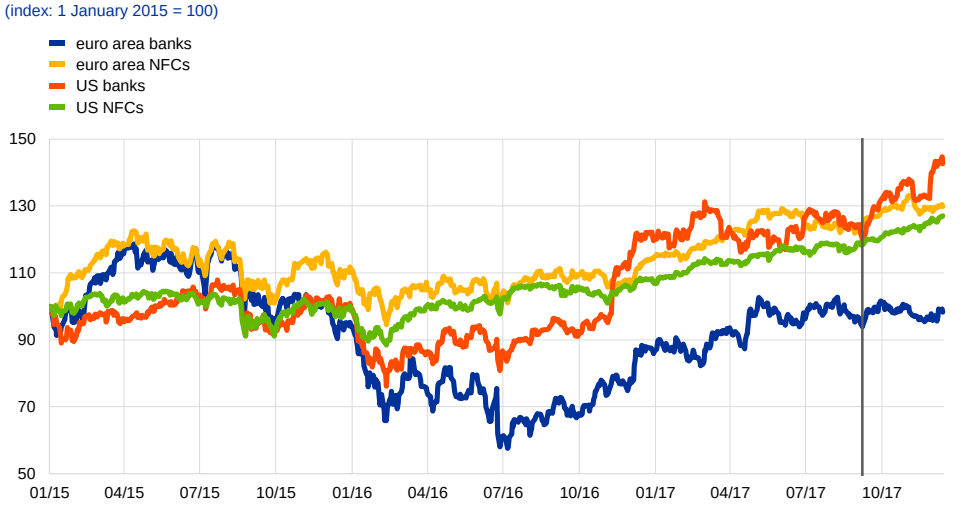


Sources: iBoxx indices and ECB calculations.
Notes: The vertical grey line denotes the start of the review period on 7 September 2017. The latest observation is for 13 December 2017.

Euro area equity prices increased. Equity prices of euro area NFCs and banks were around 4% higher at the end of the review period, owing partly to a reduction in perceived geopolitical risk (see Chart 8). Euro area equity prices are also still being underpinned by the robust economic outlook and the ensuing increase in earnings expectations. The equity prices of US NFCs and banks were 7% and 19% higher respectively at the end of the review period, also reflecting the favourable market perception of a US corporate tax reform. In the euro area, market expectations regarding equity price volatility decreased marginally, remaining at the low levels which have prevailed throughout 2017, while in the United States, they declined overall.

Chart 8

Euro area and US equity price indices



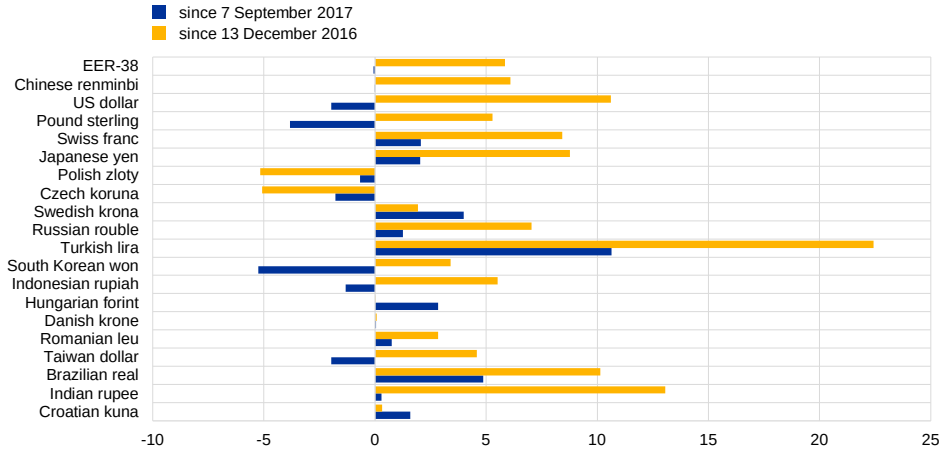
Sources: Thomson Reuters and ECB calculations.
Notes: The vertical grey line denotes the start of the review period on 7 September 2017. The latest observation is for 13 December 2017.

In foreign exchange markets, the euro has remained broadly unchanged. However, this is masking some uneven developments across currency pairs. Since peaking at the beginning of the review period, the euro has depreciated vis-à-vis the US dollar by 2.0% (see Chart 9), reflecting both expectations about future policies and related macroeconomic news. There was also a depreciation in the euro vis-à-vis the pound sterling (by 3.8%) and against the currencies of a number of emerging economies in Asia. The euro appreciated vis-à-vis the currencies of some emerging and advanced economies, including the Swiss franc (by 2.1%), the Japanese yen (by 2.0%) and the Chinese renminbi, and also appreciated against the currencies of most non-euro area EU Member States, apart from the Polish zloty and the Czech koruna, against which it depreciated by 0.7% and 1.8% respectively.

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 13 December 2017.

3 Economic activity

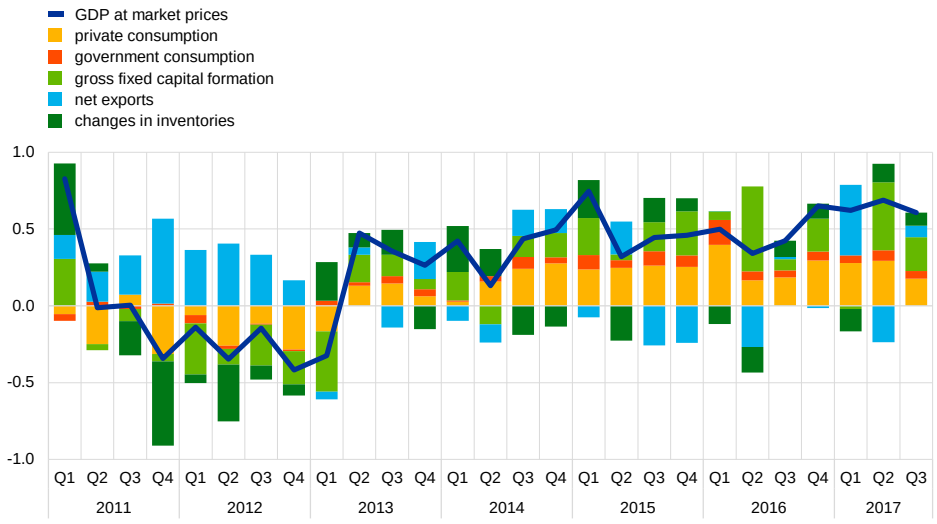
The euro area economic expansion continues to be solid and broad-based across countries and sectors. Real GDP growth is supported by growth in private consumption and investment as well as exports benefitting from the broad-based global recovery. The latest survey results and incoming data confirm robust growth momentum in the near term. Compared with the September 2017 ECB staff macroeconomic projections, the December 2017 Eurosystem staff macroeconomic projections revised the outlook for GDP growth upwards substantially. Euro area real GDP is foreseen to grow by 2.4% in 2017, 2.3% in 2018, 1.9% in 2019 and 1.7% in 2020.

The economic expansion in the euro area continues to be buoyant and is broad-based across countries and sectors. Real GDP increased by 0.6%, quarter on quarter, in the third quarter of 2017, following growth of 0.7% in the previous quarter (see Chart 10). The main driver continued to be domestic demand, notably fixed investment spending, and to a lesser extent net exports and changes in inventories. On the production side, activity was broad-based, with strong value added growth in industry (excluding construction) and slightly lower growth in the construction and services sectors.

Chart 10

Euro area real GDP and its components

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



Source: Eurostat.
Notes: The latest observations are for the third quarter of 2017.

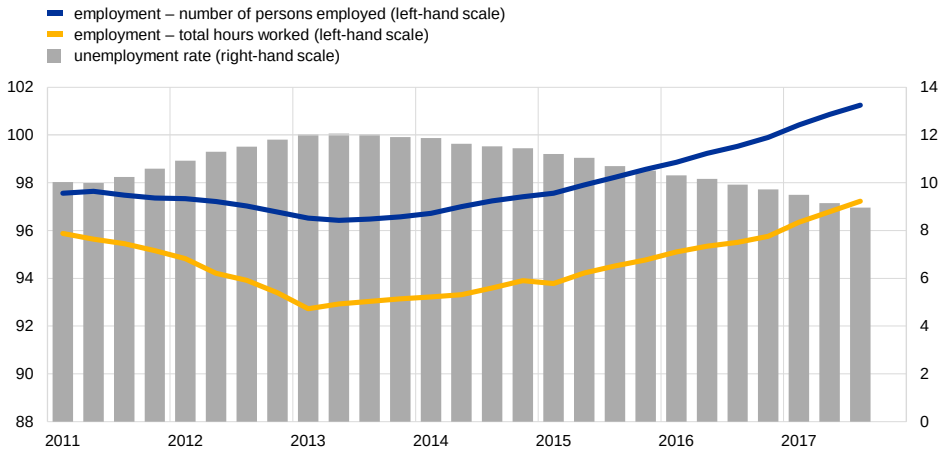
Euro area labour markets continue to exhibit strong dynamics. Employment rose further, by 0.4%, quarter on quarter, in the third quarter of 2017, resulting in an annual increase of 1.7%. Employment currently stands 1.2% above the pre-crisis peak recorded in the first quarter of 2008. Total hours worked also continued to recover, although average hours worked per person employed have remained broadly stable. This is despite both full-time workers and part-time workers working more hours on average, as these increases were offset by the shift in the

composition of employment towards a higher proportion of part-time workers.[1] The unemployment rate in the euro area stood at 8.8% in October 2017, which is its lowest level since January 2009 (see Chart 11). The decline has been broad-based across age and gender groups. Long-term unemployment (i.e. 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 level. 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.

Chart 11

Developments in the euro area labour market

(left-hand scale: index: Q1 2008 = 100; right-hand scale: percentages)



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

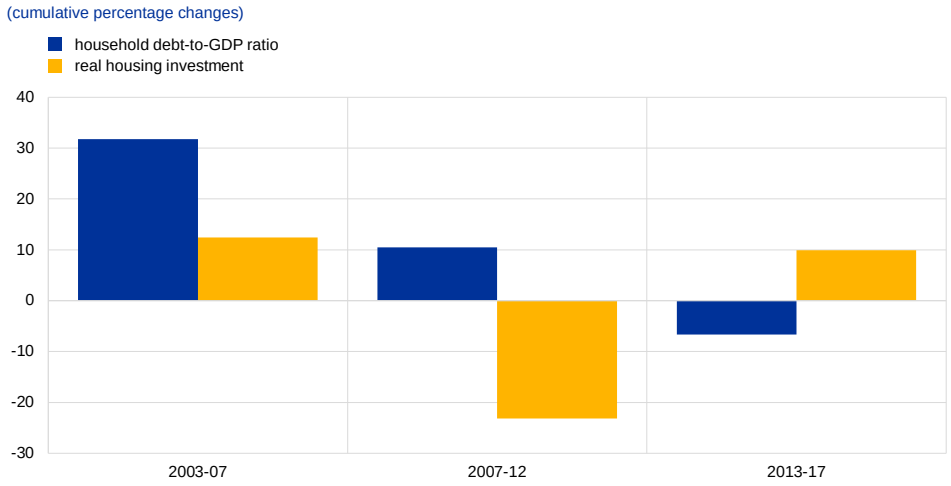
Improving labour markets continue to support income growth and consumer spending. Private consumption growth slowed slightly in the third quarter of 2017 to 0.3%, quarter on quarter, down from 0.5% in the previous quarter. This growth, particularly in durable goods, has been underpinned by the recovery in labour market conditions and rising real wages per employee. The ECB's monetary policy measures, which have eased financing conditions, also remain supportive of household spending. The savings ratio has declined in the last few quarters, mainly reflecting both an improvement in households' economic and financial situation, and the low interest rate environment, which is reducing their propensity to save. Consumer confidence rose further in November 2017 as a result of households' being more optimistic about their future financial circumstances and the general situation in the euro area. As a consequence, consumer confidence is now close to its historical highs, signalling strong underlying consumption dynamics in the near term.

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

The recovery in housing markets is expected to continue to drive growth. Housing investment increased by 1.3% in the second quarter of 2017, reflecting a continuation of the recovery in the euro area as a whole and in many individual euro area countries. Since the onset of the euro area crisis, developments in housing investment and household indebtedness have moved in opposite directions. In 2008 household indebtedness started to rise, while housing investment began to decline. Since 2013 this trend has reversed, with the recovery in investment being accompanied by household deleveraging. These developments are in sharp contrast with those during the period prior to the crisis when both indebtedness and investment were on the rise (see Chart 12).

Chart 12

Indebtedness and housing investment



Sources: Eurostat and ECB calculations.
Notes: The latest observations are for the second quarter of 2017.

Housing investment and house prices continue to be bolstered by very favourable financing conditions, portfolio shifts to housing in the context of low yields on alternative long-term investment opportunities and rising income growth related to ongoing job creation. Recent indicators suggest that this positive momentum in housing investment is set to continue. Business confidence in the construction of buildings segment improved further in October and remains at levels last seen in 2008. Construction production also rose in the third quarter, in line with the positive growth in housing investment in the same quarter, albeit at a slower pace than earlier in the year. A further improvement in the European Commission's construction confidence indicator for the buildings segment in October and November compared with the third quarter suggests that the positive growth will also continue in the fourth quarter.

Business investment grew at a steady pace in the third quarter of 2017 and the short-term outlook remains robust. Non-construction investment grew by 1.9%, quarter on quarter, in the third quarter, following growth of 3.9% in the previous quarter. In the fourth quarter evidence from the European Commission's survey suggests that supply constraints are perceived to have increased further, pointing to a need to extend or rationalise the capital stock. Furthermore, sentiment in the

capital goods producing sector remains strong, reflecting very favourable production expectations and order books. Finally, moderate debt financing growth, together with the pronounced recovery in stock prices observed in recent years, has brought the leverage ratio (debt to total assets) in the non-financial corporation (NFC) sector down to historical lows, which should free up firms' resources for investment activities.

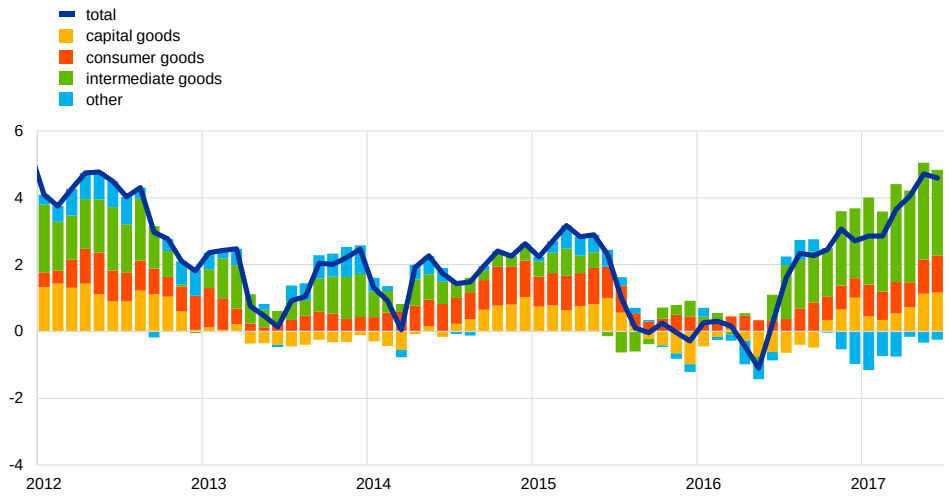
Business investment is expected to recover further in the medium term. The robust outlook for investment is supported by a number of factors. Capacity utilisation continues to rise, remaining above the average levels seen before the crisis, financing conditions are expected to stay very favourable and profit mark-ups are foreseen to increase in the context of an already cash-rich NFC sector. Moreover, deleveraging pressures are expected to diminish further as the economic expansion progresses in the context of a low interest rate environment, in turn shoring up business investment growth. However, expectations of still subdued potential output growth and limitations on banks' intermediation capacity in some countries, as well as remaining structural barriers and a lack of workers with certain skills, may continue to weigh on the outlook for business investment.

Euro area exports continue to grow robustly. Monthly trade data point to strong momentum in extra-euro area exports in the third quarter, which posted a six-year record annual increase of 4.1% (taking into account observations for July and August) and are well above their post-crisis average level. This marks a continuation of the rebound that started in 2016. Favourable developments in foreign demand more than offset the adverse impact of the recent appreciation in the euro. Exports to non-EU countries, in particular China and the rest of Asia, are the main driver of the dynamics. Above-average new manufacturing orders and export market climate indicators suggest that the strong growth in exports will continue over the coming months and that the positive momentum in intermediate and capital goods (see Chart 13) may be related to a rebound in global investment. A pick-up in the latter may sustain exports in the medium term.

Chart 13

Extra-euro area goods exports

(annual percentage changes; percentage point contributions)



Source: Eurostat.
Notes: Goods exports are in volumes. The latest observation is for August 2017.

Overall, incoming data are generally pointing to unabated upside growth momentum in the fourth quarter of 2017 and around the turn of the year, with robust growth expected to continue in 2018. The European Commission's Economic Sentiment Indicator (ESI) and the composite output Purchasing Managers' Index (PMI) continued to rise in November, remaining well above their average levels. This suggests that growth in the fourth quarter of 2017 was at least as strong as in the previous quarter (see the box entitled "The recent strength of survey-based indicators: what does it tell us about the depth and breadth of real GDP growth?" in this issue of the Economic Bulletin).

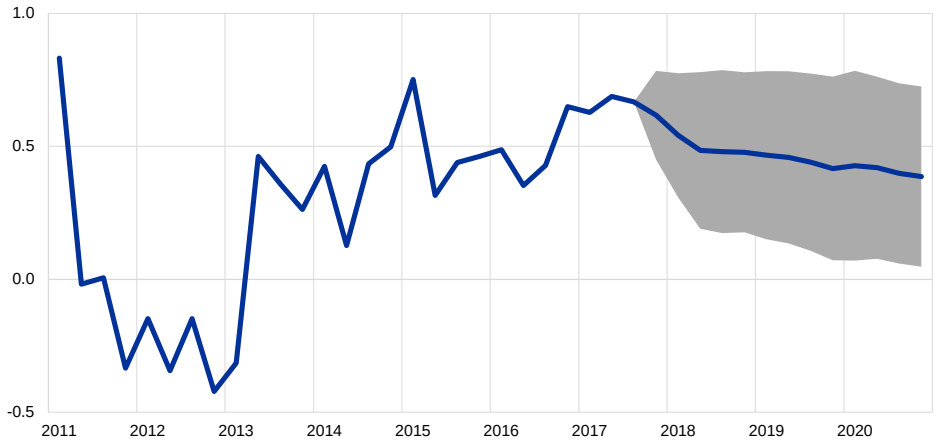
The ongoing economic expansion in the euro area is projected to continue, supported by the ECB's monetary policy measures, which are being passed through to the real economy. Lower deleveraging needs continue to contribute to private expenditure growth. Improved labour market conditions, low interest rates and very favourable financing conditions support private consumption growth. Improvements in corporate profitability and very favourable financing conditions continue to promote the recovery in business investment. At the same time, euro area exporters continue to benefit from the ongoing global economic expansion.

The December 2017 Eurosystem staff macroeconomic projections for the euro area foresee annual real GDP increasing by 2.4% in 2017, 2.3% in 2018, 1.9% in 2019 and 1.7% in 2020 (see Chart 14). Compared with the September 2017 ECB staff macroeconomic projections, the outlook for real GDP growth has been revised upwards substantially. The risks surrounding the euro area growth outlook are broadly balanced.

Chart 14

Euro area real GDP (including projections)

(quarter-on-quarter percentage changes)



Sources: Eurostat and the article entitled "December 2017 Eurosystem staff macroeconomic projections for the euro area", published on the ECB's website on 14 December 2017.
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 ranges 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.

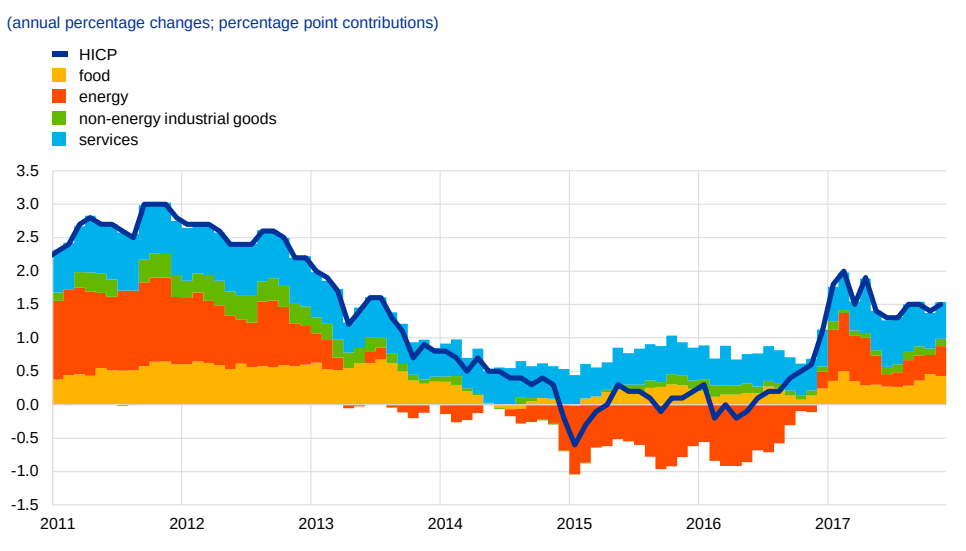
4 Prices and costs

According to Eurostat's flash estimate, euro area annual HICP inflation was 1.5% in November, up from 1.4% in October. At the same time, measures of underlying inflation have moderated somewhat recently, in part owing to special factors. Looking ahead, on the basis of current futures prices for oil, annual rates of headline inflation are likely to moderate in the coming months, mainly reflecting base effects in energy prices, before increasing again. Underlying inflation is 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 December 2017 Eurosystem staff macroeconomic projections for the euro area, which foresee annual HICP inflation at 1.5% in 2017, 1.4% in 2018, 1.5% in 2019 and 1.7% in 2020. Compared with the September 2017 ECB staff macroeconomic projections, the outlook for headline HICP inflation has been revised up, mainly reflecting higher oil and food prices.

Headline inflation increased slightly in November. According to Eurostat's flash estimate, euro area annual HICP inflation rose to 1.5% in November, from 1.4% in October, returning to the level recorded in September (see Chart 15). The November increase reflects mainly higher energy price inflation, marginally offset by a small decrease in food price inflation. The increase in energy inflation was larger than anticipated, stemming from the latest substantial increases in oil prices.

Chart 15

Contributions of components to euro area headline HICP inflation



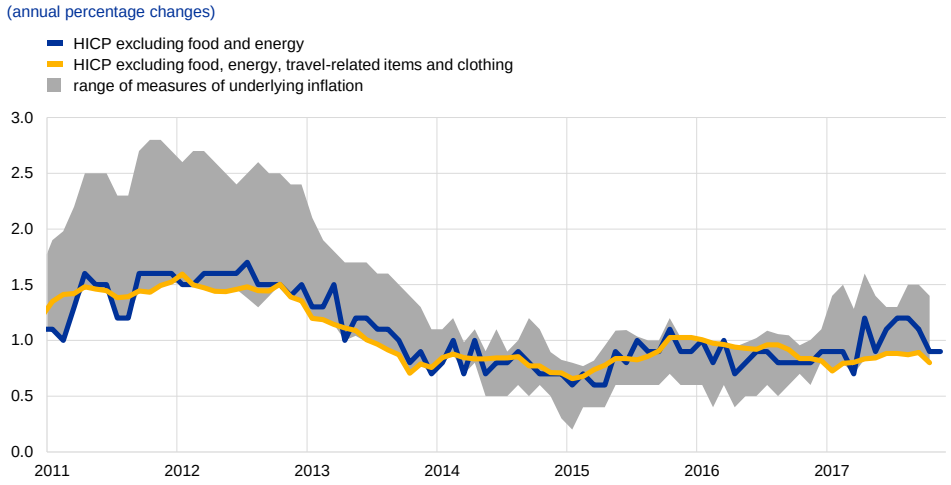
Sources: Eurostat and ECB calculations.
Note: The latest observations are for November 2017 (flash estimates).

Measures of underlying inflation have moderated somewhat recently, in part owing to special factors. HICP inflation excluding food and energy was 0.9% in November 2017, unchanged from October but down from 1.1% in September (see Chart 16). This overall decline since September was due in part to large declines in inflation for certain services items, including education fees in Italy and transport-

related insurance in Germany. November's HICP inflation excluding food and energy stood close to its levels at the turn of last year. Overall, measures of underlying inflation have not yet shown convincing signs of a sustained upward trend.

Chart 16

Measures of underlying inflation



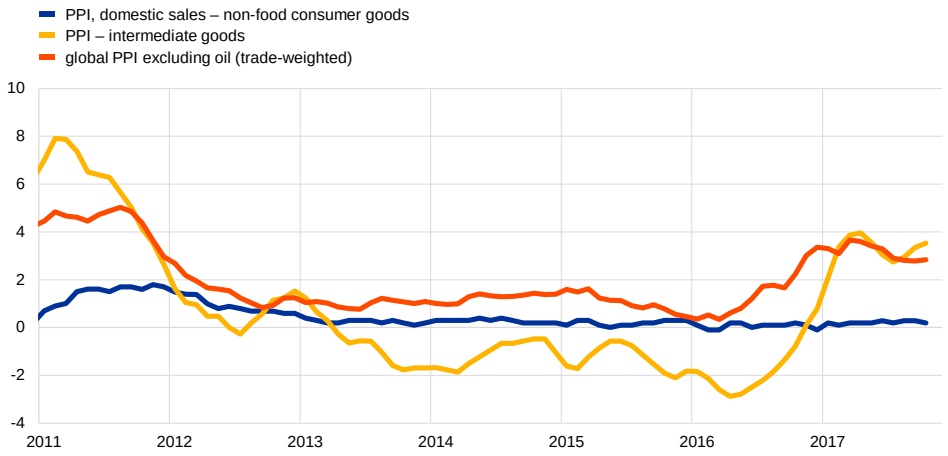
Sources: Eurostat and ECB calculations.
Notes: The range of underlying measures consists of the following: HICP excluding energy; HICP excluding unprocessed food and energy; HICP excluding food and energy; HICP excluding food, energy, travel-related items and clothing; the 10% trimmed mean; the 30% trimmed mean; the median of the HICP; and a measure based on a dynamic factor model. The latest observations are for November 2017 (HICP excluding food and energy – flash estimate) and October 2017 (all other measures).

Global price pressures remain strong but have still not passed through to the later stages of the pricing chain in the euro area. Annual oil price inflation in euro terms has increased markedly over recent months and global non-energy price pressures have remained strong (see Chart 17). While these global upward pressures on euro area import prices have been mitigated by downward pressure from the impact of the euro's appreciation over the summer, they continue to be reflected in the robust growth of import and producer prices for intermediate goods. Both grew at an annual rate of 3.5% in October. The pass-through to the later stages of the pricing chain, however, still appears to be weak, as annual producer price inflation for non-food consumer goods remained broadly stable at only 0.2% in October. One possible explanation for the weak inflation in producer prices for non-food consumer goods, despite robust price pressures at the earlier stages of the production and pricing chain, is that margins are being squeezed.

Chart 17

Global, intermediate and domestic producer prices

(annual percentage changes)



Sources: Eurostat and ECB calculations.
Note: The latest observations are for October 2017.

Wage growth has increased somewhat over recent quarters. Annual growth in compensation per employee rose from a low of 1.1% in the second quarter of 2016 to 1.7% in the third quarter of 2017. This increase was driven mainly by higher wage drift, which tends to react more quickly to cyclical developments than negotiated wages. Annual growth in negotiated wages per employee was 1.4% in the third quarter of 2017, unchanged from the previous quarter and equal to the average for 2016. Factors that may still be weighing on wage growth include still significant slack in the labour market, past low inflation, weak productivity growth and the ongoing impacts from labour market reforms implemented in some countries during the crisis.[2]

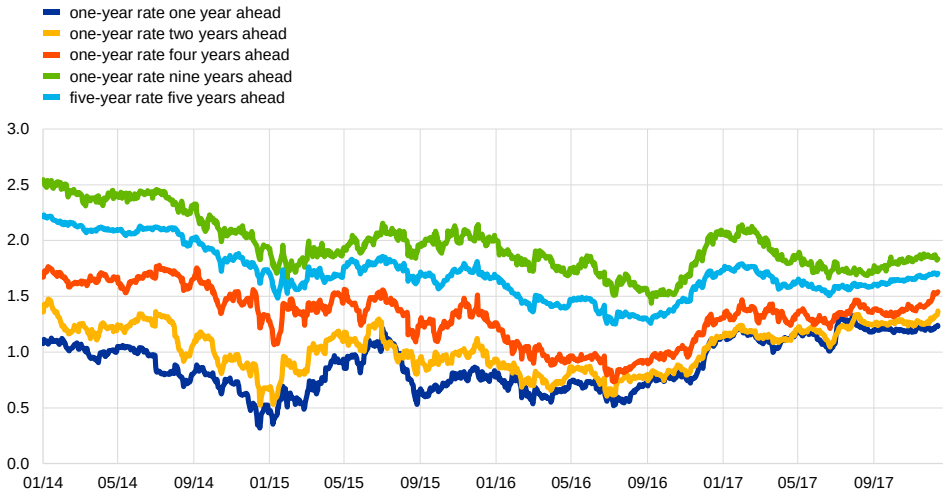
Both market-based and survey-based measures of longer-term inflation expectations have remained stable. The five-year forward inflation rate five years ahead stood at 1.71% on 13 December 2017, slightly above the level observed at the beginning of September (see Chart 18). The forward profile of market-based 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 probability of deflation implied by inflation options markets remains low and suggests that deflation risk remains contained. According to the ECB Survey of Professional Forecasters for the fourth quarter of 2017, measures of longer-term inflation expectations for the euro area stood at 1.9%.

2 See also the discussion in the box entitled "What can we learn from the ECB Survey of Professional Forecasters about perceptions of labour market dynamics in the euro area?" in this issue of the Economic Bulletin.

Chart 18

Market-based measures of inflation expectations

(annual percentage changes)



Sources: Thomson Reuters and ECB calculations.
Note: The latest observations are for 13 December 2017.

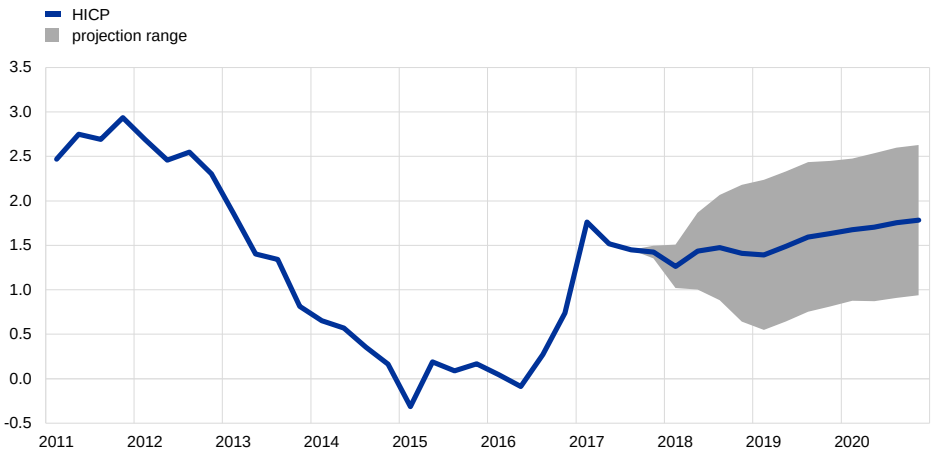
Although downward energy-related base effects are expected to cause HICP inflation to decline slightly in the near term, it is expected to be on an upward path thereafter, reaching 1.7% in 2020. On the basis of the information available at end-November, the December 2017 Eurosystem staff macroeconomic projections for the euro area foresee annual HICP inflation at 1.5% in 2017, 1.4% in 2018, 1.5% in 2019 and 1.7% in 2020 (see Chart 19).[3] Compared with the September 2017 ECB staff macroeconomic projections, the outlook for headline HICP inflation has been revised up, mainly reflecting higher oil and food prices.

[3] See the article entitled "December 2017 Eurosystem staff macroeconomic projections for the euro area", published on the ECB's website on 14 December 2017.

Chart 19

Euro area HICP inflation (including projections)

(annual percentage changes)



Sources: Eurostat and the article entitled "December 2017 Eurosystem staff macroeconomic projections for the euro area", published on the ECB's website on 14 December 2017.

HICP inflation excluding food and energy is expected to rise gradually over the medium term. HICP inflation excluding energy and food is projected to be 1.0% in 2017, 1.1% in 2018, 1.5% in 2019 and 1.8% in 2020. On the domestic cost side, important factors behind the gradual pick-up in underlying inflation are improvements in euro area labour market conditions and increasing labour supply shortages in some parts of the euro area, which are expected to drive an upturn in wage growth. Beyond this, the significant pick-up in headline inflation in 2017 compared with the previous three years can be expected to contribute to the increase in wage growth in euro area countries where wage formation processes include backward-looking indexation or expectation elements.

5 Money and credit

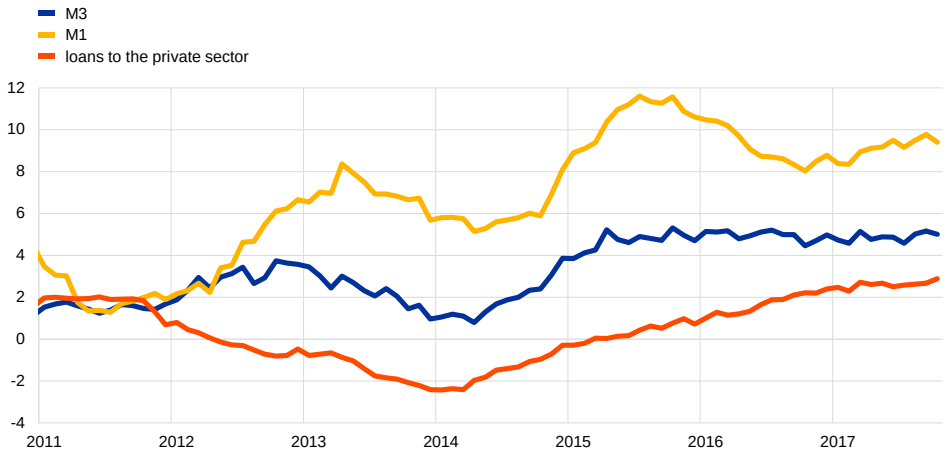
In the third quarter of 2017 and in October, broad money growth continued to expand at the robust pace generally witnessed since mid-2015. The recovery in loan growth to the private sector also continued. The annual flow of total external financing to non-financial corporations (NFCs) is estimated to have strengthened in the third quarter of 2017, reflecting improvements in both bank lending and debt securities issuance.

Growth in broad money remained robust at 4.9% on average in the third quarter of 2017 and stood at 5.0% in October, in line with the steady pace of monetary expansion since mid-2015 (see Chart 20). 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 standing at 9.4% in the third quarter of 2017 and in October (compared with 9.2% in the second quarter of 2017 and 9.8% in September).

Chart 20

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 October 2017.

Overnight deposits continued to be the main driver of M3 growth. Specifically, the annual growth rate of overnight deposits held by households and non-financial corporations remained strong in the third quarter of 2017 and in October. By contrast, the volatile annual growth rate of overnight deposits held by non-monetary financial institutions declined in October, triggering the slowdown in M1 growth over the month. The annual growth rate of currency in circulation remained broadly unchanged in the third quarter of 2017 and in October, indicating 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

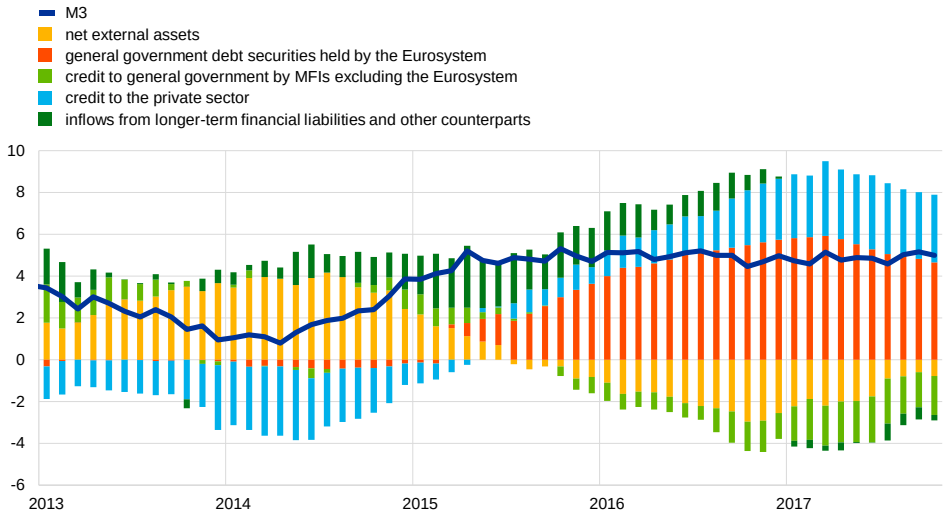
component of M3 – turned negative in this period. This development was driven by a smaller, positive contribution of money market fund shares/units, indicating a decrease in the attractiveness of these instruments, and a further decline in monetary financial institutions' (MFIs) issuance of short-term debt securities.

Domestic sources of money creation were again the main driver of broad money growth (see Chart 21). From a counterpart perspective, the Eurosystem's purchases of general government debt securities (see the red portion of the bars in Chart 21), conducted mainly in the context of the ECB's public sector purchase programme (PSPP), contributed positively to M3 growth. The ongoing recovery in credit to the private sector (see the blue portion of the bars in Chart 21) also continued to support M3 growth. This 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 portion of the bars in Chart 21). The annual rate of change of such liabilities has been negative since the second quarter of 2012, partly owing to the impact of the ECB's targeted longer-term refinancing operations (TLTRO-II), which may be acting as a substitute for longer-term market-based bank funding. Finally, 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 portion of the bars in Chart 21).

Chart 21

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 October 2017.

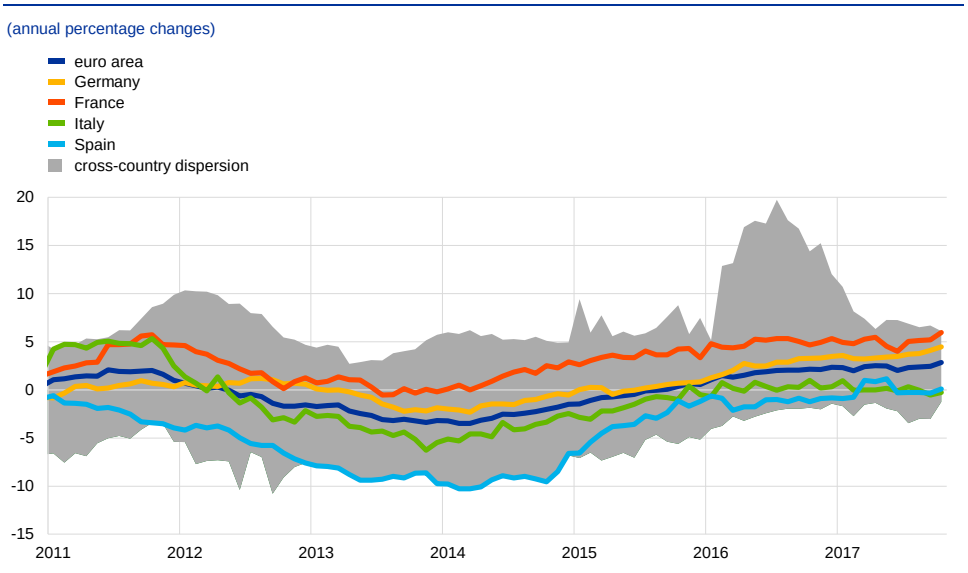
MFIs' net external assets continued to weigh on annual M3 growth (see the yellow portion of the bars in Chart 21). While the annual flow of net external assets

remained negative in the third quarter of 2017, capital outflows from the euro area, which are partly explained by PSPP-related sales of euro area government bonds by non-residents, have declined over recent months. This has mitigated the related downward pressure on M3 growth. The decline in the negative contribution from net external assets came to a halt in October. Non-residents, while remaining among the main sellers of securities eligible for the asset purchase programme (APP), may have moderated the rebalancing of their portfolios towards other euro area assets.

The recovery in the growth of loans to the private sector, observed since the beginning of 2014, has continued. The annual growth rate of MFI loans to the private sector (adjusted for loan sales, securitisation and notional cash pooling) was broadly stable in the third quarter of 2017 and increased in October (see Chart 20). Across sectors, the annual growth of loans to non-financial corporations increased to 2.9% in October, from 2.3% in the third quarter (see Chart 22). The growth of loans to NFCs has recovered significantly from the trough in the first quarter of 2014 and the cross-country dispersion of NFC loan developments has declined overall. At the same time, heterogeneity in loan growth across the four largest euro area countries increased somewhat in October 2017. The annual growth rate of loans to households remained broadly stable, standing at 2.7% in October (see Chart 23). 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 non-performing loans remains high in some countries and may constrain financial intermediation.[4]

Chart 22

MFI loans to NFCs in selected euro area countries

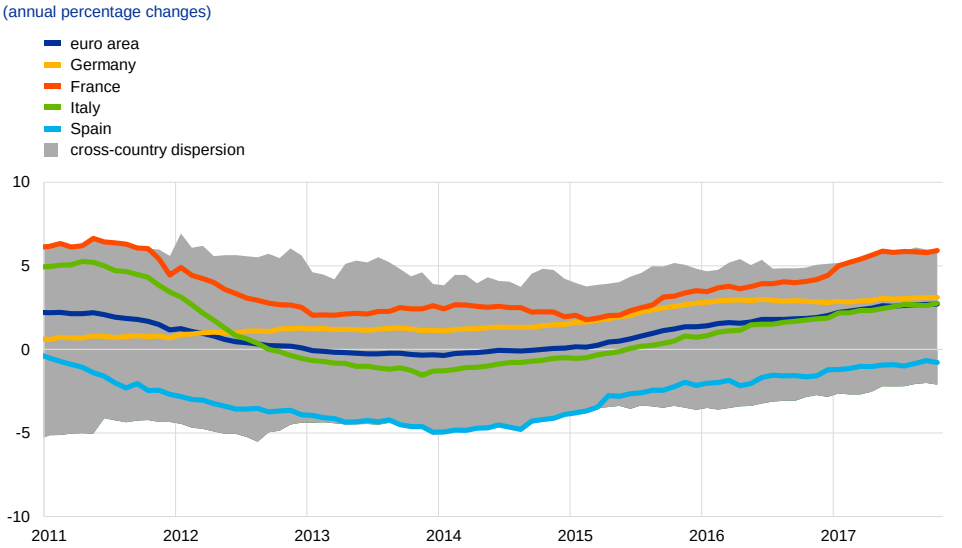


Source: ECB.
Notes: Adjusted for loan sales, securitisation and notional cash pooling. The cross-country dispersion is calculated on the basis of minimum and maximum values using a fixed sample of 12 euro area countries. The latest observation is for October 2017.

[4] See also Section 3 of *Financial Stability Review*, ECB, November 2017.

Chart 23

MFI loans to households in selected euro area countries



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 October 2017.

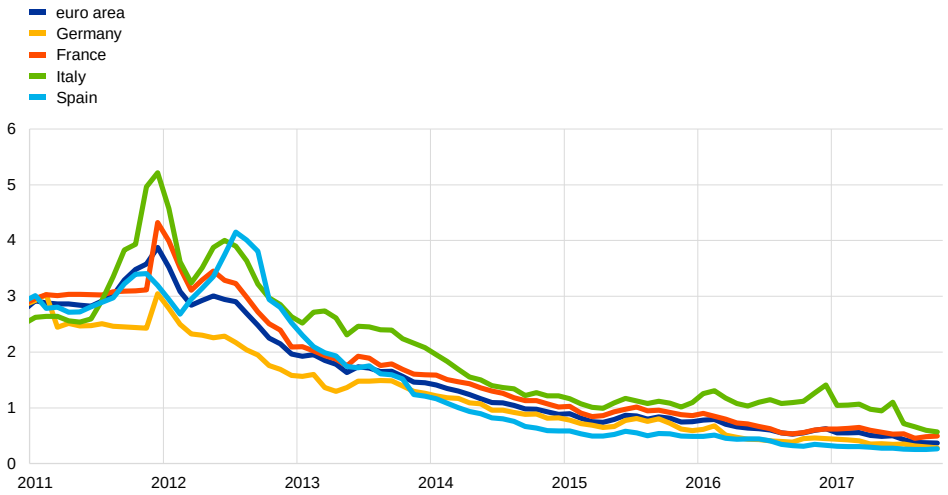
Banks' funding conditions declined further, falling to new historical lows.

Banks' composite cost of debt financing declined further in the third quarter of 2017 and remained at a historically low level in October (see Chart 24). The decrease in the third quarter was driven by developments in bank bond yields, while the cost of deposits remained stable. In October, both bank bond yields and the cost of deposits fell to new historical lows. 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 the favourable bank funding conditions.

Chart 24

Banks' composite cost of debt financing

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



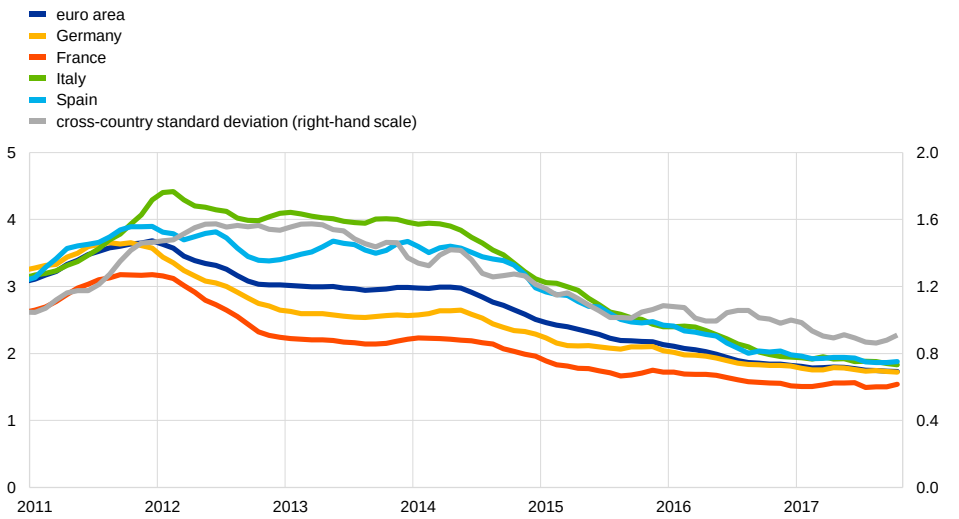
Sources: ECB, Markit Iboxx and ECB calculations.
Notes: The composite cost of deposits is calculated as an average of new business rates on overnight deposits, deposits with an agreed maturity and deposits redeemable at notice, weighted by their corresponding outstanding amounts. The latest observation is for October 2017.

Bank lending rates for NFCs remained at historically low levels (see Chart 25). The composite bank lending rate for NFCs declined further to a historical low in the third quarter of 2017, where it remained in October. As regards loans to households for house purchase, the moderate increase in the composite bank lending rate for this loan category up to August 2017, from a historical low of 1.78% in December 2016, softened in September and October 2017 (see Chart 26). 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 aforementioned decrease in banks' composite funding costs has supported the decline in composite lending rates. Between May 2014 and October 2017, composite lending rates on loans to NFCs and on loans to households fell by 120 basis points and 103 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 and stood close to its historical low in October 2017. 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 25

Composite lending rates for NFCs

(percentages per annum; three-month moving averages)

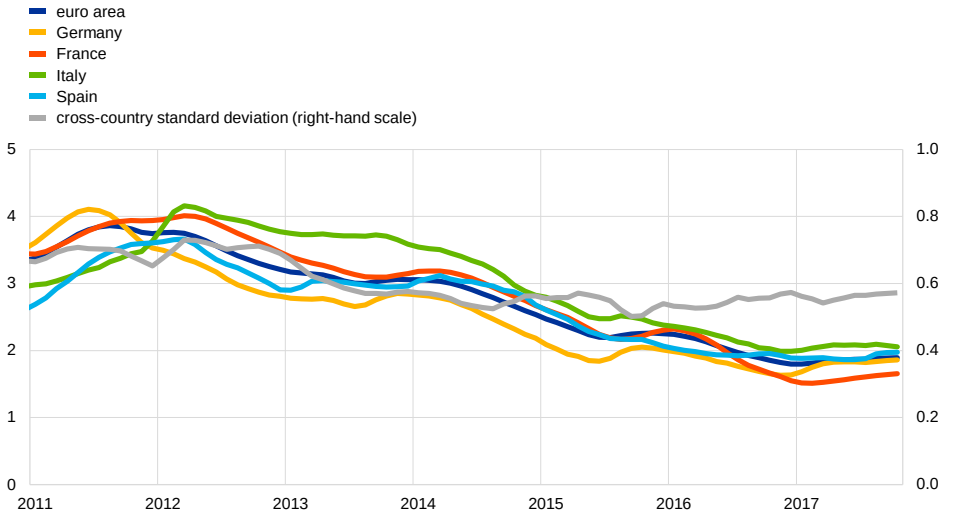


Source: ECB.
Notes: The indicator for the total cost of bank borrowing is calculated by aggregating short and long-term rates using a 24-month moving average of new business volumes. The cross-country standard deviation is calculated using a fixed sample of 12 euro area countries. The latest observation is for October 2017.

Chart 26

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 October 2017.

The annual flow of total external financing to euro area NFCs is estimated to have strengthened in the third quarter of 2017. This reflects improvements in both bank lending and debt securities issuance, which were dampened by special factors in the second quarter. 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 increased in the third quarter of 2017. The increase in net issuance was concentrated in July, while in August and September issuance was subdued. Market data point to robust gross debt issuance in October and November. Net issuance of listed shares by NFCs continued to be dampened by significant share buy-backs in some countries.

Financing costs for NFCs remain favourable. The overall nominal cost of external financing for NFCs, comprising bank lending, debt issuance in the market and equity finance, is estimated to have declined slightly further, to 4.3% in November 2017, after increasing moderately in June and July. Most of the decline since July 2017 is accounted for by the fall in the cost of equity. In addition, the cost of market-based debt is estimated to have fallen to a new historical low (see Section 2). The overall nominal cost of external financing now stands 30 basis points above its historical low of July 2016 but remains considerably lower than the level observed in summer 2014, immediately before markets started to price in expectations about the forthcoming APP.

6 Fiscal developments

In the December 2017 Eurosystem staff macroeconomic projections, the euro area budget deficit is foreseen to decline further over the projection horizon (2017-20), mainly as a result of improving cyclical conditions and decreasing interest payments. The aggregate fiscal stance for the euro area is projected to be broadly neutral. The euro area government debt-to-GDP ratio is expected to continue to decline, albeit from a still high level. In particular, countries with high debt levels require additional consolidation efforts to set their public debt ratio firmly on a downward path and to rebuild fiscal buffers.

The euro area general government budget deficit is projected to decline gradually over the projection horizon. Based on the December 2017 Eurosystem staff macroeconomic projections,[5] the general government deficit ratio for the euro area is expected to fall from 1.5% of GDP in 2016 to 0.5% of GDP in 2020 (see Table 1). The expected improvement in the fiscal outlook, which is broadly unchanged from the September 2017 projections, is mainly driven by favourable cyclical conditions and declining interest payments. While the draft budgetary plans for 2018, which the euro area countries submitted in mid-October 2017, foresee additional consolidation efforts by some countries, this is not necessarily fully reflected in the projections, as they only include measures that have already been adopted or are close to being adopted by the respective parliaments. For further details on the draft budgetary plans, see the box entitled “An assessment of the review of draft budgetary plans based on the 2018 exercise” in this issue of the Economic Bulletin. The euro area fiscal stance is projected to be broadly neutral over the projection horizon.[6]

Euro area government debt levels are expected to continue falling from their high levels. The euro area debt-to-GDP ratio, which peaked in 2014, is projected to decline from 88.9% of GDP in 2016 to 80.7% of GDP by the end of 2020. The decline is driven mainly by a positive and rising primary surplus and a favourable interest rate-growth rate differential, the latter reflecting the generally stable macroeconomic outlook. The debt ratio is slightly lower compared with the September 2017 exercise, mainly reflecting a more favourable interest-rate growth rate differential. Debt ratios are projected to improve in most euro area countries, while in a few countries the government debt ratio is expected to increase over the projection horizon. In the case of high-debt countries in particular, further consolidation efforts in full compliance with the Stability and Growth Pact are essential to set the public debt-to-GDP ratio firmly on a downward path. Rebuilding fiscal buffers would make countries less vulnerable to any renewed financial market instability or a rapid rebound in interest rates.

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5 See the December 2017 Eurosystem staff macroeconomic projections for the euro area.

6 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 euro area fiscal stance, see the article entitled “The euro area fiscal stance”, *Economic Bulletin*, Issue 4, ECB, 2016.

Table 1

Fiscal developments in the euro area

(percentages of GDP)

	2016	2017	2018	2019	2020
a. Total revenue	46.1	46.0	45.7	45.3	45.2
b. Total expenditure	47.6	47.1	46.6	46.2	45.7
of which:					
c. Interest expenditure	2.2	2.0	1.9	1.7	1.7
d. Primary expenditure (b - c)	45.4	45.1	44.7	44.5	44.0
Budget balance (a - b)	-1.5	-1.1	-0.9	-0.9	-0.5
Primary budget balance (a - d)	0.6	0.9	1.0	0.9	1.2
Cyclically adjusted budget balance	-1.4	-1.2	-1.1	-1.2	-1.0
Structural primary balance	0.7	0.9	0.7	0.7	0.7
Gross debt	88.9	87.0	85.1	83.1	80.7
Memo item: real GDP (percentage changes)	1.8	2.4	2.3	1.9	1.7

Sources: Eurostat, ECB and the December 2017 Eurosystem 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. As the projections usually take the most recent data revisions into account, there might be discrepancies compared with the latest validated Eurostat data.

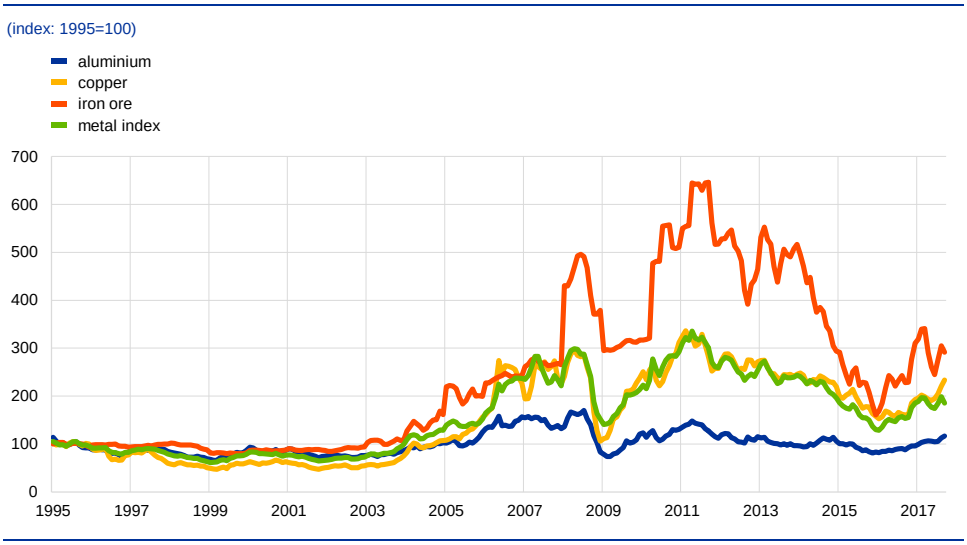
Boxes

1 What is driving metal prices?

Understanding the factors behind metal prices is important to the assessment of their implications for euro area prices. This box analyses the drivers of metal price developments since 1998, with a particular focus on the surge in metal prices between June and September 2017, a period in which aluminium, copper and iron ore prices simultaneously increased by around 10%.

While attracting less attention than oil prices, metal prices have also been fluctuating strongly since the end of 2003. Metal prices were relatively stable between 1995 and the end of 2003, then increased strongly until the middle of 2011 (apart from a dip during the global recession), then declined until early 2016, after which they started rising again (see Chart A). Prices were about 75% higher in September 2017 than in 1995, led by iron ore and copper, while aluminium prices remained more stable over this period.

Chart A
Metal prices



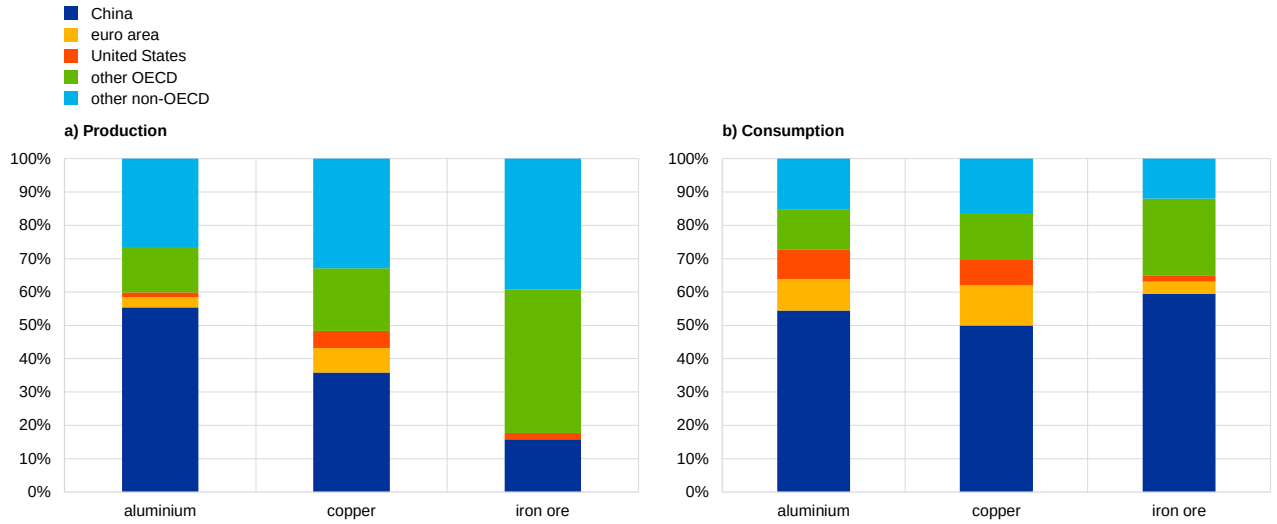
Sources: Bloomberg, Hamburg Institute of International Economics (HWWI) and ECB calculations.
Notes: The metal index includes aluminium, copper, lead, nickel, steel scrap, tin, zinc and iron ore. The weights are based on imports into euro area countries (see Chart B).

Reflecting buoyant economic growth over the last decade, China has become a dominant player in terms of its share in the consumption of metals and, for some metals, also in terms of production (see Chart B). China consumes about 50 to 60% of world metals and accounts for around 50% of world aluminium production and 35% of world copper production. However, its share in iron ore consumption decreased from 70% in 2014 to 60% in 2015, reflecting a gradual economic rebalancing in China away from commodity-intensive activities and towards services. In addition, environmental concerns supported lower steel production in China, with a negative impact on demand for iron ore.

Chart B

Geographical composition of metal production and consumption

(global percentage shares in 2016)



Sources: Bloomberg and ECB calculations.
Notes: In panel (a), aluminium and copper data come from the World Bureau of Metal Statistics (WBMS) and reflect primary production and refined production, respectively. Iron ore data are based on mine production of usable iron ore from the United States Geological Survey (USGC). In panel (b), the same sources of data are used for consumption. Iron ore consumption is not available for 2016 and is substituted by 2015 data.

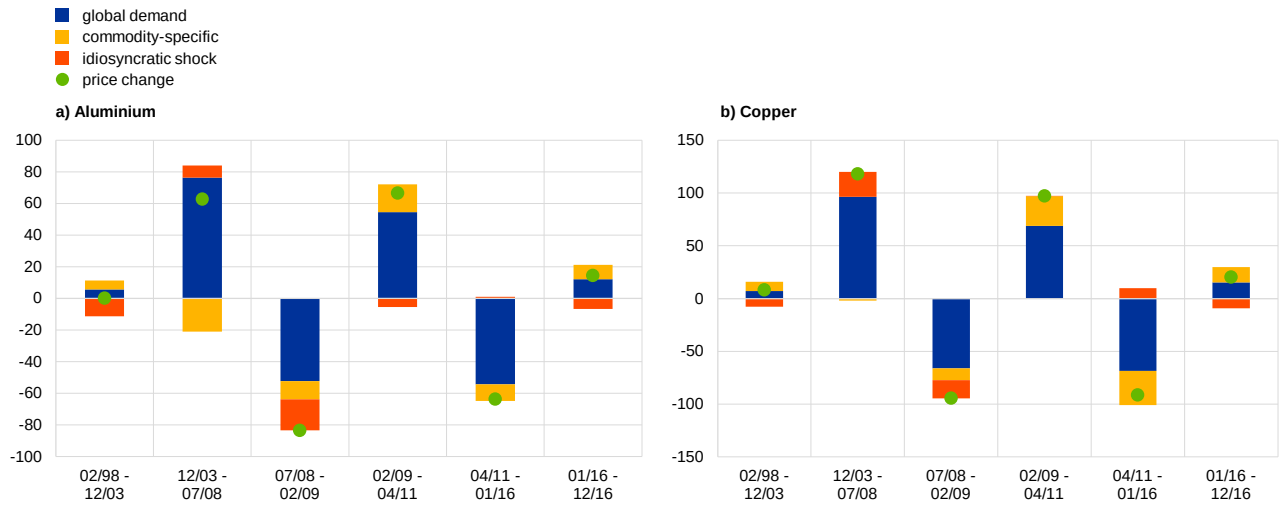
While demand factors have been a key determinant of metal price fluctuations over the last two decades, model-based estimates suggest that the recent surge in metal prices was also driven by supply factors. To disentangle the main factors behind the surge, a dynamic factor model on a large panel of energy and non-energy prices, as developed by Delle Chiaie, Ferrara and Giannone (2017),[7] is used. This approach assumes that commodity-specific shocks, such as supply shocks in individual commodity markets, tend to be idiosyncratic and hence average out when considering a large cross-section of commodity prices. By contrast, sustained changes in the common component (the global factor) tend to be indicative of demand shifts driven by the global business cycle. The global (demand) factor captures a large share of metal price fluctuations and has been of great importance since the beginning of the 2000s, largely owing to the increasing importance of China (see Chart C). However, when looking at the more recent period, the simultaneous increase in all three metal prices by around 10% between June and September 2017 was mainly driven by the commodity-specific components, which should reflect supply factors as captured by idiosyncratic and block-specific contributions (see Chart D). Increasing global demand also played a role, although to a lesser extent than supply.

[7] Delle Chiaie, S., Ferrara, L. and Giannone, D., "Common factors of commodity prices", *Working Paper Series*, No 2112, ECB, November 2017.

Chart C

Main drivers of metal prices between 1998 and 2016

(percentage changes and percentage point contributions to price changes)



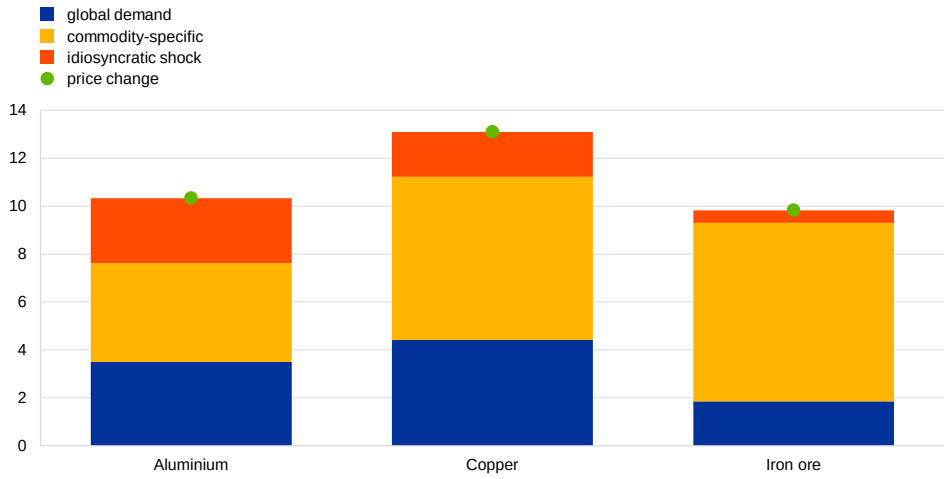
Source: Delle Chiaie, Ferrara and Giannone (2017).

These results are consistent with developments in the metal markets over this period. Copper production declined in Chile and Peru owing to weather conditions and strikes in some mines, while supply shortfalls in Australia and Brazil supported higher iron ore quotations. Aluminium prices also increased on account of strong global demand and China's policy of reducing overproduction and pollution through the shutdown of factories. Since the beginning of October 2017, metal prices have increased slightly (by around 2%), primarily owing to iron ore dynamics. Iron ore prices rose on account of increasing demand for high-grade iron ore in the aftermath of a restructuring of the steel industry in China, affected by the implementation of environmental reforms.

Chart D

Main drivers of the surge in metal prices between June and September 2017

(percentage changes and percentage point contributions)



Source: Delle Chiaie, Ferrara and Giannone (2017) (updated).
Notes: The historical decomposition for iron ore should be treated with caution owing to concerns about the quality of the series. Iron ore prices start only from 1995, and until 2010 most iron ore prices were traded using an annual benchmark price negotiation.

Despite recent increases in metal prices, most forecasts for copper, aluminium and iron ore predict a stabilisation or a decline in prices. While futures markets suggest a stabilisation of metal prices, Consensus Economics forecasts point to a decline, by around 7% by mid-2019, as increased demand is expected to be offset by increases in supply. World Bank projections indicate that the drop in metal prices will be somewhat stronger, with iron ore prices expected to decline by around 30% by late 2019. Copper and aluminium prices are also expected to fall, by around 11%. China will probably play an important role in the evolution of metal prices, as the tightening of metal markets is largely influenced by China's environmental and safety policies and the growth in demand for metals, with a stronger effect on iron ore than on copper and aluminium. Upside risks to these forecasts include unexpected supply outages, while downside risks relate to slower-than-anticipated demand growth in China and an easing of production restrictions on China's heavy industries.

Developments in metal prices play a role in the assessment of the outlook for euro area inflation and the risks to price stability in the medium term. Metal price fluctuations affect inflation mainly via their impact on the production and distribution chain, since the share of metal in consumption is rather small. Moreover, as they mostly affect industry, while having very little impact on services, their impact is more relevant for countries with a large industrial sector than for service-oriented economies. Compared to the impact of oil, the effect of metal prices on inflation is small, as they do not have a direct effect via HICP energy prices. Some estimates suggest that a 10% drop in industrial raw material prices results in 0.15% lower euro area HICP excluding energy and unprocessed food over a three-year horizon.[8]

[8] For the impact of raw materials prices, see Landau, B. and Skudelny, F., "Pass-through of external shocks along the pricing chain – a panel estimation approach for the euro area", *Working Paper Series*, No 1104, ECB, November 2009.

2 Liquidity conditions and monetary policy operations in the period from 26 July to 31 October 2017

This box describes the ECB's monetary policy operations during the fifth and sixth reserve maintenance periods of 2017, which ran from 26 July to 12 September 2017 and from 13 September to 31 October 2017 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.

In parallel, 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. This pace will be maintained until December 2017, after which it will be reduced to €30 billion on average per month until September 2018, or beyond if necessary.

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 €1,212.5 billion, an increase of €43.7 billion compared with the previous review period (i.e. the third and fourth maintenance periods of 2017). This increase in liquidity needs was attributable to an increase in average net autonomous factors, which rose by €43.9 billion to a record high of €1,090.2 billion during the period under review, while minimum reserve requirements decreased marginally by €0.2 billion to €122.2 billion.

The growth in aggregate net autonomous factors, which implies absorption of liquidity, mainly resulted from a decrease in the liquidity-providing factors. The main contribution came from net foreign assets, which fell by €33.0 billion to €637.0 billion on average in the period under review. Average net assets denominated in euro also decreased, by €26.3 billion compared with the previous review period, to €306.1 billion.

Liquidity-absorbing autonomous factors also decreased over the review period, counteracting to some extent developments in liquidity-providing autonomous factors. The main contribution came from other autonomous factors, which fell by €30.1 billion to €690.3 billion. Increases in banknotes in circulation and government deposits, by €11.5 billion and €3.4 billion respectively, had a counterbalancing effect on the level of liquidity-absorbing autonomous factors.

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

Table A

Eurosystem liquidity conditions

	26 July 2017 to 31 October 2017		3 May 2017 to 25 July 2017	Sixth maintenance period		Fifth maintenance period	
Liabilities – liquidity needs (averages; EUR billions)							
Autonomous liquidity factors	**2,033.1**	**(-15.3)**	**2,048.3**	**2,046.7**	**(+27.2)**	**2,019.5**	**(-52.2)**
Banknotes in circulation	1,142.7	(+11.5)	1,131.2	1,142.8	(+0.3)	1,142.5	(+6.2)
Government deposits	200.1	(+3.4)	196.7	218.3	(+36.4)	181.8	(-47.9)
Other autonomous factors	690.3	(-30.1)	720.5	685.6	(-9.5)	695.1	(-10.4)
Current accounts	**1,248.0**	**(+74.0)**	**1,174.0**	**1,253.3**	**(+10.5)**	**1,242.7**	**(+73.5)**
Monetary policy instruments	**752.0**	**(+35.0)**	**717.0**	**770.4**	**(+36.7)**	**733.6**	**(+15.7)**
Minimum reserve requirements	122.2	(-0.2)	122.5	122.3	(+0.1)	122.2	(-0.4)
Deposit facility	629.8	(+35.2)	594.5	648.1	(+36.6)	611.4	(+16.1)
Liquidity-absorbing fine-tuning operations	0.0	(+0.0)	0.0	0.0	(+0.0)	0.0	(+0.0)
Assets – liquidity supply (averages; EUR billions)							
Autonomous liquidity factors	**943.2**	**(-59.2)**	**1,002.4**	**937.0**	**(-12.3)**	**949.3**	**(-34.0)**
Net foreign assets	637.0	(-33.0)	670.0	635.0	(-4.0)	639.0	(-17.8)
Net assets denominated in euro	306.1	(-26.3)	332.4	302.0	(-8.3)	310.3	(-16.2)
Monetary policy instruments	**2,966.8**	**(+152.3)**	**2,814.4**	**3,010.2**	**(+85.9)**	**2,924.3**	**(+71.4)**
Open market operations	2,966.5	(+152.3)	2,814.2	3,010.0	(+86.0)	2,924.0	(+71.4)
Tender operations	772.7	(-6.0)	778.7	771.6	(-2.2)	773.8	(-2.7)
MROs	6.1	(-5.4)	11.5	6.7	(+1.2)	5.5	(-3.9)
Three-month LTROs	8.4	(+2.3)	6.1	8.3	(-0.2)	8.5	(+1.8)
TLTRO-I operations	18.6	(-2.6)	21.1	17.2	(-2.7)	19.9	(-0.6)
TLTRO-II operations	739.6	(-0.3)	739.9	739.4	(-0.5)	739.8	(-0.1)
Outright portfolios	2,193.8	(+158.3)	2,035.5	2,238.4	(+88.2)	2,150.2	(+74.1)
First covered bond purchase programme	7.2	(-0.8)	8.0	6.9	(-0.5)	7.4	(-0.3)
Second covered bond purchase programme	4.9	(-0.7)	5.5	4.8	(-0.1)	4.9	(-0.4)
Third covered bond purchase programme	229.7	(+8.4)	221.3	232.7	(+5.8)	226.9	(+3.6)
Securities Markets Programme	91.2	(-7.2)	98.3	90.5	(-1.2)	91.8	(-6.5)
Asset-backed securities purchase programme	24.6	(+0.6)	24.0	24.6	(-0.1)	24.6	(+0.4)
Public sector purchase programme	1,725.5	(+139.9)	1,585.6	1,762.6	(+73.4)	1,689.2	(+69.5)
Corporate sector purchase programme	110.8	(+18.0)	92.8	116.2	(+10.8)	105.4	(+7.7)
Marginal lending facility	0.3	(+0.0)	0.2	0.2	(-0.1)	0.3	(+0.0)
Other liquidity-based information (averages; EUR billions)							
Aggregate liquidity needs	1,212.5	(+43.7)	1,168.7	1,232.3	(+39.7)	1,192.6	(-18.7)
Autonomous factors[1]	1,090.2	(+43.9)	1,046.3	1,110.0	(+39.6)	1,070.4	(-18.2)
Excess liquidity	1,755.3	(+109.5)	1,645.8	1,778.8	(+47.1)	1,731.7	(+90.1)
Interest rate developments (averages; percentages)							
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	-0.357	(+0.001)	-0.358	-0.359	(-0.003)	-0.356	(+0.003)

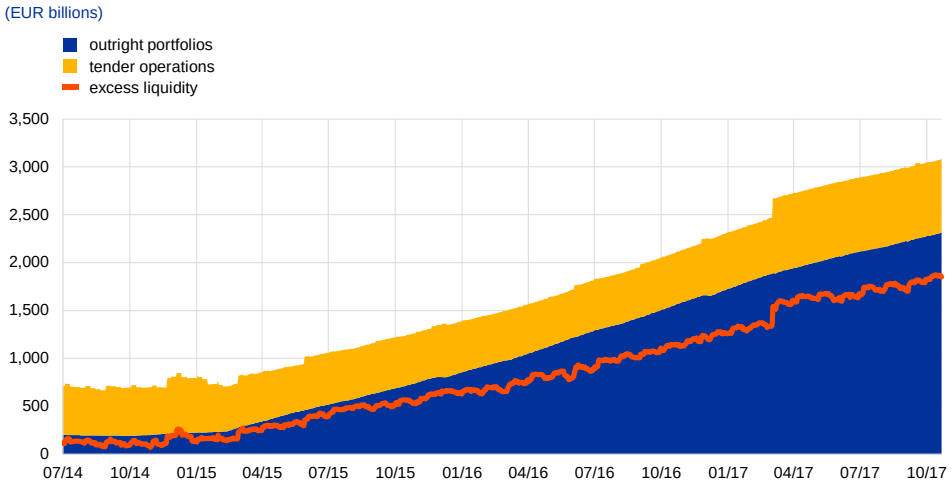
Source: ECB.
Notes: Since all figures in table A are rounded, in some cases the figure indicated as the change relative to the previous period does not represent the difference between the rounded figures provided for these periods (differing by €0.1 billion).
1) The overall value of autonomous factors also includes "items in course of settlement".

Liquidity provided through monetary policy instruments

The average amount of liquidity provided through open market operations – both tender operations and APP purchases – increased by €152.3 billion to €2,966.5 billion (see Chart A). This increase was fully attributable to the APP, while demand in tender operations decreased marginally.

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 €6.0 billion to €772.7 billion. This decrease was primarily due to a lower average level of liquidity provided through MROs, which fell by €5.4 billion. The average outstanding amount of TLTROs also decreased slightly, by €2.8 billion, as a consequence of voluntary early repayments of funds borrowed via those operations. By contrast, the average amount of liquidity provided through three-month LTROs increased by €2.3 billion.

Liquidity provided through the Eurosystem's monetary policy portfolios increased by €158.3 billion to €2,193.8 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 €139.9 billion, €8.4 billion, €0.6 billion and €18.0 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 €8.6 billion.

Excess liquidity

As a consequence of the developments detailed above, average excess liquidity in the period under review rose by €109.5 billion compared with the

previous period, to €1,755.3 billion (see Chart A). As mentioned above, the increase largely reflects the liquidity provided through the APP with a monthly target of €60 billion, which was somewhat offset by an increase in liquidity needs coming from autonomous factors. A more detailed analysis of the period under review shows that excess liquidity increased in the fifth maintenance period, growing by €90.1 billion on account of the APP purchases and a decrease in liquidity-absorbing autonomous factors, mainly as a result of lower government deposits. The sixth maintenance period saw a smaller increase in excess liquidity of €47.1 billion, as the liquidity injected via the APP was offset to some extent by higher aggregate liquidity needs of the banking sector as a result of an increase in government deposits.

The increase in excess liquidity corresponded to higher average current account holdings, which rose by €74.0 billion to stand at €1,248.0 billion in the period under review, while the average recourse to the deposit facility increased by a further €35.2 billion to stand at €629.8 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 -0.357%, compared to an average of -0.358% in the previous review period. The EONIA fluctuated within a narrow range, with a high of -0.345% on the last day of August 2017 and a low of -0.366% in mid-September 2017.

In the secured market, average overnight repo rates in the GC Pooling market declined slightly for both the standard collateral basket and the extended collateral basket relative to the previous review period. The overnight repo rate stood at -0.437% for the standard collateral basket, while for the extended collateral basket the average overnight repo stood at -0.402%.

The September 2017 quarter-end decline in the core repo rates, which was similar to that observed in June 2017, was relatively mild compared to the 2016 year-end decline and the March 2017 quarter-end decline. This suggests that market participants have adopted more efficient practices for collateral management. Moreover, this development also suggests positive effects from the cash-collateral facility for PSPP securities lending.

3 The recent strength of survey-based indicators: what does it tell us about the depth and breadth of real GDP growth?

Recent opinion surveys point to a solid increase in real GDP, which raises the question whether this strong growth dynamic can be expected to continue. For example, "soft" data from the two most prominent surveys for the euro area – the European Commission's business and consumer surveys and the IHS Markit PMI (PMI refers to Purchasing Managers' Index) – have lately shown a remarkable strength, which appears to indicate that the euro area economy is growing solidly. Both of these surveys are closely monitored by analysts and policymakers because they are considered a timely and often unique indicator of economic developments: survey results are released on a monthly basis (from the third week of the reference month onwards), while the preliminary flash GDP estimate is published only 30 days after the end of the reference quarter. This box focuses on a key data series from each survey, i.e. the Economic Sentiment Indicator (ESI) and the composite output PMI, as the two indicators involved are typically best correlated to developments in real GDP.

The ESI and the composite output PMI are both useful for gauging movements in real GDP, but feature methodological differences. The European Commission's surveys have a broad coverage in terms of countries (all euro area countries are covered except Ireland), sectors, questions and sample size (it comprises 75,000 private sector companies and 26,000 consumers). A detailed picture of economic developments can thus be obtained. As part of these surveys, the ESI includes confidence indicators for five sectors, with each one encompassing an average of two to four sub-questions. Some of the questions are related to orders, expected production/demand or employment and, as such, are of a forward-looking nature. The weights underlying the ESI are fixed as follows: industry at 40%, services at 30%, consumer (household) at 20%, and both retail trade and construction at 5%.[9] However, financial services are not included in the ESI. This is a shortcoming because the financial sector affects real GDP and developments in this sector can be very different to those in the rest of the economy, as seen during the financial crisis.

The composite output PMI is derived from replies to a question on month-on-month output changes with three possible responses: "up", "unchanged" or "down". It applies a weight of 65% for services-related activity (covers 2,000 private sector companies from the four largest euro area countries and Ireland), with the remaining 35% assigned to manufacturing output (covers 3,000 companies at the country level, including from the Netherlands, Austria and Greece). Important sectors are thus missing, e.g. public services and non-manufacturing industry (mainly construction).

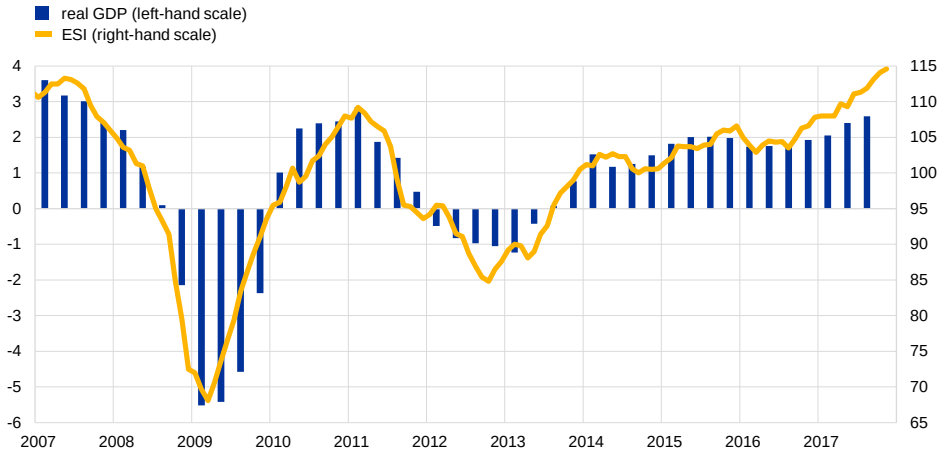
9 See Gelper, S. and Croux, C., "On the Construction of the European Economic Sentiment Indicator", *Oxford Bulletin of Economics and Statistics*, 72(1), February 2010, pp. 47-62; Pošta, V. and Pikhart, Z., "The Use of the Sentiment Economic Indicator for GDP Short-term Forecasting: Evidence from EU Economies", Statistika, 49(1), 2012, pp. 41-55; and Sorić, P., Lolić, I. and Čižmešija, M., "European economic sentiment indicator: an empirical reappraisal", *Quality & Quantity – International Journal of Methodology*, 50(5), September 2016, pp. 2025-54.

The ESI and the composite output PMI suggest that the euro area economy continued to grow strongly in the fourth quarter of 2017. As illustrated in Chart A, the ESI is constructed to track contemporaneous movements in year-on-year real GDP.[10] The close correlation between the ESI and year-on-year real GDP indicates a continued solid economic expansion in the fourth quarter. Part of the recently observed discrepancy between the ESI and year-on-year growth can be explained by the fact that the recent upswing in the ESI is largely related to the forward-looking components underlying it. Thus, the recent improvement in the ESI may also point to solid developments beyond the fourth quarter.

Chart A

Euro area real GDP and the Economic Sentiment Indicator

(year-on-year percentage changes; diffusion index)



Sources: Eurostat and European Commission.

The composite output PMI is designed to track quarter-on-quarter changes in real GDP growth. A simple PMI-based GDP tracking rule is illustrated in Chart B, i.e. the quarter-on-quarter percentage change in real GDP equals 10% of the quarterly average composite output PMI from which 50 is subtracted. The link between quarterly changes in real GDP and the composite output PMI has at times tended to weaken, particularly during the first years of the financial crisis (2008/09). Nevertheless, since 2003 (the start of the release of a flash GDP estimate for the euro area) this simple tracking rule has been more accurate in predicting the final GDP data released for calendar years than the first GDP vintage in about half of the

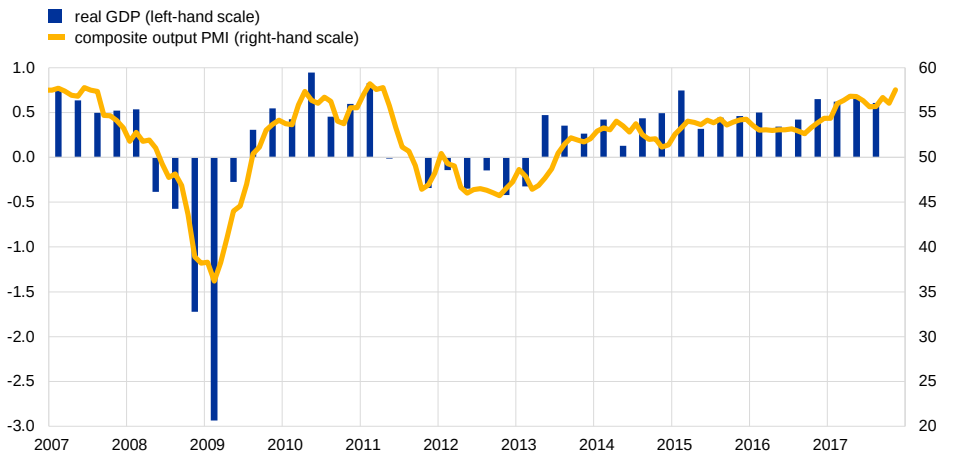
[10] For empirical evidence, including a comparison of the two surveys and considering year-on-year as well as quarter-on-quarter changes in real GDP, see the Special topic entitled "ESI and other BCS indicators vs PMI – properties and empirical performance" in "European Business Cycle Indicators: 2nd Quarter 2017", *European Economy Technical Paper*, No 17, European Commission, July 2017, pp. 18-26. More details about a PMI-based GDP tracker, including a comparison with the first flash GDP estimates, can be found in Bondt, G.J. de., "Nowcasting: Trust the Purchasing Managers' Index or wait for the flash GDP estimate?", *EcoMod2012 Conference Paper*, July 2012. Updated PMI results, including a range of stability tests, indicate that there are no signs of a significant change in the link between the PMI and GDP.

time covered. This rule indicates that, in the fourth quarter of 2017, real GDP grew broadly in line with our staff estimate for December 2017 on a quarterly basis.[11]

Chart B

Euro area real GDP and the composite output PMI

(quarter-on-quarter percentage changes; diffusion index)



Sources: Eurostat and IHS Markit.

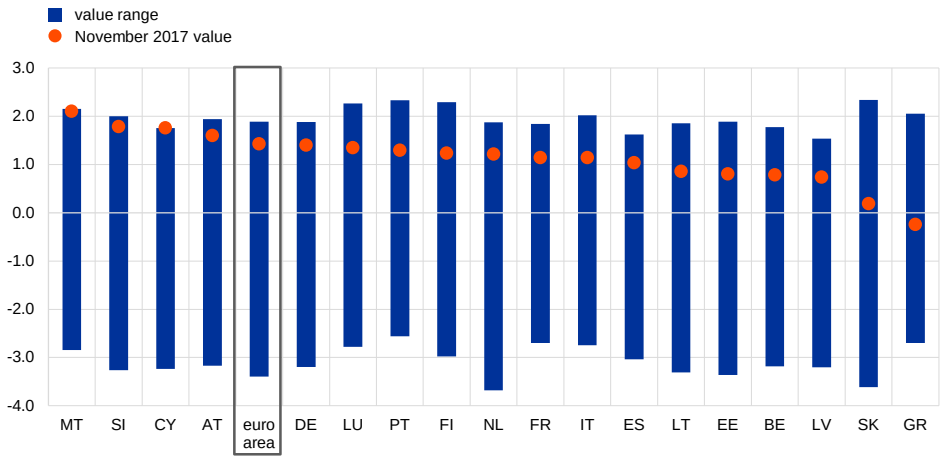
The ESI suggests that there will be a continued, unabated increase in real GDP across the euro area over the near term, with most countries experiencing this trend. Given the extent of its coverage, the ESI is more suitable for taking a closer look at the country and sectoral dimensions. The latest ESI results, which are for November 2017 (see the red dots in Chart C), show that the indicator is above its long-term average (represented by the zero line) for all euro area countries except Greece. Moreover, in all countries, excluding the three Baltic States, Belgium, Slovakia and Greece, the ESI is currently more than one standard deviation above its average level. The ESI reached its historical maximum in Malta and Cyprus in November (as indicated by the position of the red dots at the top of the blue bars).

[11] See the December 2017 Eurosystem staff macroeconomic projections for the euro area published on the ECB's website.

Chart C

Economic Sentiment Indicator

(standardised values)



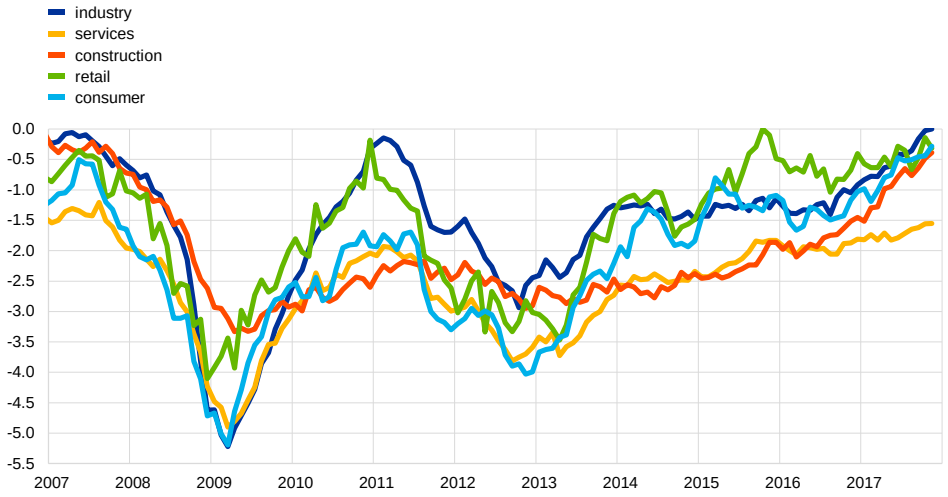
Notes: The blue bars show the maximum and minimum levels since the start of the respective country series; the red dots represent the latest results; and the zero line marks the average.
Sources: European Commission and ECB staff calculations.

A broadly positive picture also emerges at the sectoral level, with high levels of confidence being registered in most sectors across the euro area. At the sectoral level, in November 2017 the confidence indicators underlying the ESI were at a record high for manufacturing and close to an all-time high for the household (consumer) sector, retail trade and construction (see Chart D). The latter sector, in particular, displayed a remarkable cyclical upswing. In contrast, the latest results for the services sector were comparatively weak, though still above its long-term average as well as the previous peak registered in 2011. These sectoral differences are economically important. For example, aggregating the European Commission's services and industry confidence indicators – using the composite output PMI's sectoral weights (65% for services and 35% for industry) – would yield a substantially lower estimate for year-on-year real GDP growth for the fourth quarter of this year than that implied by the ESI (illustrated in Chart A). Overall, the sectoral readings suggest that all sectors are currently contributing to growth, albeit to different degrees.

Chart D

Confidence across sectors

(standardised values of deviations from the maximum)



Notes: The calculations for the confidence data start in January 1985 for all sectors except services (for which they start in April 1995).
Sources: European Commission and ECB staff calculations.

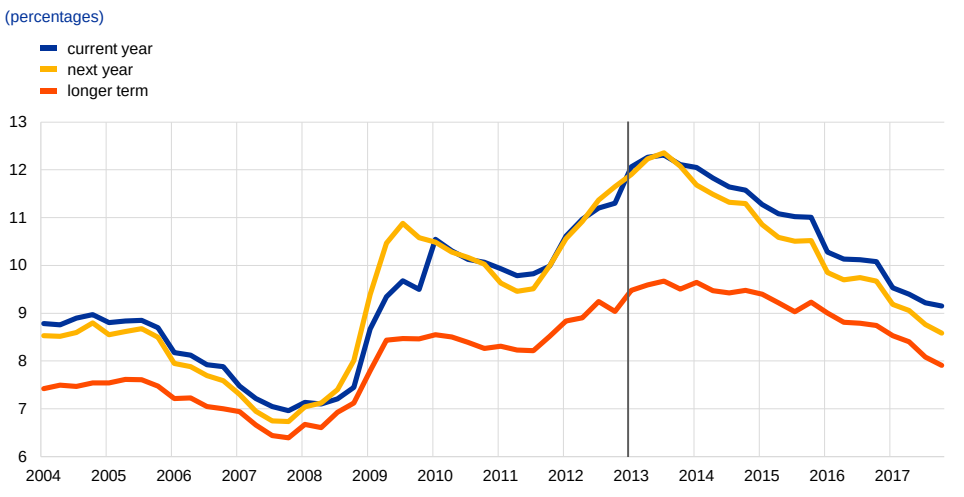
4 What can we learn from the ECB Survey of Professional Forecasters about perceptions of labour market dynamics in the euro area?

Over the last ten years labour markets in the euro area have been subject to a number of shocks, leading to large fluctuations in the unemployment rate and pay growth. In response to these developments, professional forecasters have been repeatedly adjusting their expectations for the unemployment rate and annual growth in compensation per employee (hereafter referred to as wage growth), both upwards and downwards. This box examines the revisions to the expectations reported in the ECB Survey of Professional Forecasters (SPF), and how those expectations compare with the actual data outturns.

Between 2008 and 2013 the economic setbacks associated with the financial and sovereign debt crises led participants in the SPF gradually to adjust their expectations for the unemployment rate upwards and those for wage growth downwards (see Charts A and B). This is in line with the traditional notion of unemployment as the driver of labour market slack and, in turn, quantity-price dynamics in the labour market: the more unemployed workers there are competing for jobs, the lower the wages that firms need to offer to recruit or retain workers. This co-movement was also visible in the opposite direction during the temporary recovery of 2010-11, when shorter-term wage growth expectations were revised upwards at the same time that labour market slack was projected to diminish (as indicated by the narrowing gap between shorter-term and longer-term unemployment rate expectations). In 2013, however, a different picture emerged, with expectations for both the unemployment rate and wage growth successively revised downwards.

Chart A

Unemployment rate expectations

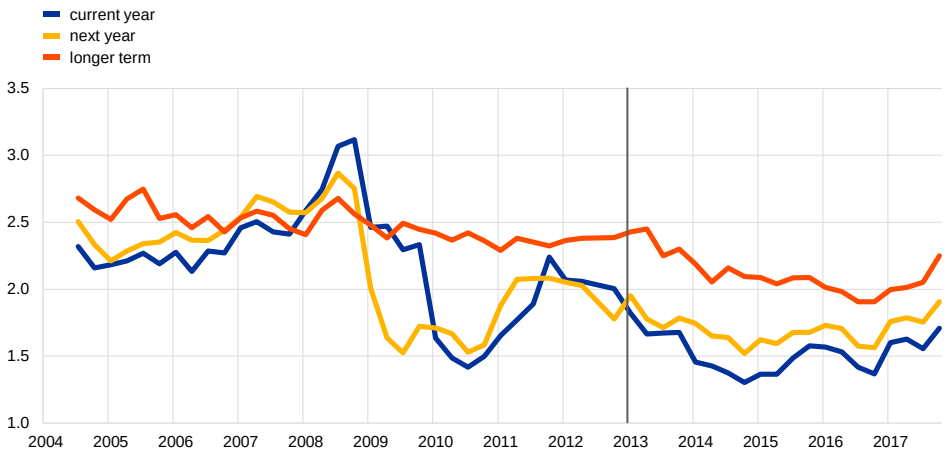


Sources: SPF and ECB staff calculations.

Chart B

Wage growth expectations

(annual percentage changes)



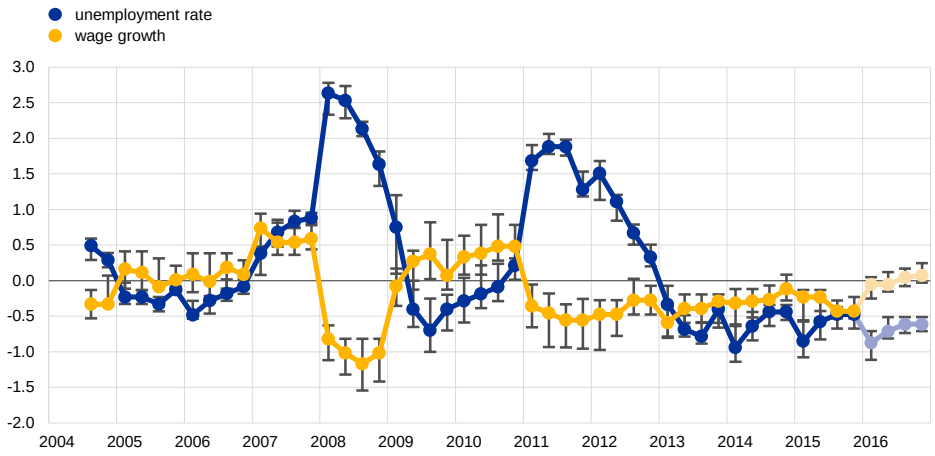
Sources: SPF and ECB staff calculations.

Up until 2013, SPF projection errors tended to mirror those for unemployment: episodes of weaker-than-expected wage growth coincided with a higher-than-expected unemployment rate and vice versa (see Chart C).[12] After 2013, however, not only did the pattern of revisions to unemployment and wage growth forecasts change, but so did the pattern of projection errors. Both wage growth and the unemployment rate were jointly overestimated by the SPF over the period 2013-15, a constellation of errors which seems unusual relative to the survey's earlier history. Moreover, this pattern was not only seen in the average forecasts reported by the SPF, but also for the large majority of individual forecasters. The whiskers on Chart C illustrate the spread of individual forecast errors (calculated as the interquartile range). Over the period 2013-15 these whiskers lie mostly below the zero line, which indicates that a large majority of respondents overestimated both wage growth and unemployment.

12 The SPF has collected expected annual growth rates (for fixed-calendar-year horizons) for compensation per employee (i.e. wage growth) since 2004.

Chart C

SPF near-term projection errors for the unemployment rate and wage growth



Sources: SPF and ECB staff calculations.
Notes: The projection horizon is the next calendar year; the date indicated refers to the survey date. The chart shows the median and interquartile range of the SPF forecast microdata. Projection errors are defined as the outturn, according to the most recent data, minus the expectation. The latest compensation per employee data refer to the third quarter of 2017. The latest SPF expectations for the next-calendar-year horizon which can be definitively evaluated are those for the year 2016, from surveys carried out in 2015. However, this chart also presents an indicative assessment of expectations from 2016 surveys for 2017, on the assumption that the data for the final quarter are in line with the Eurosystem staff macroeconomic projections for December. The pattern of unemployment and wage growth projection errors for the calendar-year-after-next horizon (collected only in third and fourth quarter surveys until 2013) is similar.

This historically unusual pattern of forecast errors since 2013 may suggest a structural break in labour market dynamics in the euro area. Specifically, the pattern suggests that even though the amount of slack in the labour market (as measured by unemployment) turned out to be less than expected, other factors were keeping wage growth subdued. Such factors could include: increased wage flexibility, in view of the depth of the crisis and following structural reforms in labour markets; a larger increase in low productivity jobs; and effects arising from the low inflation environment.[13] This pattern may also signal that, at the current juncture, the unemployment rate underestimates the total amount of slack in the labour market. For example, an elevated proportion of part-time workers who want to increase their hours or of marginally attached workers may have allowed employment to expand without generating significant wage inflation. This is consistent with the findings of the survey for the second quarter of 2017: when posed a question on perceived risks to wage developments, respondents emphasised the uncertainty around the response of wages to slack, and the risk that wage growth could turn out weaker than expected, if marginally attached workers re-entered the labour market as the economic recovery progressed.

However, the influence of factors behind recent unusual labour market developments may already be waning. Expectations for wage growth have been picking up in 2017 at all forecast horizons. In particular, the latest SPF (for the fourth quarter of 2017) shows that expectations for wage growth in the longer term have now recovered over half of the decline experienced over the period 2013-16 (see Chart B). This in turn may suggest that the factors which have been holding down wage growth are now perceived to be weakening.

13 See the box entitled “Recent wage trends in the euro area”, *Economic Bulletin*, Issue 3, ECB, 2016.

5 An assessment of the review of draft budgetary plans based on the 2018 exercise

On 22 November 2017 the European Commission released its opinions on the draft budgetary plans of euro area governments for 2018, together with an analysis of the budgetary situation in the euro area as a whole. Each opinion includes an assessment of the compliance of the relevant plan with the Stability and Growth Pact (SGP). It also follows up on the guidance provided in the country-specific recommendations for fiscal policies under the 2017 European Semester, as adopted by the Economic and Financial Affairs Council on 11 July 2017.[14]

In general, the draft budgetary plans envisage broadly neutral support of the euro area economy by fiscal policies, but with considerable divergence between countries. Some member countries have reached their medium-term budgetary objectives (MTOs) and several of them are using their room for manoeuvre under the EU's fiscal rules. In contrast, structural efforts in a considerable number of member countries are falling short of SGP commitments, despite the solid and broad-based economic expansion in the euro area. In its statement on 4 December 2017 on the draft budgetary plans for 2018, the Eurogroup concluded that "a broadly neutral fiscal stance appears still appropriate at the aggregate euro area level in 2018".[15] This is also in keeping with the view that when the output gap is small, fine-tuning of support of the macroeconomy by fiscal policies is not warranted.[16] The Eurogroup also noted that "at the same time, the improving economic conditions call for the need to rebuild fiscal buffers, while continuing to strengthen the economies' growth potential".

Based on its 2017 autumn economic forecast, the Commission finds that only six of the eighteen draft budgetary plans are fully compliant with the SGP.[17] This refers to the plans of Germany, Latvia, Lithuania, Luxembourg, the Netherlands and Finland (all under the SGP's preventive arm), and is one more than the number of countries whose plans were found to be fully compliant last year. The Commission considers that the draft budgetary plans of a further six countries are only "broadly compliant" with the SGP.[18] This refers to the plans of Estonia, Ireland, Cyprus, Malta

14 For background and further detail, see the box entitled "Country-specific recommendations for fiscal policies under the 2017 European Semester", *Economic Bulletin*, Issue 4, ECB, June 2017.

15 See Eurogroup statement on the Draft Budgetary Plans for 2018.

16 The concept of the aggregate fiscal stance for the euro area is important in the context of Economic and Monetary Union, where a single monetary policy is complemented by fiscal policies that are conducted at the national level. It is, however, not a legally binding concept. For a discussion of the difficulties surrounding the assessment of the fiscal stance, see the article entitled "The euro area fiscal stance", *Economic Bulletin*, Issue 4, ECB, June 2016.

17 Greece is not included in the exercise.

18 For countries subject to the SGP's preventive arm, draft budgetary plans are "broadly compliant" if, according to the Commission's forecast, the plan may result in some deviation from the MTO or the adjustment path towards it, but the shortfall relative to the requirement would not represent a significant deviation from the required adjustment. Deviations from the fiscal targets under the preventive arm are classified as "significant" if they exceed 0.5% of GDP in one year or, on average, 0.25% of GDP in two consecutive years. For countries subject to the SGP's corrective arm, the Commission assesses draft budgetary plans as being "broadly compliant" if their forecast projects that the headline deficit targets will be achieved but there is a noticeable shortfall in fiscal effort compared with the recommended value, putting at risk compliance with the EDP recommendation.

and Slovakia under the preventive arm, and Spain under the corrective arm. While the headline deficit of Spain, which had submitted a draft budgetary plan on a no-policy-change basis, is forecast to fall below the 3% of GDP deficit reference value by the 2018 deadline under the excessive deficit procedure (EDP), this is associated with cumulated shortfalls in structural efforts relative to commitments under the SGP.[19] The draft budgetary plans of the six remaining countries are considered to pose a "risk of non-compliance with the SGP".[20] This refers to the plans of France – with an EDP deadline in 2017 – under the SGP's corrective arm, and, under its preventive arm, to Belgium, Italy, Austria, Portugal and Slovenia (Austria having submitted its plan on a no-policy-change basis in the absence of a sworn-in government).

Debt ratios are falling only slowly in countries with high government debt. Among the group of the six countries whose draft budgetary plans pose risks of non-compliance with the SGP, Belgium, France, Italy and Portugal are projected to record high government debt ratios of above 90% of GDP in 2018 (see the chart). With the exception of Portugal, these countries are not expected to reduce government debt towards the reference value of 60% of GDP in line with the SGP's debt rule. In its statement on 4 December 2017, the Eurogroup noted that "a slow pace of debt reduction from high levels in a number of Member States remains a matter for concern". In the case of Italy, the letter sent by the Commission on 22 November 2017 states that "insufficient progress towards compliance with the debt criterion" has been made, and that "Italy's public debt remains a key vulnerability".[21] At the same time, the Commission has still not issued a report under Article 126(3) of the Treaty on the Functioning of the European Union (TFEU) based on notified data for 2016.

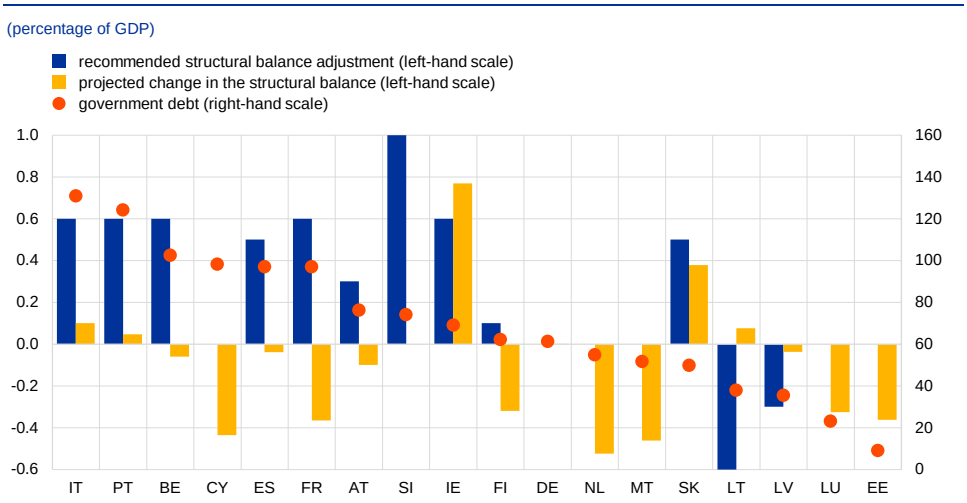
19 According to the European Commission's 2017 autumn economic forecast, no structural effort is forecast in 2018, whereas a structural effort of 0.5% of GDP is specified in the EDP recommendation that the Council issued to Spain in 2016 under Article 126(9) of the Treaty on the Functioning of the European Union.

20 For countries subject to the SGP's preventive arm, the Commission assesses a draft budgetary plan as being "at risk of non-compliance with the SGP" if it forecasts a significant deviation from the MTO or the required adjustment path towards the MTO in 2018, and/or non-compliance with the debt reduction benchmark, where that benchmark is applicable. For countries subject to the SGP's corrective arm, the Commission assesses a draft budgetary plan as being "at risk of non-compliance with the SGP" if its forecast for 2018, subject to ex post confirmation, could lead to the stepping up of the EDP, as neither the recommended fiscal effort nor the recommended headline deficit target are forecast to be achieved.

21 See Letter to Italy.

Chart A

Recommended and projected structural balance adjustments for 2018 and government debt in 2018



Sources: AMECO and country-specific recommendations for fiscal policies as adopted by the Economic and Financial Affairs Council on 11 July 2017.
Notes: Germany, Estonia, Cyprus, Lithuania, Luxembourg, Malta and the Netherlands are recommended to remain at their MTOs. For Austria and Finland, the structural effort requirements are lower than those specified in their respective country-specific recommendations when corrected for flexibility granted under the SGP (notably in the areas of hosting refugees, structural reforms, investment and pensions). For Italy and Slovenia, the structural effort requirements may be reduced by way of applying discretion.

By way of applying discretion, the Commission recommends that the 2018 structural adjustment requirements under the Stability and Growth Pact for Italy and Slovenia be significantly reduced.[22] For countries with structural effort requirements in 2018 of 0.5% of GDP and higher, the recitals to the Council's 2017 recommendations on the member states' economic, employment and fiscal policies issued on 11 July 2017 indicated that upcoming assessments would "take due account of the goal of achieving a fiscal stance that contributes to both strengthening the ongoing recovery and ensuring the sustainability of […] public finances." On this basis, the Commission recommends a reduction in the structural effort requirements applicable to Italy from 0.6% to 0.3% of GDP, and a reduction in those applicable to Slovenia from 1.0% to 0.6% of GDP.[23] Generally, for the credibility of the SGP, predictability and transparency in the application of its fiscal rules are important.[24] Notwithstanding the reduced requirements, neither country is forecast to comply fully with the SGP's preventive arm next year, according to the Commission's 2017 autumn forecast.

The exercise of reviewing draft budgetary plans appears to have lost effectiveness over time. Introduced in response to the crisis, the review of draft budgetary plans was intended to provide a means of identifying and preventing

22 For further detail, see the box entitled "The application of discretion in the autumn 2017 fiscal surveillance exercise" in the Commission's communication 2018 Draft Budgetary Plans: Overall assessment.

23 The Council will make a final assessment in spring 2019 at the latest, when it decides on compliance with the SGP for 2018.

24 In its staff report on Article IV consultations on the euro area, the International Monetary Fund stated that "… greater discretion for the European Commission in assessing compliance with the rules, weakens the SGP's credibility" and that "steps need[ed] to be taken to restore SGP credibility".

potential deviations from sound fiscal policies early in the budgetary process, i.e. before budgets are finalised. Where a risk of particularly serious non-compliance with the provisions of the SGP is identified – that is, where a plan in fact envisages structural efforts that fall clearly short of requirements – the Commission can ask the relevant member country to provide an updated budgetary plan. The Commission has not made any such requests since the start of the first review exercise in autumn 2013, stating that the "particularly serious non-compliance" criterion has not been satisfied in any particular case.[25] However, the Commission has written to those countries planning considerable shortfalls relative to SGP requirements, requesting that additional measures be taken. Early in the history of the review exercise, particularly in 2014, certain countries publicly committed themselves to following up on such requests.[26] By contrast, in the context of the current review, none of the countries planning for shortfalls in fiscal efforts in 2018 have responded by taking additional measures.[27] Moreover, in previous years, certain countries whose draft budgetary plans had posed risks of non-compliance with the SGP based on the Commission's forecast had committed to "implementing the measures necessary to ensure that the […] budget will be compliant with the SGP", based on a quantification of consolidation gaps relative to SGP commitments.[28] However, this year, in its statement on the draft budgetary plans for 2018, the Eurogroup merely invites the countries concerned "to consider in a timely manner the necessary measures to address the risks identified by the Commission to ensure that their 2018 budgets will be compliant with the SGP provisions." It should also be noted that, unlike in previous years, no follow-up to the current review exercise based on the Commission's winter forecast appears to be envisaged in the Eurogroup in early 2018. Since the start of the draft budgetary plan review exercise in autumn 2013, the proportion of countries that have submitted draft budgetary plans compliant with the SGP has remained unchanged at around one-third, despite the improving economic conditions.[29]

Looking ahead, it is crucial that the draft budgetary plan review exercise is again made more effective. Generally, the extent to which the draft budgetary plan review has incentivised countries to include additional measures in their final budgets is difficult to assess.[30] Governments may take additional measures during the finalisation of the budget or during its implementation throughout the year, without linking them specifically to the outcome of the review exercise. Moreover, the assessment of whether countries have complied with the SGP in a particular year is

25 This included cases in which the improvement in the structural balance towards the country-specific MTO was forecast to fall significantly short of requirements, i.e. by more than 0.5 percentage point of GDP. This is the threshold for the significant deviation procedure under the SGP's preventive arm.

26 For example, the Commission sent letters to Italy, Austria and France in October 2014. It had previously requested additional measures from Austria in May 2014, when the Austrian government after the Parliamentary elections had submitted a (non-compliant) updated draft budgetary plan for 2014.

27 In October 2017 the Commission wrote to Belgium, Spain, France, Italy and Portugal.

28 See the Eurogroup statement of 5 December 2016 as a reference.

29 Since the start of the review exercise in autumn 2013, only the plans produced each year by Germany and the Netherlands have all received positive assessments.

30 See for some information the box entitled "Follow-up to the review of draft budgetary plans for 2015", *Economic Bulletin*, Issue 2, ECB, March 2015.

based on outturn data and is only taken around 18 months or more after the start of the draft budgetary plan review. By that time, changes in the estimates regarding a country's position in the cycle, as well as amendments to the rules, may potentially result in a more favourable assessment of compliance with the SGP.[31] One way in which a country's compliance with the SGP can be improved is by requesting updated plans in all cases where significant deviations from requirements are envisaged. Enhancing the functioning of the draft budgetary plan review exercise is important, particularly in order to address budgetary imbalances in economically favourable times so as to have more fiscal space in a future cyclical downturn.

[31] For example, structural effort requirements have been lowered in exchange for additional structural reforms and investment in 2015.

Articles

1 The oil market in the age of shale oil

US shale oil production has expanded greatly since 2011, and now rivals that of Russia and Saudi Arabia in terms of market share. However, major producers of conventional oil, and members of the Organization of Petroleum Exporting Countries (OPEC) in particular, have been slow to adapt their production policies. This article investigates the reasons for this delayed reaction and provides an assessment of the relative importance of supply and demand factors in driving oil price developments in the wake of the shale oil "revolution". Shale oil is the key novel factor affecting the structure of the oil market and influencing OPEC's decisions whether to target price stabilisation or market share. The prolonged period of oversupply and low oil prices between the end of 2014 and the third quarter of 2016 was a result of the interplay of these factors; the partial recovery in prices, which occurred in 2017, reflects a gradual rebalancing of the market following the global supply restraint agreed by OPEC and major non-OPEC producers. Analysts expect oil prices to remain in a range consistent with the production costs of the major marginal producers – currently assessed to be around USD 50 per barrel over the short term. However, according to their projections, and given current extraction technology, prices must rise to around USD 65-70 per barrel over the medium term if shale oil production is to continue expanding profitably at a robust pace.

1 Introduction

Commodities, and oil in particular, remain the most important source of volatility in consumer price inflation. This poses a challenge for projections, as oil prices account for most of the prediction errors in inflation rates. Understanding the drivers of oil price movements is fundamental to an assessment of their persistence and of the implications for inflation expectations, as well as, ultimately, to the ability to tailor the monetary policy response. The surge in shale oil production since 2011 is generally considered to have created a structural transformation of the oil market, however several questions remain open: to what extent has that transformation so far affected the supply and demand factors which drive the oil price; and what is its relevance over the longer term?

The shale oil revolution has attracted significant interest because it marks a historical and unexpected turning point in US energy production trends. After three decades of steady decline, US oil production provided the largest contribution to global supply growth in the period from 2012 to 2014, and today rivals that of Saudi Arabia and Russia in terms of its share of global oil production. Initially, shale oil was essentially a US phenomenon, as both technical and legislative issues limited its global impact. In particular, the oil streams in the US, Canadian and Mexican pipeline systems were only able to absorb flows from the periphery into the internal US states, and exports of US crude oil were banned by a law which had been

introduced for national security reasons. Both of these factors led to an extraordinary build-up of inventory, depressing oil prices within the United States. Quality differentials for delivery in landlocked stocking points, such as the West Texas Intermediate (WTI) benchmark[32] (the main benchmark used in the United States) were priced at an increasing discount. Prices for energy products became cheaper in the United States than in the rest of the world. However, the subsequent inversion of the oil streams in the pipelines and the creation of additional rail capacity in 2014, combined with the repeal of the export ban a year later, served to close the gap between US and international oil prices and bring US shale oil into the global arena. By this point, the US Energy Information Administration (US EIA) had made several positive reassessments of shale oil, in terms of both future quantities and life span, suggesting that permanent changes were occurring in the global oil market.

OPEC's production decisions during the shale oil age – which began around 2011 – have been particularly influenced by the evolving supply conditions in the United States. In November 2014 production targets were abandoned in an attempt to regain market share; this aim was achieved, but at the cost of a drop in oil prices of more than half. Persistently low prices and producer nations' impaired public finances prompted OPEC's decision in November 2016 to change its policy again and restrain production, in an effort to rebalance the oil market which had been swamped with inventory. Had OPEC accepted the fact that in its role as swing supplier it was now competing with shale oil producers?

This article describes the evolution of the oil market during the shale oil age, the shifts in OPEC's production strategies and the effects of both of these developments on oil prices. It is structured as follows: Sections 2 and 3 review oil price dynamics and market fundamentals both before and during the shale oil age, with a particular focus on the market shares of major oil producing countries (notably the United States) following the revolution set in motion by the shale oil industry. Box 1 provides details of the structural VAR (SVAR) model of the global oil market used to assess the relevance of supply and demand factors, in which two types of strategies are distinguished, depending on whether OPEC acts to protect its market share (the "strategic" approach) or to stabilise oil prices around a target value (the "accommodative" approach). Box 2 discusses the historical decomposition of the oil price, focusing on the period of shale oil production. Section 4 assesses the potential implications of shale oil for the global supply curve and the equilibrium price, based on micro-level evidence. Section 5 summarises the main themes of the article and concludes with perspectives over the medium and the long term.

2 A narrative of pre-shale oil price dynamics

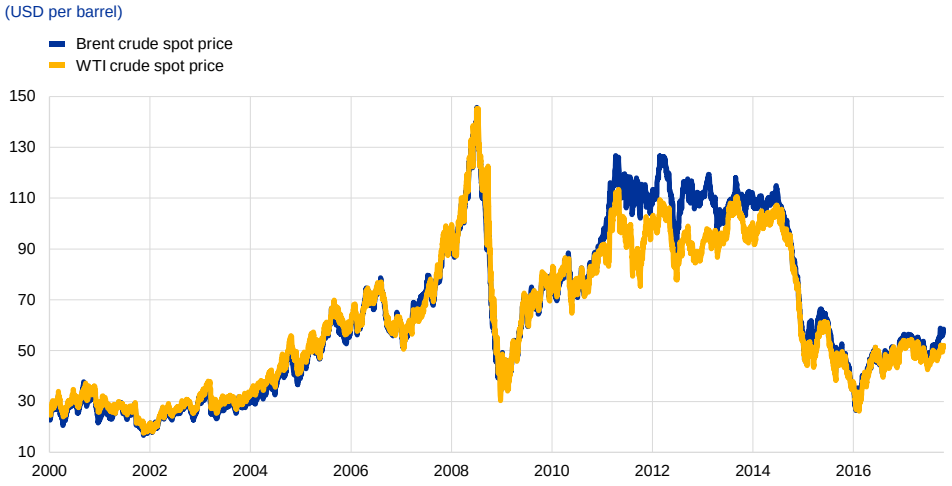
Developments in the oil price in the years preceding the global financial crisis sowed the seeds for the shale oil revolution. The steep rise in price from USD 23 per barrel in 2003 to an all-time high of USD 145 per barrel on the eve of the global

[32] The delivery point under the WTI contract is Cushing in Oklahoma.

financial crisis was primarily a reflection of surging demand in major emerging economies such as China (see Charts 1 and 4). On the supply side, while non-OPEC producers were struggling to keep up with expanding consumption, OPEC's preference – according to the empirical analysis – was to maintain a relatively tight market and exploit its renewed power to influence market equilibrium (see Chart 3).

Chart 1

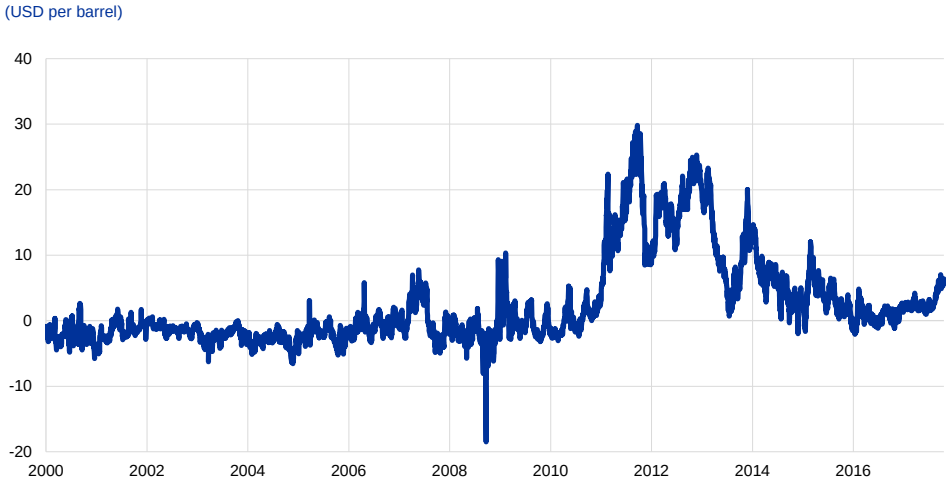
Brent and WTI crude spot prices since 2000



Sources: Bloomberg, Datastream and ECB staff calculations.
Note: The latest observations are for 19 October 2017.

Chart 2

Changes in the price differential between Brent crude and WTI since 2000



Sources: Bloomberg, Datastream and ECB staff calculations.
Note: The chart plots the difference (spread) between Brent crude and WTI prices. The latest observations are for 19 October 2017.

Against this background, capital flowed to the shale oil industry to finance investments in research and development. Medium-sized energy companies, generally more financially constrained than the multinationals, took advantage of these capital inflows to further develop horizontal drilling and hydraulic fracturing techniques in the United States, making shale oil production viable and profitable.

The development of shale oil production also benefited from the fact that resources were located in sparsely populated areas, and that in the United States land ownership rights include rights to sub-surface minerals and environmental regulation is less strict than in, for example, Europe.[33] The extraction of oil and natural gas from shale rock formations has had a lasting effect on the US energy mix and markedly reduced the United States' dependency on external energy; this has, in turn, helped reduce the perennial US trade deficit.

Over the same period (2003-2007), OPEC regained influence on the oil market by addressing increasing demand from fast-developing emerging economies and stepping in to compensate for significant and protracted disruptions in production. In particular, new lows in prices in the aftermath of the Asian financial crisis of 1997 had restrained field investments for years, and conventional production, which lacked spare capacity, was unable to expand and respond to the growing demand from China and other emerging economies. The gap between global demand and supply was exacerbated by two major disruptions: a drop of 60% in Venezuelan oil production[34] caused by a protracted strike which took place at the national oil company, Petróleos de Venezuela, in late 2002 in an attempt to force the then-president to call early elections; and the Second Gulf War in 2003. Given the general market conditions, OPEC was able to maintain a relatively tight market balance in order to support high oil prices during this period prior to the global financial crisis (see Box 1).

The global financial crisis dramatically reduced economic activity and demand for crude oil and pushed prices below USD 40 per barrel in early 2009 (see Charts 3 and 4). The decline in annual consumption was particularly severe in the United States and more than offset the growth in demand in some emerging economies. However, prices rebounded ahead of firming improvements in global economic conditions, as a result of a very substantial production cut by OPEC of almost three million barrels per day that was not fully reversed until 2012. It can be seen that OPEC's policies are motivated by a series of macro and micro factors as market conditions change; Box 1 details a possible empirical framework which may be established to partially evaluate these factors.

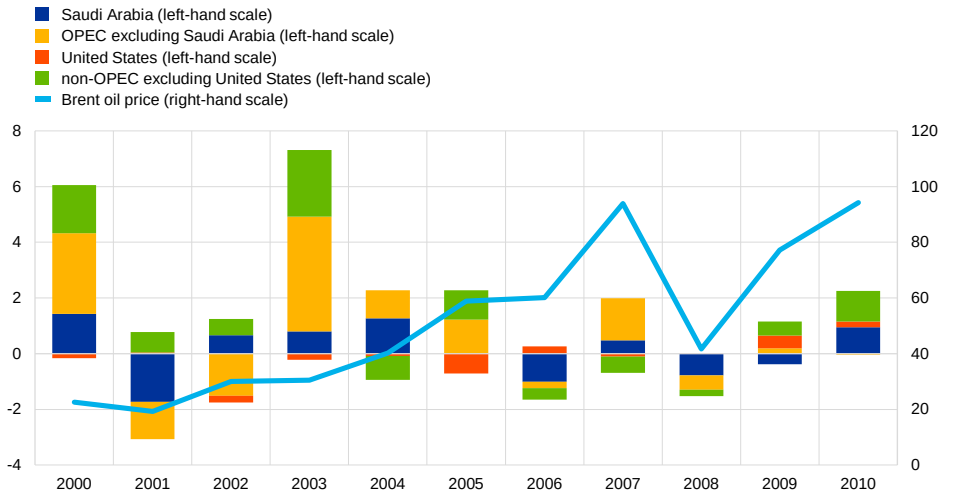
33 See Di Nino V. and Faiella I., "Shale Fuels: The Solution to the Energy Conundrum?", *European Energy and Climate Security,* September 2015, pp.133-153.

34 From its highest point, in January 1997, to its lowest, in January 2003.

Chart 3

Contribution to annual crude oil supply growth (2000-2010)

(percentage points, left-hand scale; USD per barrel, right-hand scale)

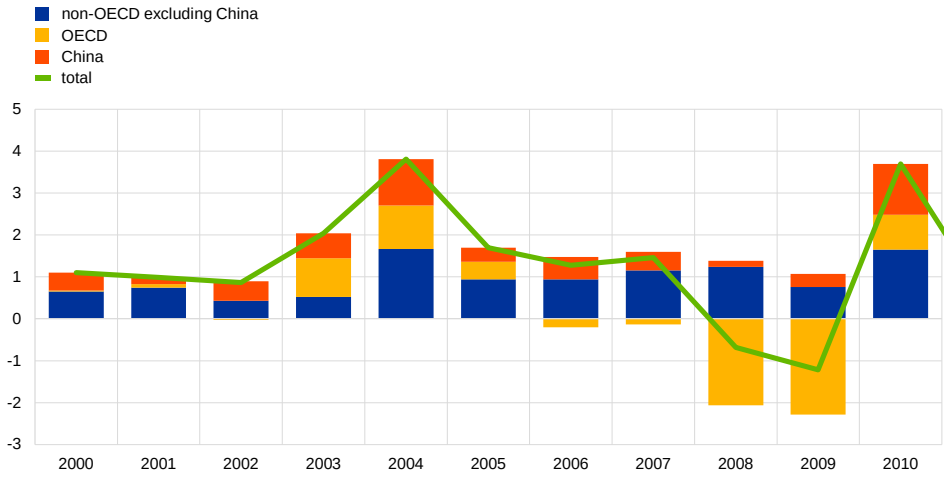


Sources: US EIA, Bloomberg and ECB staff calculations.
Notes: The value for the final month of a year is taken as the value for that year.

Chart 4

Contribution to annual oil demand growth (2000-2010)

(percentage points)



Sources: International Energy Agency (IEA) and ECB staff calculations.

Box 1

A Bayesian structural VAR model incorporating different supply shocks

This box presents an overview of a structural VAR (SVAR) model of the global oil market used to assess the relevance of supply and demand factors and provides certain insights regarding the debate about which factors dominate oil market dynamics. According to early literature published in the aftermath of the two oil crises of the 1970s, supply factors were the major drivers of price, and the macroeconomic effects of oil market shocks were unrelated to the nature of

the underlying shock.[35] This view persisted in the literature until the end of the second half of 2000, when an increasing consensus identified global demand conditions as the key factor in explaining oil price movements in certain episodes, such as in the run-up to the 2008 crisis[36]. In particular, Kilian and Murphy[37] show that both current and forward-looking demand for oil are driven by expectations about future activity (that is, by speculative demand).

By analogy with Kilian and Murphy, a SVAR model can be used to identify global and speculative demand shocks and, specifically, to distinguish between two supply shocks – "strategic" and "accommodative" – depending on how OPEC reacts to non-OPEC production changes. In the framework of this model, OPEC can decide to protect its market share (the strategic approach), target a desired oil price level (the accommodative approach), or adopt any combination of the two.[38] Using the strategic approach, OPEC production follows the same dynamics as that of non-OPEC producers, amplifying the impact of the shock on oil prices; whereas using the accommodative approach, OPEC tends to offset non-OPEC changes in production, attenuating oil price fluctuations. Shifts between approaches depend, among other factors, on the production capacity of competitors. The rapid rise of shale oil production is therefore likely to have brought about changes in OPEC's production plans[39]. The model contains 24 lags and employs monthly data from February 1973 to April 2017 with the following reduced form representation:

$$Y_t = c + A(L)Y_{t-1} + u_t$$

Y_t is a vector of five endogenous variables including (1) the monthly percentage change in OPEC crude oil production, (2) the monthly percentage change in non-OPEC crude oil production, (3) the growth rate of the interpolated global GDP, (4) the log-real price of oil (Brent crude deflated by the US consumer price index), and (5) the monthly changes in global oil inventories measured as changes in OECD crude oil stocks and in US crude oil inventories. The vector c contains the intercepts, A(L) is a matrix polynomial in the lag operator and u_t is a vector of reduced form error terms.

The key identifying assumptions are sign restrictions imposed on the impact responses of the five variables to the structural shocks; no magnitude restriction is added.[40] This model

35 See Nakov, A. and Pescatori, A., "Inflation-output gap trade-off with a dominant oil supplier", *Federal Reserve Bank of Cleveland Working Paper,* 2007; and Yergin, D., "The Prize: The Epic Quest for Oil", in *Money and Power*, Simon & Schuster, New York, 1992.

36 See Kilian, L., "Exogenous oil supply shocks: how big are they and how much do they matter for the US economy?", *The Review of Economics and Statistics,* Vol. 90, No 2, 2008, pp. 216-240; Baumeister, C. and Peersman, G., "Time-varying effects of oil supply shocks on the US economy", *American Economic Journal: Macroeconomics,* Vol. 5. No 4, 2013, pp. 1-28; and Baumeister, C. and Hamilton, J., "Sign restrictions, structural vector autoregressions, and useful prior information", *Econometrica,* Vol. 83, No 5, 2015, pp. 1963-1999.

37 See Kilian, L. and Murphy, D., "The role of inventories and speculative trading in the global market for crude oil", *Journal of Applied Econometrics,* Vol. 29, No 3, 2014, pp. 454-478.

38 For theoretical underpinnings of OPEC production strategies see Behar, A. and Ritz R., "An Analysis of OPEC's Strategic Actions, US Shale Growth and the 2014 Oil Price Crash", *IMF Working Papers*, No 131, 2016.

39 A number of micro and macro factors seem to influence OPEC decisions. These include global demand, the internal cohesiveness of OPEC, the fiscal needs of oil-producing countries and, most importantly, the production capacity of non-OPEC producers and the marginal cost of high-cost producers.

40 Recent works establish that the historical decomposition of the oil price into fundamental shocks is strongly influenced by the imposition of magnitude restrictions on elasticities of demand and supply curves. See Caldara, D., Cavallo, M. and Iacoviello, M., "Oil Price Elasticities and Oil Price Fluctuations", *International Finance Discussion Papers*, Board of Governors of the Federal Reserve System, No 1173, 2016.

set -up rests on the ability to pin down “strategic” and “accommodative” OPEC behaviour in reaction to non-OPEC supply shocks. If OPEC seeks to maintain its market share (the strategic approach), it will react to expansions in non-OPEC production by also increasing its supply. In this case, both productions have the same sign, leading to a decrease in oil prices and an increase in oil demand. On the other hand, if OPEC aims to stabilise oil prices around a target (for given global demand conditions) it must drain the eventual excess supply by reducing its own supply to support prices. In this case, no sign restrictions are imposed on price and global activity, as they could increase or decrease depending on the net impact on production.[41] Aggregate demand shocks are identified by simultaneous increases in supply and price. In the case of a speculative demand shock, market players purchase oil ahead of expected future shortages in the oil market and, as a result, the real price of oil, inventories and oil production will go up while aggregate demand will decrease (see Table A for a summary of sign restrictions).

Table A

Sign restrictions imposed

(shocks)

Variables	Strategic supply	Accommodative supply	Aggregate demand	Speculative demand	Residual
OPEC supply	-	+	+	+	
NON-OPEC supply	-	-	+	+	
Real activity	-		+	-	
Real price of oil	+		+	+	
Inventories				+	

Source: ECB calculations.

Three major conclusions can be drawn from the results of this analysis: (i) there is no clear dominance of demand and supply factors – each play a relevant role in explaining oil price dynamics, depending on the historical period analysed; (ii) OPEC policies have contributed to maintaining a high oil price in certain specific episodes; and (iii) speculative demand is never a relevant factor. In particular, the contribution of global economic activity to the evolution of the oil price is reduced in this framework, especially during the period from early 2005 until 2015, although it remains the major driver in the late 1970s and early 1980s (see Chart Ab). With regard to supply factors, the model identifies two specific episodes when OPEC acted to keep the market tight. One of these, the period between 1979 and 1985, is generally characterised by less buoyant demand, increasing non-OPEC supply and declining prices. During that time OPEC (namely Saudi Arabia) attempted to support prices by restricting production, thereby preventing prices from dropping further. The second episode was between the end of 2004 and the beginning of 2008, that is, in the run-up to the global financial crisis, when OPEC actively worked to maintain a relatively tight market balance and elevated prices (see Chart Aa).

More generally, this framework has two major advantages over standard models of the oil market which do not differentiate between OPEC and non-OPEC production. First, it is able to identify with more precision the turning points related to specific events in the oil market by distinguishing between different types of supply policies. Second, it reduces the residual shock,

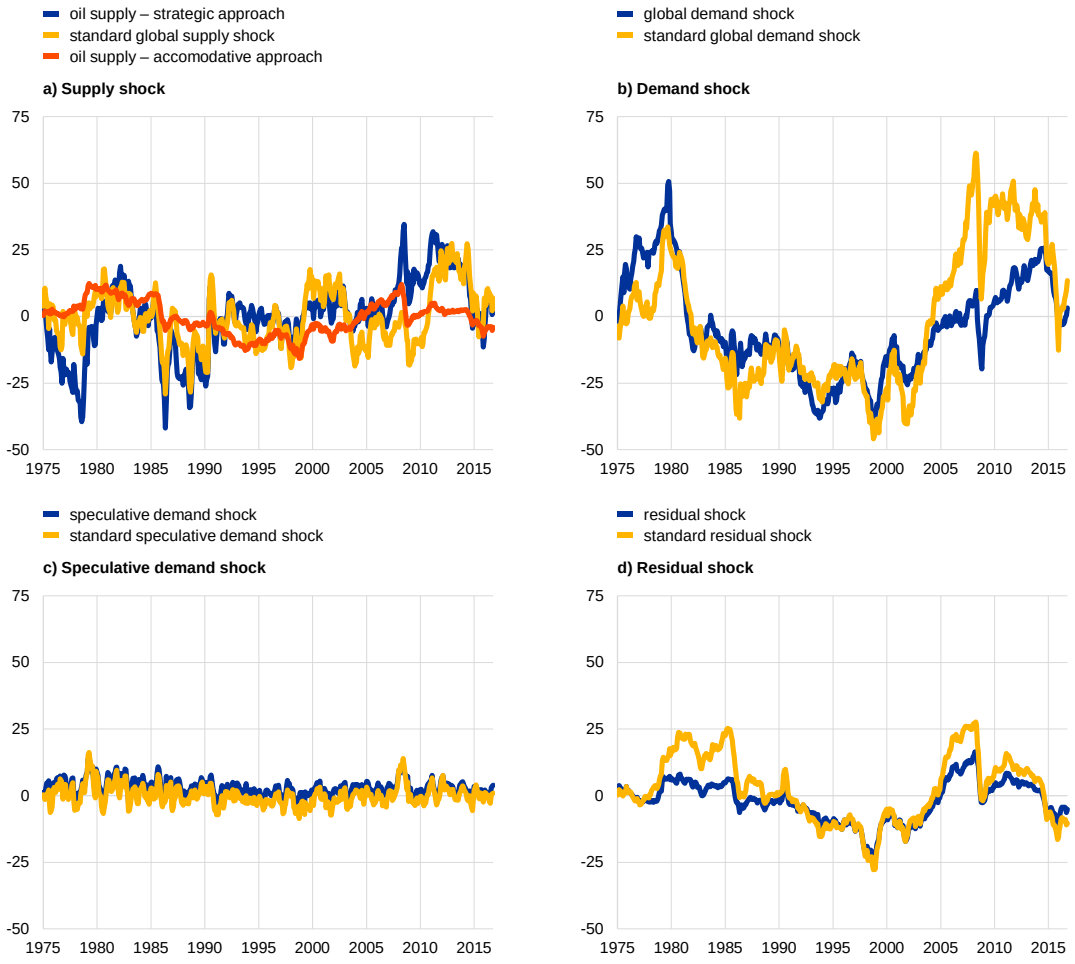
41 To select only those supply shocks which have some persistent effect, a further restriction is imposed, i.e. that the oil price reaction persists for at least 12 periods in the case of a strategic supply shock.

which represents the unexplained part of oil price dynamics particularly in the early 1980s and in the run-up to the global financial crisis (see Chart Ad).

Chart A

Historical decomposition of oil prices (1975-2016)

(percentage monthly contributions)



Sources: US EIA, IEA, World Economic Outlook and ECB staff calculations from SVAR models.
Notes: The chart shows the historical contribution of different types of oil shock to the logarithm of the real price of oil. The historical decompositions have been normalised to start at zero in January 1975. A negative value implies that the specific shock contributed to a reduction in the oil price, and a positive value implies that it contributed to an increase. The standard model refers to a four-variable model (production, demand, inventories and prices) which does not differentiate between OPEC and non-OPEC supply. The latest observations are for December 2016.

3 A narrative of oil price dynamics in the shale oil age

This section assesses the evolution of oil prices and major market fundamentals in the age of shale oil, taking 2011 as a reference date – the year when shale oil production started to expand at a faster pace. Three phases are considered: the period from January 2011 to mid-2014; from mid-2014 to October 2016 and from November 2016 to April 2017; each of which corresponds to a major change in OPEC's position and in oil prices. During the first period, oil prices

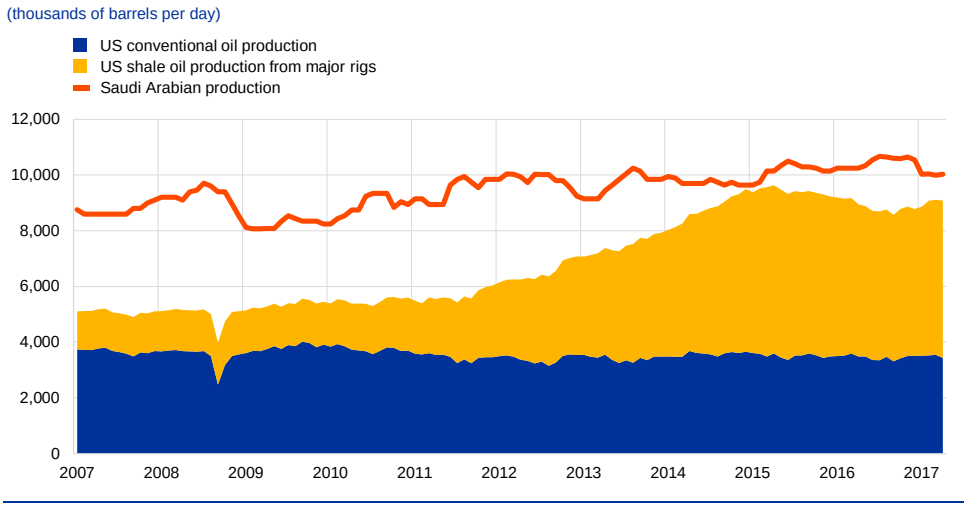
remained rather elevated owing to persistent geopolitical tensions and market segmentation, even though shale oil production was expanding. Prices dropped from around USD 120 per barrel to below USD 40 per barrel during the second period, and, more recently, prices have fluctuated within a range of values broadly compatible with marginal producers' production costs.

3.1 The first period of the shale oil age: January 2011 to mid-2014

During the initial phase of expansion (January 2011 until mid-2014) shale oil production trebled and drove the US share of the market to 12%, up from 7% in 2011. Total US production expanded by 76% from almost 5.4 million barrels per day at the beginning of 2010 to around 9.5 million barrels per day at the end of 2014 (see Charts 5, 6 and 7). This increase was principally due to production from major shale rigs – such as those in the Eagle Ford and the Permian regions – which had more than doubled since 2011, while US conventional production remained stable.

Chart 5

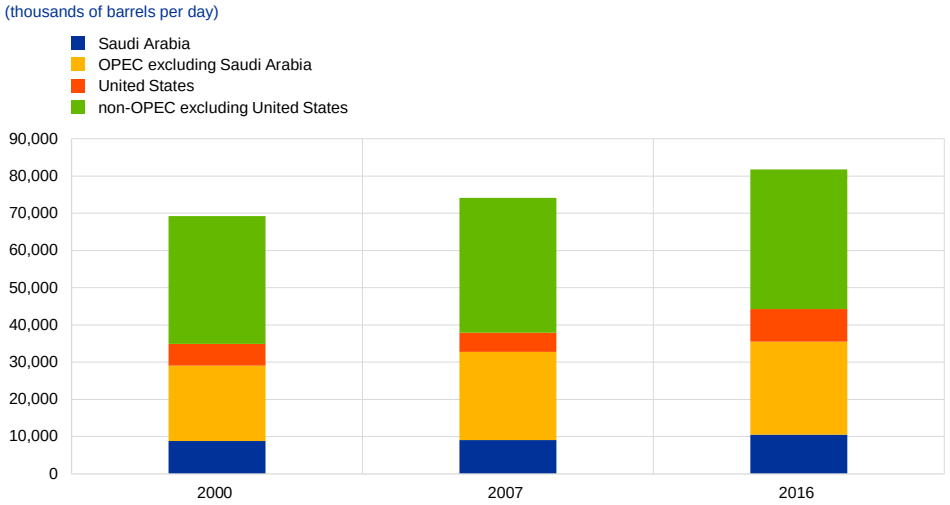
Expansion of US crude oil production since 2007



Source: US EIA.
Note: The latest observations are for 1 September 2017.

Chart 6

Changes in the structure of oil production (2000-2016)



Source: US EIA.
Notes: The value for the final month of a year is taken as the value for that year. The latest observations are for December 2016.

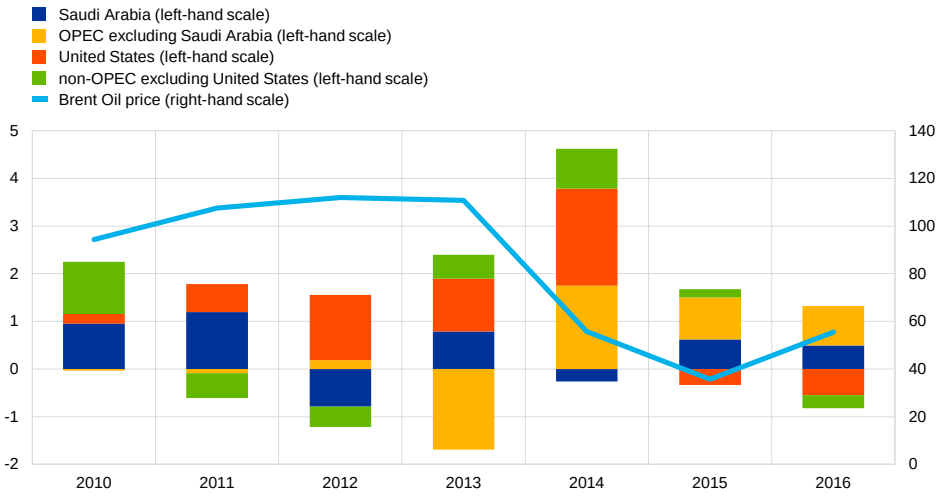
However, OPEC's share of overall production decreased only marginally, owing to declines in production by other major non-OPEC producers (Norway, the United Kingdom and Mexico). More significantly, Saudi Arabia expanded its production quota; in mid-2013 it exceeded the production share it had held prior to the global financial crisis. Acting as the OPEC swing producer, it compensated for production cuts in those Middle Eastern countries which were experiencing political instability and the effects of an international embargo (Libya and Iran, respectively).

In this initial phase, oil prices appear to have been supported more by positive developments in demand, while supply factors were relatively muted (see Charts 7, 8 and 9). The impact of shale oil producers was still fairly small, since they faced high production costs and rather limited production capacity. The first projections by the US EIA on shale oil production date back to 2011. Since then production has proved to be well above expectations, forcing the US EIA to regularly revise its forecasts upward. This is likely to have led to an OPEC strategy of "wait and see", and a period in which it incrementally fine-tuned its supply to keep the market well balanced so that the prices remained above USD 100 per barrel, especially in Europe. This is consistent with a SVAR analysis which shows that oil prices were driven by stronger oil demand during this period (see Box 2).

Chart 7

Contribution to annual crude oil supply growth (2010-2016)

(percentage points, left-hand scale; USD per barrel, right-hand scale)

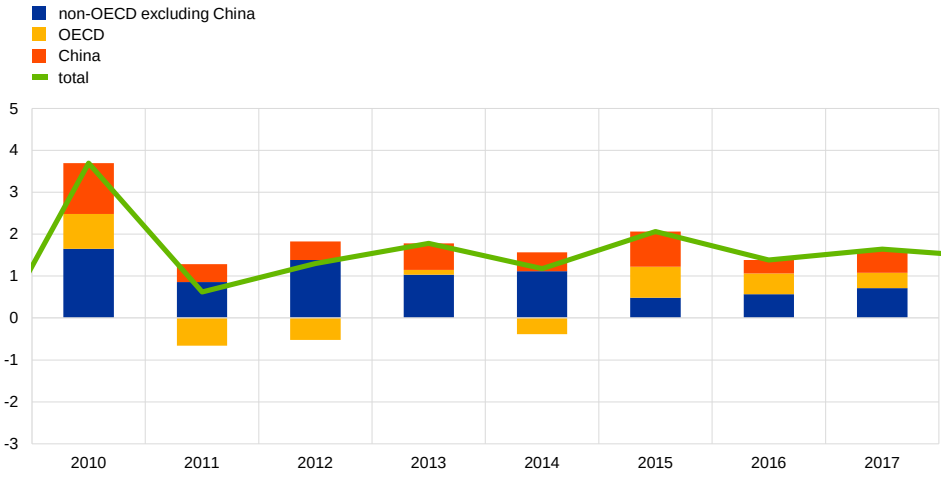


Sources: US EIA, Bloomberg and ECB staff calculations.
Notes: The value for the final month of a year is taken as the value for that year.

Chart 8

Contribution to annual oil demand growth (2010-2017)

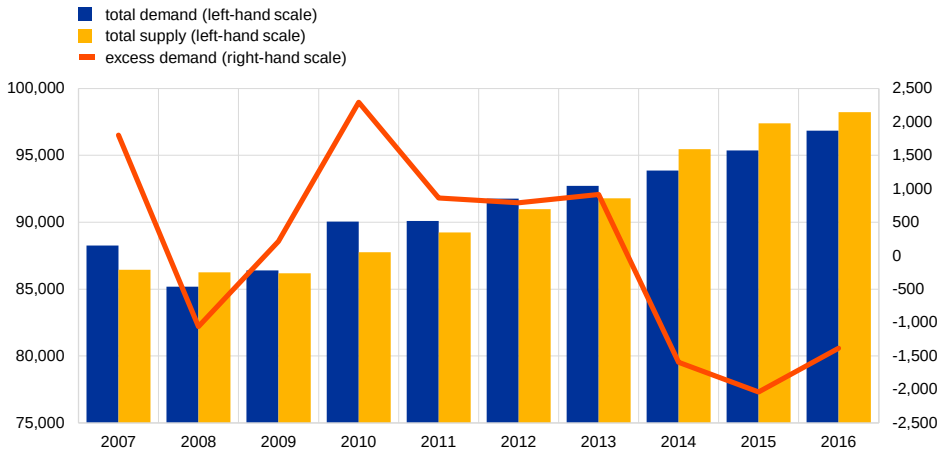
(percentage points)



Sources: IEA and ECB staff calculations.

Chart 9

Changes in supply and demand (2007-2016)



Sources: US EIA and IEA.
Notes: The value for the final quarter of a year is taken as the value for that year. The latest observations are for December 2016.

Nevertheless, from the end of 2013 the pace of expansion of shale oil production picked up and proven reserves were heavily reappraised upwards from two billion barrels in 2011 to 11.6 billion barrels in 2015.[42] The extraordinary new capacity of shale oil production represented a fresh challenge to the prominence of OPEC's role in the oil market. In 2014, other non-OPEC supply also rose by around one million barrels per day, reflecting solid production figures in Brazil, Canada and Russia. OPEC rapidly started to lose market share (−2 percentage points between mid-2011 and mid-2014) and became concerned about the prospects for its high-cost producers.

3.2 Two years targeting market share

During the period from mid-2014 until October 2016, OPEC switched to a strategy of targeting market share. The reassessment of potential shale oil production growth in June 2014 can be considered as a turning point for the oil market, as it indicated that operators had underestimated the relevance of shale oil production. During the first half of 2014 not only did the US EIA repeatedly adjust its projections upwards[43], but more importantly, it extended its estimates of the life expectancy of shale oil production to 2030. In this context, OPEC realised that its loss of market share over the previous three years would not be regained without a change in strategy.

42 See *Review of emerging resources: US shale gas and shale oil plays*, Energy Information Administration, July 2011; and *U.S. Crude Oil and Natural Gas Proved Reserves, Year-end 2015,* Energy Information Administration, December 2016.

43 See *Medium-Term Oil Market Report 2014*, International Energy Agency, Paris, 2014.

While it is generally the role of swing producers to counteract temporary shocks, shale oil had modified the market structure permanently.[44] At this point, shale oil producers were still facing high break-even prices although production capacity was growing. Therefore an OPEC production policy consistent with maintaining high oil prices would have favoured continued development in the shale oil industry and progress in fracking technology, and resulted in further pressure on OPEC's market share. Supply growth from the United States and Russia was not offset by reductions in OPEC production, and global demand growth was showing signs of slowing down. This led the International Energy Agency (IEA) to revise its forecasts for 2014 and 2015 downwards, mainly due to weaker projections for Chinese and European oil demand growth.

On the back of these developments, OPEC took its decision in November 2014 to abandon production quotas. This attempt to regain market share was only partially successful. As a consequence of lower prices the investment plans of OPEC's competitors were heavily curtailed – especially in shale oil and non-conventional fields – but competitors were not driven out of the market. On the contrary, they became more efficient over time. The supply glut continued to drive prices to a level as low as USD 30 per barrel in early 2016. Despite the low prices, shale oil rig counts resumed their growth in April 2016, and shale oil production proved to be more resilient than expected as producing companies were able to compress extraction costs. The shale oil industry survived through mergers and acquisitions, as highly indebted mid-sized firms were acquired by larger entities with greater financial resources and capable of operating in an environment of low oil prices. In the period from mid-2014 to April 2017, oil prices were driven mainly by supply dynamics. This is consistent with the results produced by applying the oil market model presented in Box 2.

3.3 Reversion to a policy of price stabilisation

Targeting market share was proving too expensive for the strained public finances of OPEC members[45] **who agreed with major non-OPEC producers in November 2016 to adopt an approach of oil market rebalancing in order to support prices.** Global supply was cut by 1.8 million barrels per day but prices only rose to around USD 50 per barrel. However, the involvement of Russia and other major non-OPEC producers helped to partially preserve OPEC's role in the market; in September 2017 OPEC's production still represented 42% of global supply. Yet US production regained, and then exceeded, its 2014 level, suggesting that major shale oil production companies, at least in the short run, were economically viable at a price of around USD 50 per barrel.

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44 See Dale, S. "The new economics of oil", *The Oxford Institute for Energy Studies*, October 2015.

45 The market prices required to guarantee a balanced public budget in OPEC countries ("fiscal expenditures break-even prices") were estimated by the IMF to be between USD 58 for Qatar and USD 106 for Iran in 2015. It was estimated that oil prices of around USD 93 were needed in order to stabilise Saudi Arabia's fiscal situation. See the Statistical Appendix to the *Regional Economic Outlook: Middle East and Central Asia*, IMF, October 2016.

The decline in OPEC's production was a reaction to the considerable fall in the production costs of high-cost shale oil producers. In particular, these producers introduced a series of technological improvements that raised their competitiveness. The life of shale oil rig wells was extended by using injection liquids that had novel chemical compositions and, in particular, by the widespread use of re-fracking techniques[46]. Drilling closer to the "sweet spot"[47] increased the recovery rate and contributed further to reductions in break-even prices. The resilience of shale oil producers to low prices exacerbated the excess supply and kept oil prices persistently below the levels justified by production costs. Prices that fluctuate around USD 50 per barrel seem to be more consistent with short- to medium-term equilibrium prices. In order to progress with the rebalancing of the oil market through global supply restraints, member countries who signed up to the November 2016 OPEC agreement have recently extended it until the end of 2018, with the possibility of a review in June of that year.

Box 2
Historical decomposition of the oil price in the shale oil age

This box provides an assessment of the factors affecting oil price dynamics in the shale oil age – which began in 2011 – based on the framework and the methodological approach explained in Box 1. The developments in oil prices and in OPEC's decisions can be divided into three distinct periods, identified by local peaks and troughs in prices: the periods from January 2011 to May 2014; from June 2014 to February 2015; and from November 2016 to April 2017.

While demand factors were more relevant until mid-2014, the estimates obtained from the SVAR model suggest that since then, oil prices have been driven by supply dynamics. In the first period, which coincides with the beginning of the shale oil revolution, the 14% increase in oil prices was driven by stronger oil demand growth (+38%), partially balanced by a slight increase in supply (+10%) which contributed negatively to the price dynamics. However, since mid-2014, it is OPEC's decisions which have been key in explaining the developments in oil prices. In November 2014, OPEC abandoned production quotas. Indeed, the empirical analysis reveals that most (39%) of the 57% price drop experienced in the second half of 2014 and until early 2015 was due to supply factors. In particular, market share targeting represents 25%, and an additional 7% can be attributed to the price stabilisation policy. Speculative demand, which in this period can be interpreted as expectations of future excess supply, delaying destocking of inventories, made a negative contribution of another 7%, while demand factors contributed 9% to the drop in the oil price over the same period.

Since autumn 2016, supply factors have continued to be key drivers of prices, as OPEC switched back to a policy of price targeting. It announced the reinstatement of production quotas in an attempt to facilitate the reabsorption of excess supply. Chart A shows that it was primarily supply factors related to market share stabilisation which supported upward movements in prices (contributing around 15% of the increase from November 2016 to April 2017), although the

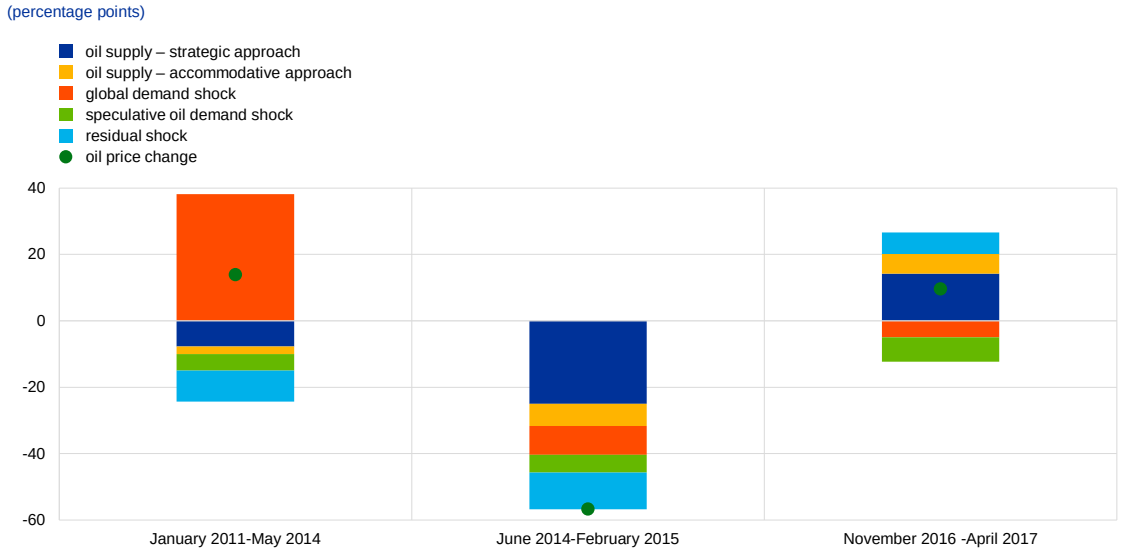
46 See "Hydraulic fracturing accounts for about half of current U.S. crude oil production", *Today in Energy*, Energy Information Administration, March 15, 2016.

47 "Sweet spot" is the term used for the area of a shale basin with the highest concentration of crude oil, generally associated with lower extraction costs and higher efficiency rates.

price stabilisation strategy also contributed, but to a lesser extent (6% of the increase). Conversely, demand factors were less relevant until the first quarter of 2017 and seem to have depressed prices slightly since then (see Chart A).

Chart A

Historical decomposition of oil price dynamics (2011–2016)



Sources: IEA, US EIA, WEO and ECB staff calculations from SVAR models (see Box 1).
Note: The latest observations are for April 2017.

4 The relevance of shale oil in the medium term according to micro evidence

Shale oil will remain an important factor in oil production in the future. The hypothesis maintained throughout this analysis is that producers began to be perceived as effective competitors once their supply capacity expanded and their break-even prices fell. However, how relevant is shale oil production expected to be in the medium term? This section provides evidence, based on the latest projections from Rystad[48], that shale oil will remain an important factor for at least two reasons: i) the additional efficiency gains it is expected to achieve, and ii) the rapid increase of investment flows into the industry which are expected over the coming years.

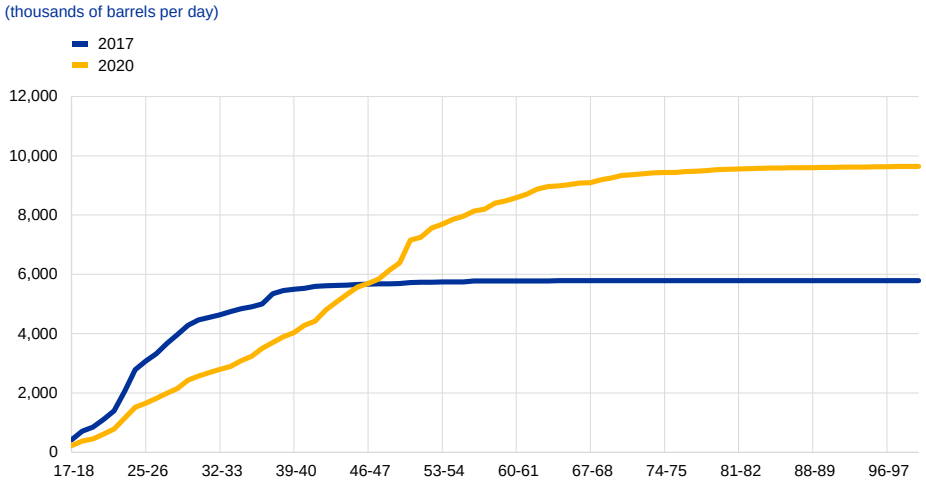
Technological progress has succeeded in consistently reducing the break-even production prices of shale oil. Based on data released by Rystad in August 2017, Chart 10 shows the potential production in millions of barrels per price range in 2017 and in 2020, for given current and prospective shale oil wells (based on current ongoing and exploration projects). The data can therefore be interpreted as inverse

[48] Rystad is a specialised provider of the datasets on oil market variables that have been used in this section to assess the potential evolution of shale oil production.

aggregate shale oil supply curves; the blue line plots the current supply and the yellow line plots the forecasted supply. Almost the entire supply from currently active rigs can be produced economically for prices in the range of USD 40-45 per barrel (see Chart 10); this is a reduction of 30% from the production costs of a few years ago.

Chart 10

Current (2017) and future (2020) shale oil production by break-even price



Sources: Rystad data and ECB staff calculations.
Note: The horizontal axis shows break-even price (BEP) ranges in USD. The definition of BEP in the oil sector is the costs related to the entire oil cycle production. These include selling, general and administrative expenses, property acquisition costs, finding costs, costs of licensing rounds, signature bonuses, the costs of drilling, exploration and development of wells , production and maintenance costs, transportation costs, taxes or royalties paid to the host state, return on capital and a risk premium to cover the uncertainties inherent in oil and gas investments.

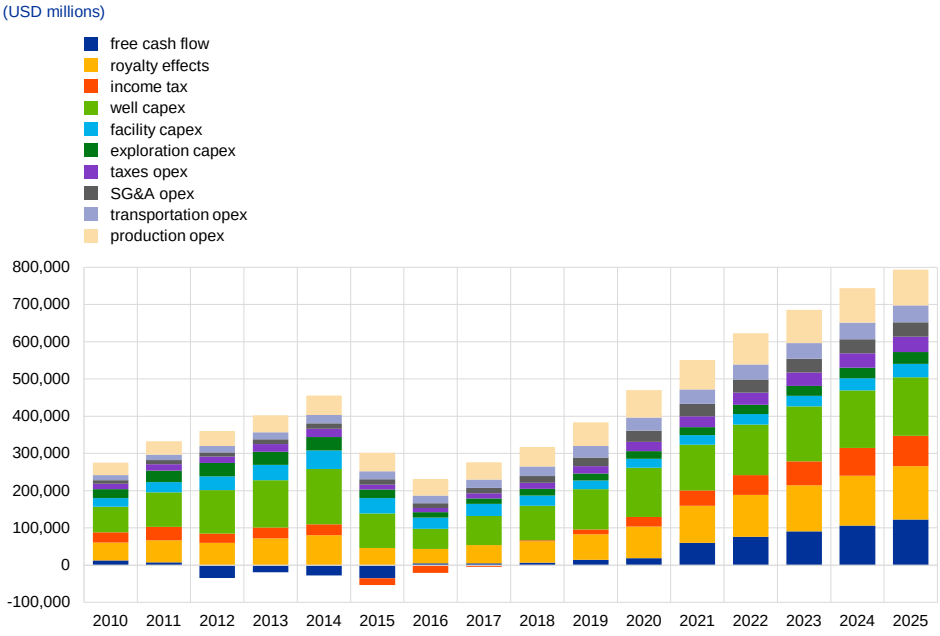
The comparison of the two curves (2017 and 2020) in Chart 10 also shows that current production of existing wells is limited to six million barrels per day. However shale oil supply is expected to expand rapidly beyond that limit at prices above USD 40-45 per barrel in the future. In particular, the development of newly approved projects could – according to these estimations – sustain a supply of around nine million barrels per day (equivalent to an increase of more than 50% over three years) provided that oil prices rise above USD 65 per barrel, which corresponds to the break-even price of just a few years ago. A note of caution accompanies the 2020 supply curve: since currently viable wells will be largely exhausted within two years and they are operating at prices below USD 40-45 per barrel, the curve shows that production in three years is expected to be lower than today if prices remain within that range over the medium term (see Chart 15). Similar analyses, conducted on other on-shore (non-shale) and off-shore production, show instead unchanged inverse supply curves, revealing a constant cost/supply structure and confirming that additional supply in the future will also almost exclusively come from shale oil.

The development of capital investment in US shale oil production also provides evidence of the resilience of shale oil production over the coming years. Capital inflows into the industry are underway and are expected to become particularly pronounced in the medium term. As shown in Chart 11, capital investment in the next five years is expected to be stronger than in the past (growing

at an average of 18% per year, compared with the five-year average of 14% for the period ending in 2014). Capital investment in wells, which includes construction and drilling costs (among other factors), will experience one of the largest rises – in line with expected increases in US shale oil production mainly in the Permian region (Midland and Delaware).

Chart 11

Capital investment in US shale oil production (including projections)



Sources: Rystad data and ECB staff calculations.

5 Conclusions

This article has reviewed the contribution made by market fundamentals to oil price dynamics in response to the emergence of a key novel factor – shale oil production. Empirical results from a SVAR model with sign restrictions suggest that, especially since 2014, shale oil has had an effect on developments in oil prices: directly, by contributing to global supply growth; and indirectly, by influencing OPEC production policies. OPEC was incentivised to pursue market share as shale oil production increased but was not competitive enough. However, as shale oil producers gained in competitiveness, OPEC preferred a policy of price stabilisation around a value compatible with the break-even cost of the marginal producers.

Micro evidence suggests that not only has shale oil modified other producers' incentives and therefore the mechanism of price formation over recent years, but it will remain a crucial element of oil production, at least for the next 15 years. Rapidly increasing investment inflows are expected to maintain the robust pace of production growth, thereby highlighting the relevance of technological improvements in oil production. However, important questions remain open concerning, for example, the life expectancy of the shale oil revolution – particularly given the

unlikelihood that it will expand beyond the geographical borders of the United States to any significant extent. Geological conditions, environmental concerns, water shortages and less efficient supply chains have so far prevented the widespread diffusion of shale oil technology elsewhere.

2 The impact of global value chains on the macroeconomic analysis of the euro area

With the decline in transportation costs and the reduction of barriers to trade in the last decades, production processes have become more fragmented as firms locate their production and source their inputs across national borders. This has significantly increased trade in intermediate goods and services. Euro area countries, in particular, have been increasingly participating in cross-border production chains, both within the currency area and outside.

This article analyses how global value chains affect the euro area economy. In particular, accounting for the presence of global value chains has an impact on some key economic indicators. The rise in importance of the value-added concept as opposed to conventional gross trade and the increase in intermediate trade change the way macroeconomic indices are computed and interpreted. Moreover, firms' and sectors' participation in global value chains creates or strengthens cross-country linkages via trade in intermediate inputs, which has consequences for macroeconomic analysis, namely for real activity spillovers and the skill mix and compensation of the labour force.

1 Introduction

The last few decades have witnessed a rapid expansion of global value chains (GVCs). Firms have been locating their production and sourcing their inputs across national borders. As a result, production has been increasingly organised in several stages across different countries, implying that exports have a significant amount of imported inputs incorporated into them (the "import content of exports"). As a result, production processes have become internationally fragmented, trade in intermediate goods and services has substantially increased (around 60% of world trade is estimated to be in intermediate goods), and the gross value of exports has become much higher than the value added originating in each exporting country. Multilateral free trade negotiations and the subsequent reduction of tariffs and non-tariff barriers, the opening-up of emerging market economies (EMEs) to global trade, financial liberalisation, the internationalisation of business services and technological improvements are the most prominent factors that contributed to the expansion of cross-country supply chains until recently.

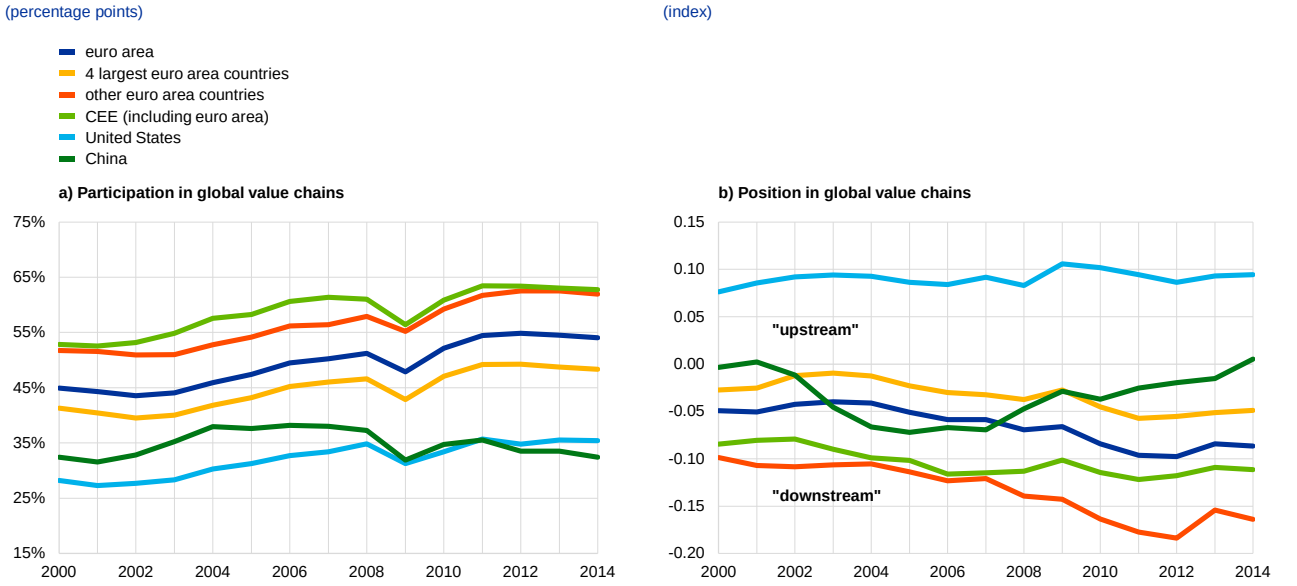
Euro area countries, in particular, have been increasingly participating in cross-border production chains, stimulated by a harmonised regulatory framework within the European Union (EU) and integration in a common currency area. As a result, the establishment of a regional production chain and trade in intermediate products with the rest of the world have been fostered. A comparison of countries' GVC participation indices[49] (Chart 1, panel a) shows that the euro area[50] is more

[49] See Box 1 for details of the various measures of GVC integration.

involved in global production chains than other large economies, such as the United States and China.

Chart 1

Participation and position in global value chains between 2000 and 2014



Sources: World Input-Output Database (WIOD) (2016 release) and authors' calculations.
Notes: See Box 1 for details of the measures. The "4 largest euro area countries" are Germany, France, Italy and Spain. The "other euro area countries" are all of the other euro area countries, excluding CEE countries. "CEE" refers to all of the countries in central and eastern Europe that are EU members, five of which are in the euro area and six of which are outside the euro area.

In the years following the Great Recession, which occurred in the period 2008-09, the pace of supply chain expansion slowed substantially. Panel a of Chart 1 shows that the halt in the expansion of global value chains has been a global phenomenon. It has been partly due to increasing labour costs in emerging markets, as well as the onshoring[51] of multinational activities towards export markets (the "shortening of global value chains", in which production is brought closer to demand markets). In addition, the introduction of protectionist non-tariff barriers (for instance through local content requirements and other regulations) has increased trade costs, thus weighing on the expansion of global value chains. Other contributing factors may have been a global demand shift towards services, which are less trade intensive than goods, as well as robotisation, which is encouraging renewed localisation of production in the advanced economies.[52]

Euro area countries, however, have been less affected by GVC shortening than other countries (Chart 1, panel a). The process of shortening was particularly

50 The euro area aggregates in Chart 1 include intra-euro area trade in global value chains. Excluding intra-euro area trade would deliver a lower participation in global value chains in the euro area. This highlights the relevance of regional production chains.

51 Onshoring consists in transferring parts of the intermediate production processes close to the customers' location. For instance, in the production of a car model which is sold in Asia, the production of components and parts of the vehicles would be relocated in the Asian region.

52 For an account of the factors behind the global trade slowdown in general, see IRC Trade Task Force, "Understanding the weakness in global trade: what is the new normal?", *Occasional Paper Series*, No 178, ECB, September 2016.

pronounced in China. While in 2014 (the last year for which data are available) the degree of participation of the United States in global value chains was comparable to that in 2008, in the euro area it was significantly higher and was driven by intra-euro area trade.

Since the beginning of the 21st century, euro area countries have also recorded a rise in the foreign value added embedded in their exports, that is, they have been increasingly using imported inputs in the production of their exports. In panel b of Chart 1, the evolution over time of the position of selected economies in the global value chain is plotted. The position index[53] of the euro area has fallen further below zero in recent years, meaning that euro area firms are using more foreign inputs and supplying fewer intermediate products to other countries. Hence, they are located more "downstream" in global value chains. Large euro area countries are, in turn, located "upstream" with respect to both small euro area countries and central and eastern European (CEE) countries[54]. This means that the last two country groupings use a relatively higher share of imported inputs in the production of their exports, often as a result of final assembly activities as part of the pan-European contribution to global value chains. Conversely, the United States is comparatively upstream as it provides intermediate products related to R&D, the financial sector and the commodity sectors to the rest of the world. Also, China[55] has been moving significantly upstream when comparing 2007 with 2014.

Global value chains have an impact on some key economic indicators. The rise in importance of the value-added concept, as opposed to conventional gross trade, and the increase in intermediate trade have brought about some challenges with regard to the way macroeconomic indices are computed and interpreted. In Section 2, the implications of global value chains for the measurement and interpretation of three key indicators – real effective exchange rates, export market shares and the global demand elasticity of trade – will be analysed.

Firms' and sectors' participation in global value chains also creates or strengthens cross-country linkages via trade in intermediate inputs. This has important consequences for macroeconomic analysis. Specifically, in Section 3 the focus is on real spillovers, as well as the skill mix and compensation of the labour force.

53 See Box 1 for a definition.

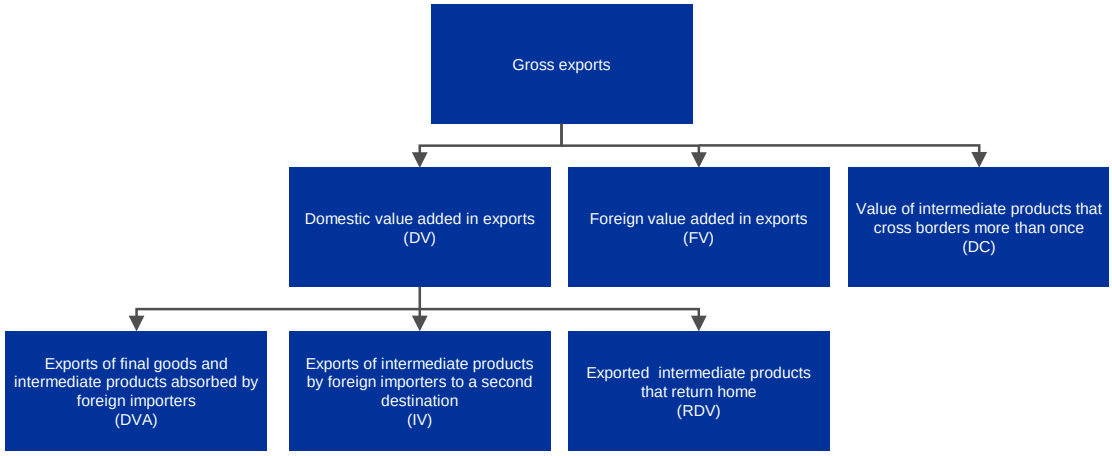
54 The CEE countries considered in this analysis are: Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.

55 See the article entitled "China's economic growth and rebalancing and the implications for the global economy", *Economic Bulletin*, Issue 7, ECB, 2017.

Box 1
The measurement of global value chain integration

Recent strands of the GVC literature have made use of global input-output tables in order to trace value-added flows through the various stages of production.[56] The first goal is to decompose gross export flows of goods and services in order to disentangle the sources of value added from what merely constitutes back-and-forth trade in intermediate products (double-counting).[57] Figure A identifies the three main components of statistics on gross export flows: (i) domestic value added (DV); (ii) foreign value added (FV); and (iii) a double-counting term (DC). Domestic value added reflects the use of domestic inputs in the production of exports and therefore captures the genuine contribution of exports to GDP. Foreign value added refers to the use of foreign inputs in the process of export production. Finally, the third component consists of the value of intermediate products that cross borders more than once, thus representing double-counted flows.

Figure A
Decomposition of gross exports into value-added components



Source: Based on Koopman et al. (2014).
Note: The value of intermediate products that cross borders more than once is the value incorporated in all those intermediate inputs that are produced in a country A, which are exported to country B (and are hence counted as an export of country A) to produce products for another country (either A itself or a third country C) and are therefore counted again in country B's gross exports.

Within the domestic value-added component, it is important to further distinguish between those trade flows that are absorbed abroad for final consumption or investment (DVA) and those that are re-exported to other countries (IV) and thus depend on the demand of those countries.[58] Finally, returned domestic value added (RDV) refers to exports that are used as inputs in production processes abroad, but then return and are consumed domestically.

Value-added accounting allows the involvement in cross-border production chains of a given country or sector to be gauged. Backward (or downstream) participation in global value chains can be measured as the value added embedded in the foreign inputs (FV in Figure A)

56 See Koopman, R., Wang, Z. and Wei, S. J., "Tracing value added and double counting in gross exports", *American Economic Review*, Vol. 104(2), 2014, pp. 459-494, and Wang, Z., Wei, S. J. and Zhu, K., "Quantifying international production sharing at the bilateral and sector levels", NBER Working Paper No 19677, National Bureau of Economic Research, 2013.

57 Double-counting arises when an intermediate input crosses a border more than once.

58 DVA and IV stand for domestic value added absorbed and indirect value added, respectively.

utilised in the production of exports. Forward (or upstream) participation, on the other hand, can be measured as the value added in intermediate products which are exported to a trade partner and then reprocessed and exported further by the trade partner (IV in Figure A).

Synthetic measures of GVC participation and the GVC position can be derived from this decomposition. The extent of a country's or a sector's involvement in global value chains can be defined as the sum of GVC-related components divided by gross exports (E_{ijt}), i.e.:

$$GVC\_Participation_{ijt} = \frac{FV_{ijt}}{E_{ijt}} + \frac{IV_{ijt}}{E_{ijt}}$$

A measure of the relative downstream or upstream position of a country or a sector can be derived by considering the relative importance of sourcing of inputs and processing of output:

$$GVC\_Position_{ijt} = \ln\left(1 + \frac{IV_{ijt}}{E_{ijt}}\right) - \ln\left(1 + \frac{FV_{ijt}}{E_{ijt}}\right)$$

A relatively higher share of foreign value added from upstream input providers would indicate a downstream position and hence lead to a negative value of the index. Conversely, a higher share of value added in re-exported intermediate products travelling further down the value chain would be an indication of an upstream position and, in this case, the GVC position index would be positive. Measures of both GVC participation and GVC position can be computed for bilateral trade relations involving countries/sectors i and j or as an aggregate indication for a country or a sector.

Global input-output tables are needed in order to decompose gross trade into its value-added components. In most of the analyses in this article, the World Input-Output Database (WIOD)[59] is used. Two releases are available: the 2013 release, which includes 40 countries and the rest of the world as an aggregate for the period 1995-2011; and the 2016 release, which presents a more detailed sectoral decomposition and covers 43 countries and the rest of the world for the period 2000-2014.

2 Implications of global value chains for the measurement and interpretation of macroeconomic indicators

2.1 Global value chain-based real effective exchange rates

Real effective exchange rates (REERs) are a measure of the international price and cost competitiveness of a country. REERs are computed as a trade-weighted average of a country's bilateral exchange rates vis-à-vis its most important trading partners, adjusted for price levels.[60] As such, they are used in aggregate export and import flow models and as a synthetic indicator for the analysis of trade performance and balance of payments adjustments.

59 See www.wiod.org.

60 See also "Revised trade weights for the effective exchange rates of the euro reflect the increasing importance of emerging market economies", *Economic Bulletin*, Issue 6, ECB, 2015.

A challenge to the interpretation of conventional REERs is posed by the fact that imports are pervasively used to produce exports in today's global economy. As a result, countries often compete against each other in specific stages of the value-added chain (e.g. two emerging economies may compete in the assembly of an iPhone). The conventional REER measures, however, assume that countries compete to sell products that they produce entirely at home, using only domestic inputs.

In particular, bilateral value-added trade patterns may differ significantly from gross trade patterns, which implies that gross value trade weights may over- or understate the degree of bilateral competition for value-added exports. To account for this effect, value-added real effective exchange rates (VAREERs) based on bilateral value-added trade data can be constructed. VAREERs thus take into account that gross trade flows of intermediate goods, for instance between neighbouring countries, may distort the extent to which value added in terms of final goods is traded between countries.

Moreover, as countries trade intermediate inputs intensively, this affects the impact of exchange rate changes on trade. An appreciation vis-à-vis a trading partner from which a country largely imports intermediate goods (e.g. components imported by China from Japan for iPhone assembly) may actually be beneficial for the competitiveness of that country as it reduces the cost of intermediate goods imports. To account for this effect, input-output real effective exchange rates (IOREERs) can be constructed. IOREERs identify an additional channel through which exchange rate movements affect price competitiveness. An appreciation not only increases the relative price of domestic goods and therefore worsens the country's price competitiveness, it also has a counteracting effect on competitiveness as it reduces the cost of foreign inputs used in production.

REERs based on GVC weights therefore offer a complementary measure that enriches the interpretation of more traditional measures based on gross trade and used in the computation of the REERs disseminated by the ECB.[61] VAREERs are calculated by replacing conventional bilateral total gross trade weights with value-added weights. IOREERs, instead, take into account bilateral trade in intermediates and attach a lower weight to partners that provide a sizeable share of inputs in a country's production in order to account for the fact that an appreciation vis-à-vis such trading partners may actually be beneficial to the competitiveness of the importing country as it reduces the cost of production.[62]

Although GVC weights are highly correlated with gross trade weights, their absolute differences are non-negligible. Table 1 reports the correlation coefficients between GVC-based trade weights (i.e. the share of each trading partner

61 See Bems, R. and Johnson, R. C., "Demand for Value Added and Value-Added Exchange Rates", NBER Working Paper No 21070, National Bureau of Economic Research, 2015.

62 In order to ensure full consistency, GVC REERs are computed following the ECB method for the computation of its published REERs, namely by using three-year non-overlapping averages as weights. Standard REERs are in turn recalculated by deflating nominal exchange rates with relative GDP deflators and by considering a basket of only 40 (instead of 57) currencies because of data availability limitations for input-output data.

in the total trade of any given country) and conventional trade weights. On first inspection, the different weights look highly correlated for the majority of countries, with the exception of some small countries (Lithuania, Luxembourg and Slovakia), which have a correlation coefficient below 0.8. However, despite the high degree of correlation, absolute differences between GVC weights and conventional trade weights are substantial. In order to illustrate this, Chart 2 shows for each country the average of the absolute percentage deviations of its trading partners' value-added and input-output-based trade weights from conventional trade weights. It turns out that in most cases value-added and input-output-based trade weights on average deviate by around 50% from the conventional trade weights and, in some cases, the average absolute percentage deviation is even higher than 100%.

Table 1

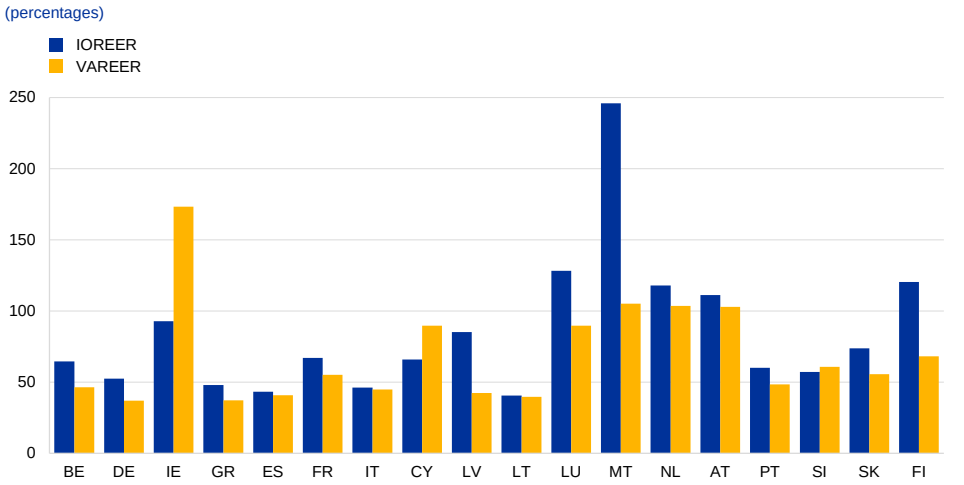
Coefficient of correlation with gross trade weights: VAREER and IOREER weights

	BE	DE	IE	GR	ES	FR	IT	CY	LV	LT	LU	MT	NL	AT	PT	SI	SK	FI
IOREER	0.91	0.88	0.92	0.94	0.94	0.91	0.94	0.90	0.91	0.65	0.50	0.85	0.94	0.92	0.97	0.87	0.71	0.84
VAREER	0.97	0.93	0.97	0.83	0.91	0.93	0.93	0.87	0.92	0.88	0.83	0.93	0.92	0.97	0.96	0.96	0.93	0.87

Sources: Bems and Johnson (2015), op. cit., ECB and ECB staff calculations.

Chart 2

Average absolute deviation of VAREER and IOREER country weights from conventional trade weights



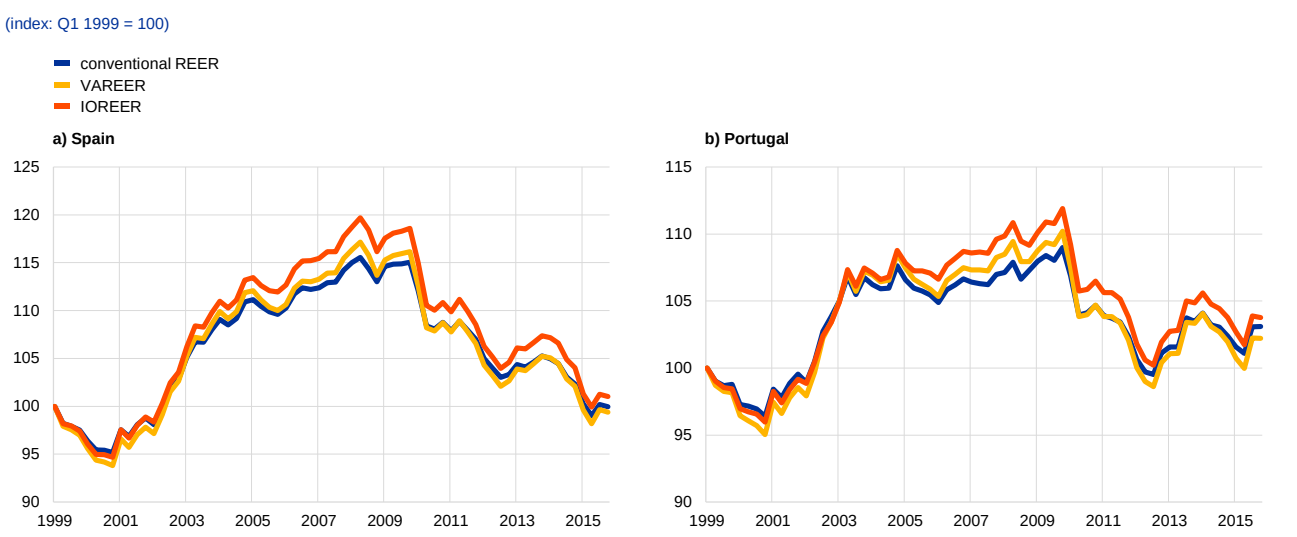
Sources: Bems and Johnson (2015), op. cit., ECB and ECB staff calculations.
Note: The average absolute percentage deviation of GVC-based trade weights from conventional trade weights is calculated as follows for any given country. In a first step, for each of the given country's trading partners, the percentage deviation of its GVC-based trade weight from its conventional trade weight is calculated. In a second step, the arithmetic average of the absolute values of these percentage deviations is calculated in order to obtain the average absolute percentage deviation.

An interesting finding is that the GVC REERs show larger changes in price competitiveness for the euro area countries that were most affected by the crisis, thus suggesting that they might have been useful in the detection of pre-crisis country vulnerabilities. Across euro area countries, a comparison of the dynamics of GVC REERs with conventional REERs delivers broadly consistent messages. In the case of the euro area countries most affected by the crisis, however, the evolution of REERs (see the examples of Spain and Portugal in Chart 3) shows that both the VAREER and, to a larger extent, the IOREER measures point

to stronger losses in competitiveness in the years preceding the crisis and, correspondingly, larger gains in the post-crisis period. In macroeconomic analysis it would thus be beneficial to look at GVC REERs, which could provide useful complementary insights into competitiveness developments.

Chart 3

Comparison of VAREER, IOREER and conventional REER indices



Sources: Bems and Johnson (2015), op. cit., ECB and ECB staff calculations.

2.2 Global value chains and export market shares

With GVC integration, gross exports might not gauge a country's international contribution to trade in terms of value added. As intermediate inputs cross borders several times within production chains, tracing value-added flows can be crucial for the assessment of the effective contribution of a country to the world market. Input-output data can be used in order to gather information on countries' value-added structures[63] and can be complemented with trade price data in order to investigate the price and non-price factors behind the evolution of market shares.

Value-added and gross trade shares broadly deliver the same trends in market shares for the period 2000-14. Chart 4 compares changes in market shares of value added in exports of goods (called "value-added market shares" for simplicity) with conventional global market shares based on gross exports of goods.[64] Both measures point to substantial gains in market shares for CEE euro area countries and corresponding losses for most non-CEE euro area countries. Less pronounced gains in terms of value added compared with gross trade in Slovenia and Slovakia can be explained by the outsourcing to these countries of the final assembly of motor vehicles by Germany, France and Italy. A similar trend is observed in the

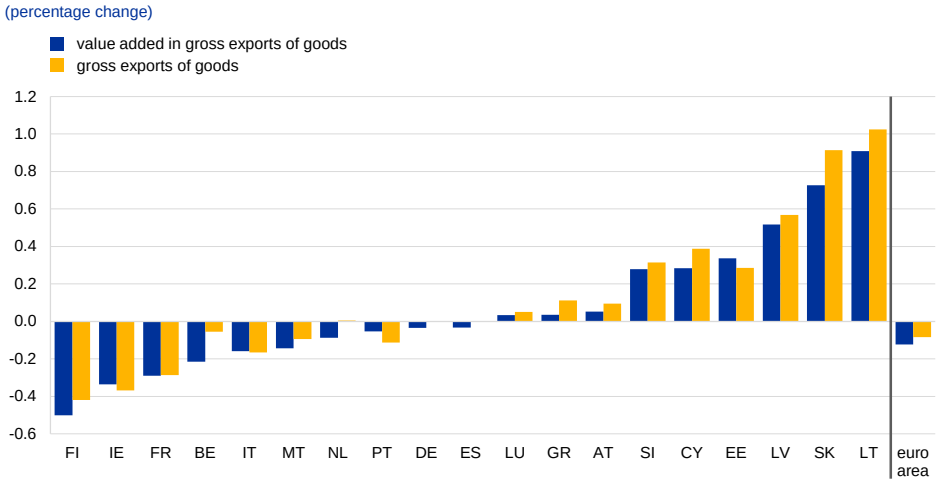
63 See Box 1.

64 Market shares are computed using bilateral trade and price information from the UN Comtrade database and input-output data from the WIOD (2016 release).

manufacturing of food products, chemical products and wood products outsourced from Finland, Sweden and Germany to Lithuania and Latvia. Estonia shares the above-mentioned tendencies of the other Baltic countries, while larger gains in terms of value added are driven by the reduced outsourcing of electronic production from Finland.[65]

Chart 4

Changes in global market shares of euro area countries between 2000 and 2014



Sources: WIOD, UN Comtrade, Latvijas Banka and Oesterreichische Nationalbank staff calculations.
Notes: Cumulative log changes of global market shares are shown. Figures for the euro area are calculated as a weighted average for individual euro area countries (using gross exports and value added in gross exports as weights).

The decomposition of the determinants of the changes in global market shares suggests that the international fragmentation of production plays a non-negligible role in the shifts of market shares (Chart 5). Changes in global value-added market shares can be decomposed into shifts in production chains, the variation of price factors and the change of residual non-price factors which can be thought of as being related to product quality and consumers' tastes.[66] The decomposition is done at the very detailed product level which makes it possible to control for differences in market conditions. First, the elasticity of real trade flows to changes in relative prices is estimated for every product on every geographical market. Taken together with the information on the changes in unit values, it provides the contribution of price and cost factors at a disaggregated level. Then, the aggregate contribution of price competitiveness is obtained. To account for the fact that each product contains value added from various countries, the aggregation uses weights calculated from trade in value added (rather than gross trade, as in the conventional REER). Moreover, a specific term accounting for shifts in global value chains is introduced into the decomposition; it is calculated as the weighted growth in a country's share in the production of all goods exported by all countries. The positive shift in production chains can be achieved either by a higher domestic

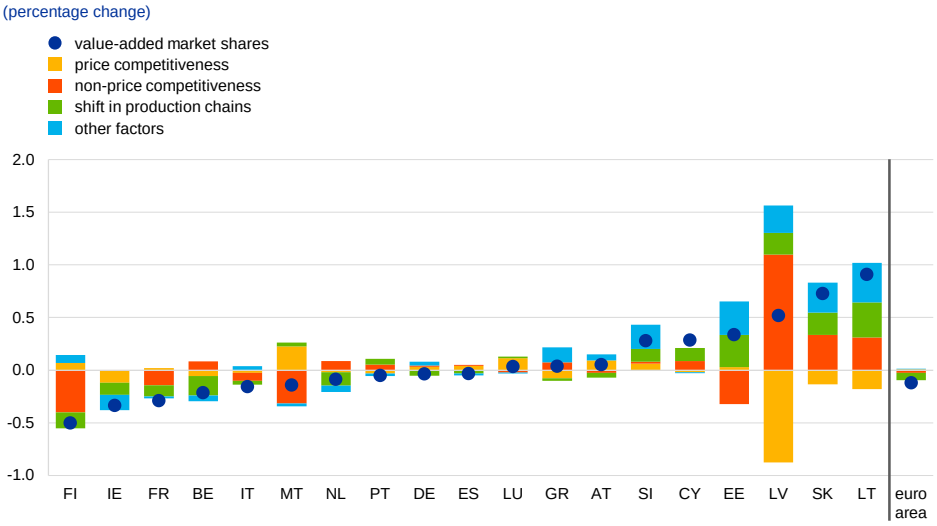
65 This was related to the manufacturing process of Elcoteq in Estonia, which started in the late 1990s and was later reduced substantially.

66 The decomposition also includes "other factors" such as shifts in demand or changes in the set of competitors. The empirical importance of other factors is found to be minor, but they are still needed for a theoretically sound decomposition.

content in a country's own gross exports, or by a higher value-added share in third countries' gross exports. Finally, the non-price competitiveness is measured as a residual term that is not explained by the above-mentioned factors.[67]

Chart 5

Decomposition of value-added market shares between 2000 and 2014



Sources: WIOD, UN Comtrade, Latvijas Banka and Oesterreichische Nationalbank staff calculations.
Notes: Other factors include the extensive margin, the set of competitors and shifts in the demand structure. The chart shows cumulative log changes of global market shares. Figures for the euro area are calculated as a weighted average for individual euro area countries (using value added in gross exports as a weight). For details of the methodology, see Benkovskis and Wörz (2015).

Changes in GVC participation and outsourcing resulted in market share losses for non-CEE euro area countries (except for Portugal, Luxembourg, Malta and Cyprus) and gains for CEE euro area countries between 2000 and 2014 (Chart 5). At the same time, increases in quality and consumers' preferences for CEE euro area countries' products overcompensated for the losses in price competitiveness. Compared with gross export market shares, the decomposition considering value-added shares downplays the role of non-price competitiveness, since some part of quality gains and losses of the gross exports can be attributed to the outsourcing process.[68] Thus, the analysis based on value-added shares enhances the role of cost and price factors.

In conclusion, using value-added flows instead of gross exports for the computation of global market shares improves the understanding of the drivers behind the external performances of euro area countries. Although both market shares follow similar trends, the decomposition of the value-added shares reveals the role of production outsourcing and provides a more precise contribution of price and non-price factors.

67 For details of the methodology, see Benkovskis, K. and Wörz, J., "'Made in China' – How does it affect our understanding of global market shares?", *Working Paper Series*, No 1787, ECB, 2015.

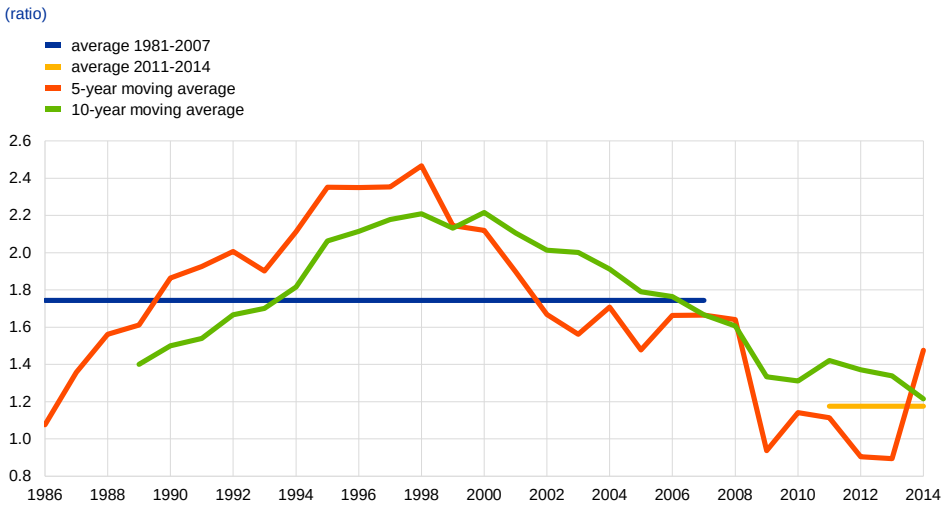
68 For more empirical results, see Benkovskis and Wörz (2015), op. cit.

2.3 Global income elasticities of trade

While trade grew by twice as much as income over the period 1981-2007, the trade-to-GDP growth ratio fell to about unity in the period 2011-2014 (Chart 6). In particular, the drop in the ratio was driven by a collapse in trade flows following the Great Recession that was significantly stronger than the decline in global income.

Chart 6

Ratio of global import growth to GDP growth



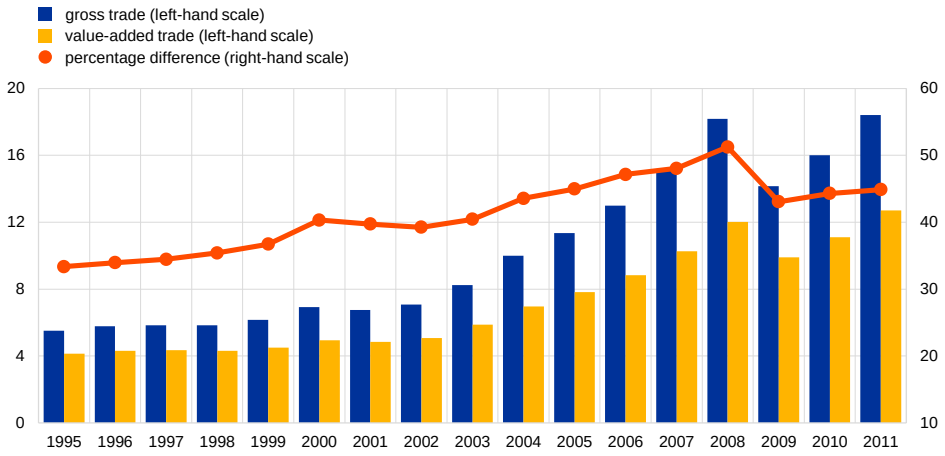
Source: ECB staff calculations.
Notes: The last observation refers to 2014. The red line shows the ratio of the average growth rate of global imports of goods and services to global GDP growth over a rolling five-year window (the green line is based on a ten-year window).

The changing international fragmentation of production is one of the drivers of the trade growth dynamics in relation to income growth. Although (tariff and non-tariff-related) trade costs, trade openness and financial liberalisation have been important determinants of trade growth, the intensity of engagement in global value chains plays a key role in explaining the disproportionate growth of trade compared with income at the end of the last century and the unexpectedly sharp drop after the crisis. First, from a merely statistical point of view, the organisation of production chains implies that goods and services cross borders several times during the production process and are hence partly double-counted in customs trade flow statistics (see Figure A in Box 1). As a result, registered gross trade flows exceed the effective value added of trade flows (Chart 7). Second, trade in global value chains is mainly in durable goods, which are known to have a high income elasticity, explaining the steepness of the trade reaction in the global crisis. Third, supply chain effects might intensify negative demand shocks, as downstream firms would initially cut inventories, affecting input providers.

Chart 7

Global gross trade versus value-added trade

(left-hand scale: USD trillions; right-hand scale: percentages)

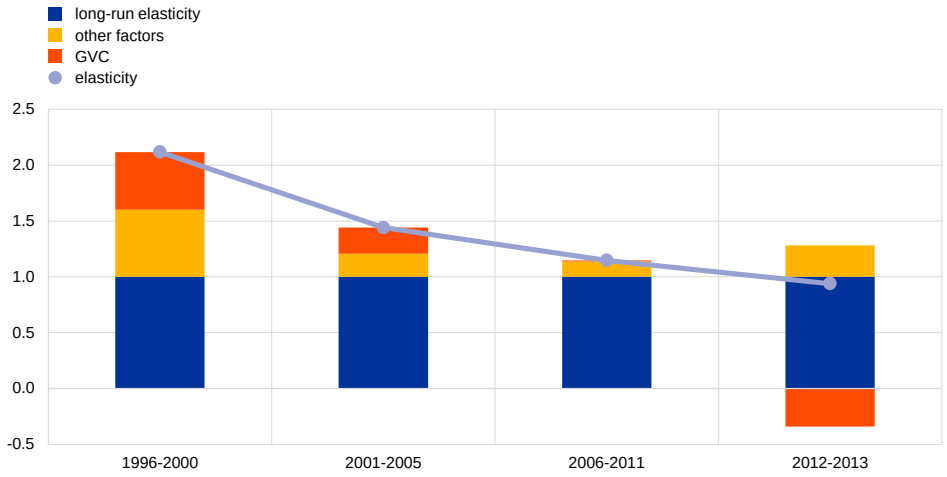


Sources: WIOD and ECB calculations.

Chart 8

Contributions to the global income elasticity of trade

(trade-income elasticity and contributions)



Source: IRC Trade Task Force, "Understanding the weakness in global trade: what is the new normal?", Occasional Paper Series, No 178, ECB, 2016, Section 3.
Notes: The calculations follow Borin and Mancini (2015), op. cit. Other factors refer to the income elasticity of the non-GVC-related import content of final demand.

GVC participation helps to explain significant variations in the global trade-income elasticity. Regression results based on a standard import demand model[69] augmented by a GVC participation index show that global value chains have a significant impact on import elasticities. Moreover, the decomposition of the income elasticity of trade for the period 1995-2011 shows that the contribution of global value

[69] See Anderton, R., Baltagi, B. H., Skudelny, F. and Sousa, N., "Intra- and Extra-Euro Area Import Demand for Manufactures", *Applied Economics Quarterly*, Vol. 53(3), 2007, pp. 221-241.

chains has been about 40% on average.[70] However, recent data on GVC integration indicate a flattening trend in recent years[71] and this translates into a negative contribution of global value chains to the global income elasticity of trade for the period 2012-13 (Chart 8).

The results of this analysis suggest that GVC dynamics are relevant for medium-term trade projections. From a euro area policy perspective, the decline in GVC participation was one of the factors explaining recent downward revisions to the global income elasticity of trade.[72] Going forward, a close monitoring of GVC dynamics is warranted to ensure consistent trade projections.

3 Other implications of cross-country production linkages for macroeconomic analysis

3.1 Sectoral spillovers via global production linkages

Production linkages are a potential channel for real economic activity spillovers.[73] Firms and sectors are increasingly sourcing or selling their inputs across borders and production processes are broken down in such a way that value is added in each step. This section utilises the World Input-Output Database to investigate empirically how production linkages give rise to real activity spillovers and to establish which characteristics of the network are relevant for the transmission of spillovers. Chart 9 reports correlation coefficients of sectors' growth in real value added at a given distance[74] in the input-output network. It shows that because sectors are more closely connected with each other through trade in intermediate inputs, their value-added growth is more correlated. As a recent strand of literature[75] has shown, shocks to specific firms or sectors transmit through production networks and might potentially translate into aggregate macroeconomic disturbances.

70 See Borin, A. and Mancini, M., "Follow the value added: bilateral gross export accounting", Banca d'Italia Working Paper No 1026, 2015, for methodological details.

71 See Chart 1.

72 See IRC Trade Task Force, "Understanding the weakness in global trade: what is the new normal?", *Occasional Paper Series*, No 178, ECB, 2016.

73 International input-output linkages may have also contributed to synchronising inflation rates by intensifying the spillovers from foreign cost shocks; see Auer, R. A., Borio, C. and Filardo, A., "The globalisation of inflation: the growing importance of global value chains", BIS Working Paper No 602, Bank for International Settlements, 2017, and Auer, R. A., Levchenko, A. A., and Sauré, P., "International inflation spillovers through input linkages", NBER Working Paper No 23246, National Bureau of Economic Research, 2017.

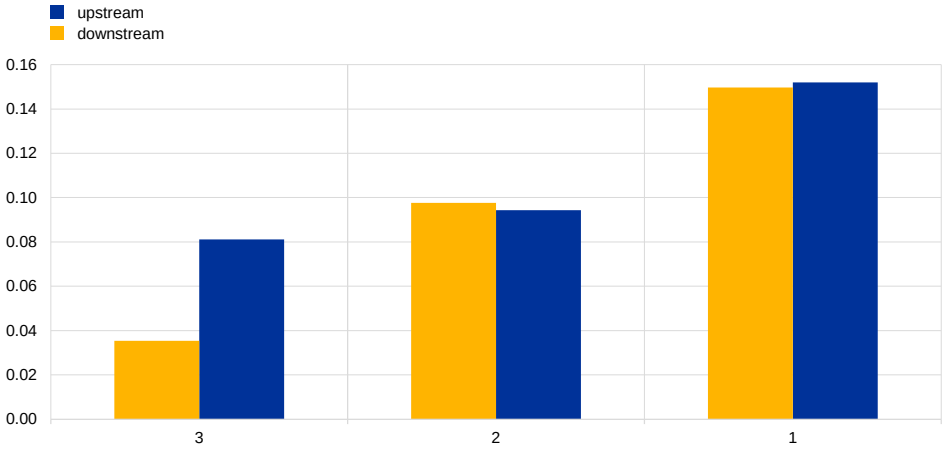
74 Distance measures the shortest path between any two sectors in the network, that is, how many times inputs from one sector are sold in order to reach another sector. It is computed with the Dijkstra algorithm.

75 See Gabaix, X., "The granular origins of aggregate fluctuations", *Econometrica*, Vol. 79(3), 2011, pp. 733-772, and Acemoglu, D., Carvalho, V. M., Ozdaglar, A. and Tahbaz-Salehi, A., "The network origins of aggregate fluctuations", *Econometrica*, Vol. 80(5), 2012, pp. 1977-2016.

Chart 9

Real value-added synchronisation and distance between sectors

(correlation coefficients for value added in interrelated sectors)



Sources: WIOD (2013 release) and ECB calculations.
Notes: The chart shows the average (1996-2009) pairwise correlation between sectors' value added at a given distance to upstream and downstream sectors. The distance is equal to one when two sectors trade directly, two when two sectors trade through another sector and three when two sectors trade through two other sectors.

The presence of hub sectors is relevant for the transmission of economic shocks as they connect otherwise unrelated entities through input-output linkages and could act as a conductor of shocks. In the World Input-Output Database[76] the upstream hubs (i.e. sectors that supply inputs to other sectors) are mostly located in the United States, the United Kingdom, Germany and Russia, and operate in sectors such as computer activity, headquarter activity, R&D, finance and raw materials. As regards the downstream part of the value chain (i.e. sectors that purchase inputs from other sectors), the hubs are transport equipment, electronics, construction and basic metals in Germany, the United States and more recently China. Box 2 focuses on the spillover effects originating in some of these sectors.

Activity spills over via these sectors to many other trading partners. A panel econometric analysis of the WIOD data confirms that, on average, spillovers to a sector stemming from other upstream and downstream sectors involved in its production chains are significant.[77]

Box 2

Identification of sectoral spillovers in the global economy

To investigate the transmission of shocks through global supply chains, a non-linear panel model is estimated. In the model, the change in real value added of sector *i* is related to its past values and to the previous period's change in value added of a set of direct and indirect upstream

[76] See Box 1 for a description of the database.

[77] See Box 2 for further details.

and downstream sectors.[78] The estimation controls for other observed factors determining the activity of sector *i*, x_{it}, as well as common unobserved time factors in the error term ε_{it}:

$$y_{it} = \eta_t + \rho^{lag} y_{i,t-1} + \rho^{up} \tilde{y}^{up}_{i,t-1} + \rho^{down} \tilde{y}^{down}_{i,t-1} + \boldsymbol{\beta}' \boldsymbol{x}_{it} + \varepsilon_{it}$$

$\tilde{y}^{up}_{i,t-1}$ and $\tilde{y}^{down}_{i,t-1}$ are weighted averages of the value added of a selected group of upstream and downstream sectors:

$$\tilde{y}^{*}_{i,t-1} = \sum_{j \neq i} 1\left(w^{*}_{ij,t-1} \geq r^{*}\right) w^{*}_{ij,t-1} y_{j,t-1}$$

where * stands for "up" and "down" and the weight $w^{*}_{ij,t-1}$ measures the bilateral importance of the value-added contribution and is inversely proportional to the bilateral distance. The aggregate $\tilde{y}^{*}_{i,t-1}$ is constructed such that only sectors with a weight above a certain level *r* are included in the average. The threshold is endogenously determined by the model and allows the identification of the most important sectors for spillover transmission.[79]

The regressions confirm that upstream and downstream spillovers through supply chains are significant. The spillover effects are positive and of sizeable magnitude and their significance is not lost when including other determinants of sector *i*'s activity (employment and capital), the country's activity and global factors (agriculture, fuel and metal prices and US interest rates). This means that the change in activity of a sector is related to the change in activity of both its input providers and its customers.

The impact of a change in real value added in any sector can be traced and quantified by using the estimated coefficients from the model. This exercise identifies spillovers that stem solely from a change in real value added in the affected sectors. For example, the transport equipment sector (i.e. the car industry) in Germany and the electronics and optical equipment sector in China illustrate how changes in real value added propagate to other domestic sectors, the euro area and the rest of the world (Chart A). Obviously, the supply chain impact is the greatest in the domestic economy, affecting 27 and 30 sectors respectively (blue bars), but it also affects many other sectors in the euro area (yellow bars) and even spills over to other countries and involves a total of 236 and 172 sectors respectively (red bars). When these and other hub sectors' ties to the rest of the value chains are severed, spillovers gradually diminish and become statistically insignificant.[80]

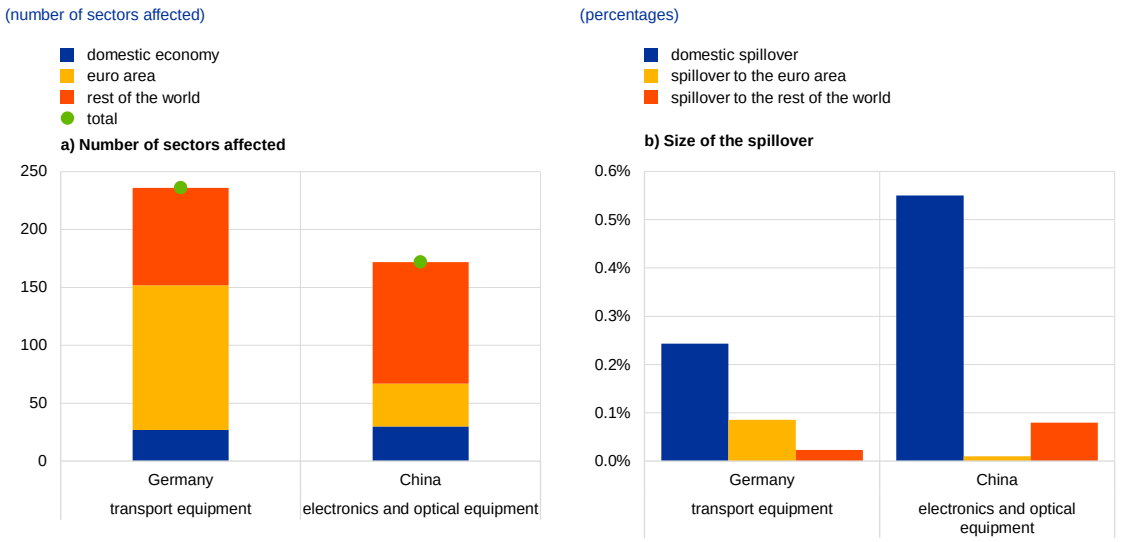
[78] The analysis in this box does not attempt to investigate the nature of the shock. In a Cobb-Douglas setting, demand-side shocks transmit upstream in the value chain, whereas supply shocks propagate to downstream sectors; see Acemoglu, D., Akcigit, U. and Kerr, W., "Networks and the macroeconomy: An empirical exploration", *NBER Macroeconomics Annual*, Vol. 30(1), 2016, pp. 273-335. For a further investigation of the impact of demand and supply shocks in this analysis, see Frohm, E. and Gunnella, V., "Sectoral interlinkages in global value chains: spillovers and network effects", *Working Paper Series*, No 2064, ECB, 2017.

[79] For further details of the methodology, see Frohm and Gunnella (2017), op. cit.

[80] See Figure 5 of Frohm and Gunnella (2017), op. cit.

Chart A

Spillovers from specific sectors



Sources: WIOD (2013 release) and ECB calculations.
Notes: In panel b, the impact of the sector reported on each other sector i is computed as $\hat{\rho}^* w^*_{ij,t}$ and the overall impact as $\hat{\rho}^* \sum_{i \neq j} 1\left(w^*_{ij,t} \geq \hat{r}^*\right) w^*_{ij,t}$, with domestic (same-country) effects, euro area effects and effects on the rest of the countries in the sample (rest of the world) being calculated by considering the affected sectors. Spillovers are aggregated by using the sectors' respective GDP weights in total GDP of the aggregate considered.

Overall, this analysis suggests that there is significant scope for propagation of sectoral shocks through global supply chains. As hub sectors could potentially be the channel of transmission across countries and sectors, particular attention should be paid to their developments and their links with other sectors in the global economy.

3.2 The impact of global value chains on labour value added, hours worked and compensation

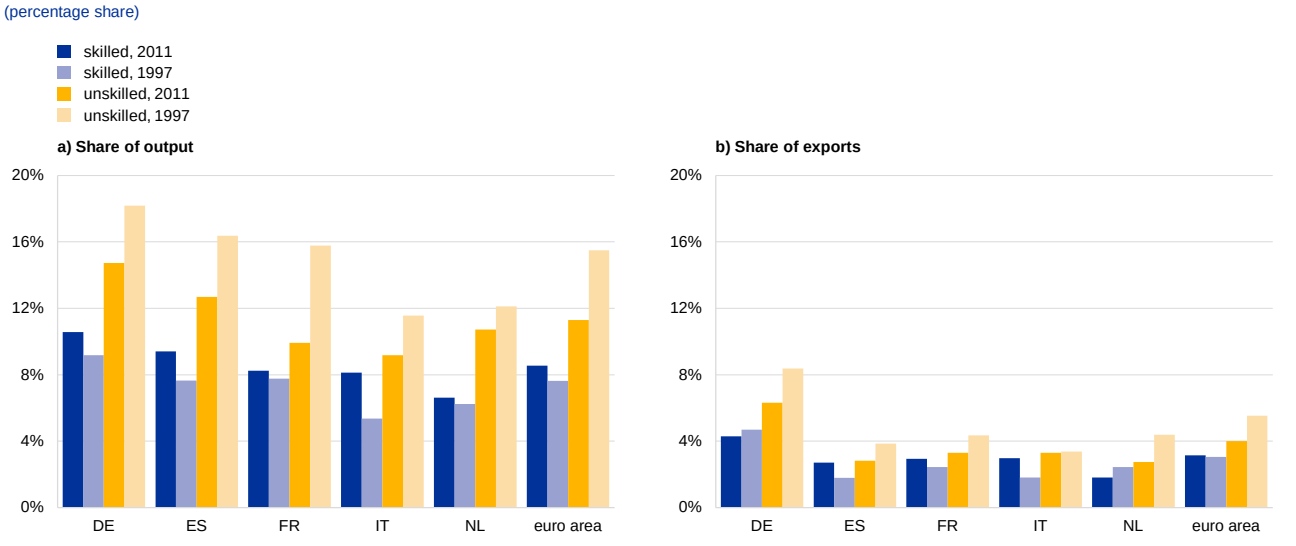
Between 1997 and 2011 unskilled labour's value-added share in the euro area has substantially declined, whereas skilled labour's share has increased. Aggregating sectoral data at the country level helps to disentangle the evolution of the labour value-added contribution for different skill groups within the euro area.[81] The overall importance of labour in both euro area output and exports decreased slightly from 1997 to 2011. Among the five largest euro area economies, Germany is characterised by the highest shares of labour value added. Euro area exports contain significantly less labour value added than gross output, revealing that exporting firms rely more heavily on imported inputs and/or capital (Chart 10). With

81 For this purpose, use is made of the World Bank's Labor Content of Exports (LACEX) Database developed by Calì et al. in 2016 on the basis of a panel of global input-output tables, exports from the Global Trade Analysis Project and national employment data. The database is a panel covering 24 sectors and 150 countries and measures the contribution of labour to a given country's exports – measured as employees' compensation (LACEX dataset) or the number of jobs (JOCEX dataset).

regard to the skill mix, skilled labour has captured a growing part of labour value added at the expense of unskilled labour.

Chart 10

Average domestic labour value-added share in the euro area and its five largest economies



Sources: Labor Content of Exports Database (World Bank) and ECB staff calculations.
Notes: The shares for the euro area are computed as a weighted average of all available euro area countries, with gross output as a weight. Due to missing data, Slovenia is not included in the computations.

Trade in global value chains changes the scope of tasks being performed in each industry, possibly affecting the skill mix and compensation within sectors. The changes to production processes and input choices related to international production segmentation in the past decades could have affected the level of employment and compensation per hour for different types of workers. Therefore, there is a need to assess the relationship between recent labour market developments and different measures of GVC participation across different sectors and for different skill groups.

Box 3

Employment, labour compensation and global value chains

This box presents the analysis of the relationship between hours worked and compensation for different skill groups, on the one hand, and GVC participation, on the other hand, in a panel of euro area sectors over the period 1995-2009. The estimating regression is:

$$\log y_{i,c,t} = \gamma_0 + \alpha * \log\left(\frac{K}{L}\right)_{i,c,t} + \gamma_1 * \log IV_{i,c,t} + \gamma_2 * \log FV_{i,c,t} + FE_{i,c} + FE_{c,t} + \epsilon_{i,c,t}$$

where the unit of observation is a sector *i* in country *c* at time *t*, $y_{i,c,t}$ is either the log of the share of high-skilled hours in total hours or the log of compensation of high-skilled and low-skilled workers, and $IV_{i,c,t}$ and $FV_{i,c,t}$ are backward and forward GVC indices, respectively.[82] Sector-country

[82] See Box 1 for a description of the GVC participation indices.

($FE_{i,c}$) and country-time ($FE_{c,t}$) fixed effects are included in order to control for unobserved time-invariant differences across industries and aggregate country-level changes in each year.[83]

The estimation results confirm that there is a significant effect of foreign value added on the skill mix and on the compensation of both high and low-skilled workers.

Estimation results using within-sector changes show that participation in global value chains may be associated with a shift towards high-skilled labour.[84] A panel fixed-effects estimation shows that participation in global value chains is associated with a change in the skill composition within sectors characterised by a shift towards high-skilled workers (Chart 11, panel a).[85] When disentangling the effect between backward and forward-looking participation indices, this effect is mainly driven by an increased usage of imported inputs.[86] Such a job polarisation might be related to a combination of both offshoring and skill-biased technical change at the sectoral level.

Turning to wages, panel analysis shows that backward participation in global value chains is associated with an increase in hourly compensation for all skill groups (Chart 11, panel b). Both high and low-skilled workers experience an increase in their hourly compensation when the sector they are working in sees an increase in the foreign value added embedded in its exports (backward participation).[87] This result is supported by existing studies that show that imported inputs generate important productivity effects, through channels involving learning, innovation, and variety or quality aspects.[88] While an increased share of imported inputs in the production process might benefit total factor productivity and hence potential output,[89] competitiveness would improve only when productivity increases faster than input costs (wages and the rental rate of capital). A number of firm-level studies find a positive net effect of imported inputs on external competitiveness, hence enabling entry into new export markets.[90] Moreover, the strengthening of global value chains has the potential to weaken the elasticity of exports to the exchange rate, for example if exports are increasingly made of inputs bought in foreign currencies.[91]

83 The wage regressions also include the capital-to-labour ratio as a determinant of the marginal productivity of labour in a Cobb-Douglas production function setting.

84 The results presented here do not provide evidence of causality, but are designed to assess correlation between different GVC participation indices and labour market outcomes.

85 For more details of the methodology, see Box 3.

86 See Box 1 for a description of the GVC participation indices.

87 This is consistent with firm-level studies such as Bas, M. and Strauss-Kahn, V., "Does importing more inputs raise exports? Firm-level evidence from France", *Review of World Economics*, Vol. 150, 2014, pp. 241-275.

88 See, for example, Halpern, L., Koren, M. and Szeidl, A., "Imported Inputs and Productivity", *American Economic Review*, Vol. 105(12), 2015, pp. 3660-3703.

89 See Box 4 for an analysis of technology transmission through production linkages in the CEE countries.

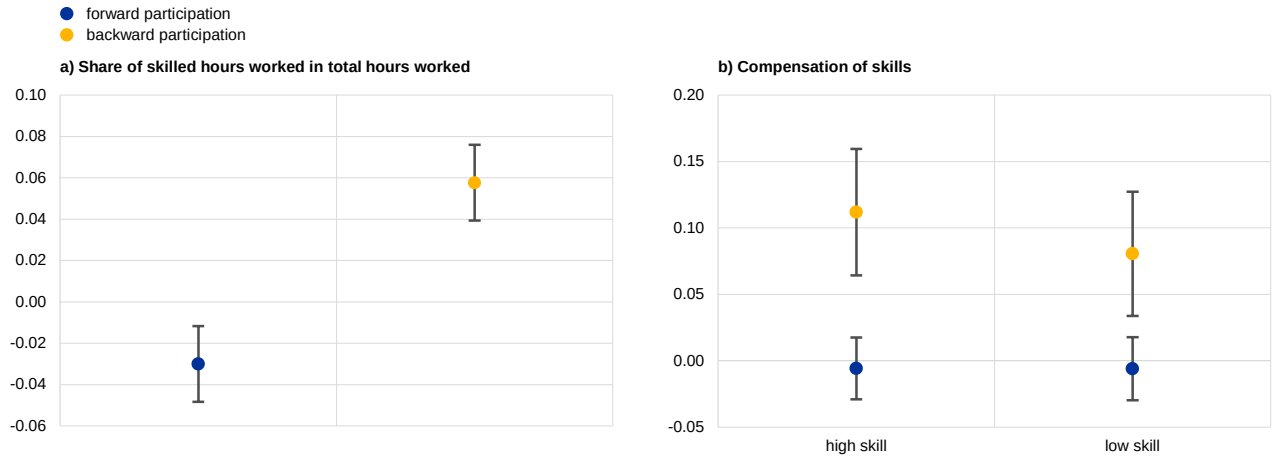
90 See, for example, Kasahara, H. and Lapham, B., "Productivity and the decision to import and export: Theory and evidence", *Journal of International Economics*, Vol. 89(2), 2013, pp. 297-316.

91 See Section 2.1 of this article for an account of the effects of the use of imported inputs in production on countries' price competitiveness.

Chart 11

GVC participation correlations with skill composition and compensation of high and low-skilled employees

(percentage change corresponding to a 1% increase in the GVC participation index)



Sources: World Input-Output Database (2013 release) and ECB staff calculations.

This analysis suggests that global value chains have an impact on labour market outcomes. A greater share of imported inputs in production may be associated with a shift towards high-skilled labour. Foreign inputs could raise wages for all skill groups. At the same time, global value chains may have positive welfare implications for the participating economies, namely technological advancement following the more efficient allocation of workers to high-skilled tasks which also implies higher wages in advanced economies, on the one hand, and increased salaries for workers in emerging economies, on the other.[92]

Box 4

Technology transfer through global value chains and productivity growth in central and eastern European countries

Supply chain linkages are an important channel for technology transmission from parent to host firms. Firms involved in production chains can benefit from being related to more technologically advanced parent firms as they can learn and absorb their technology. According to the literature, there are two main transmission channels. On the one hand, firms utilising parent companies' intermediate products in their production – i.e. firms with backward supply linkages – can have access to new technology embedded in those products and to a wide variety of inputs. On the other hand, firms providing intermediate products to their parent companies – i.e. firms with forward supply linkages – are subject to quality checks which improve their products. This, in turn, would enhance their productivity and allow them to upgrade capital.

Given the high integration of CEE countries in global value chains, productivity developments of firms in these countries depend heavily on these technology spillovers. As shown in panel a of Chart 1, CEE countries are integrated in GVCs to a much larger extent than the

92 Welfare gains for advanced economies only materialise when resources are efficiently and rapidly reallocated across skill groups. See Rodriguez-Clare, A., "Offshoring in a Ricardian World", *American Economic Journal: Macroeconomics*, Vol. 2(2), 2010, pp. 227-258.

euro area on average, even after the general slowdown in GVC participation growth after 2011. For this reason, this box uses the CEE region as a case study to analyse to what extent and how technology spills from parent to host firms in GVCs.

According to the literature, new technology diffuses across countries in two stages: first from global frontier firms to national frontier firms, and second from national frontier firms to national non-frontier firms. This framework is adapted to GVCs and it is assumed that the relevant global frontier firms are parent firms and that only national frontier firms in the host country participate directly in GVCs. Accordingly, in a first stage, the most productive firms in the host country absorb technology from parent firms. In a second stage, the new technology spills from firms participating in GVCs to non-frontier firms in the host economy, which operate in domestic production chains and interact with national frontier firms. Moreover, transmission depends on the exposure to and learning from the relevant frontier firms ("pass-through" effect), as well as the ability to catch up with the frontier ("catch-up" effect).

Table A

TFP growth of national frontier and non-frontier firms

	First stage of technology diffusion		Second stage of technology diffusion	
	GVC forward participation (exports)	GVC backward participation (imports)	GVC forward participation (exports)	GVC backward participation (imports)
	0.156***	0.430***	0.060*	0.151***
TFP growth of GVC frontier	(0.044)	(0.058)	(0.036)	(0.041)
	0.281***	0.364***	0.041	0.010
Lagged TFP gap between GVC frontier and national frontier	(0.044)	(0.054)	(0.026)	(0.024)
			0.947***	0.920***
TFP growth of national frontier			(0.051)	(0.049)
			0.560***	0.569***
Lagged TFP gap between national frontier and non-frontier firms			(0.077)	(0.080)
	0.079**	0.199**	0.068**	0.203**
GVC participation growth	(0.036)	(0.079)	(0.032)	(0.079)
Observations	642	642	642	642
Adjusted R-squared	0.224	0.334	0.727	0.736

Sources: CompNet, WIOD (2016 release) and ECB calculations.
Notes: Robust standard errors in parentheses, clustered at the country-sector level. Country-sector fixed effects, a constant and dummies for crisis and post-crisis periods are included.
*** p<0.01, ** p<0.05, * p<0.10

Parametric analysis using data from the Competitiveness Research Network (CompNet) and the latest WIOD release for nine CEE countries and ten years (2003-12) provides evidence in support of the importance of technology transfer for total factor productivity (TFP) growth in CEE economies. First, TFP growth of the most productive firms in CEE countries, assumed to be directly participating in GVCs, is associated positively and significantly with TFP growth of non-CEE EU frontier firms operating in sectors involved in the same production chain (the "GVC frontier"). The first two columns of Table A confirm the importance not only of the pass-through effect, but also of the catch-up effect (proxied by the lagged TFP gap to the GVC frontier). Second, TFP growth of non-frontier firms in CEE countries is related fundamentally to TFP growth of the most productive domestic firms participating in GVCs, rather than to the GVC frontier (the last two columns of Table A). Thus, non-frontier firms benefit only indirectly from the technology transfer through GVCs. These results confirm the two-stage technology diffusion process proposed by the literature. Moreover, Table A shows that backward linkages are more important for technology transfer than forward

linkages, as higher-quality inputs are made available to host firms and generate positive externalities.

In conclusion, technology transfer through GVCs, particularly via backward linkages, is a key factor behind productivity developments in CEE countries.

4 Conclusions

Euro area countries are heavily involved in global production chains. This has an impact on some key macroeconomic indicators. It is therefore essential to consider global value chains when dealing with certain macroeconomic concepts. More specifically:

- Measures of competitiveness which account for the presence of global value chains, such as value-added and input-output REERs, portray different pictures regarding episodes of currency appreciation/depreciation compared with conventional REERs.
- Although shifts in production chains are not a major determinant of the change in global market shares of euro area countries, taking into account global value chains helps to understand the drivers of competitiveness.
- Developments in global value chains have played a role in the accelerating and then decelerating dynamics of the elasticity of trade to global demand over the past decades. To the extent that the high responsiveness of trade to income – which was observed before the crisis also as a result of the expansion of global value chains – is no longer observed in the future, a lower elasticity of trade to income could be regarded as the “new normal”.

Firms’ and sectors’ involvement in production chains creates cross-country interlinkages. This has a bearing on the analysis of macroeconomic spillovers:

- Real spillovers via input-output linkages occur and certain sectors may play a key role in their transmission. Moreover, production chains are a channel for foreign and domestic technological transfer to non-frontier firms, which takes place through the technology that is embedded in imported intermediate products.
- Finally, sectors increasing their involvement in global value chains tend to hire a higher share of high-skilled workers and show systematically higher wages for any given skill level. In particular, sectors located downstream in the value chain see a positive effect on wages from using more foreign inputs.

Statistics

Contents

Further information

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

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 [1] (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 [2] (HICP)
							Total	excluding food and energy					
	1	2	3	4	5	6	7	8	9	10	11	12	13
2014	3.5	2.6	3.1	0.4	7.3	1.3	1.7	1.8	1.6	1.5	2.7	2.0	0.4
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	1.8	0.9	6.7	1.8	1.1	1.8	1.3	0.7	-0.1	2.0	0.2
2016 Q4	1.0	0.4	0.6	0.3	1.7	0.6	1.5	1.7	1.8	1.2	0.3	2.2	0.7
2017 Q1	0.8	0.3	0.3	0.4	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	0.7	1.8	0.7	2.1	1.8	1.9	2.7	0.4	1.4	1.5
Q3	.	0.8	0.4	0.6	1.7	0.6	2.2	1.8	2.0	2.8	0.6	1.6	1.4
2017 June	-	-	-	-	-	-	1.9	1.8	1.6	2.6	0.4	1.5	1.3
July	-	-	-	-	-	-	2.0	1.8	1.7	2.6	0.4	1.4	1.3
Aug.	-	-	-	-	-	-	2.2	1.8	1.9	2.9	0.7	1.8	1.5
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. [3]	-	-	-	-	-	-	.	.	.	.	.	.	1.5

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 [1]		
	Composite Purchasing Managers' Index						Global Purchasing Managers' Index [2]					
	Global [2]	United States	United Kingdom	Japan	China	Memo item: euro area	Manufacturing	Services	New export orders	Global	Advanced economies	Emerging market economies
	1	2	3	4	5	6	7	8	9	10	11	12
2014	54.2	57.3	57.9	50.9	51.1	52.7	53.3	54.1	51.5	2.7	3.8	2.0
2015	53.2	55.8	56.2	51.4	50.4	53.8	51.8	53.7	50.3	0.9	3.7	-1.0
2016	51.6	52.4	53.4	50.5	51.4	53.3	51.8	51.9	50.2	1.0	1.3	0.7
2016 Q4	53.2	54.6	55.5	52.0	53.1	53.8	53.4	53.2	50.5	1.8	-1.3	3.9
2017 Q1	53.3	54.3	54.6	52.5	52.3	55.6	53.4	53.3	51.8	2.1	1.4	2.6
Q2	53.1	53.6	54.8	53.0	51.3	56.6	52.5	53.3	51.5	-0.3	1.6	-1.6
Q3	53.3	54.9	54.1	51.8	51.9	56.0	52.7	53.5	51.8	.	.	.
2017 June	53.1	53.9	53.8	52.9	51.1	56.3	52.1	53.4	51.7	-0.3	1.6	-1.6
July	53.1	54.6	54.1	51.8	51.9	55.7	52.5	53.3	51.6	1.5	2.3	0.9
Aug.	53.6	55.3	54.0	51.9	52.4	55.7	52.8	53.9	52.4	1.2	1.2	1.2
Sep.	53.2	54.8	54.1	51.7	51.4	56.7	52.8	53.4	51.6	.	.	.
Oct.	53.6	55.2	55.8	53.4	51.0	56.0	52.7	53.9	51.7	.	.	.
Nov.	53.2	54.5	54.9	52.2	51.6	57.5	53.6	53.1	52.2	.	.	.

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 [1]					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
2014	0.09	0.13	0.21	0.31	0.48	0.23	0.13
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 May	-0.36	-0.37	-0.33	-0.25	-0.13	1.19	-0.01
June	-0.36	-0.37	-0.33	-0.27	-0.15	1.26	-0.01
July	-0.36	-0.37	-0.33	-0.27	-0.15	1.31	-0.01
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

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 [1], [2]					Euro area [1], [2]	United States	United Kingdom	Euro area [1], [2]			
	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
2014	-0.02	-0.09	-0.12	0.07	0.65	0.74	1.95	1.45	-0.15	-0.11	0.58	1.77
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 May	-0.73	-0.74	-0.74	-0.39	0.36	1.10	1.05	0.88	-0.76	-0.67	0.43	1.54
June	-0.69	-0.65	-0.59	-0.17	0.54	1.19	1.07	0.93	-0.60	-0.41	0.65	1.63
July	-0.71	-0.71	-0.67	-0.21	0.58	1.29	1.07	0.93	-0.70	-0.51	0.72	1.75
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

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											
	Broad index	50	Basic materials	Consumer services	Consumer goods	Oil and gas	Financials	Industrials	Technology	Utilities	Telecoms	Health care	Standard & Poor's 500	Nikkei 225
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
2014	318.7	3,145.3	644.3	216.6	510.6	335.5	180.0	452.9	310.8	279.2	306.7	668.1	1,931.4	15,460.4
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 May	387.1	3,601.9	765.9	281.9	707.5	318.8	186.4	616.2	477.1	272.5	363.8	935.1	2,395.3	19,726.8
June	383.6	3,547.8	767.8	283.0	698.8	299.9	182.4	617.2	475.2	283.6	355.4	927.3	2,434.0	20,045.6
July	377.8	3,483.9	745.3	270.9	685.3	289.5	187.7	606.5	465.2	273.5	339.7	891.3	2,454.1	20,044.9
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

Source: ECB.

2 Financial developments

2.4 MFI interest rates on loans to and deposits from households (new business) [1), 2)]

(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					
	Overnight	Redeemable at notice of up to 3 months	With an agreed maturity of:				By initial period of rate fixation		APRC [3)]		By initial period of rate fixation				APRC [3)]	Composite cost-of-borrowing indicator
			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
2016 Nov.	0.08	0.49	0.43	0.78	6.39	16.73	4.91	5.74	6.12	2.43	1.76	1.91	1.76	1.79	2.24	1.79
Dec.	0.08	0.49	0.43	0.76	6.33	16.69	4.78	5.48	5.87	2.31	1.77	1.90	1.80	1.75	2.24	1.78
2017 Jan.	0.07	0.48	0.41	0.76	6.34	16.64	5.05	5.87	6.24	2.27	1.76	1.88	1.80	1.76	2.28	1.81
Feb.	0.07	0.48	0.40	0.77	6.38	16.69	5.09	5.72	6.17	2.39	1.77	1.89	1.84	1.81	2.29	1.85
Mar.	0.06	0.48	0.40	0.74	6.39	16.70	4.99	5.62	6.08	2.39	1.74	1.88	1.85	1.82	2.25	1.85
Apr.	0.06	0.47	0.39	0.72	6.34	16.70	4.83	5.58	5.97	2.36	1.73	1.89	1.91	1.85	2.26	1.87
May	0.06	0.47	0.39	0.81	6.33	16.70	5.08	5.78	6.22	2.43	1.73	1.90	1.90	1.87	2.23	1.87
June	0.06	0.47	0.38	0.77	6.31	16.82	4.68	5.74	6.19	2.41	1.69	1.89	1.91	1.89	2.21	1.87
July	0.05	0.46	0.38	0.76	6.27	16.80	4.95	5.84	6.28	2.36	1.75	1.91	1.90	1.90	2.21	1.88
Aug.	0.05	0.45	0.35	0.75	6.24	16.80	5.32	5.89	6.34	2.35	1.75	2.00	1.92	1.94	2.21	1.91
Sep.	0.05	0.45	0.35	0.74	6.28	16.80	5.07	5.71	6.20	2.34	1.70	1.93	1.96	1.96	2.20	1.89
Oct. [(p)]	0.05	0.44	0.35	0.75	6.24	16.80	4.88	5.68	6.15	2.40	1.67	1.92	1.93	1.96	2.18	1.88

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) [1), 2)]

(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
	Overnight	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
2016 Nov.	0.07	0.12	0.42	2.65	2.60	2.91	2.38	1.82	1.82	1.68	1.29	1.43	1.52	1.82
Dec.	0.07	0.12	0.59	2.64	2.58	2.84	2.30	1.83	1.84	1.68	1.33	1.46	1.62	1.81
2017 Jan.	0.06	0.12	0.51	2.64	2.68	2.80	2.30	1.81	1.86	1.73	1.22	1.37	1.62	1.79
Feb.	0.06	0.10	0.53	2.64	2.58	2.78	2.35	1.77	1.76	1.71	1.18	1.31	1.53	1.76
Mar.	0.06	0.08	0.58	2.58	2.52	2.79	2.35	1.76	1.79	1.72	1.30	1.62	1.57	1.82
Apr.	0.06	0.10	0.40	2.56	2.55	2.69	2.35	1.79	1.78	1.70	1.34	1.50	1.64	1.81
May	0.05	0.10	0.43	2.52	2.49	2.77	2.37	1.76	1.73	1.71	1.20	1.47	1.63	1.76
June	0.05	0.06	0.43	2.51	2.46	2.68	2.34	1.74	1.71	1.67	1.27	1.43	1.56	1.76
July	0.05	0.11	0.35	2.45	2.45	2.76	2.36	1.75	1.74	1.72	1.23	1.33	1.65	1.74
Aug.	0.05	0.10	0.36	2.44	2.49	2.70	2.41	1.74	1.78	1.78	1.24	1.43	1.59	1.74
Sep.	0.04	0.07	0.44	2.42	2.45	2.73	2.39	1.71	1.68	1.73	1.19	1.45	1.58	1.73
Oct. [(p)]	0.04	0.11	0.42	2.41	2.40	2.69	2.36	1.70	1.66	1.70	1.23	1.34	1.61	1.73

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 [1]						
	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	135	.	59	466	62	349	161	45	.	32	79	33
2017 May	1,302	521	139	.	93	481	68	368	173	52	.	37	84	21
June	1,288	507	144	.	80	484	72	355	149	60	.	33	81	33
July	1,289	514	146	.	86	477	66	383	177	54	.	43	77	32
Aug.	1,293	516	147	.	84	474	71	356	169	54	.	29	80	25
Sep.	1,299	530	145	.	81	478	65	371	162	61	.	38	82	29
Oct.	1,279	529	146	.	84	457	62	371	175	44	.	41	74	36
Long-term														
2014	15,128	4,048	3,160	.	993	6,285	643	225	65	48	.	16	86	10
2015	15,246	3,784	3,287	.	1,056	6,481	637	216	68	46	.	13	81	9
2016	15,397	3,695	3,233	.	1,186	6,643	641	220	62	53	.	18	79	8
2017 May	15,423	3,626	3,245	.	1,140	6,779	634	281	68	90	.	18	101	4
June	15,406	3,620	3,216	.	1,144	6,788	638	230	62	50	.	24	84	9
July	15,399	3,618	3,232	.	1,154	6,762	633	268	74	93	.	21	76	4
Aug.	15,326	3,592	3,173	.	1,150	6,777	633	127	29	35	.	3	54	5
Sep.	15,367	3,570	3,180	.	1,178	6,805	634	231	56	63	.	17	90	5
Oct.	15,347	3,587	3,147	.	1,184	6,789	640	236	78	42	.	21	85	10

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
Oustanding amount											
2014	16,448.6	4,590.6	3,291.0	.	1,051.3	6,822.7	693.0	6,016.4	591.3	850.5	4,574.6
2015	16,514.6	4,301.6	3,433.5	.	1,117.8	6,959.3	702.4	6,813.1	584.3	984.0	5,244.9
2016	16,637.7	4,213.1	3,368.1	.	1,245.0	7,108.2	703.4	7,089.5	537.6	1,097.9	5,454.0
2017 May	16,724.9	4,146.3	3,384.1	.	1,232.3	7,260.3	701.9	7,845.6	631.3	1,151.9	6,062.4
June	16,693.4	4,127.4	3,360.0	.	1,223.7	7,272.4	709.9	7,694.5	640.5	1,151.7	5,902.4
July	16,688.5	4,132.6	3,378.3	.	1,240.4	7,238.8	698.5	7,718.2	663.1	1,197.6	5,857.6
Aug.	16,618.5	4,108.3	3,320.5	.	1,234.3	7,250.5	704.7	7,638.4	630.8	1,174.6	5,833.0
Sep.	16,666.3	4,100.2	3,325.3	.	1,259.1	7,282.2	699.5	7,937.9	657.7	1,237.6	6,042.6
Oct.	16,625.3	4,115.8	3,293.3	.	1,267.5	7,246.3	702.2	8,169.9	649.6	1,299.6	6,220.6
Growth rate											
2014	-0.6	-8.2	1.0	.	5.3	3.2	1.1	1.5	7.2	1.9	0.7
2015	0.2	-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 May	1.6	-2.0	2.9	.	8.1	2.2	0.1	0.8	5.9	1.1	0.2
June	1.5	-2.2	3.7	.	8.3	1.7	0.4	0.7	4.8	1.2	0.3
July	1.8	-1.1	3.4	.	9.3	1.8	-0.9	0.8	6.1	1.4	0.1
Aug.	1.5	-1.5	1.9	.	9.1	2.0	-0.4	0.8	6.1	1.4	0.2
Sep.	1.3	-1.5	0.9	.	7.5	2.3	-0.4	0.9	6.1	2.0	0.2
Oct.	0.9	-0.9	-0.9	.	7.2	1.9	-0.4	0.9	6.0	2.8	0.1

Source: ECB.

2 Financial developments

2.8 Effective exchange rates [1)]

(period averages; index: 1999 Q1=100)

	EER-19						EER-38	
	Nominal	Real CPI	Real PPI	Real GDP deflator	Real ULCM [2)]	Real ULCT	Nominal	Real CPI
	1	2	3	4	5	6	7	8
2014	101.4	97.2	96.4	91.0	96.4	98.6	114.3	95.4
2015	91.7	87.6	88.6	82.8	80.6	88.2	105.7	87.0
2016	94.4	89.5	90.8	85.0	79.8	89.3	109.7	89.3
2016 Q4	94.5	89.6	90.5	84.7	79.5	89.1	109.4	88.9
2017 Q1	93.8	89.0	89.6	83.4	78.7	88.3	108.6	88.1
Q2	95.3	90.3	91.0	84.7	78.8	89.2	110.2	89.1
Q3	98.6	93.2	93.7	.	.	.	114.5	92.4
2017 June	96.3	91.3	91.9	-	-	-	111.5	90.1
July	97.6	92.4	93.0	-	-	-	113.4	91.5
Aug.	99.0	93.6	94.3	-	-	-	115.1	92.9
Sep.	99.0	93.6	94.0	-	-	-	115.1	92.8
Oct.	98.6	93.1	93.5	-	-	-	114.9	92.4
Nov.	98.5	93.1	93.3	-	-	-	115.1	92.6
Percentage change versus previous month								
2017 Nov.	-0.1	0.0	-0.2	-	-	-	0.2	0.2
Percentage change versus previous year								
2017 Nov.	4.2	3.9	3.0	-	-	-	5.0	4.0

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
2014	8.186	7.634	27.536	7.455	308.706	140.306	4.184	0.806	4.4437	9.099	1.215	1.329
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
2016 Q4	7.369	7.523	27.029	7.439	309.342	117.918	4.378	0.869	4.5069	9.757	1.080	1.079
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
2017 June	7.646	7.410	26.264	7.438	308.285	124.585	4.211	0.877	4.5721	9.754	1.087	1.123
July	7.796	7.412	26.079	7.437	306.715	129.482	4.236	0.886	4.5689	9.589	1.106	1.151
Aug.	7.876	7.405	26.101	7.438	304.366	129.703	4.267	0.911	4.5789	9.548	1.140	1.181
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
Percentage change versus previous month												
2017 Nov.	-0.2	0.6	-0.9	0.0	0.6	-0.3	-0.8	-0.3	1.0	2.4	0.8	-0.2
Percentage change versus previous year												
2017 Nov.	5.2	0.4	-5.5	0.0	1.0	13.2	-3.7	2.2	2.8	0.0	8.2	8.7

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 [1]			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
Outstanding amounts (international investment position)												
2016 Q3	23,519.8	24,521.3	-1,001.5	10,318.1	8,434.1	7,682.4	10,463.6	-62.1	4,854.3	5,623.5	727.0	13,856.0
Q4	23,982.9	24,780.0	-797.1	10,680.0	8,610.8	7,862.2	10,570.0	-57.7	4,790.9	5,599.2	707.6	13,782.1
2017 Q1	25,161.7	25,746.9	-585.2	11,055.3	8,909.6	8,253.0	10,859.1	-62.8	5,189.5	5,978.2	726.6	14,242.7
Q2	24,571.9	25,201.4	-629.5	10,766.7	8,719.8	8,175.2	10,679.9	-48.8	4,996.1	5,801.8	682.7	13,888.6
Outstanding amounts as a percentage of GDP												
2017 Q2	224.3	230.1	-5.7	98.3	79.6	74.6	97.5	-0.4	45.6	53.0	6.2	126.8
Transactions												
2016 Q4	94.9	0.6	94.3	102.5	38.7	23.2	-22.8	15.9	-51.3	-15.4	4.6	-
2017 Q1	629.7	567.3	62.4	187.1	199.8	172.3	65.7	21.8	251.0	301.8	-2.5	-
Q2	209.4	160.8	48.7	51.0	70.6	174.5	110.6	-1.3	-13.2	-20.4	-1.7	-
Q3	57.4	-104.0	161.5	-153.8	-165.0	175.1	19.4	-19.7	55.3	41.5	0.6	-
2017 Apr.	172.0	161.3	10.7	46.0	7.0	40.9	16.8	2.2	87.4	137.5	-4.5	-
May	97.0	89.2	7.9	31.8	33.0	70.2	65.0	4.0	-10.4	-8.8	1.4	-
June	-59.6	-89.7	30.1	-26.8	30.6	63.4	28.7	-7.5	-90.2	-149.0	1.4	-
July	-17.9	-61.0	43.1	-176.3	-186.0	65.8	52.0	-3.9	101.7	72.9	-5.2	-
Aug.	54.9	17.0	37.9	10.9	18.9	68.6	-24.8	-7.9	-16.0	22.9	-0.7	-
Sep.	20.4	-60.1	80.5	11.6	2.0	40.6	-7.8	-7.8	-30.4	-54.3	6.4	-
12-month cumulated transactions												
2017 Sep.	991.5	624.7	366.9	186.8	144.1	545.1	173.0	16.7	241.9	307.6	1.0	-
12-month cumulated transactions as a percentage of GDP												
2017 Sep.	9.0	5.7	3.3	1.7	1.3	4.9	1.6	0.2	2.2	2.8	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 [1]		
		Total	Private consumption	Government consumption	Gross fixed capital formation				Changes in inventories [2]	Total	Exports [1]	Imports [1]
						Total construction	Total machinery	Intellectual property products				
	1	2	3	4	5	6	7	8	9	10	11	12
	Current prices (EUR billions)											
2014	10,157.6	9,786.6	5,633.9	2,129.1	1,997.1	1,006.5	599.7	385.6	26.5	371.0	4,541.7	4,170.8
2015	10,515.1	10,030.3	5,754.3	2,168.9	2,078.1	1,016.2	637.9	418.4	29.0	484.8	4,847.0	4,362.2
2016	10,788.8	10,310.0	5,891.6	2,218.8	2,189.3	1,051.8	674.3	457.7	10.3	478.8	4,935.9	4,457.1
2016 Q4	2,725.6	2,613.9	1,489.2	558.9	557.9	266.9	171.2	118.5	7.9	111.8	1,264.8	1,153.0
2017 Q1	2,747.6	2,630.1	1,504.9	562.1	559.8	272.7	171.6	114.2	3.2	117.5	1,297.6	1,180.2
Q2	2,778.6	2,660.8	1,515.5	564.9	573.3	277.4	175.8	118.8	7.0	117.8	1,307.8	1,190.0
Q3	2,804.9	2,681.3	1,522.4	567.6	581.2	279.3	180.7	119.9	10.1	123.6	1,320.2	1,196.7
	as a percentage of GDP											
2016	100.0	95.6	54.6	20.6	20.3	9.7	6.2	4.2	0.1	4.4	-	-
	Chain-linked volumes (prices for the previous year)											
	quarter-on-quarter percentage changes											
2016 Q4	0.6	0.7	0.5	0.3	1.0	1.2	1.6	-0.1	-	-	1.6	1.8
2017 Q1	0.6	0.2	0.5	0.2	-0.1	1.8	1.0	-5.9	-	-	1.3	0.4
Q2	0.7	1.0	0.5	0.3	2.2	0.3	1.5	7.8	-	-	1.0	1.7
Q3	0.6	0.6	0.3	0.2	1.1	0.1	2.9	0.6	-	-	1.2	1.1
	annual percentage changes											
2014	1.3	1.3	0.8	0.7	1.9	-0.4	4.6	3.8	-	-	4.7	4.9
2015	2.1	2.0	1.8	1.3	3.3	0.5	5.3	7.3	-	-	6.4	6.7
2016	1.8	2.3	2.0	1.8	4.5	2.5	5.5	8.3	-	-	3.3	4.7
2016 Q4	1.9	2.3	1.9	1.6	4.5	2.6	3.4	11.1	-	-	3.8	4.8
2017 Q1	2.1	1.9	1.7	1.0	4.1	3.7	3.9	5.6	-	-	4.8	4.8
Q2	2.4	2.3	1.9	1.1	3.5	4.2	4.3	0.9	-	-	4.5	4.4
Q3	2.6	2.4	1.9	1.1	4.2	3.4	7.2	2.0	-	-	5.2	5.1
	contributions to quarter-on-quarter percentage changes in GDP; percentage points											
2016 Q4	0.6	0.7	0.3	0.1	0.2	0.1	0.1	0.0	0.1	0.0	-	-
2017 Q1	0.6	0.2	0.3	0.1	0.0	0.2	0.1	-0.3	-0.1	0.5	-	-
Q2	0.7	0.9	0.3	0.1	0.4	0.0	0.1	0.3	0.1	-0.2	-	-
Q3	0.6	0.5	0.2	0.0	0.2	0.0	0.2	0.0	0.1	0.1	-	-
	contributions to annual percentage changes in GDP; percentage points											
2014	1.3	1.3	0.5	0.1	0.4	0.0	0.3	0.1	0.3	0.1	-	-
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	-	-
2016 Q4	1.9	2.2	1.0	0.3	0.9	0.3	0.2	0.4	-0.1	-0.3	-	-
2017 Q1	2.1	1.8	0.9	0.2	0.8	0.4	0.2	0.2	-0.1	0.2	-	-
Q2	2.4	2.2	1.1	0.2	0.7	0.4	0.3	0.0	0.2	0.2	-	-
Q3	2.6	2.3	1.1	0.2	0.9	0.3	0.4	0.1	0.2	0.3	-	-

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	Infor-mation and com-munica-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
	Current prices (EUR billions)											
2014	9,123.0	152.0	1,782.5	461.6	1,720.2	418.4	458.0	1,050.1	980.8	1,777.4	322.0	1,034.6
2015	9,443.2	153.8	1,899.9	468.7	1,782.7	433.1	464.2	1,073.0	1,025.7	1,811.4	330.6	1,072.0
2016	9,680.3	151.4	1,936.5	489.3	1,831.2	451.3	454.0	1,100.2	1,070.7	1,857.6	338.1	1,108.5
2016 Q4	2,443.5	38.6	489.6	123.8	463.0	114.5	112.2	277.5	270.7	468.6	85.1	282.1
2017 Q1	2,464.6	40.0	490.8	126.1	469.1	114.8	112.5	279.7	275.1	470.9	85.5	283.0
Q2	2,492.1	39.8	498.0	128.0	475.7	116.4	112.5	282.1	278.9	474.4	86.2	286.6
Q3	2,516.6	40.3	504.6	129.5	479.9	117.2	113.0	284.5	282.5	478.1	87.0	288.2
	as a percentage of value added											
2016	100.0	1.6	20.0	5.1	18.9	4.7	4.7	11.4	11.1	19.2	3.5	-
	Chain-linked volumes (prices for the previous year)											
	quarter-on-quarter percentage changes											
2016 Q4	0.6	-1.0	1.2	0.5	0.8	0.8	-0.4	0.3	0.8	0.4	0.2	1.0
2017 Q1	0.7	1.9	0.0	1.5	1.1	1.0	-0.1	0.6	1.5	0.3	0.3	0.4
Q2	0.7	-0.5	1.0	0.7	0.7	1.0	0.5	0.2	0.9	0.5	0.5	0.8
Q3	0.7	-0.2	1.3	0.4	0.6	0.8	0.1	0.5	0.7	0.4	0.6	0.2
	annual percentage changes											
2014	1.3	1.7	2.7	-1.0	1.7	4.3	-1.9	0.4	2.7	0.5	0.1	1.3
2015	1.9	3.1	4.0	0.4	1.7	3.4	-0.1	0.7	2.8	0.9	1.1	3.4
2016	1.7	-1.3	2.0	1.6	1.9	3.0	0.4	0.9	2.9	1.3	0.9	3.0
2016 Q4	1.9	-2.7	2.6	1.7	2.1	3.6	-0.2	1.0	2.7	1.6	0.9	2.5
2017 Q1	2.0	0.4	1.8	2.6	2.7	4.4	-0.6	1.2	3.5	1.3	1.0	2.6
Q2	2.4	0.0	3.0	3.2	3.1	4.7	-0.1	1.2	3.1	1.5	1.2	2.8
Q3	2.6	0.2	3.6	3.1	3.3	3.6	0.0	1.6	3.9	1.5	1.6	2.3
	contributions to quarter-on-quarter percentage changes in value added; percentage points											
2016 Q4	0.6	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	-
2017 Q1	0.7	0.0	0.0	0.1	0.2	0.0	0.0	0.1	0.2	0.1	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	0.0	0.0	0.1	0.1	0.1	0.0	-
	contributions to annual percentage changes in value added; percentage points											
2014	1.3	0.0	0.5	-0.1	0.3	0.2	-0.1	0.0	0.3	0.1	0.0	-
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	0.3	0.0	-
2016 Q4	1.9	0.0	0.5	0.1	0.4	0.2	0.0	0.1	0.3	0.3	0.0	-
2017 Q1	2.0	0.0	0.4	0.1	0.5	0.2	0.0	0.1	0.4	0.3	0.0	-
Q2	2.4	0.0	0.6	0.2	0.6	0.2	0.0	0.1	0.3	0.3	0.0	-
Q3	2.6	0.0	0.7	0.2	0.6	0.2	0.0	0.2	0.4	0.3	0.1	-

Sources: Eurostat and ECB calculations.

3 Economic activity

3.3 Employment [1)]

(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													
as a percentage of total persons employed													
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
annual percentage changes													
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													
as a percentage of total hours worked													
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
annual percentage changes													
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													
annual percentage changes													
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 [1]	Under-employ-ment, % of labour force [1]	Unemployment												Job vacancy rate [2]
			Total		Long-term unemploy-ment, % of labour force [1]	By age				By gender					
						Adult		Youth		Male		Female			
			Millions	% of labour force		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			81.8		18.2		52.2		47.8			
2014	160.334	4.6	18.635	11.6	6.1	15.212	10.4	3.423	23.8	9.932	11.5	8.703	11.8		1.4
2015	160.600	4.6	17.451	10.9	5.6	14.300	9.8	3.152	22.3	9.260	10.7	8.191	11.0		1.5
2016	161.877	4.3	16.230	10.0	5.0	13.280	9.0	2.951	20.9	8.473	9.7	7.757	10.4		1.7
2016 Q4	162.300	4.2	15.753	9.7	4.9	12.882	8.7	2.871	20.4	8.241	9.4	7.512	10.0		1.7
2017 Q1	161.635	4.3	15.385	9.5	4.8	12.636	8.5	2.750	19.6	7.977	9.1	7.409	9.9		1.9
Q2	162.214	4.2	14.845	9.1	4.5	12.147	8.2	2.698	19.1	7.698	8.8	7.147	9.5		1.9
Q3	.	.	14.561	9.0	.	11.891	8.0	2.670	18.8	7.554	8.6	7.006	9.3		1.9
2017 May	-	-	14.869	9.2	-	12.162	8.2	2.708	19.2	7.710	8.8	7.159	9.5		-
June	-	-	14.689	9.0	-	12.011	8.1	2.678	19.0	7.631	8.7	7.057	9.4		-
July	-	-	14.688	9.0	-	12.019	8.1	2.669	18.9	7.615	8.7	7.072	9.4		-
Aug.	-	-	14.562	9.0	-	11.887	8.0	2.676	18.8	7.565	8.6	6.997	9.3		-
Sep.	-	-	14.432	8.9	-	11.766	7.9	2.666	18.7	7.483	8.5	6.949	9.2		-
Oct.	-	-	14.344	8.8	-	11.687	7.9	2.657	18.6	7.456	8.5	6.888	9.2		-

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						Con-struction produc-tion	ECB indicator on industrial new orders	Retail sales				New passenger car regis-trations
	Total (excluding construction)		Main Industrial Groupings						Total	Food, beverages, tobacco	Non-food	Fuel	
		Manu-facturing	Inter-mediate goods	Capital goods	Consumer goods	Energy							
	1	2	3	4	5	6	7	8	9	10	11	12	13
% of total in 2010	100.0	86.0	33.6	29.2	22.5	14.7	100.0	100.0	100.0	39.3	51.5	9.1	100.0
annual percentage changes													
2014	0.8	1.7	1.1	1.8	2.7	-5.4	2.0	3.1	1.5	0.7	2.5	0.0	3.8
2015	2.1	2.4	1.0	3.6	2.6	0.8	-0.9	3.6	2.7	1.8	3.3	2.3	8.8
2016	1.5	1.6	1.9	1.7	1.2	0.2	2.2	0.3	1.5	1.3	1.7	1.8	7.2
2016 Q4	2.4	1.8	2.4	1.8	1.3	5.4	2.3	3.2	2.4	1.7	3.1	1.4	4.1
2017 Q1	1.3	1.3	2.2	1.3	-0.6	1.8	1.9	5.5	2.2	1.4	2.8	1.4	4.8
Q2	2.7	2.8	3.9	2.4	1.7	1.7	3.7	6.7	2.9	2.7	3.3	1.3	6.0
Q3	3.7	4.0	4.9	4.6	2.0	0.3	3.0	8.8	2.9	1.8	4.3	0.3	5.5
2017 May	4.1	4.3	4.1	5.5	3.2	1.6	2.9	8.4	2.7	2.1	3.6	-0.1	7.1
June	2.9	2.6	4.3	1.5	1.2	4.8	4.3	5.9	3.5	2.7	3.6	4.1	6.5
July	3.7	3.8	5.0	4.5	1.1	1.7	2.8	7.3	2.3	1.5	3.6	1.0	4.6
Aug.	3.9	4.3	5.3	5.1	2.6	0.1	1.9	9.0	2.3	1.3	3.7	-0.2	6.9
Sep.	3.4	3.9	4.6	4.4	2.3	-0.8	3.1	10.2	4.0	2.5	5.7	0.2	5.3
Oct.	3.7	4.4	5.0	3.3	5.3	-2.2	.	.	0.4	0.2	0.6	0.3	5.9
month-on-month percentage changes (s.a.)													
2017 May	1.3	1.5	0.6	2.3	1.4	0.6	-0.1	2.5	0.4	-0.4	0.8	1.2	2.8
June	-0.5	-0.8	0.0	-1.9	-0.4	0.9	0.1	-0.4	0.4	0.6	0.3	1.0	-1.8
July	0.3	0.5	0.6	1.0	0.5	-1.2	0.0	-0.7	0.0	-0.5	0.3	-0.5	-2.0
Aug.	1.5	1.8	1.2	3.4	0.3	0.6	0.0	3.2	-0.2	0.0	0.0	-0.7	2.9
Sep.	-0.5	-0.6	-0.5	-1.6	0.2	-0.5	0.1	0.7	0.8	1.0	0.5	-0.5	1.5
Oct.	0.2	0.1	0.0	-0.3	0.2	0.1	.	.	-1.1	-1.3	-1.1	-0.1	-3.0

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

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
1999-13	100.0	-6.1	80.7	-12.8	-13.6	-8.7	7.0	-	51.0	52.4	52.9	52.7
2014	101.4	-3.8	80.5	-10.1	-26.6	-3.1	4.7	87.7	51.8	53.3	52.5	52.7
2015	104.2	-3.1	81.4	-6.2	-22.4	1.6	9.2	88.4	52.2	53.4	54.0	53.8
2016	104.8	-2.6	81.9	-7.7	-16.6	1.5	11.2	89.1	52.5	53.6	53.1	53.3
2016 Q4	106.9	-0.6	82.4	-6.5	-13.1	1.8	12.4	89.4	54.0	54.9	53.5	53.8
2017 Q1	108.0	1.1	82.6	-5.5	-11.0	2.0	13.2	89.4	55.6	56.9	55.1	55.6
Q2	110.0	3.3	82.9	-2.7	-5.0	3.2	13.4	89.8	57.0	58.3	56.0	56.6
Q3	112.1	5.4	83.5	-1.5	-2.2	2.9	14.9	89.9	57.4	58.0	55.3	56.0
2017 June	111.1	4.5	-	-1.3	-3.5	4.4	13.3	-	57.4	58.7	55.4	56.3
July	111.3	4.5	83.2	-1.7	-1.8	3.9	14.2	90.2	56.6	56.5	55.4	55.7
Aug.	111.9	5.0	-	-1.5	-3.3	1.6	15.1	-	57.4	58.3	54.7	55.7
Sep.	113.1	6.7	-	-1.2	-1.7	3.0	15.4	-	58.1	59.2	55.8	56.7
Oct.	114.1	8.0	83.8	-1.1	0.4	5.5	16.2	89.6	58.5	58.8	55.0	56.0
Nov.	114.6	8.2	-	0.1	1.6	4.2	16.3	-	60.1	61.0	56.2	57.5

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) [1]	Debt ratio	Real gross disposable income	Financial investment	Non-financial investment (gross)	Net worth [2]	Housing wealth	Profit share [3]	Saving ratio (net)	Debt ratio [4]	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	94.4	1.0	1.9	1.3	2.7	1.0	32.5	4.6	132.4	2.9	7.1	1.6
2015	12.3	93.7	1.5	2.2	1.5	3.4	2.5	33.4	6.3	134.3	4.4	4.7	2.4
2016	12.1	93.3	1.9	1.9	5.5	4.3	4.4	33.4	7.7	134.3	3.9	6.2	1.9
2016 Q3	12.2	93.4	1.5	2.2	5.8	4.1	4.0	33.5	7.7	133.6	4.0	6.3	1.9
Q4	12.1	93.3	1.5	1.9	5.2	4.3	4.4	33.4	7.7	134.3	3.9	6.4	1.9
2017 Q1	12.1	93.0	1.5	1.9	10.8	4.7	4.6	33.5	7.3	133.7	4.4	9.9	2.3
Q2	12.1	93.1	1.4	1.9	5.5	4.9	4.9	33.3	6.7	132.9	4.2	8.6	2.2

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 [1]	
	Total			Goods		Services		Primary income		Secondary income			
	Credit	Debit	Net	Credit	Debit	Credit	Debit	Credit	Debit	Credit	Debit	Credit	Debit
	1	2	3	4	5	6	7	8	9	10	11	12	13
2016 Q4	946.0	860.8	85.3	548.4	457.9	199.2	193.7	170.0	144.3	28.4	64.8	9.4	9.6
2017 Q1	955.2	871.1	84.1	558.9	479.8	206.1	188.8	163.0	145.9	27.2	56.6	7.4	17.7
Q2	964.4	890.2	74.1	559.1	477.5	208.0	190.8	170.5	151.5	26.8	70.3	7.0	17.2
Q3	969.3	866.4	102.8	566.3	475.4	210.9	188.9	166.2	134.5	25.8	67.5	5.8	4.6
2017 Apr.	318.9	297.3	21.6	184.2	158.4	69.3	62.8	56.5	49.6	8.9	26.5	2.0	6.1
May	326.3	297.9	28.4	188.9	162.2	68.6	64.1	59.8	50.8	9.0	20.8	2.1	5.5
June	319.2	295.0	24.1	186.0	156.9	70.0	64.0	54.2	51.1	8.9	23.0	2.9	5.6
July	319.9	289.3	30.6	185.1	158.7	70.0	62.5	56.3	44.7	8.5	23.5	2.4	1.4
Aug.	323.2	288.7	34.5	187.4	158.1	70.0	62.8	56.9	46.5	8.9	21.3	1.7	1.3
Sep.	326.1	288.4	37.8	193.8	158.7	70.9	63.6	53.0	43.3	8.4	22.8	1.7	1.9
12-month cumulated transactions													
2017 Sep.	3,834.9	3,488.5	346.4	2,232.7	1,890.7	824.2	762.2	669.7	576.3	108.2	259.3	29.6	49.1
12-month cumulated transactions as a percentage of GDP													
2017 Sep.	34.7	31.6	3.1	20.2	17.1	7.5	6.9	6.1	5.2	1.0	2.3	0.3	0.4

1) The capital account is not seasonally adjusted.

3.9 Euro area external trade in goods [1] , values and volumes by product group [2]

(seasonally adjusted, unless otherwise indicated)

	Total (n.s.a.)		Exports (f.o.b.)					Imports (c.i.f.)					
			Total				Memo item:	Total				Memo items:	
	Exports	Imports		Intermediate goods	Capital goods	Consump-tion goods	Manu-facturing		Intermediate goods	Capital goods	Consump-tion goods	Manu-facturing	Oil
	1	2	3	4	5	6	7	8	9	10	11	12	13
Values (EUR billions; annual percentage changes for columns 1 and 2)													
2016 Q4	2.3	2.5	525.4	245.2	109.4	157.4	440.1	462.7	257.5	75.7	119.7	336.5	50.1
2017 Q1	10.9	13.8	539.5	258.5	110.1	161.1	449.5	485.8	279.3	78.4	120.1	344.3	59.9
Q2	5.3	9.7	545.1	257.1	112.4	163.0	455.5	486.2	275.5	79.5	123.4	352.0	52.1
Q3	6.1	7.6	547.4	.	.	.	458.5	483.2	.	.	.	351.3	.
2017 Apr.	-1.7	4.4	180.0	85.5	36.7	53.7	149.7	161.6	92.0	26.9	40.2	116.5	17.9
May	13.7	18.1	184.1	86.9	38.5	55.4	154.5	165.3	93.9	26.7	42.2	119.7	17.6
June	4.2	6.7	181.0	84.6	37.3	53.9	151.3	159.3	89.7	25.9	41.0	115.9	16.6
July	6.1	8.9	178.9	83.7	36.4	54.2	149.6	160.8	90.1	26.2	40.8	117.1	15.8
Aug.	6.8	8.8	183.2	86.2	37.9	55.5	153.9	162.2	91.3	27.0	41.1	119.1	15.9
Sep.	5.6	5.1	185.3	.	.	.	155.0	160.2	.	.	.	115.1	.
Volume indices (2000 = 100; annual percentage changes for columns 1 and 2)													
2016 Q4	1.6	1.0	120.5	118.2	119.4	124.9	120.1	110.1	109.2	108.3	112.0	112.8	104.4
2017 Q1	6.4	3.1	121.1	121.6	119.1	124.5	120.6	110.3	111.3	108.2	110.0	112.3	109.6
Q2	1.5	2.0	122.6	121.5	121.7	125.7	122.1	112.5	112.9	110.3	114.3	115.4	104.4
Q3	.	.	.	.	.	.	.	.	.	.	.	.	.
2017 Mar.	9.2	6.0	122.6	122.7	122.1	126.1	122.5	110.7	111.9	106.5	113.0	112.7	103.6
Apr.	-6.0	-5.2	121.2	120.7	118.7	124.5	120.3	110.6	111.3	109.0	111.3	113.5	102.4
May	8.9	9.6	123.6	122.9	124.5	127.2	123.7	114.7	115.1	112.7	116.8	117.8	104.8
June	1.8	1.6	123.0	121.0	122.0	125.5	122.4	112.2	112.3	109.1	114.8	114.8	106.0
July	3.6	3.4	121.5	119.5	118.3	126.5	120.9	113.2	113.1	109.9	113.6	115.6	101.3
Aug.	4.8	4.8	124.8	123.0	124.7	130.1	124.9	115.3	115.2	116.7	114.9	119.4	98.8

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 [1)]

(annual percentage changes, unless otherwise indicated)

	Total					Total (s.a.; percentage change vis-à-vis previous period) [2)]						Memo item: Administered prices	
	Index: 2015 = 100	Total		Goods	Services	Total	Processed food	Unprocessed food	Non-energy industrial goods	Energy (n.s.a.)	Services	Total HICP excluding administered prices	Administered prices
			Total excluding food and energy										
	1	2	3	4	5	6	7	8	9	10	11	12	13
% of total in 2017	100.0	100.0	70.9	55.4	44.6	100.0	12.1	7.5	26.3	9.5	44.6	86.6	13.4
2014	100.0	0.4	0.8	-0.2	1.2	-	-	-	-	-	-	0.2	1.9
2015	100.0	0.0	0.8	-0.8	1.2	-	-	-	-	-	-	-0.1	0.9
2016	100.2	0.2	0.9	-0.4	1.1	-	-	-	-	-	-	0.2	0.2
2016 Q4	101.0	0.7	0.8	0.4	1.1	0.4	0.3	-0.3	0.1	2.4	0.3	0.8	0.3
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	0.6	1.6	1.3
Q3	101.8	1.4	1.2	1.4	1.5	0.2	0.6	0.4	0.1	-0.9	0.4	1.5	1.1
2017 June	102.0	1.3	1.1	1.0	1.6	0.0	0.2	-0.4	0.1	-0.9	0.3	1.3	1.3
July	101.4	1.3	1.2	1.1	1.6	0.1	0.2	0.3	0.0	-0.7	0.2	1.3	1.1
Aug.	101.7	1.5	1.2	1.4	1.6	0.2	0.2	0.6	0.0	0.7	0.1	1.6	1.1
Sep.	102.1	1.5	1.1	1.6	1.5	0.1	0.1	0.1	0.0	1.0	0.0	1.6	1.0
Oct.	102.2	1.4	0.9	1.5	1.2	0.0	0.1	0.8	0.0	0.7	-0.2	1.4	1.1
Nov. [3)]	102.3	1.5	0.9	.	1.2	0.2	0.2	0.0	0.0	1.5	0.0	.	.

	Goods						Services					
	Food (including alcoholic beverages and tobacco)			Industrial goods			Housing		Transport	Communication	Recreation and personal	Miscellaneous
	Total	Processed food	Unprocessed 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
2014	0.5	1.2	-0.8	-0.5	0.1	-1.9	1.7	1.4	1.7	-2.8	1.5	1.3
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
2016 Q4	0.8	0.6	1.0	0.2	0.3	0.2	1.2	1.2	1.2	-0.1	1.3	1.2
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
2017 June	1.4	1.6	1.0	0.8	0.4	1.9	1.3	1.3	2.4	-1.6	2.4	0.9
July	1.4	1.9	0.6	0.9	0.5	2.2	1.3	1.2	2.2	-1.8	2.5	0.8
Aug.	1.4	2.0	0.6	1.4	0.5	4.0	1.3	1.2	2.5	-1.9	2.4	0.8
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. [3)]	2.2	2.1	2.4	.	0.4	4.7	.	.	.	.	.	.

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 [1]										Con-struction	Residential property prices [2]	Experimental indicator of commercial property prices [2]
	Total (index: 2010 = 100)	Total		Industry excluding construction and energy						Energy			
			Manu-facturing	Total	Intermediate 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 2010	100.0	100.0	78.1	72.1	29.4	20.1	22.6	13.8	8.9	27.9			
2014	106.9	-1.5	-0.9	-0.3	-1.1	0.4	0.1	-0.1	0.3	-4.3	0.3	0.4	1.6
2015	104.0	-2.7	-2.4	-0.5	-1.3	0.7	-0.6	-0.9	0.2	-8.2	0.2	1.6	3.8
2016	101.6	-2.3	-1.5	-0.5	-1.7	0.4	0.0	0.0	0.1	-6.9	0.4	3.2	5.7
2016 Q4	103.1	0.4	1.0	0.4	0.0	0.5	0.8	1.2	0.1	0.4	1.2	3.7	5.5
2017 Q1	104.7	4.1	4.0	2.1	3.1	0.8	1.7	2.6	0.2	9.9	1.9	3.8	.
Q2	104.2	3.3	3.1	2.4	3.5	0.9	2.4	3.5	0.2	5.7	1.9	4.0	.
Q3	104.4	2.4	2.6	2.1	3.0	1.0	2.2	3.2	0.3	3.2	1.9	.	.
2017 May	104.2	3.4	3.1	2.4	3.6	0.9	2.3	3.6	0.2	5.7	-	-	-
June	104.0	2.4	2.1	2.2	3.0	0.9	2.4	3.5	0.3	2.5	-	-	-
July	104.0	2.0	2.2	2.0	2.7	1.0	2.2	3.2	0.2	1.9	-	-	-
Aug.	104.3	2.5	2.7	2.2	2.9	1.0	2.2	3.2	0.3	3.4	-	-	-
Sep.	104.8	2.8	2.9	2.2	3.3	1.0	2.2	3.1	0.3	4.3	-	-	-
Oct.	105.2	2.5	2.5	2.3	3.5	0.9	1.8	2.4	0.2	3.1	-	-	-

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 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 [1]	Imports [1]		Import-weighted [2]			Use-weighted [2]		
			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
2014	104.5	0.9	0.6	0.5	0.9	0.7	-0.7	-1.5	74.1	-3.4	2.0	-8.5	-0.4	4.6	-6.4
2015	106.0	1.4	0.4	0.3	0.5	0.8	0.3	-1.9	47.1	0.0	4.2	-4.5	2.9	7.0	-2.7
2016	106.8	0.8	0.4	0.3	0.5	0.8	-1.5	-2.5	39.9	-3.5	-3.9	-3.2	-7.3	-10.3	-2.9
2016 Q4	107.2	0.7	0.9	0.7	0.7	0.9	-0.2	0.2	46.5	9.1	1.1	18.6	3.3	-6.7	18.5
2017 Q1	107.4	0.7	1.5	1.5	1.0	1.3	2.5	4.5	50.8	18.3	5.9	33.2	13.0	0.1	32.4
Q2	107.8	1.1	1.4	1.4	1.0	1.3	2.3	3.2	45.6	6.8	-2.7	18.2	6.7	-2.4	19.9
Q3	108.2	1.3	1.4	1.3	1.0	1.3	1.7	1.8	44.0	1.7	-7.4	11.9	2.4	-5.8	13.0
2017 June	-	-	-	-	-	-	-	-	41.7	2.3	-7.1	13.7	3.2	-4.8	15.1
July	-	-	-	-	-	-	-	-	42.2	1.0	-6.1	8.9	2.0	-4.4	10.1
Aug.	-	-	-	-	-	-	-	-	43.5	1.1	-9.0	12.3	1.0	-8.1	13.1
Sep.	-	-	-	-	-	-	-	-	46.3	3.1	-7.2	14.7	4.1	-4.8	15.8
Oct.	-	-	-	-	-	-	-	-	49.0	2.5	-6.2	12.0	5.2	-1.2	13.2
Nov.	-	-	-	-	-	-	-	-	53.3	-2.6	-8.5	3.4	0.2	-3.8	4.9

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
1999-13	4.7	-	-	-2.0	34.7	57.7	56.7	-	49.9
2014	-0.9	-1.5	0.9	-17.4	15.1	49.6	53.5	49.7	48.2
2015	-2.8	1.3	2.7	-13.2	-0.2	48.9	53.5	49.6	49.0
2016	-0.4	1.7	4.4	-7.3	0.2	49.8	53.9	49.3	49.6
2016 Q4	4.6	3.1	4.9	-5.4	2.4	58.6	54.9	51.6	50.5
2017 Q1	9.0	5.5	6.4	-3.7	12.9	67.8	56.7	55.0	51.4
Q2	7.8	4.2	5.9	1.8	12.3	62.5	55.9	54.6	51.5
Q3	8.7	4.9	6.8	3.2	10.5	60.4	55.7	54.4	51.4
2017 June	7.1	3.4	5.8	3.6	11.7	58.4	55.3	54.3	50.9
July	7.5	4.4	6.2	5.3	10.1	57.8	55.2	53.7	51.0
Aug.	8.1	4.0	6.4	0.1	9.9	59.4	55.6	54.3	51.3
Sep.	10.5	6.1	8.0	4.3	11.5	64.0	56.3	55.2	51.8
Oct.	8.7	8.4	8.6	7.8	13.0	66.4	56.7	55.8	52.1
Nov.	11.1	7.5	8.2	7.9	14.7	69.4	56.9	56.8	52.1

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 [1]
			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	
2014	102.6	1.3	1.3	1.2	1.3	1.2	1.7
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
2016 Q4	112.3	1.6	1.6	1.5	1.6	1.5	1.4
2017 Q1	100.4	1.4	1.3	1.6	1.3	1.6	1.6
Q2	111.1	1.7	2.1	0.8	1.9	1.5	1.4
Q3	.	.	.	.	.	.	1.4

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 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
						Unit labour costs						
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	-3.3	-1.8	0.5	1.2	0.9	0.6	2.0	1.6	1.3	1.4
2016	105.6	0.8	1.3	0.0	-0.3	1.3	0.0	1.7	4.3	0.7	1.2	1.7
2016 Q4	106.1	0.8	3.6	-0.4	0.0	1.2	-0.3	2.3	4.9	0.9	1.1	1.6
2017 Q1	106.3	1.0	0.5	0.6	0.3	0.5	-0.4	1.9	4.3	1.8	1.4	1.6
Q2	106.5	0.9	1.3	-0.1	0.6	0.1	0.4	1.1	5.6	2.6	1.4	1.9
Q3	106.7	0.9	0.9	-0.5	1.0	0.6	1.6	0.1	3.6	2.1	1.1	1.2
						Compensation per employee						
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	1.6	2.8	0.7	1.4	1.6	1.2	2.0
2016	109.5	1.3	0.5	1.4	1.5	1.5	0.7	2.2	3.3	0.8	1.2	1.5
2016 Q4	110.3	1.4	0.7	1.6	1.3	1.6	0.7	2.1	3.4	0.9	1.4	2.0
2017 Q1	110.7	1.5	-0.2	1.6	1.4	1.4	0.8	1.8	3.6	2.1	1.6	1.6
Q2	111.1	1.7	0.7	1.7	2.3	1.4	1.6	1.7	4.8	2.4	1.8	1.4
Q3	111.6	1.7	1.3	1.8	1.9	1.9	2.1	1.1	3.1	2.8	1.6	0.7
						Labour productivity per person employed						
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	1.1	4.3	3.7	0.4	0.4	1.9	0.1	-0.7	0.1	-0.1	0.5
2016	103.7	0.5	-0.8	1.4	1.8	0.2	0.6	0.4	-0.9	0.1	0.0	-0.2
2016 Q4	104.0	0.6	-2.8	2.0	1.3	0.4	1.0	-0.2	-1.5	-0.1	0.3	0.4
2017 Q1	104.1	0.5	-0.7	0.9	1.1	0.9	1.2	-0.1	-0.6	0.3	0.1	-0.1
Q2	104.3	0.7	-0.6	1.9	1.7	1.3	1.2	0.6	-0.8	-0.2	0.3	-0.6
Q3	104.6	0.8	0.4	2.3	0.9	1.3	0.5	0.9	-0.4	0.6	0.4	-0.4
						Compensation per hour worked						
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	-0.1	1.3	1.5	1.5	1.0	1.7	3.4	0.7	1.5	1.7
2016 Q4	112.2	1.6	1.3	1.4	1.6	1.9	1.3	2.1	4.2	1.0	1.8	2.4
2017 Q1	112.5	1.6	0.3	1.4	1.1	1.6	0.9	1.5	3.6	2.1	1.9	1.6
Q2	112.9	1.7	1.9	1.4	2.0	1.5	1.9	2.4	5.2	2.5	1.9	1.2
Q3	113.3	1.5	0.4	1.3	1.3	1.7	2.3	0.9	3.2	2.7	1.7	0.1
						Hourly labour productivity						
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	3.4	-0.2	0.8	0.9	0.0	-1.0	0.0	0.0	0.2
2016	105.8	0.6	-0.9	1.3	1.6	0.3	1.0	-0.2	-1.2	0.1	0.3	0.0
2016 Q4	106.2	0.9	-1.7	1.8	1.7	0.8	1.6	-0.4	-1.4	0.2	0.7	0.7
2017 Q1	106.2	0.7	0.9	0.8	1.0	1.4	1.5	-0.4	-1.1	0.6	0.4	-0.1
Q2	106.5	0.9	0.5	1.6	1.5	1.4	1.6	1.3	-0.6	0.2	0.5	-0.5
Q3	106.6	0.8	0.4	1.8	0.7	1.2	1.0	0.8	-0.4	0.7	0.5	-0.7

Sources: Eurostat and ECB calculations.

5 Money and credit

5.1 Monetary aggregates [1)]

(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								
	Currency in circulation	Overnight deposits		Deposits with an agreed maturity of up to 2 years	Deposits redeemable at notice of up to 3 months			Repos	Money market fund shares	Debt securities with a maturity of up to 2 years		
	1	2	3	4	5	6	7	8	9	10	11	12
Outstanding amounts												
2014	970.1	4,975.6	5,945.7	1,585.7	2,147.6	3,733.2	9,678.9	120.8	430.0	110.1	660.9	10,339.8
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	6,128.3	7,203.4	1,328.6	2,175.7	3,504.3	10,707.7	70.4	523.2	95.7	689.2	11,396.9
2016 Q4	1,075.1	6,128.3	7,203.4	1,328.6	2,175.7	3,504.3	10,707.7	70.4	523.2	95.7	689.2	11,396.9
2017 Q1	1,087.2	6,292.0	7,379.1	1,304.7	2,181.3	3,486.0	10,865.2	74.4	531.6	100.2	706.2	11,571.3
Q2	1,094.9	6,424.8	7,519.7	1,258.0	2,194.2	3,452.2	10,971.9	68.2	513.7	80.1	662.1	11,634.0
Q3	1,103.9	6,573.9	7,677.8	1,222.4	2,208.2	3,430.5	11,108.3	66.6	530.8	80.1	677.5	11,785.8
2017 May	1,092.5	6,374.4	7,466.9	1,267.6	2,190.1	3,457.7	10,924.6	71.9	519.6	83.3	674.8	11,599.4
June	1,094.9	6,424.8	7,519.7	1,258.0	2,194.2	3,452.2	10,971.9	68.2	513.7	80.1	662.1	11,634.0
July	1,095.0	6,468.2	7,563.2	1,245.9	2,200.4	3,446.3	11,009.5	66.3	518.2	79.9	664.4	11,673.9
Aug.	1,099.6	6,528.0	7,627.6	1,239.0	2,205.0	3,444.0	11,071.6	70.5	521.0	76.9	668.4	11,740.0
Sep.	1,103.9	6,573.9	7,677.8	1,222.4	2,208.2	3,430.5	11,108.3	66.6	530.8	80.1	677.5	11,785.8
Oct. [p]	1,110.0	6,591.1	7,701.2	1,216.1	2,215.4	3,431.5	11,132.7	73.1	529.0	69.3	671.3	11,804.0
Transactions												
2014	59.6	376.6	436.2	-88.4	3.7	-84.7	351.5	3.8	11.8	12.8	28.3	379.8
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	542.0	579.5	-105.8	16.0	-89.8	489.7	-4.2	38.0	16.1	49.9	539.5
2016 Q4	8.2	171.4	179.6	-53.4	4.0	-49.4	130.2	-7.6	20.6	3.2	16.2	146.4
2017 Q1	12.1	166.4	178.5	-21.5	5.5	-16.0	162.5	4.1	8.5	4.0	16.5	179.0
Q2	7.8	152.4	160.2	-37.1	12.5	-24.6	135.5	-5.6	-17.5	-18.4	-41.5	94.0
Q3	9.0	157.8	166.8	-32.7	10.8	-22.0	144.8	-1.1	17.0	-0.2	15.7	160.6
2017 May	1.4	48.0	49.4	-9.2	5.1	-4.0	45.4	-0.1	0.1	0.6	0.6	46.0
June	2.5	54.2	56.7	-8.6	4.2	-4.5	52.2	-3.5	-5.7	-0.5	-9.7	42.5
July	0.1	49.5	49.6	-10.0	3.0	-7.0	42.6	-1.6	4.3	1.5	4.2	46.8
Aug.	4.6	63.3	67.9	-5.9	4.6	-1.3	66.5	4.5	2.8	-5.5	1.8	68.4
Sep.	4.3	45.1	49.3	-16.8	3.2	-13.6	35.7	-3.9	9.9	3.7	9.7	45.4
Oct. [p]	6.2	14.3	20.5	-7.3	7.2	-0.1	20.4	6.4	-1.9	-13.0	-8.5	11.9
Growth rates												
2014	6.5	8.4	8.1	-5.2	0.2	-2.2	3.8	3.1	2.8	18.5	4.6	3.9
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
2016 Q4	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 Q1	3.7	9.9	8.9	-7.6	0.8	-2.5	5.0	-14.5	12.9	3.9	7.9	5.1
Q2	3.8	10.5	9.5	-9.4	1.1	-3.0	5.2	-18.6	5.0	-14.0	-0.6	4.9
Q3	3.5	10.9	9.8	-10.5	1.5	-3.2	5.4	-13.2	5.7	-12.9	1.0	5.2
2017 May	3.9	10.1	9.2	-8.5	1.0	-2.8	5.1	-17.1	7.1	-9.1	1.7	4.9
June	3.8	10.5	9.5	-9.4	1.1	-3.0	5.2	-18.6	5.0	-14.0	-0.6	4.9
July	3.4	10.2	9.2	-9.9	1.2	-3.2	5.0	-18.5	4.3	-17.6	-1.7	4.6
Aug.	3.5	10.6	9.5	-9.2	1.4	-2.7	5.4	-11.3	6.2	-24.0	-0.4	5.0
Sep.	3.5	10.9	9.8	-10.5	1.5	-3.2	5.4	-13.2	5.7	-12.9	1.0	5.2
Oct. [p]	3.5	10.5	9.4	-9.9	1.8	-2.7	5.4	-0.4	3.7	-26.2	-0.7	5.0

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
Outstanding amounts													
2014	1,864.7	1,366.5	366.5	112.6	19.1	5,556.2	2,749.7	811.9	1,991.5	3.1	851.0	223.4	334.4
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	2,079.0	1,656.1	296.1	118.2	8.4	6,052.6	3,401.2	643.8	2,005.7	1.9	990.1	198.2	383.2
2016 Q4	2,079.0	1,656.1	296.1	118.2	8.4	6,052.6	3,401.2	643.8	2,005.7	1.9	990.1	198.2	383.2
2017 Q1	2,159.7	1,734.4	301.3	117.6	6.5	6,135.9	3,498.1	620.5	2,014.7	2.6	973.0	191.5	392.3
Q2	2,187.9	1,769.1	293.5	118.9	6.4	6,187.6	3,560.6	599.2	2,025.5	2.3	970.1	196.5	403.1
Q3	2,218.1	1,806.7	285.9	120.1	5.3	6,255.3	3,635.2	582.0	2,036.2	2.0	977.4	201.0	419.2
2017 May	2,174.1	1,755.0	294.1	118.8	6.2	6,171.9	3,540.9	605.8	2,022.6	2.6	961.7	196.1	400.2
June	2,187.9	1,769.1	293.5	118.9	6.4	6,187.6	3,560.6	599.2	2,025.5	2.3	970.1	196.5	403.1
July	2,193.0	1,777.7	289.8	119.4	6.1	6,205.3	3,578.7	593.1	2,031.3	2.1	978.3	194.8	409.4
Aug.	2,205.8	1,793.1	286.9	120.0	5.7	6,231.9	3,607.3	588.4	2,034.2	2.0	988.5	199.2	417.1
Sep.	2,218.1	1,806.7	285.9	120.1	5.3	6,255.3	3,635.2	582.0	2,036.2	2.0	977.4	201.0	419.2
Oct. [p)]	2,228.6	1,822.0	280.4	120.8	5.4	6,293.0	3,674.6	574.1	2,042.2	2.2	950.8	202.6	420.6
Transactions													
2014	68.9	90.9	-26.2	1.4	2.7	140.7	208.8	-65.1	-1.2	-1.8	56.8	7.0	22.3
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	127.9	151.8	-24.3	0.2	0.2	299.9	333.6	-46.5	13.7	-0.8	30.9	-29.6	18.8
2016 Q4	9.8	30.6	-18.9	-1.0	-0.8	70.7	90.4	-23.4	4.6	-0.7	43.1	-7.9	-1.4
2017 Q1	83.7	79.7	6.5	-0.7	-1.9	83.5	97.4	-23.6	8.9	0.7	-15.5	-6.4	9.2
Q2	37.7	40.8	-4.8	1.7	0.0	54.9	65.7	-20.4	10.0	-0.3	13.6	5.3	10.6
Q3	35.2	41.0	-6.0	1.3	-1.1	66.0	75.5	-16.8	7.6	-0.3	12.8	4.8	16.1
2017 May	16.4	15.7	-0.1	1.4	-0.6	19.0	22.0	-6.1	3.7	-0.5	8.7	-2.6	2.3
June	15.8	15.3	-0.2	0.5	0.2	16.4	20.6	-6.4	2.5	-0.3	10.7	0.3	2.9
July	8.9	11.5	-2.8	0.5	-0.3	15.5	18.7	-5.7	2.7	-0.2	11.5	-1.5	6.4
Aug.	14.5	16.6	-2.4	0.6	-0.4	27.0	28.9	-4.7	2.9	0.0	12.6	4.6	7.7
Sep.	11.8	12.9	-0.9	0.2	-0.5	23.4	27.9	-6.4	2.0	-0.1	-11.4	1.7	2.0
Oct. [p)]	8.8	13.9	-6.0	0.7	0.2	37.2	39.0	-8.0	6.0	0.2	-28.2	1.6	1.3
Growth rates													
2014	4.0	7.6	-6.5	1.3	15.3	2.6	8.2	-7.4	-0.1	-36.3	7.1	3.7	7.4
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	6.6	10.1	-7.6	0.2	2.1	5.2	10.9	-6.7	0.7	-29.9	3.2	-13.0	5.1
2016 Q4	6.6	10.1	-7.6	0.2	2.1	5.2	10.9	-6.7	0.7	-29.9	3.2	-13.0	5.1
2017 Q1	7.8	11.4	-5.5	-0.3	-32.6	5.3	11.4	-10.1	1.0	1.6	1.4	-13.0	4.2
Q2	8.1	11.2	-4.3	0.4	-21.4	4.8	10.7	-12.4	1.3	-25.3	3.2	-6.2	6.1
Q3	8.1	11.8	-7.4	1.1	-42.3	4.6	9.9	-12.6	1.6	-25.3	5.7	-2.0	8.9
2017 May	7.4	10.7	-5.8	0.5	-22.3	5.1	11.1	-11.7	1.3	-24.3	2.7	-9.5	5.2
June	8.1	11.2	-4.3	0.4	-21.4	4.8	10.7	-12.4	1.3	-25.3	3.2	-6.2	6.1
July	7.6	10.7	-5.4	1.1	-25.2	4.5	10.1	-12.6	1.4	-29.9	4.4	-9.3	6.6
Aug.	8.1	11.3	-5.1	1.6	-32.2	4.5	9.9	-12.4	1.5	-28.8	6.4	-5.9	8.7
Sep.	8.1	11.8	-7.4	1.1	-42.3	4.6	9.9	-12.6	1.6	-25.3	5.7	-2.0	8.9
Oct. [p)]	8.3	11.8	-7.2	1.7	-21.7	4.8	10.1	-12.9	1.8	-21.7	4.7	-1.5	7.6

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) Refers to the general government sector excluding central government.

5 Money and credit

5.3 Credit to euro area residents [1)]

(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								
					Loans						Debt securities	Equity and non-money market fund investment fund shares
					Total		To non-financial corporations [3)]	To households [4)]	To financial corporations other than MFIs and ICPFs [3)]	To insurance corporations and pension funds		
	Total	Loans	Debt securities	Total		Adjusted loans [2)]						
	1	2	3	4	5	6	7	8	9	10	11	12
Outstanding amounts												
2014	3,613.5	1,136.1	2,475.2	12,509.1	10,454.5	10,724.6	4,317.2	5,201.5	806.6	129.2	1,282.2	772.5
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	12,839.2	10,669.8	10,977.6	4,312.7	5,409.7	834.6	112.7	1,385.4	784.0
2016 Q4	4,393.6	1,083.3	3,297.1	12,839.2	10,669.8	10,977.6	4,312.7	5,409.7	834.6	112.7	1,385.4	784.0
2017 Q1	4,434.5	1,071.6	3,348.8	12,967.5	10,751.7	11,045.5	4,332.0	5,456.6	850.3	112.9	1,423.2	792.6
Q2	4,463.9	1,064.5	3,385.2	12,963.9	10,729.7	11,046.9	4,299.9	5,485.1	832.1	112.7	1,437.8	796.3
Q3	4,548.3	1,050.5	3,483.7	13,016.4	10,783.7	11,101.9	4,303.0	5,524.1	844.8	111.9	1,438.8	793.9
2017 May	4,475.9	1,066.4	3,395.1	12,977.5	10,747.8	11,060.1	4,338.9	5,472.8	824.5	111.6	1,437.6	792.1
June	4,463.9	1,064.5	3,385.2	12,963.9	10,729.7	11,046.9	4,299.9	5,485.1	832.1	112.7	1,437.8	796.3
July	4,496.7	1,058.1	3,424.3	12,985.3	10,735.4	11,070.2	4,303.5	5,485.5	832.2	114.2	1,455.2	794.7
Aug.	4,541.5	1,057.1	3,470.0	12,991.9	10,761.2	11,083.5	4,304.1	5,507.1	835.4	114.7	1,440.5	790.2
Sep.	4,548.3	1,050.5	3,483.7	13,016.4	10,783.7	11,101.9	4,303.0	5,524.1	844.8	111.9	1,438.8	793.9
Oct. [p]	4,557.9	1,044.8	3,499.3	13,070.6	10,837.4	11,154.3	4,330.0	5,534.4	860.9	112.1	1,433.0	800.2
Transactions												
2014	73.3	16.7	56.6	-99.8	-47.0	-32.8	-60.6	-14.6	16.3	11.8	-89.7	36.9
2015	295.3	-21.0	316.0	83.0	55.9	77.0	-15.0	98.5	-22.0	-5.7	25.6	1.5
2016	488.3	-34.6	522.8	316.4	233.6	258.0	81.7	119.5	43.6	-11.1	78.7	4.1
2016 Q4	152.6	-17.2	170.0	80.6	60.3	68.3	15.4	37.5	4.7	2.7	18.2	2.0
2017 Q1	77.4	-11.1	88.0	143.3	96.4	86.4	26.5	49.1	20.6	0.2	36.7	10.1
Q2	34.6	-5.2	39.8	57.3	26.1	48.3	-1.1	37.8	-10.5	0.0	19.4	11.8
Q3	88.7	-10.8	99.6	77.8	79.5	86.6	21.4	44.0	14.7	-0.7	2.1	-3.9
2017 May	16.9	-3.2	20.0	29.3	15.2	24.5	8.5	9.3	-0.4	-2.2	13.9	0.2
June	-8.5	-2.5	-5.8	28.3	11.6	15.8	-16.7	17.0	10.2	1.1	4.4	12.3
July	32.9	-6.0	38.8	34.1	18.2	37.0	11.7	1.6	3.4	1.5	18.1	-2.2
Aug.	39.3	-1.3	40.5	18.5	34.2	22.4	5.3	23.7	4.7	0.6	-14.4	-1.2
Sep.	16.5	-3.5	20.3	25.1	27.2	27.1	4.5	18.7	6.7	-2.8	-1.5	-0.5
Oct. [p]	3.0	-5.7	8.9	47.5	53.3	53.3	27.2	11.1	14.8	0.2	-8.7	2.8
Growth rates												
2014	2.1	1.5	2.4	-0.8	-0.4	-0.3	-1.4	-0.3	1.7	11.9	-6.6	4.6
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
2016 Q4	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 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
2017 May	9.6	-4.8	15.0	2.9	2.2	2.7	1.6	2.7	2.3	0.3	8.1	3.9
June	8.2	-3.8	12.6	3.1	2.4	2.5	1.2	3.0	3.7	8.4	7.2	6.4
July	7.7	-4.1	11.9	3.0	2.2	2.6	1.2	2.9	3.4	3.6	7.5	5.6
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. [p]	7.4	-4.2	11.5	2.9	2.7	2.9	1.7	3.2	4.7	-1.6	4.4	2.8

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 [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)]				
	Total		Up to 1 year	Over 1 and up to 5 years	Over 5 years	Total		Loans for consumption	Loans for house purchase	Other loans
		Adjusted loans [4)]					Adjusted loans [4)]			
	1	2	3	4	5	6	7	8	9	10
Outstanding amounts										
2014	4,317.2	4,269.8	1,112.3	724.5	2,480.4	5,201.5	5,546.5	563.0	3,861.7	776.9
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	4,312.7	4,312.2	1,001.2	797.8	2,513.6	5,409.7	5,726.4	615.2	4,046.2	748.4
2016 Q4	4,312.7	4,312.2	1,001.2	797.8	2,513.6	5,409.7	5,726.4	615.2	4,046.2	748.4
2017 Q1	4,332.0	4,333.1	1,005.1	802.6	2,524.3	5,456.6	5,767.6	626.4	4,085.7	744.5
Q2	4,299.9	4,314.1	988.8	798.6	2,512.5	5,485.1	5,797.5	635.0	4,112.9	737.1
Q3	4,303.0	4,324.3	976.4	812.4	2,514.2	5,524.1	5,828.8	644.4	4,148.7	730.9
2017 May	4,338.9	4,345.7	1,000.4	804.3	2,534.2	5,472.8	5,790.8	634.8	4,097.0	741.0
June	4,299.9	4,314.1	988.8	798.6	2,512.5	5,485.1	5,797.5	635.0	4,112.9	737.1
July	4,303.5	4,325.6	984.4	802.7	2,516.4	5,485.5	5,809.1	639.4	4,112.0	734.0
Aug.	4,304.1	4,325.9	980.9	804.9	2,518.2	5,507.1	5,818.8	642.5	4,132.0	732.6
Sep.	4,303.0	4,324.3	976.4	812.4	2,514.2	5,524.1	5,828.8	644.4	4,148.7	730.9
Oct. [p)]	4,330.0	4,350.7	990.7	816.4	2,522.9	5,534.4	5,840.2	647.2	4,156.6	730.7
Transactions										
2014	-60.6	-67.1	-14.1	2.5	-49.0	-14.6	6.0	-3.0	-2.9	-8.6
2015	-15.0	23.7	-62.1	31.9	15.2	98.5	77.0	21.8	80.2	-3.5
2016	81.7	98.6	-17.3	44.3	54.7	119.5	114.3	23.5	105.2	-9.2
2016 Q4	15.4	29.7	-10.6	7.7	18.2	37.5	33.1	9.0	32.2	-3.7
2017 Q1	26.5	31.4	6.2	6.4	14.0	49.1	43.4	11.1	38.9	-0.8
Q2	-1.1	10.1	-2.8	2.1	-0.4	37.8	40.2	10.5	27.9	-0.6
Q3	21.4	33.4	-6.1	17.1	10.4	44.0	35.9	10.9	36.7	-3.6
2017 May	8.5	9.2	4.4	1.1	3.1	9.3	15.5	6.5	2.3	0.5
June	-16.7	-9.7	-3.9	-2.3	-10.4	17.0	11.7	1.5	15.6	-0.1
July	11.7	20.5	-1.1	5.8	7.0	1.6	12.7	4.8	-0.6	-2.6
Aug.	5.3	5.3	-1.5	3.4	3.4	23.7	11.9	3.6	20.4	-0.3
Sep.	4.5	7.5	-3.4	8.0	0.0	18.7	11.3	2.5	16.9	-0.7
Oct. [p)]	27.2	27.6	14.2	4.3	8.7	11.1	12.5	3.1	7.9	0.1
Growth rates										
2014	-1.4	-1.5	-1.3	0.3	-1.9	-0.3	0.1	-0.5	-0.1	-1.1
2015	-0.3	0.6	-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
2016 Q4	1.9	2.3	-1.7	5.8	2.2	2.3	2.0	4.0	2.7	-1.2
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	-2.6	3.8	2.0	3.0	2.6	6.0	3.3	-1.1
Q3	1.5	2.4	-1.3	4.2	1.7	3.1	2.7	6.8	3.4	-1.2
2017 May	1.6	2.5	-2.6	4.9	2.3	2.7	2.6	6.3	2.9	-1.0
June	1.2	2.0	-2.6	3.8	2.0	3.0	2.6	6.0	3.3	-1.1
July	1.2	2.3	-2.2	3.7	1.8	2.9	2.6	6.7	3.1	-1.4
Aug.	1.4	2.4	-1.8	3.8	1.9	3.1	2.7	6.7	3.3	-1.3
Sep.	1.5	2.4	-1.3	4.2	1.7	3.1	2.7	6.8	3.4	-1.2
Oct. [p)]	1.7	2.9	-0.8	4.5	1.9	3.2	2.7	6.7	3.4	-1.0

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 [1)]

(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 [2)]	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 counter-parties [3)]	Reverse repos to central counter-parties [3)]
	1	2	3	4	5	6	7	8	9	10
Outstanding amounts										
2014	269.6	7,132.9	2,186.3	92.4	2,392.6	2,461.5	1,386.3	233.4	184.5	139.7
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	314.4	6,923.8	2,054.1	70.9	2,146.7	2,652.2	1,136.9	265.4	205.9	121.6
2016 Q4	314.4	6,923.8	2,054.1	70.9	2,146.7	2,652.2	1,136.9	265.4	205.9	121.6
2017 Q1	308.2	6,881.1	2,031.7	69.3	2,106.5	2,673.6	1,104.0	254.7	183.1	111.8
Q2	305.7	6,766.4	2,002.0	66.8	2,066.4	2,631.2	1,030.0	248.3	154.2	109.7
Q3	365.3	6,700.4	1,977.1	61.5	2,016.2	2,645.7	1,023.9	262.9	140.6	85.4
2017 May	315.5	6,832.1	2,014.7	66.9	2,080.8	2,669.7	1,047.4	246.2	162.4	104.3
June	305.7	6,766.4	2,002.0	66.8	2,066.4	2,631.2	1,030.0	248.3	154.2	109.7
July	324.7	6,722.5	1,991.0	63.3	2,052.9	2,615.3	1,042.3	196.8	128.1	76.4
Aug.	348.3	6,726.5	1,982.2	62.5	2,036.2	2,645.7	1,029.5	252.0	124.4	69.0
Sep.	365.3	6,700.4	1,977.1	61.5	2,016.2	2,645.7	1,023.9	262.9	140.6	85.4
Oct. [p]	341.7	6,697.9	1,961.3	60.8	2,013.3	2,662.5	968.3	246.8	154.2	109.5
Transactions										
2014	-3.2	-170.8	-120.8	2.1	-160.1	108.0	238.5	-6.2	0.7	17.8
2015	8.9	-216.1	-106.3	-13.5	-215.4	119.0	-86.0	-13.3	21.4	-4.0
2016	26.7	-110.2	-70.2	-9.1	-110.5	79.6	-276.2	-72.5	12.8	-12.0
2016 Q4	12.1	-6.1	-20.2	-2.2	-12.0	28.3	-42.9	-38.0	-0.2	-7.5
2017 Q1	-7.5	-16.2	-16.3	-1.5	-27.3	28.9	-33.6	-31.9	-21.6	-9.1
Q2	-2.6	-10.0	-22.1	-2.4	-2.6	17.1	-15.1	4.6	-28.9	-2.1
Q3	65.0	-17.4	-22.0	-2.9	-29.7	37.2	24.3	17.5	-13.6	-24.3
2017 May	-15.3	9.2	-6.0	-2.4	9.4	8.1	-19.7	13.5	-13.0	0.6
June	-9.9	-10.2	-8.9	-0.1	-4.5	3.3	6.6	-3.8	-8.2	5.4
July	19.1	-5.6	-8.9	-1.1	0.1	4.3	31.6	-38.4	-26.0	-33.3
Aug.	23.5	-0.2	-7.8	-0.8	-9.2	17.5	-13.6	47.5	-3.7	-7.5
Sep.	22.4	-11.5	-5.3	-1.0	-20.6	15.4	6.3	8.3	16.2	16.5
Oct. [p]	-23.5	-13.9	-16.6	-0.7	-8.9	12.3	-63.3	-12.8	13.6	24.0
Growth rates										
2014	-1.4	-2.3	-5.1	2.3	-6.3	4.5	-	-	0.4	14.6
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	3.0	-	-	6.3	-9.0
2016 Q4	9.4	-1.6	-3.3	-11.5	-4.9	3.0	-	-	6.3	-9.0
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	3.5	-	-	-30.7	-22.6
Q3	22.1	-0.7	-3.9	-12.5	-3.4	4.3	-	-	-31.2	-33.4
2017 May	3.9	-1.2	-4.3	-11.6	-3.9	3.9	-	-	-23.4	-23.6
June	-7.7	-1.1	-3.9	-10.9	-3.7	3.5	-	-	-30.7	-22.6
July	-2.4	-0.8	-4.0	-11.5	-2.8	3.5	-	-	-35.6	-39.5
Aug.	9.0	-0.8	-4.1	-11.8	-2.9	3.9	-	-	-38.2	-48.0
Sep.	22.1	-0.7	-3.9	-12.5	-3.4	4.3	-	-	-31.2	-33.4
Oct. [p]	8.6	-1.0	-4.6	-12.6	-3.6	4.1	-	-	-19.6	-17.6

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	Socual 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 Q3	-1.8	.	.	.	.	0.5
Q4	-1.5	.	.	.	.	0.6
2017 Q1	-1.3	.	.	.	.	0.8
Q2	-1.3	.	.	.	.	0.9

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				Compen-sation 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 Q3	46.1	45.6	12.5	13.0	15.3	0.5	47.9	44.1	10.0	5.2	2.2	22.7	3.8
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	0.4	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	43.9	9.9	5.1	2.1	22.7	3.5

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	MFIs	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 curren-cies
	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 Q3	89.7	2.7	15.6	71.4	.	.	.	.	.	.	.	.	.	.
Q4	88.9	2.7	15.4	70.8	.	.	.	.	.	.	.	.	.	.
2017 Q1	89.2	2.6	15.1	71.4	.	.	.	.	.	.	.	.	.	.
Q2	89.1	2.7	14.8	71.5	.	.	.	.	.	.	.	.	.	.

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 [1)]

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

	Change in debt-to-GDP ratio [2)]	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 Q3	-1.4	-0.5	-0.5	-0.2	0.2	-0.1	-0.3	0.0	-0.2	-0.1	-0.4	1.5
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	-0.1	-0.1	0.0	0.2	-0.3	-0.2	-0.3	1.0
Q2	-1.7	-0.9	-0.7	-0.3	-0.2	-0.1	-0.1	0.1	-0.2	-0.1	-0.2	0.8

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 [1)]

(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 [2)]					Average residual maturity in years [3)]	Average nominal yields [4)]						
	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	4	5	6	7	8	9	10	11	12	13
2014	15.8	13.8	5.1	2.0	0.5	6.4	3.1	1.6	0.4	3.5	2.8	0.8	1.6
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	6.8	2.6	1.2	-0.1	3.0	2.9	0.2	1.2
2016 Q3	14.4	12.7	4.0	1.7	0.4	6.8	2.6	1.3	-0.1	3.1	2.8	0.2	1.2
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
2017 May	14.4	12.7	4.3	1.7	0.4	7.0	2.5	1.2	-0.2	2.9	2.6	0.1	1.2
June	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
July	13.9	12.2	4.3	1.7	0.4	7.1	2.5	1.2	-0.2	2.9	2.6	0.2	1.3
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.	13.2	11.6	3.8	1.7	0.4	7.2	2.4	1.1	-0.2	2.8	2.5	0.2	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	Germany	Estonia	Ireland	Greece	Spain	France	Italy	Cyprus
	1	2	3	4	5	6	7	8	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 Q3	-2.8	0.6	0.3	-1.6	-1.9	-4.9	-3.3	-2.4	-1.0
Q4	-2.5	0.8	-0.3	-0.7	0.4	-4.5	-3.4	-2.5	0.5
2017 Q1	-2.0	1.0	-0.5	-0.5	1.0	-4.1	-3.4	-2.4	0.8
Q2	-1.5	0.8	-0.5	-0.6	1.0	-3.6	-3.3	-2.4	1.0
	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 Q3	108.8	69.2	9.5	75.1	176.4	99.9	97.4	132.1	111.5
Q4	106.1	68.1	9.4	72.8	179.1	99.0	96.5	132.0	108.5
2017 Q1	107.8	66.6	9.2	74.7	176.2	99.9	98.8	134.0	107.6
Q2	106.6	66.0	8.9	74.3	175.0	99.8	99.3	134.7	107.6

	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Austria	Portugal	Slovenia	Slovakia	Finland
	10	11	12	13	14	15	16	17	18	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 Q3	0.2	0.3	1.6	0.9	-0.4	-0.7	-3.7	-1.8	-2.4	-2.0
Q4	0.0	0.3	1.6	1.1	0.4	-1.6	-2.0	-1.9	-2.2	-1.7
2017 Q1	-0.1	0.7	0.5	2.3	1.0	-1.2	-1.6	-1.4	-1.9	-1.5
Q2	0.4	0.7	0.4	2.0	1.1	-1.3	-1.4	-1.2	-1.7	-0.9
	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 Q3	38.3	41.2	21.6	59.3	61.5	82.7	132.8	81.7	52.7	61.6
Q4	40.5	40.1	20.8	57.6	61.8	83.6	130.1	78.5	51.9	63.1
2017 Q1	39.4	39.2	23.9	58.1	59.6	81.7	130.4	80.2	53.5	62.6
Q2	40.0	41.7	23.4	56.8	58.7	81.4	132.1	79.8	51.8	61.8

Source: Eurostat.

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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 13 December 2017.

ISSN	2363-3417 (html)	DOI	10.2866/81373 (html)
ISSN	2363-3417 (pdf)	DOI	10.2866/81373 (pdf)
EU catalogue No	QB-BP-17-008-EN-Q (html)		
EU catalogue No	QB-BP-17-008-EN-N (pdf)		